Interactions Used by Instructors in E-Learning Environments
Fernando Mortera-Gutierrez, Ph.D.

Abstract
The literature on interaction in distance education shows that different types of instructional design methods and delivery technologies allow for differing degrees of interaction, instructional practices, and teaching strategies. While many studies have focused on the role of distance learners (e.g., learner interactions, learner-centered instruction, learner attitudes), there has been comparatively little focus on instructional strategies and interactions used by instructors who teach at a distance. These eLearning instructors share sets of interactions, instructional practices, and teaching strategies that differ from those of their students. This article proposes that instructors’ educational paradigms, personal teaching styles, and previous distance learning experience indicate the degree of interaction used in their teaching in eLearning environments.

Introduction
Currently, eLearning (Hirumi, 2002) has been defined as a learning activity facilitated predominantly through the use of telecommunication technologies such as electronic mail, electronic bulletin board systems, chat, desktop videoconferencing, and the World Wide Web (Web). With the spread of eLearning, researchers have claimed that distance education requires specific instructional design strategies, interactions, and skills that correspond with the characteristics of particular distance learning programs and courses (Cyrs, 1997a; McIsaac &
In addition to these strategies and skills, researchers claim that a theoretical instructional design base is essential for teaching effectively at a distance. Moore and Thompson affirmed,

... distance education is much more than simply adding a new communications technology to an existing educational organization. Major pedagogical, instructional, and philosophical implications result from the learner or learners being more or less permanently separated from the teacher. (Moore and Thompson, 1997, p. 2).

Willis (1998) explained that instructional design in the field of distance education

... provides a process and framework for systematically planning, developing, and adapting instruction based on identifiable learner needs and content requirements. This process is essential in distance education, where the instructor and students may share limited common background and typically have minimal face-to-face contact. (Willis, 1998).

Kodali (1998) identified diverse instructional design models used in online courses, which are built around the main components of the instructional process itself: instructional analysis; identification of learning objectives and goals; analysis of instructional content; selection and implementation of instructional strategies and delivery; selection of learning materials; instructional management; and evaluation and assessment. Kodali discovered that although different instructional design models used these components in varied ways, each model consisted of three basic components identified by Reigeluth and Merrill (1979: *conditions, methods, and outcomes*).

Researchers have identified additional key elements in the design of distance learning programs and courses, including instructor interactions, communication skills, and learning principles (Cyrs, 1997b; Moore & Kearsley, 1996), because distance learning instruction encompasses “planning, teaching, interacting, learning, and assessment” (Rossman & Rossman, 1995, p. 26). According to these views, the distance learning instructional elements are more
comprehensive than those included in the traditional view of instruction typically used in face-to-face settings (Reigeluth, 1983). Besser and Bonn (1996) warned, “educators must not see distance education as a universal innovation applicable to all types of instructional situations, but must carefully analyze the appropriateness of distance independent learning to various types of instructional situations” (p. 7). What differentiates distance education from traditional face-to-face education is its pertinence to different types of instructional design situations, especially in the type of interactions, skills and teaching strategies used to engage and motivate the learner at a distance.

A dimension that makes distance education design even more complex is the instructor's paradigmatic approach (e.g., behaviorist, constructivist, or systemic), which affect how interaction and design influence instruction and teaching at a distance. These paradigmatic approaches have major consequences for instructional design and learner outcomes, serving “as conceptual and communication tools for analyzing, designing, creating and evaluating, ranging from broad educational environments to narrow training applications” (Gustafson & Branch, 1997, p. 76). Therefore, in distance education, the different instructional design models are influenced by diverse factors (e.g., instructional design components, instructor strategies, and educational paradigmatic approaches), which determine the amount and quality of interaction and instruction between instructors and their distant learners.

In particular, the field of distance education lacks research on the implications of relationships between distance education instructional design models and instructor interactions--practices and skills--at a distance. Researchers criticize the literature in distance education because of lack of research rigor (McIsaac & Gunawardena, 1996) and call for more qualitative research (Windschitl, 1998). Except for anecdotal reports and a growing body of literature on
faculty development procedures within distance education (Willis, 1994a), little information is available about the effects of improvement efforts, or on the actual skill acquisition of distance education faculty (Thach & Murphy, 1995). More recent research, however, substantiates the paucity of instructor training with interactive videoconference (Taylor, 1999).

Therefore, the few scattered studies about instructional design strategies, teaching practices and interactions used by distance learning instructors create an urgent need to study such type of instructional practices and interactions in more detail. While considerable research has concentrated on the role of the distance learner during the learning process (e.g., learner-centered instruction, learners' perceptions) (Moore & Kearsley, 1996; Schlosser & Anderson, 1994), comparatively little attention has been paid to instructional design practices, skills and interactions used by distance instructors (Thach & Murphy, 1995). As a result, little is known about the ways in which educators enhance their own instructional design performance over time.

**Instructor Interactions at a Distance**

Garrison (1989) identified two-way interaction as a critical feature of the educational process. Interaction is necessary not only for learners to receive feedback on their progress but also to engage the learners in active learning. Research indicates that higher levels of interaction typically lead to more positive attitudes toward and greater satisfaction with learning (Hackman & Walker, 1990).

Wagner (1994) cautioned that two-way interactive technologies (e.g., video, audio, audiographics, and computer conferencing), "while capable of providing two-way interactivity,
still depend on user skill to successfully bring about interaction in an instructional context” (p. 9). Research on interaction in distance education reveals that different types of instructional design models and delivery technologies allow for differing degrees of interaction (Hanson et al., 1996). Interactions in distance learning are an important component for the delivery and development of instruction.

The current distance education literature addresses distance interaction from the learner's perspective. As Hirumi (2002) describes, interaction typically emphasizes the interaction occurring between the learner and the content, the learner and the instructor, and the learner with other learners (Moore, 1989). More recently it has been noted that the interaction between learners and the technology, particularly with high technology communication devices, is critical (Hillman, Willis, & Gunawardena, 1994). Hence, the four typical types of interaction for distance learners are: (a) learner-content, (b) learner-instructor, (c) learner-learner, and (d) learner-technology. However, distance instructors develop similar, although relatively different, instructional interactions: (a) instructor-learner, (b) instructor-content, and (c) instructor-technology (Mortera & Murphy, 2000) (see Table 1).

<table>
<thead>
<tr>
<th>Table 1</th>
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<tbody>
<tr>
<td><strong>Traditional View of Interactions in Distance Education</strong></td>
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<tr>
<td><strong>Learner Interactions</strong></td>
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<tr>
<td>Learner-Instructor</td>
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<tr>
<td>Learner-Learner</td>
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<tr>
<td>Learner-Content</td>
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<td>Learner-Technology</td>
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The literature on distance interactions explains them as a result of a transactional distance situation, a learner control factor, and immediacy and intimacy in terms of social presence (McIsaac & Gunawardena, 1996).
According to McIsaac and Gunawardena (1996), these instructional interactions are complex processes that instructional designers must keep in mind to produce effective, efficient, and quality distance education courses. Transactional distance, social presence, and learner control are described by the authors as three critical factors that directly affect instructional interactions at a distance. *Transactional distance*, according to Moore (1993), is the distance that exists in every educational relationship. This distance is established by the amount of dialogue occurring between the learner and the instructor, and the extent of structure that exists in the design of a course.

The theory of transactional distance (Moore, 1993) has impacted both distance education and online teaching and learning in its focus on the psychological and communications space that takes place among three elements: *structure of instructional programs, dialogue among instructor and learners, and the nature and degree of self-directedness of the learner*. This pedagogical distance ranges from high to low: high transactional distance indicates that the educational setting is highly structured with limited dialogue; low transactional distance indicates limited structure with high levels of dialogue. On the other hand, *social presence* is a strong communication component that reduces isolation between the distant learner and other learners and instructor. Lack of social presence might affect learner's performance and outcomes during the instructional transaction (Short, Williams, & Christie, 1976). McIsaac and Gunawardena (1996) explain that social presence is "the degree to which a person is perceived as a 'real person' in a mediated situation" (p. 427). The notion is that social presence can be transferred both by the medium itself and by the people using the medium for interaction. Transactional distance and social presence are strongly interrelated and together influence the learner's control of the learning process. *Learner control* is a chief factor in establishing positive
or negative instructional interactions between the distant learner and the instructor. Learner control implies independence, competence, and support during distance interactions (Garrison & Baynton, 1987). As described by Saba (2000), interaction in distance education needs more analysis and discussion in future studies, especially in the areas of instructional strategies and teaching practices among distance instructors.

Morera (1999) discovered that instructional interactions in distance education are the different teaching-learning intercommunication ways among distance instructors and distance learners, where information and resources are shared in real and delayed time during the instructional and learning processes. Instructional interactions are based on the different kind of students, types of institutions, cost, telecommunications technology used, instructional design models applied, course content, and course material, and instructor skills and behavior. Instructors’ personal and unique styles determine their dynamic instructional interactions in each given case. Therefore, it is evident that the huge universe of interactions developed during the delivery of instruction in distance education courses can play an important role during the implementation of instructional strategies and teaching practices at a distance.

Morera (1999) further discovered that distance learning instructors develop instructional interactions that are similar to, although relatively different from, the learner’s perspective, and posited the existence of four new types of interactions for instructors: (a) instructor-facilitator, (b) instructor-peers, (c) instructor-support staff and technical personnel, and (d) instructor-organization. In addition, instructors continue to use the three traditional types of interactions: (a) instructor-learner, (b) instructor-content, and (c) instructor-technology (see Table 2). A major finding of Mortera’s study was that the types of instructional interactions vary depending on the point of view of the “key players” (Willis, 1994b): learners,
instructors, facilitators, authorities, and administrative and technical staff. Each of these players can develop distinct types of distance interaction. Table 2 shows the types of interactions that instructors ordinarily develop when they are engaged in distance education courses and programs.

Table 2
Instructor Interactions in Distance Education

<table>
<thead>
<tr>
<th>Instructor Interactions</th>
<th>Perspectives</th>
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<tbody>
<tr>
<td>Instructor-Learner</td>
<td>(traditional perspective)</td>
</tr>
<tr>
<td>Instructor-Content</td>
<td>(traditional perspective)</td>
</tr>
<tr>
<td>Instructor-Technology</td>
<td>(traditional perspective)</td>
</tr>
<tr>
<td>Instructor-Facilitator</td>
<td>(new perspective)</td>
</tr>
<tr>
<td>Instructor-Peers</td>
<td>(new perspective)</td>
</tr>
<tr>
<td>Instructor-Support Staff &amp; Technical Personnel</td>
<td>(new perspective)</td>
</tr>
<tr>
<td>Instructor-Institution (authorities)</td>
<td>(new perspective)</td>
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The conceptualization of just one perspective (i.e., the learner's viewpoint) does not allow for understanding of all interaction and intercommunication phenomena within distance education environments. It is necessary to visualize the other types of interactions and intercommunication from the perspective of their different actors. Mortera's (1999) study found that instructors used particular methods of interaction with their eLearners as well as with the content, technology, far-site facilitators, peers, support staff and technical personnel, and institutional authorities.

Further studies will be necessary to create a theoretical framework of instructor interactions at a distance to understand their implications. However, the identification of instructor interactions as a distinctive realm within the interaction process itself is a key contribution to the discussion of instructional design factors, strategies and teaching practices influencing distance education programs and courses. Table 3 shows a comparison of the types
of interactions that learners and instructors usually develop when they are engaged in distance education courses and programs.

### Table 3  
Interactions in eLearning: Learner and Instructor Perspectives

<table>
<thead>
<tr>
<th>Learner's Perspective</th>
<th>Instructor's Perspective</th>
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<tr>
<td>Learner-Instructor</td>
<td>Instructor-Learner</td>
</tr>
<tr>
<td>Learner-Learner</td>
<td>Instructor-Content</td>
</tr>
<tr>
<td>Learner-Content</td>
<td>Instructor-Technology</td>
</tr>
<tr>
<td>Learner-Technology</td>
<td>Instructor-Facilitator</td>
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<tr>
<td></td>
<td>Instructor-Peers</td>
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<tr>
<td></td>
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<tr>
<td></td>
<td>Instructor-Institution (authorities)</td>
</tr>
</tbody>
</table>

### Instructional Practices and Teaching Strategies

Mortera’s (1999) research findings point to a new dimension of processes related to instructors’ interactions at a distance and instructional design components: *specific instructional design practices and teaching strategies used by instructors at a distance*. Instructional design practices and strategies in distance education are the diverse instructional actions and learning activities implemented during a given distance learning situation, whereas different instructional design components and educational paradigms are applied by the instructor to the learners. Teaching and delivery of distance education courses seem to imply a myriad of different instructional design practices and strategies (Mortera, 1999).

As Hirumi (2002) states, the types of interactions implemented by instructional and teaching practices are basic strategies within the instructional design process itself. Instructional implementation is concerned with understanding, improving, and applying methods of instruction into different learning environments. Different kinds of instructional practices and strategies based on learning interactions include strategies to increase participation, develop
communication, receive feedback, enhance collaboration and retention, and support learner control/self-regulation (Cyrs, 1997b). A literature review of instructional design in distance education revealed the following instructional practices and teaching strategies typically used by instructors at a distance: organizing and planning, communicating, delivering, managing, developing learning activities, motivating students, giving feedback and supervising, and evaluating and assessing learning outcomes (Cyrs, 1997b; Moore, 1997; Murphy & Severn, 1998; Willis, 1994a). These types of instructional design practices and strategies are molded by the nature of distance learning environments and distance education interactions. Table 4 illustrates commonly used distance instructors’ types of instructional design strategies and teaching practices with examples of each.

<table>
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<tr>
<th>Types of Strategies and Teaching Practices</th>
<th>Examples of Strategies and Teaching Practices</th>
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<tbody>
<tr>
<td><strong>Organization and Planning</strong></td>
<td>Base on a needs assessment</td>
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<tr>
<td><strong>Communication</strong></td>
<td>Maintain continuous contact with eLearners</td>
</tr>
<tr>
<td><strong>Delivery</strong></td>
<td>Provide accessible instructional materials on time</td>
</tr>
<tr>
<td><strong>Management</strong></td>
<td>Provide transparent management systems; can also negotiate with eLearners</td>
</tr>
<tr>
<td><strong>Development of Learning Activities</strong></td>
<td>Adapt them based on recurring formative evaluation</td>
</tr>
<tr>
<td><strong>Motivation</strong></td>
<td>Arouse eLearners’ interest; encourage peer tutoring; increase self-esteem through positive reinforcement</td>
</tr>
<tr>
<td><strong>Feedback and Support</strong></td>
<td>Give ongoing feedback to eLearners; involve support staff and administrators for support</td>
</tr>
<tr>
<td><strong>Evaluation and Assessment</strong></td>
<td>Base criteria on learner objectives and on each learner's unique and individual characteristics</td>
</tr>
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</table>

**Conclusions**

A literature review on instructional design practices and teaching strategies (Willis, 1994a; McIsaac & Gunawardena, 1996; Moore, 1997; Cyrs, 1997b,) revealed a myriad of
possibilities highly developed by instructors and teachers despite the technological and institutional constraints existing in the distance education world. These practices and strategies are based on the following factors: the kind of distance interaction developed; the content and learning objectives and goals of each distance learning course and program; and mainly an instructor's educational paradigm, personal style of teaching, and previous distance learning experience and skills. Mortera’s (1999) research suggested that instructors with broad experience in distance education are likely to be more effective in interacting with distant students, designing the course content, and using technology than are instructors with limited distance education experience.

However, these practices and strategies do not necessarily represent those described as desirable in the literature on distance education and instructional design. In spite of evidence to the contrary, "educators stubbornly persist in replicating face-to-face instructional experiences via technology" (Wagner, 1994, p. 8). Similarly, in depicting the “ideal online course,” Carr-Chellman and Duchastel (2000) charged that the web is simply being used as a medium for the delivery of instruction created within another framework” (p. 229). In support of these views, Mortera and Murphy (2000) described inexperienced distance instructors’ tendencies to reconstruct their previous face-to-face learning experiences. Instructors unable to reconstruct the face-to-face environment became frustrated and disappointed, whereas those who were successful were satisfied with their old frames of reference (Mortera & Murphy, 2000). Regressing to face-to-face modes of instruction has been found in instructional practices, distance interactions, and delivery strategies at a distance, which minimize the potential for desirable and positive distance learning course interactions.
Instructors’ previous experiences with both face-to-face and distance learning tend to shape the purpose, sequence, and ways they implement instructional design variables. This conclusion stresses the need for developing unique instructional design models for distance education courses. There are unique distance education characteristics that have to be properly addressed and have to be faced to avoid the reproduction of the traditional face-to-face way to teach at a distance. This hypothesis needs to be verified in future research.

On the other hand, instructional design practices and strategies tend to follow the Reigeluth and Merrill (1979) and Moore (1997) instructional implementation concepts, which are concerned with understanding, improving, and applying methods of instruction into different learning environments. However, Mortera (1999) identified two major strategies for developing distance courses: One strategy is based on the course content and presented in the syllabus, which defines what to do, when, and how. The second strategy is based on an instructional analysis of student needs, telecommunications technology, conditions of learning environments, and identification of learning objectives and goals to decide what to do, when, and how. Mortera suggested that great numbers of distance courses are not planned in advance of the semester and they develop an “instructional implementation- improvisation style.” Also, there are courses that adhere to neither the syllabus or to an instructional analysis are likely to result in total chaos.

Instructional design practices and teaching strategies commonly are based on the distance delivery technology used, whether videoconferencing or web-based instruction. An important ingredient for developing these delivery instructional practices and strategies is the instructor's previous experience with distance delivery technology. Instructors with more experience on delivery technology deal with problems related to technology better and create solutions for
delivery problems faster and easier than the instructors with less or poor knowledge on telecommunications technology.

Finally, and the most important, it is that the learning-activities are the core of the instructional practices and teaching strategies. A variety of learning activities can be developed through the entire academic period in each course or program at a distance, from readings, group discussions, group assignments, group presentations, reflexive journals, students' personal portfolios, dialogues among students, to final papers, labs, and quizzes. Learning activities are designed depending on the educational philosophy of each instructor and personal and unique styles.

Acknowledgments

I want to express my sincere gratitude and acknowledgment to Dr. Karen Murphy (Texas A&M University), for her comments, suggestions, and contributions for this article.

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