

## **The Impact of Technology Use on Pre-service EFL Student Teachers' Perception of Types of Interaction**

**Hayat Rasheed Alamri, Ph.D.**

Assistant Professor of TEFL

College of Education

Taibah University

Al-Madinah Al-Munawwarah

Saudi Arabia

Mobile: +96654357030

E-mail: [hayatalamri@hotmail.com](mailto:hayatalamri@hotmail.com)

### **Abstract**

This research investigated the effects of e-course instruction on female pre-service EFL student teachers in the College of Education at Taibah University in terms of types of interactions: learner-content, learner-instructor, and learner-learner interactions.

The study sample consisted of 40 female pre-service EFL student teachers who were assigned to control and treatment groups based on their responses to demographic information sheet. Control group participants (n=20) received traditional face-to-face classroom instruction, and treatment group participants (n=20) received e-course instruction. The study instruments included a rubric for evaluating a class-related academic website; and a survey for measuring learner perceptions of interactions (i.e., learner-content, learner-instructor, and learner-learner). Results of the scatter-plot graphs and the General Linear Model Univariate analysis indicated adequate sample size and selection, normality population distribution, moderate linearity, and similar relationships between the covariate and the dependent variable for both study groups. The inferential statistics Analysis of Covariance (ANCOVA) tests were selected at alpha level of 0.05 of significance.

The results of ANCOVA tests revealed that differences in the effect of the e-course instruction on learner perceptions of interactions (overall and the three types of interaction) were statistically significant in favor of the treatment group. The results of Eta Squared also indicate large effect size values of the e-course instruction on all dependent variables associated with learner perceptions of interaction.

Recommendations based on these findings include: (a) colleges of education should consider planning and offering online courses in addition to the face-to-face courses and (b) higher education institutions should use learner interaction data to make positive changes in campus environments in order to create settings that are more conducive to learner development. In this sense, interaction may be considered an indicator of higher education institutions' responsiveness to learner needs and a measure of effectiveness, success, and vitality.

### **Introduction**

Online education can be defined as an innovative form of DE that delivers instruction to a remote audience, using computer networks as the main medium. The general purposes of online education are to: (a) increase access to education for individuals living far from schools at all levels, (b) remove barriers of time and space, and (c) develop a cost-effective approach to providing interactive learning opportunities for adults (Jung, 2001). The features of online DE provide rich opportunities for developing flexible, individualized instruction for distance learners, using the Web as

a primary delivery mode (Liu, 2003; Calvin, 2005). Learners can use online DE tools to exchange and retrieve information, data, images, audio, and video. In addition, two or more participants can communicate in real time, allowing learners to exchange ideas and interact with one or more peers or instructors at the same time. These changes are providing a new communication platform with better options for virtual instructors and learners (Hsu, 2004).

Adopting online DE as a medium of instruction is, in fact, a secondary issue; the main issue is to understand e-course-delivery technologies in a world that demands opportunities for continuous learning, flexibility, convenience, and accessibility to higher education. Thus, as part of the digital revolution, many online DE researchers are focusing on variables that affect online DE. Many studies have been designed to determine how e-courses provide learners with equivalent or higher levels of learning outcomes, achievement, attitudes and learning experiences compared to face-to-face classroom learners (Kennedy et al., 2002; Brooks, 2003; Culbertson et al, 2004; Ivankova & Stick, 2005;). Most research papers on online DE conducted in the Arab countries in general (Nasser & Abouchedid, 2000; Abu Azah, 2001) and in Saudi Arabia in particular (Al-Habis & Al-Kendary, 2000; Al-Sharhan, 2002) have focused on the same variables as those in western countries.

In contrast, few attempts have been made to study variables that affect instructors and learners' acceptance and adoption of online DE tools and methods, including learners' perception of types of interaction. Since the types of interaction are considered key elements of learners' success and effective teaching in face-to-face classroom settings, research attention needs to be given to the same variables regarding instruction via online courses (Piguet & Peraya, 2000; Hew & Cheung, 2003; Abdullah, 2004).

Learners in face-to-face classrooms can pose questions, make comments to their instructors, interact in verbal discussions, and collaborate in small groups. They may have a sense of belonging to the class environment or peers enrolled in the course. Moreover, learners may also develop a relationship with each other to discuss topics related to the class subject (Picciano, 2002). Further more, Picciano (2002) pointed out that the greater the interactivity among learners and between them and the instructors in the class, the more satisfied with learning experiences they would be.

Similar interactions are now taking place in e-courses, with a few important differences—for instance, interactions in asynchronous e-courses take place via online discussions, e-mail communications, audio/video conferencing, chat rooms, and group projects (Hammer, 2001; Farahani, 2003). In online setting, learners are able to: (a) contribute as much as they want at their own pace and time; (b) interact with no fear of wait- time and turn taking; (c) gain more self-control; and (d) increase their communication with instructors and peers (Archee, 2004; Hao, 2004).

## Statement of the Problem

Based on what had been mentioned above concerning the importance of interaction in classroom setting, the researcher, as an instructor in the College of Education, had noticed the weakness of undergraduate EFL student teachers, more specifically the seventh and eighth levels, in interacting and communicating with their instructors and peers inside the language classrooms. Although pre-service EFL student teachers -at these levels- are about to start their future career as teachers in the intermediate and secondary school levels, most of them face some sort of difficulties in interaction. They appear reluctant to participate in course content and unwilling to take the challenge to interact by asking questions, giving comments, sharing ideas, and/or speaking their minds. The researcher also noticed that the absence of oral interaction in the classroom from the part of the learners may result in many critical difficulties such as: their fear of instructor; peer frequent interruption; shyness of committing mistakes in pronunciation and language structure; lack of timely feedback from the instructor and classmates; and/or lack of encouragement to participate in classroom activities.

In order to support her observation, the researcher explored the pre-service EFL student teachers' perceptions of the interaction through a survey questionnaire that contains 3 questions about their personal opinions of their face-to-face learning environments. The questions explore the pre-service EFL student teachers' perceptions of their interaction with the content, the instructor, and peers.

A pre-pilot study was conducted with 239 participants in two sections of the *Methods of Teaching English (1)* course. The participants were assumed to be similar to the sample population of the study. When estimating the percentage of the questions regarding their perception of face-to-face classroom interaction, 22.2% of the participants reported their agreement of having a challengeable content which facilitates their communication, 50.6% reported their disagreement, and 27.2% agreed to some extent on the first question. The second question refers to learners having the opportunity in class to ask questions, give comments, and share ideas with the instructor. The responses of the participants reported 21.8% agreed, 49% disagreed, and 29.3% agreed to some extent on the question. The third question refers to learners working collaboratively in pairs or groups in classroom activities. Out of the total number of the participants, 35.1% reported their agreement, 41.4% indicated their disagreement, and 23.4% agreed to some extent on the question. The three questions of the questionnaire reflect learners' perceptions of interaction with the content, the instructor, and peers. Based on the percentage of the responses, it seems the pre-service EFL student teachers were lacking interaction in their face-to-face learning environments.

Furthermore, a good deal of studies (Irons et al., 2002; Thurmond, 2003; Alderman & Fletcher, 2005;) reported a shortage of research on the effect of e-courses on pre-service student teachers' perception of types of interaction. Hence, the current research investigated the effects of an e-course setting on the perception of types of interaction of female pre-service EFL student teachers in the College of Education at Taibah University in Al Madinah Al Munawwarah.

## Purposes of the Study

Based on the above discussion and background, the primary purpose of the present research was to investigate the effect of e-course on these three types of interaction: (a) learner-content, (b) learner-instructor, and (c) learner-learner interactions as perceived by female pre-service EFL student teachers in face-to-face and e-course treatments.

## Research Questions

**In harmony with the purpose of the study, the following research questions were posed:**

- 1. What are the effects of e-course instruction on female pre-service EFL student teachers who are primarily taught in a face-to-face classroom setting and those primarily taught in an e-course setting regarding their perceptions of types of interactions?**

Three sub-questions were derived from the first research question:

- 1.1. What are the effects of e-course instruction on female pre-service EFL student teachers who are primarily taught in a face-to-face classroom setting and those primarily taught in an e-course setting regarding their perceptions of learner-content interaction?
- 1.2. What are the effects of e-course instruction on female pre-service EFL student teachers who are primarily taught in a face-to-face classroom setting and those primarily taught in an e-course setting regarding their perceptions of learner-instructor interaction?
- 1.3. What are the effects of e-course instruction on female pre-service EFL student teachers who are primarily taught in a face-to-face classroom setting and those primarily taught in an e-course setting regarding their perceptions of learner-learner interaction?

## Significance of the Study

**The significance of the present research appeared in its attempts to:**

1. Provide insights into the perception of types of interaction that will help Saudi educators understand how female pre-service EFL student teachers participate and communicate in a technology-based foreign language education environment.

2. Provide better understanding of female pre-service EFL student teachers' perception of types of interaction with online learning environments that can help Saudi university leaders make informed decisions relevant to online teacher education programs.
3. Help colleges of education in Saudi universities to integrate e-courses into their teacher education programs.

## Definition of Terms

### Online Distance Learning

Due to [White \(2003, p.27\)](#), online DE has emerged more specifically to refer "an approach to teaching and learning that includes the use of Internet technologies for learning and teaching."

In the current research, *distance education (DE)*, *distance learning (DL)*, and *online distance learning (online DL)* will be used interchangeably. Online DL is defined as the educational setting in which instruction is delivered and supported by asynchronous (academic website, e-mail, and discussion group) and synchronous (text/voice chat room) delivery modes, through which female pre-service EFL student teachers are able to participate at any time and any place in order to learn.

### Online Course/E-Course

According to [Lockwood \(2002\)](#), online/e-courses are "courses offered online in which enrolled students interact with the instructor and other students via computer" (p.7).

In the current research, the terms online course and e-course will be used interchangeably to designate courses offered online in which enrolled female pre-service EFL student teachers interact with the instructor and peers. E-course is the course offered to female pre-service EFL student teachers and include classroom-based content posted online through asynchronous (academic website, e-mail, and discussion group) and synchronous (text/voice chat room).

### Interaction/Online Interaction

[Inoue & Bell \(2006\)](#) defined interaction as "two-way communication between tutor and learner, between one or more learners, and between learners and the learning materials" (p.312).

#### (a) Learner-Content Interaction

While [Sutton \(1999\)](#) defines learner-content interaction as the type in which "learning takes place when the learner interacts with the content. The content can be in the form a text, radio, television, audiotape, videotape, and computer software" (p.1).

#### (b) Learner-Instructor Interaction

According to [Wang et al \(2007\)](#) instructor-learner interaction refers to "the communication between the instructor and the students in the learning process" (p.2).

#### (c) Learner-Learner Interaction

According to [Johnston et al. \(2005\)](#), learner-learner interaction is considered the "opportunities to use discussion boards, live chats, and group work to promote this type [of interaction]" (p.1).

## Review of Literature

In this review of literature, the researcher aims at presenting: (1) the importance of interaction in education, (2) ELT classroom interaction, and (3) background of the three types of interaction.

## The Importance of Interaction in Education

The theoretical foundation for building a sustainable interactive online learning community rests on three constructs: interactivity (incorporating concepts and designs that engage learners in active collaboration), social context (learner-centered learning community concepts), and technologies (which support and enhance knowledge development and management) (Tu & Corry, 2003). The three constructs overlap to the extent that one cannot be implemented without including the other two. For online DE, interaction has been identified as the most important construct (Moore, 1989; Wagner, 1994; Sutton, 1999; Vrasidas, 2000; Dzakira & Idrus, 2003). Moore (1989) emphasizes minimal instructor intervention—mostly presenting assignments, monitoring progress, providing specialized attention to learners struggling with self-direction, and helping learners overcome isolation and apprehension.

Many researchers have found evidence indicating that increased levels of interaction result in increased motivation, positive attitudes toward learning, higher satisfaction with instruction, more meaningful learning, and higher achievement (Kelsey, 2000; Prammanee, 2003a; Contreras-Castillo et al., 2004; Jeon-Ellis et al., 2005; Thorpe & Godwin, 2006). According to Woods and Ebersole (2003), encouraging learner interaction in online settings contributes to positive learner-instructor and learner-learner relationships. Walls (2005) notes that an important barrier to perceptions of effectiveness in online instructional contexts is lack of interaction, which can affect a long list of factors such as learner and faculty satisfaction, instructional outcomes, learner control, participation and persistence, and learning community construction.

### **ELT Classroom Interaction**

Hampel and Hauck (2004, p.67) describe the necessity for social interaction in communicative language teaching as satisfying the demands of both second language acquisition (SLA) and socio-cultural learning theories. In other words, interaction helps fulfill learner requirements for exposure to comprehensible input as well as to practice in negotiating meaning. Active interactions with either native speakers or other learners of a target language have at least five potential benefits: (a) they promote lively exchanges within a social context, which facilitates the development of communicative competence (Pellettieri, 2000); (b) they encourage learners to achieve a high level of performance (Kern & Warschauer, 2000); (c) they provide opportunities for learners to engage in meaning negotiation, thereby receiving direct or indirect information (Strambi & Bouvet, 2003); (d) they foster positive perceptions of the learning environment, which in turn lowers learner anxiety and enhances motivation (Masuyama & Shea, 2004); and (e) they exert a positive effect on learner satisfaction (Hao, 2004; Gottwald, 2005; Kisamore & Peack, 2008).

The above-cited research also supports the efforts of pre-service student teacher education programs to integrate ICTs into their curricula. Exposure to and experience with diverse technologies do not automatically ensure that pre-service student teachers will view technology as a viable asset in their own classrooms; showing them the value of interaction in their own language learning efforts may stop them from dismissing the use of technology as abstract and impractical (Shoffner, 2007). Pre-service language student teachers can use ICTs to engage in rich and authentic discourse with their peers in target-language cultures through e-pals. Moreover, to motivating them and raising their self-esteem and confidence, ICTs can enhance pre-service language student teachers' interactions and involvement in collaborative settings in a manner that will reinforce their later decisions to use ICTs in their own classrooms (Samuel & Abu Bakar, 2006).

### **Interaction Types**

The most well known classification scheme for interaction is Moore's (1989) framework. For the purposes of this study and based on the learner-centered approach, the previous three types of interaction are going to be explored and investigated.

### **Learner-Content Interaction**

Moore (1989) points out that the oldest form of learner-content interaction is the didactic text: in medieval times nearly all texts were aimed at instructing—not merely informing, and certainly not at entertaining. In the nineteenth

century, the use of print for teaching was advanced by the invention of home study guides that accompanied a text, providing explanations and directions for self-study. Distance learners in the twentieth century have interacted with content broadcast on radio and television programs and later with electronic recordings in the form of audiotapes, videotapes, and computer software. [Mishra and Juwah \(2006\)](#) describe interactive teleconferencing and the interactive features of the WWW as the most advanced forms of didactic interaction ever invented.

[Holmberg \(1995\)](#) believes that effective learner-content interaction is dependent on the instructor's ability to support learner motivation and to facilitate learning through guided didactic conversations. [Schoenfeld-Tacher and Persichitte \(2000\)](#) also claim that it is the DL instructor who must facilitate the learning process by assuring proper sequencing and presenting the proper content using the most effective modes of content delivery.

### **Learner-Instructor Interaction**

Once content is presented, learner-instructor interaction is required to support learner-content interaction. [Mishra & Juwah \(2006\)](#) found that the purpose of learner-instructor interaction should be a mix of social and instructional goals, and observed that for their social interaction responsibilities, instructors need to provide counseling, encouragement, and motivation. For their instructional interaction responsibilities, instructors need to clarify doubts, elaborate on difficult points, explain concepts, and demonstrate processes ([Schoenfeld-Tacher & Persichitte, 2000](#)).

In his research, [Prammanee \(2003b\)](#) reached similar conclusions, noting that learner-instructor interactions involve motivation, feedback, and dialog between learners and either instructors or other experts who prepare the subject material. [Prammanee](#) also emphasizes aspects of learner-instructor interaction that (a) help learners take advantage of individualized types of instruction, (b) allow instructors to assist with learner-content interaction, and (c) encourage instructor efforts to motivate learners.

[Moore \(1989\)](#) noted that both online and classroom instructors are required to organize their students' applications of course content through skills practice or the manipulation of information and ideas, to ascertain if learners are making progress, and to change strategies when necessary. Finally, online and classroom instructors alike must provide counsel, support, and encouragement to each learner, with the extent and nature of such support dependent upon the educational level of the learners and instructor professionalism.

### **Learner-Learner Interaction**

Historically, there have been limited opportunities for integrating learner-learner interaction into face-to-face classroom settings; therefore, the bulk of online DE research has focused on learner-content and learner-instructor interaction. Still, [Robertson \(2002\)](#) argues that learner-learner interaction is the one most commonly associated with online DE—perhaps due to the use of online forums and e-mail lists, which invites comparisons with classroom-based education in terms of topic conversations, posing questions, and in-class and extra-class peer or group activities. It is now generally accepted that online exchanges (asynchronous or synchronous) of information, ideas, and dialog among learners can occur with or without the real-time presence of an instructor to facilitate interaction.

Experienced instructors know how to use face-to-face classroom discussions and group work in ways that draw out learner opinions, prior knowledge, and experience for new knowledge construction ([Jusri & Lim, 2003](#)). Similar approaches can be applied to online classes, with the added benefit of relaxed time limits for interaction, giving learners multiple opportunities for reflection and exploration before responding to questions and comments or presenting projects. In the same manner as classroom interactions, constructivist-based instructional activities such as learner-moderated discussions and small group cooperative learning can be applied to e-courses ([Chou, 2002](#)). [Harsh and Sohail \(2002\)](#) suggest that a mix of online DE design principles and opportunities for learner-learner interaction can optimize learning experiences for learners in both online and in-person settings.

## **Research Methodology**

### **Subjects and Sampling**

The data gathered via the demographic information sheet supported the use of a criterion sampling technique to identify students who could be placed in the treatment group—that is, students who owned computers with certain hardware and software specifications, who had sufficient Internet experience, and who had expressed a strong interest in participating in the research (i.e., signed an informed consent form). Of the 30 students who were eligible to be in the treatment group, 20 students did sign the forms and were considered the treatment group participants. Data on selected characteristics for the 20 students who enrolled in the treatment group are shown in [Table 1](#).

**Table (1)**  
**Characteristics of Computer & Internet Experience the Treatment Group**

Computer & Internet Experience		N=20	Percentage	Total	
				N	%
Taken a Computer Training Course	Never	11	55%	20	100%
	Only 1	6	30%		
	Only 2	2	10%		
	More than 2	1	5%		
Computer Experience	Intermediate	8	40%	20	100%
	Advanced	11	55%		
	Expert	1	5%		
Speed of DSL	256 KB	7	35%	20	100%
	512 KB	6	30%		
	1 MB or faster	7	35%		

While the demographic information sheet reduced the number of the eligible participants in the treatment group, the researcher took into consideration the need to form two homogenous groups in terms of grade level and GPA. To achieve this goal, the researcher selected 20 students for the control group from all other members of the accessible population (n=44) primarily based on their grade level and GPA. The 44 students would be taught in face-to-face classrooms and only the selected 20 students would respond to the pre and post research instrument.

The selected participants in the treatment and control groups were 15 students who belong to class sections A and B (taught by the one instructor) and 5 students were belong to section C (taught by another instructor). This procedure eliminated potential bias due to the effects of instructor personality on academic performance.

**Table (2)**  
**Background Information for both Treatment & Control Groups**

Grade Level	Treatment Group		Control Group		GPA	Treatment Group		Control Group	
	N	%	N	%		N	%	N	%
5 <sup>th</sup>	11	55%	11	55%	A	5	25%	5	25%
6 <sup>th</sup>	2	10%	2	10%	B	8	40%	7	35%
7 <sup>th</sup>	6	30%	6	30%	C	6	30%	7	35%
8 <sup>th</sup>	1	5%	1	5%	D	1	5%	1	5%

The data in [Table 2](#) confirm the high level of homogeneity across the control and treatment groups. Each group had 20 participants, and each group had identical numbers of students at grade levels 5, 6, 7 and 8 (11, 2, 6 and 1,

respectively). Each group had nearly identical numbers at the four GPA levels of A, B, C and D: 5, 8, 6 and 1 for the treatment group and 5, 7, 7 and 1 for the control group, respectively.

### **Instrumentation**

In this research, a combination of asynchronous and synchronous delivery modes were used to present the e-course content, supplementary materials, learning activities, classroom discussions, and feedback. Although there is some evidence based on the review of literature regarding the type of effect that each delivery mode may have on the teaching/ learning process, still a combination of them makes the educational setting worthwhile. For asynchronous e-course delivery modes, an academic website, e-mail, and a discussion group were used. Moreover, as a synchronous delivery mode, a text/voice chat room was used.

### **The Selection of Website Evaluation Rubric**

The researchers designed a website evaluation rubric to evaluate the academic website used in this study. The rubric was based on information presented in Liu & Ku (2003), Dabaj & Isman (2004), Bendus (2005), and Shon & Lee (2006). Its eleven variable sets were designed to gather data on the appropriateness of the website for the study goals. Item responses were given as 1 for "yes," 2 for "no," and 3 for "not applicable." The main rubric variables were *usability* (15 items), *aesthetic features* (12 items), *accessibility* (11 items), *objectivity* (9 items), *credibility* (5 items), *accuracy, currency and audience* (4 items each), *support and feedback* (3 items each), and *interactivity* (2 items). A final yes/no question asked the evaluators whether they would recommend the Website for use by the instructor in the study.

### **Validity of Website Evaluation Rubric**

The Website evaluation rubric was validated by nine raters responded to the request to evaluate the website in terms of reliability as a source of accurate information associated with the research objectives. The researcher made modifications to some web pages in response to their feedback.

### **Pilot Study**

The pilot study was conducted with 21 female pre-service EFL student teachers in the seventh grade enrolled in a six-hour online course over a two-week period. Procedures for administrating the pilot surveys were similar to those would be applied during the actual study.

### **Interaction survey**

An interaction survey was developed based on a broad literature review that included instruments created by Yildiz & Chang (2003), Roblyer & Wiencke (2004), and Gottwald (2005) and the teaching experiences of the instructor. The interaction survey consisted of 30 items (all phrased in positive terms) that examined e-course effectiveness via the perceptions of the study participants. Answers were given along a five-point Likert type scale ranging from "strongly disagree" (1) to "strongly agree" (5). The survey was divided into three sections to determine participant perceptions of learner-content interaction (items 1-10), learner-instructor interaction (items 11-20), and learner-learner interaction (items 21-30).

### **Scoring Method**

Participants were asked to rate each item using a five-point Likert type scale: score (1) referred to "Strongly Disagree" value, score (2) referred to "Disagree", score (3) referred to "Neutral", score (4) referred to "Agree", and score (5) referred to "Strongly Agree" value.

### **Validity of Interaction Survey**

Face and content validity for the demographic information sheet and the interaction survey were established by a panel of fourteen experts chosen based on their knowledge and experience in the field of TEFL, research design, and

educational technology. The panel consisted of eleven TEFL content experts, two language experts, and one methodology expert.

### Reliability of Interaction Survey

The reliability for the survey was confirmed by the pilot study data, with Cronbach's alpha used as a measure of internal consistency for all survey sections by using Statistical Package for the Social Sciences [SPSS] V.16. Pilot study respondents were asked to rate their perceptions of interaction with the online experience. According to their feedback, Cronbach's alpha coefficients were .86 for learner-content interaction, .83 for learner-instructor interaction, .96 for learner-learner interaction, and .94 for overall interaction survey.

### Experiment Description

The study experiment was conducted in two stages. In the first "pre-treatment procedures" stage, online participants were asked to complete three tasks to ensure that they were properly registered in the online section of the course, and learners in both the control and treatment groups were asked to complete the interaction survey. The second stage consisted of "classroom procedure design", in which the three-week instructional period was described in detail.

### Pre-Treatment Procedures

The research experiment was conducted in two stages. The first "pre-treatment procedures" stage was started in which meetings were held with the learners enrolling in the course *Methods of Teaching English as a Foreign Language (1)* in all the three sections to explain the research experiment in detail. Learners were informed of the two chapters that would be taught as a part of the research experiment, and the duration of the study. The online learners were asked to begin the online registration process through following the given procedures.

### Course Content, Activities & Instructional Strategies

The content of the course "*Methods of Teaching English as a Foreign Language (1)*" aims at helping future teachers who will implement Saudi Arabia's English curriculum in intermediate and secondary schools. The pre-service EFL student teachers in the control and treatment groups use the same textbook<sup>1</sup> and practice the same exercises, drills, and procedures. As a result, content, activities, supplementary materials, assessment, feedback, and classroom instructional strategies were essentially indistinguishable for the control and treatment groups except for the content delivery modes and teaching method. The treatment group was taught via using a combination of asynchronous delivery modes (e-mail, an academic website and a discussion group) and synchronous delivery modes (i.e., txt/voice chat room); whereas the control group was taught in face-to-face settings.

To promote active and meaningful learning, the researcher developed a range of learning activities and established ample opportunities for social interactions to promote learner collaboration. Classroom activities were designed based on the efforts of [Telg \(2003\)](#), [Wang & Wang \(2004\)](#), [Kronic & Ruic-Dimitrijevic \(2007\)](#), and [Dal-Bianco and MacSween \(2008\)](#). Activities focused on two chapters in the course textbook: "*Teaching of Vocabulary*" and "*Teaching of Grammar*", supplementary materials related to chapter objectives, in-class activities (e.g., presentations, icebreakers, daily discussion statements), home assignments, and one test.

The researcher designed eight PowerPoint presentations consisting of techniques, exercises, and drills for teaching the course content. Detailed in-class activities were designed to enhance and stimulate learner participation, interaction, and collaboration in both groups. Each presentation started with an "icebreaker" or "openness"<sup>2</sup> activity and ended with a daily statement,<sup>3</sup> procedures that promote interactive communication in the form of comments and

Abu-Ghararah, A. (2005). *Teaching English as a Foreign Language: Procedures, Techniques and Activities* (2<sup>nd</sup> ed.). Riyadh: Tawbah Library. <sup>1</sup>

<sup>2</sup> "Activit[ies] designed to ease participants into a course module of instruction" ([Richards et al., 2004, p.106](#)).

<sup>3</sup> Statements spoken or written by famous persons such as William Shakespeare, Allen Strik, Thomas Edison, Albert Einstein, etc.

opinions. Icebreaker activities varied according to topic—for the *Teaching of Vocabulary* chapter the researcher prepared "scrambled letters," "word derivation," and "crossword puzzle" activities. Another activity, "educational songs," gave learners opportunities to practice using new vocabulary items. *Teaching of Grammar* chapter activities included "Am I wrong?"—that is, students were asked to correct grammar errors in presented sentences.

The researcher also designed two types of home assignments to provide practice and to assess learner comprehension of the course content. The first was individual and the second was based on a peer editing strategy in which learners had to complete peer evaluation worksheets. At the end of the experiment period, a single take-home exam on the course content was prepared and assigned to both control and treatment groups.

Classroom instructional strategies were selected based on reviews of articles by researchers such as Morehead (2001), DeBourgh (2003), Benson (2004), Abdul-Hamid & Lewis (2005), Junk et al. (2007), and Bacer (2008) to promote learners' interaction. In both online and face-to-face classes, instructional strategies were a mix of instructor demonstrations (i.e., lecture approach), questions and answers, and supplementary materials related to course content. Other instructional strategies in both online and face-to-face environments included learner self-directed reading, learner classroom discussions of course topics, learner presentations of course content, and peer editing.

### Treatment Procedures

The researcher created two course plans for the "*Teaching of Vocabulary*" and "*Teaching of Grammar*" chapters. Each plan addressed course content, supplementary material and its delivery mode, instructional strategies and learning activities associated with the content and the interaction types they reflected. The e-course plan was designed to cover 10 online meetings over a 3-week period, with each online meeting lasting for 1 hour (10 instructional hours total). The face-to-face course plan covered 6 meetings over 3 weeks, with each section meeting twice per week. The first weekly meeting for each section lasted 110 minutes and the second meeting 60 minutes, for a total of 9 instructional hours per section.

### Data Collection

Data were collected two times during the experiment. As stated above, the participants of the control and treatment groups completed the interaction pre-survey. At the end of the three-week instruction period, the researcher distributed the interaction post-survey to the online participants via e-mail. Paper copies of the survey were distributed in person to the control group learners in the same day; completed forms were handed in before the end of the class session.

### Data Analysis

All data were analyzed utilizing the Statistical Package for the Social Sciences (SPSS), version 16. An alpha level of .05 was established a priori as the criteria for statistical significance.

Cronbach's alpha reliability coefficient ( $\alpha$ ) was used to test the internal consistency of the interaction survey. Descriptive statistics were used to organize, summarize, and describe demographic information sheet content. Appropriate statistics such as frequencies and percentages were used. Due to the nature of the research design and collected data, analysis of covariance (ANCOVA) served as the main inferential statistical tool for addressing the research questions and testing the hypotheses.

### Results

In order to answer the four research questions, a component ANCOVA of differences in overall interaction and the three types of interaction between the control and treatment groups was calculated. As shown in Table 3, the values of Levene's test was not statistically significant ( $p=.25, .11, .25, .19$ ), which supports an assumption of equality of variance between the two groups in overall interaction and the three types of interaction.

**Table (3)**  
**Summary of ANCOVA for the Control and Treatment Groups on the Types of Interaction**

Variables	Levene's Test	Control Group		Treatment Group		F	Level of Sig.	Partial eta Squared	Interaction with Treatment
		M	SD	M	SD				
Overall Interaction	.25	4.10	.41	4.60	.35	16.87	.000*	.31	Significant
Learner-Content Interaction	.11	3.96	.52	4.59	.39	17.86	.000*	.33	Significant
Learner-Instructor Interaction	.25	4.31	.44	4.64	.35	6.63	.014*	.15	Significant
Learner-Learner Interaction	.19	4.01	.64	4.58	.40	11.18	.002*	.23	Significant

\*Significant at the .05 level

As shown in Table 3, a statistically significant difference in favor of the treatment group ( $M=4.60$ ,  $SD=.35$ ) was found between the two groups' post-intervention scores for learner perceptions of overall interaction ( $F [1,37]=16.87$ ,  $p=.000$ ,  $\text{partial eta squared}=.31$ ). The female pre-service EFL student teachers who took the e-course had significantly higher scores than their control group classmates in terms of their perceptions of overall interaction. Furthermore, the partial eta squared value of .31 indicates a strong relationship between the pre- and post-intervention learner perceptions of overall interaction scores. This value indicated a large effect size as claimed by Cohen's (1998)<sup>4</sup> guidelines who categorized the effects of eta squared values as .01 = small, .06 = moderate, and .14  $\geq$  large. Since no interaction occurred between the treatment and covariate (.25 Levene's test), all variance can be attributed to the effect of the e-course.

Moreover, Table 3, a statistically significant difference in favor of the treatment group ( $M=4.59$ ,  $SD=.39$ ) in post-intervention scores on learner perceptions of learner-content interaction was found between the two groups at an alpha level of .05 ( $F [1,37]= 17.86$ ,  $p=.000$ ,  $\text{partial eta squared}=.33$ ). The participants in the treatment group had significantly higher scores in this type of interaction compared to their face-to-face classroom counterparts. Moreover, the partial eta squared value of .33 indicates a strong relationship between the pre- and post-intervention scores for perceptions of learner-content interaction. Since there was no interaction between the treatment and covariate (Levene's test =.11), all variance can be attributed to the effect of the e-course.

A statistically significant difference in favor of the treatment group ( $M=4.64$ ,  $SD=.35$ ) was found between the control and treatment group scores on post-intervention learner perceptions of learner-instructor interaction at an alpha of .05 ( $F [1,37]= 6.63$ ,  $p=.014$ ,  $\text{partial eta squared}=.15$ ) (see Table 3). This result indicates that e-course students had significantly higher scores than their face-to-face counterparts. Moreover, a strong relationship was found between pre- and post-intervention learner perceptions of learner-instructor interaction scores as indicated by a partial eta squared value of .15. Since there was no interaction between the treatment and covariate (Levene's test =.25), all variance can be attributed to the effect of the e-course instruction.

Likewise, a statistically significant difference was found in favor of the treatment group ( $M=4.58$ ,  $SD=.40$ ) for scores on post-intervention learner perceptions of learner-learner interaction at an alpha level of .05 ( $F [1,37]=11.18$ ,  $p=.002$ ,  $\text{partial eta squared}=.23$ ). Participants who took the e-course had significantly higher scores than the face-to-face classroom participants and the partial eta squared value of .15 indicates a strong relationship between the pre- and post-

<sup>4</sup>Cohen (1998, cited in Pallant, 2005).

intervention scores for learner perceptions of learner-instructor interaction. Since there was no interaction between the treatment and covariate (*Levene's test* = .19), all variance can be attributed to the effect of the e-course instruction.

## Discussion of Interaction Results

In the light of the data analysis and its initial interpretations and results, the following discussion and conclusions can be stated according to (a) the literature review; (b) results from related studies; and (c) the researcher's personal observations during the research experiment period. The discussion and conclusions deal with learners' perceptions of overall interaction and these three types: learner-content, learner-instructor, and learner-learner interactions in the e-course instruction.

### Overall Interaction

It is clear from the results of the ANCOVA tests, perceptions of overall interactions indicates statistically higher scores in favor of the treatment group. There are several possible explanations for this finding that learners in the e-course were more positive about their overall interactions than the learners in the face-to-face classroom setting.

First, it might be due to the suitability of course content and its delivery modes, content-associated activities (e.g., icebreakers, openness, in-class exercises, daily discussion statements, and educational songs), instructional strategies, multiple assessment procedures, and variety of feedback formats to online instruction. The female pre-service EFL student teachers who participated in the e-course appeared capable of interacting online with each other and using online tools in a manner that will benefit their teaching careers. A second possible explanation is the cooperative and flexible nature of asynchronous and synchronous delivery modes of instructions and communication (i.e., the academic website, e-mail, discussion group, and text/voice chat room) during course demonstrations, question and answer activities, and when receiving and giving personal and group written feedback. The e-course learners in this study probably benefited from the variety of used communication tools to interact with their peers and the instructor. A third indication of increased overall interaction is the growth in the number of messages over the course of the study period. To build a body of evidence in support of this explanations, the researcher calculated the number of received messages in the form of private e-mails and discussion group comments. Of the 588 total e-mail messages, 332 (56.5%) were sent individually and 256 (43.5%) via group e-mail. Of the 332 discussion group messages, 256 (77.1%) were sent by the learners and 76 (22.9%) by the instructor. The messages-exchange process indicates a high level of interaction between the e-course learners and the instructor/researcher during the three-week experimental period.

Although the results regarding learner perceptions of overall interaction show a statistically significant difference in favor of the treatment group, the mean scores indicate that learners in both groups were already strong in the overall interaction but treatment group learners had a slight edge over control group learners (see Table 3). There are two possible reasons of the strengths of the control group learners.

First, the researcher designed identical course content, activities, instructional strategies, and assessment techniques for both learner groups. The face-to-face classroom learners might have benefited slightly from opportunities for interaction and communication similar to those offered to the e-course learners. Second, as a learning community, the face-to-face classroom learners might have benefited from a more comfortable atmosphere for exchanging knowledge and communication, which affected their overall level of interaction to a slight degree.

A possible explanation for the statistically non-significant results for the face-to-face classroom learners in terms of perceptions of overall interaction is their lack of extensive opportunities for interaction, whereas the e-course learners had access to asynchronous and synchronous delivery modes. According to Tu and Corry (2003), most face-to-face classroom instruction is based on a mix of language and nonverbal communicative behaviors, with a strong emphasis on oral and/or written communication. In contrast, online learning depends heavily on aural and visual communication technologies that support communication and increase interaction.

## Learner-Content Interaction

As revealed by ANCOVA tests result, perceptions of learner-content interaction indicate statistically higher scores in favor of the treatment group. This result might be due to the e-course classroom activities, instructional strategies, and assessment techniques used to deliver e-course content. Specifically, the e-course content had a strong connection to the stated objectives described in previous e-mails sent to the learners, which increased both their awareness of what to expect in terms of instructional content as EFL student teachers and their interaction with course materials.

A second possible explanation is the interactive and concise manner in which e-course content was presented—the Flash files found on the academic website were described by the learners as helpful, attractive, and easy to access. Positive feedback was also received regarding the use of PowerPoint presentations as a study guide and learning resource. Successful uploading and posting lectures in advance was apparently helpful for e-course learners who were motivated to prepare in advance for individual class sessions.

On a related topic, the competition among learners regarding in-class activities such as icebreakers and openness might increase learner-content interaction—for example, the e-course learners in the present study who were aggressive in terms of clicking on the *tum* icon on the chat room screen to attract the instructor's attention. Similar enthusiasm was shown while reading, interpreting, and communicating in the "statement of the day" closing activity, as well as while leading text/voice chat room presentation sessions and summarizing key concepts for each lecture.

In the present study, face-to-face classroom learners were given the same materials, activities, instructional strategies, assignments, and supplementary materials, yet they perceived lower scores in terms of their perceptions of interaction with course content. One possible explanation might be the lack of variation in course content delivery modes. Furthermore, the face-to-face classroom learners had limited opportunities and spent less time in class discussing course-related topics, addressing questions, and providing answers due to the limited face-to-face class-time, which might have affected their level of interaction with course content. In addition, based on the researcher observation, some of the face-to-face classroom learners seemed shy, and sometimes, reluctant to participate in front of their peers during classroom activities such as icebreaker, openness, statement-of-the-day interpretation, or other in-class activities.

## Learner-Instructor Interaction

The results of ANCOVA in [Table 3](#) indicate a statistically significant effect of the e-course instruction on the participants' perceptions of interactions with the instructor, with mean scores and large effect size value showing that the treatment group learners perceived higher levels of learner-instructor interaction. There are several possible explanations for this finding including frequent electronic access to the instructor (as well as classmates) in and outside of scheduled class sessions. This frequent access, referred to as "online social presence," consists of sending/receiving private or group e-mails, exchanging instant messages, or contacting instructors during text/voice chat room sessions. This access might have increased the social presence of the online instructor that promote learner-instructor interaction.

A second possible explanation might be the clarity of pre-course online classroom guidelines—specifically, the "Very Important Points" regarding e-mails, posted materials, text/voice chat room sign-in, and home assignment deadlines. This procedure might have also supported a change in perception regarding the roles of e-course learners from receivers of knowledge to communicators, collaborators, and responsible-learners. Moreover, that guidelines might make them aware of the online instructor new roles as a facilitator, guide, and advisor. Knowing these roles might facilitate learner-instructor interaction.

In addition, this finding might be explained by the use of topic-based discussions and question/answer strategies during online text/voice chat room sessions. During discussions, the researcher observed that e-course learners expressed themselves clearly, gave comments, asked questions, and shared possible answers when communicating via

synchronous CMC. This level of interaction and communication of e-course learners with the instructor might also attest to the reduced shyness and enhanced interactivity that the researcher observed.

Although the results of the present study regarding learner perceptions of learner-instructor interaction indicate a statistically significant difference in favor of the treatment group, the mean scores show that learners in both groups were already strong in this type of interaction. The results for the treatment group were slightly higher than for the control group (see Table 3). A possible explanation of the meaningful score of face-to-face learners might be due to the cooperation of the researcher who set one hour before each class to give face-to-face classroom learners further opportunities to discuss class-related issues in addition to the scheduled one office hour per week. Some learners took advantage of this time to discuss specific points related to course content which might increase their interaction with the instructor.

### Learner-Learner Interaction

It is clear from the results of ANCOVA test in Table 3 that perceptions of overall interactions indicate statistically higher scores in favor of the treatment group. The first possible explanation for this finding is the "ID Card" activity that was applied before the first online session—arguably the starting point of learner-learner interaction and a good first impression. As part of this activity, e-course learners shared personal information such as names, hobbies, preferences, and future goals, thereby initiating interpersonal relationships.

A second possible explanation might be due to the introduction of a variety of e-course activities (e.g., scrambled letters, word derivation, crossword puzzle, Am I Wrong?) that might provide opportunities for collaboration, exchanging information, and building language knowledge bases. E-course learners worked in groups when using the text/voice chat room for the "word derivation" and "scrambled letters" activities which promote learner-learner interaction. The educational songs, as a classroom activity, that the learners presented synchronously in front of their classmates might also provide opportunities for sharing interpersonal positive encouragement and comments.

A third explanation might be due to the new role of instructor, during classroom activities, that was reduced to monitoring and giving a few oral prompts and written feedback. According to the researcher's observations, stepping aside and letting e-course learners engage in course content helped develop strong relationships, increased self-confidence for using the language, and made learners more responsible for their learning results.

Another possible explanation for this finding is the use of a peer editing (reviewing) strategy, which provided e-course learners with opportunities for communication and interaction both asynchronously (when exchanging home assignments) and synchronously (when discussing each other's efforts via the text/voice chat room). Although the peer editing strategy was considered a new experience for them, the e-course learners accepted it as an opportunity to exchange written feedback and comments.

Although the results of the present study in terms of learner perceptions of learner-learner interaction indicate a statistically significant difference in favor of the treatment group, the mean scores show that learners in both groups were already strong in this type of interaction. The treatment group had a slight edge over the control group (see Table 3). When searching for a possible explanation, the researcher observed that face-to-face classroom learners simply introduced themselves orally to their classmates instead of using a form of the ID Card activity. Moreover, similar to their e-course counterparts, face-to-face classroom learners also worked in groups on the "word derivation" and "scrambled letters" activities and individually on the "crossword puzzle" and "Am I Wrong?" activities which might enhance their perceptions of learner-learner interaction.

The statistically non-significant results among face-to-face classroom learners might have also been affected by the low level of participation of face-to-face classroom learners participated in topic-based discussions as the majority of them seemed preferring to listen passively instead of participate actively. Regarding the educational song activity, only four face-to-face classroom learners were willing to present their educational songs in front of the entire class, while the rest preferred to present their selections in written forms. The same was true for the peer editing (review)

strategy, which failed in the face-to-face classroom because of time limits. This strategy had to be completed within the allotted class time, while face-to-face learners had less opportunities than online learners to contact each other before or after class to exchange assignments for editing.

## Conclusions

Based on constructs from Moore's (1991, 1993) theories on interaction and transactional distance learning, the researcher of this study examined the effects of an e-course on learner perceptions of types of interaction and levels of satisfaction. Some conclusions are derived from the results of the study:

1. The female pre-service EFL student teachers who participated in the e-course used in this research had more positive experiences with the course compared to the study participants in the face-to-face classroom setting. The results strongly suggest that e-course instruction was an effective means of helping learners visualize how to use technology for such purposes as online discussions, course activities, accessing supplementary materials, and assessment.
2. The e-course participants had positive perceptions of learner-content, learner-instructor, and learner-learner interactions compared to the study participants in the face-to-face classroom setting. E-course seems an ideal instructional method for online learners in providing enough space for interaction, discussion, posing questions, and sharing knowledge, either asynchronously or synchronously.
3. The e-course learners had positive perceptions of aspects regarding satisfaction with course content, instructional strategies, and communication tools. E-course participants indicated much acceptance and comfort on the online instructional delivery modes.
4. The e-course could be used effectively in a university environment if online female pre-service EFL student teachers are provided with a flexible course design that includes online discussion sessions, activities, supplementary materials, and different assessment techniques. Posting information online apparently was an important factor in maintaining e-course learner engagement. Moreover, it can be used effectively in university classrooms due to the integration of asynchronous and synchronous technologies into online classroom instruction and learner interaction.
5. The importance of online instructor roles in encouraging discussion, posing questions, discussing comments, and supporting topic-based communication were essential to promoting positive perceptions of interaction among learners.
6. Based on the results of the study, there is also a strong support that online course delivery is a valid tool for training Saudi pre-service EFL student teachers on how to use technology into their own learning and how to integrate it into their future teaching routines.

## Recommendations and Implications for Practice

Based on the study findings, the following recommendations and implications were derived:

1. Colleges of education should consider planning and offering online courses in addition to the face-to-face courses, and in the same subjects.
2. Formal courses should be introduced into teacher preparation curricula to prepare pre-service EFL student teachers for the day that they either conduct online courses or deliver a percentage of face-to-face class content via ICTs and CMC.
3. Colleges of education should encourage faculty to develop online courses by offering such incentives as equipment, bonuses, release time, etc. and assist their efforts to become more proficient in the use of ICT and CMC equipments.
4. Based on the results of this study, higher education institutions should use learner interaction data to evaluate, improve, and change both online and face-to-face classroom settings in order to make them more effective in

- terms of learner development. In this sense, learner interaction will serve as an indicator of an institution's responsiveness to learner needs and a measure of their effectiveness and vitality.
5. Instructors need to put considerable time and effort into course preparation, guided by expectations of what constitutes good content, instructional strategies, and activities.
  6. Instructors need to provide sufficient opportunities for online meetings involving learners to establish an inclusive classroom atmosphere and sense of a learning community.
  7. When designing online programs, instructors need to utilize different types of asynchronous and synchronous communication tools as a means of supporting different types of learner interactions.

## References

- Abdul-Hamid, H. & Lewis, C. (2005). Identifying effective online instructional practices in undergraduate and graduate level courses. In G. Richards (Ed.), *Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2005* (pp. 1864-1868).
- Abdullah, A. (2004). *Distance learning students' perceptions of the online instructor roles and competencies*. Unpublished doctoral dissertation, the School of Information Studies.
- Abu Azah, A. (2001). The reality of students' use of the internet in Sultan Kabus University. *The Journal of the King Fahad National Library*, 16 (2) , 167-199.
- Alderman, B. & Fletcher, S. (2005). The role of interaction in enhancing achievement and student satisfaction in an online course: A Rubric Analysis. In G. Richards (Ed.), *Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2005* (pp. 214-219).
- Al-Habis, A. & Al-Kendary, A. (2000). Scientific principles for designing Internet based educational unit. *The Educational Journal. Kuwait*, 15 (57), 150-165.
- Al-Sharhan, J. (2002). A study of faculty perspectives in College of Education in King Saud University In Using the Internet. *Journal of King Saud University*, 2 (14), 551-572.
- Archee, R. (2004). Analyzing mediated group interaction: An interpretive approach. In *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2004* (pp. 4107-4114).
- Bacer, K. (2008). Engaging the online learner through a dynamic, interactive learning environment. *Proceedings of Hawaii International Conference on Education. Honolulu, Hawaii, 5-8 January 2008* (pp. 3142-3151).
- Bendus, O. (2005). Evaluation of online courses: Integrating principles of effective online teaching into practice of evaluation. In G. Richards (Ed.), *Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2005* (pp. 231-233).
- Benson, A. (2004). Interactions, for effective learning distance education in higher education: Two graduate level programs. In *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2004* (pp. 4665-4670)
- Brooks, L. (2003). How the attitudes of instructors, students, course administrators, and course designers affects the quality of an online learning environment. *Online Journal of Distance Learning Administration*, 6(4), 1-9. Retrieved: October 16, 2006, from the World Wide Web: <http://www.westga.edu/~distance/ojdla/winter64/brooks64.htm>
- Calvin, J. (2005). *Explaining learner satisfaction with perceived knowledge gained in web-based courses*

- through course structure and learner autonomy. Unpublished doctoral dissertation, the Graduate School of the Ohio State University, Ohio.
- Chou, C. (2002). A comparative content analysis of student interaction in synchronous and asynchronous learning networks. *Proceedings of the Thirty-Fifth Annual Hawaii International Conference on System Sciences (HICSS'02)*. New York: The IEEE Computer Society (pp.1-9). Retrieved: March 20, 2007, from the World Wide Web:  
<http://csdl2.computer.org/comp/proceedings/hicss/2002/1435/05/14350134b.pdf>
- Contreras-Castillo, J., Favela, J., Perez-Fragoso, C., & Angel, E. (2004). Informal interactions and their implications for online courses. *Computers & Education*, 42 (2),149-168. Retrieved: October 11, 2007, from the World Wide Web: <http://www.elsevier.com/locate/compedu>
- Culbertson, C., Daugherty, M. & Merrill, C. (2004). Effects of modular technology education on junior high students' achievement scores. *Journal of Technology Education (JTE)*, 16 (1), 1-10. Retrieved: October 16, 2006, From the World Wide Web:  
<http://scholar.lib.vt.edu/ejournals/JTE/v16n1/culbertson.html>
- Dabaj, F. & Isman, A. (2004). Communication barriers in distance education: "Text-based internet-enabled online courses". *International Journal of Instructional Technology and Distance Learning*, 1(2), 1-21. Retrieved: July 01, 2007, from the World Wide Web:  
[http://www.itdl.org/journal/Feb\\_04/article02.htm](http://www.itdl.org/journal/Feb_04/article02.htm)
- Dal-Bianco, V. & MacSween, F. (2008). Teacher role and online communication during a blended learning business English course. In *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2008* (pp. 3681-3686).
- DeBourgh, G. (2003). Predictors of student satisfaction in distance-delivered graduate nursing courses: What matters most? *Journal of Professional Nursing*, 19(3), 149-163. Retrieved: May 19, 2006, from the World Wide Web: <http://www.einstein.br/biblioteca/artigos/163.pdf>
- Dzakira, H. & Idrus, R. (2003). Teacher- learner interactions in distance education: a case of two Malaysian Universities. *Turkish Online Journal of Distance Education (TOJDE)*, 4 (3), 1-20. Retrieved: June 14, 2007, from the World Wide Web: <http://tojde.anadolu.edu.tr/index.htm>
- Farahani, G. (2003). *Existence and importance of online interaction*. Unpublished doctoral dissertation, the Faculty of the Virginia Polytechnic Institute and State University, Virginia.
- Gottwald, W. (2005). *A comparison of student perceptions regarding online courses and traditional courses: A case study*. Unpublished doctoral dissertation, the Graduate School of Wayne State University, Detroit, Michigan.
- Hammer, V. (2001). *The influence of interaction on active learning, learning outcomes, and community bonding in an online technology course*. Unpublished doctoral dissertation, the College of Education at the University of Cincinnati.
- Hampel, R. & Hauck, M. (2004). Towards an effective use of audio conferencing in distance language courses. *Language Learning & Technology*, 8(1), 66-82. Retrieved: April 16, 2007, from the World Wide Web: <http://llt.msu.edu/vol8num1/hampel/>
- Hao, Y. (2004). *Students' attitudes toward interaction in online learning: Exploring the relationship between attitudes, learning styles, and course satisfaction*. Unpublished doctoral dissertation, the Faculty of the Graduate School of the University of Texas at Austin.
- Harsh, O. & Sohail, M. (2002). Role of delivery, course design and teacher-student interaction: Observations of adult distance education and traditional on-campus education. *The International Review of Research in Open and Distance Learning (IRRODL)*, 3(2), 1-11. Retrieved: August 27, 2007, from the World Wide Web:  
<http://www.irrodl.org/index.php/irrodl/article/view/92/171>

- Hew, K. & Cheung, W. (2003). Models to evaluate online learning communities of asynchronous discussion forums. *Australasian Journal of Educational Technology (AJET)*, 19(2), 241-259. Retrieved: April 19, 2006, From the World Wide Web: <http://www.ascilite.org.au/ajet/ajet19/hew.html>
- Holmberg, B. (1995). The evolution of the character and practice of distance education. *Open Learning*, June 1995, 47-53. Retrieved: February 18, 2008, from the World Wide Web: <http://www.uni-oldenburg.de/zef/cde/found/holmbg95.htm>
- Hsu, K. (2004). *Teaching and learning on-line in in-service art teacher education: The Ohio State University experience*. Unpublished doctoral dissertation, the Graduate School of the Ohio State University, Ohio.
- Inoue, Y. & Bell, S. (2006). *Teaching with educational technology in the 21<sup>st</sup> century: The case of the Asia-Pacific region*. US: Information Science Publishing.
- Irons, L., Keel, R. & Bielema, C. (2002). Blended learning and learner satisfaction: Keys to user acceptance? *Journal of United States Distance Learning Association (USDLA)*, 16(12), 33-43. Retrieved: April 11, 2007, from the World Wide Web: [http://www.usdla.org/html/journal/DEC02\\_Issue/article04.html](http://www.usdla.org/html/journal/DEC02_Issue/article04.html)
- Ivankova, N. & Stick, S. (2005). Collegiality and community-building as a means for sustaining student persistence in the computer-mediated asynchronous learning environment. *Online Journal of Distance Learning Administration*, 8(3), 1-16. Retrieved: April 19, 2006, from the World Wide Web: <http://www.westga.edu/~distance/ojdla/fall83/ivankova83.htm>
- Jeon-Ellis, G., Debski, R. & Wigglesworth, G. (2005). Oral interaction around computers in the project-oriented CALL classroom. *Language Learning & Technology*, 9(3), 121-145. Retrieved: July 20, 2007, from the World Wide Web: <http://lt.msu.edu/vol9num3/jeon/default.html>
- Johnston, J., Killion, J., & Oomen, J. (2005). Student satisfaction in the virtual classroom. *The Internet Journal of Allied Health Sciences and Practice*, 3(2), 1-7. Retrieved: August 21, 2007, from the World Wide Web: <http://ijahsp.nova.edu/articles/vol3num2/johnston.htm>
- Jung, I. (2001). Issues and challenges of providing online in-service teacher training: Korea's experience. *The International Review of Research in Open and Distance Learning (IRRODL)*, 2(1), 1-18. Retrieved: April 19, 2006, from the World Wide Web: <http://www.irrodl.org/index.php/irrodl/article/view/30/374>
- Junk, V., Junk, W. & Tovey, B. (2007). Techniques to engage the online learner. *Proceedings of Hawaii International Conference on Education, Honolulu, Hawaii, 6-9 January 2007* (pp.1-27).
- Jusri, D. & Lim, G. (2003). Significance of online teaching vs. face-to-face: Similarities and differences. In G. Richards (Ed.), *Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2003* (pp. 1044-1047).
- Kelsey, K. (2000). A Case study of student satisfaction and interaction in a distance education course. *Journal of Southern Agricultural Education Research*, 50(1), 47-53. Retrieved: April 13, 2007, from the World Wide Web: <http://pubs.aged.tamu.edu/jsaer/pdf/Vol50/50-00-047.pdf>
- Kennedy, D., Webster, L., Benson, R., James, D. & Bailey, N. (2002). My.monash: Supporting students and staff in teaching, learning and administration. *Australian Journal of Educational Technology*, 18(1), 24-39. Retrieved: April 19, 2006, From the World Wide Web: <http://www.ascilite.org.au/ajet/ajet18/kensnedy.html>
- Kern, R. & Warschauer, M. (2000). Introduction: Theory and practice of network-based language teaching. In M. Warschauer & Kern, R. (Eds.), *Network-based language teaching: Concepts and practice*. UK: Cambridge University Press.
- Kisamore, J. & Peck, S. (2008). Computer personalities and student interaction: An examination of student

- satisfaction. *Proceedings of Hawaii International Conference on Education. Honolulu, Hawaii, 5 – 8 January 2008* (pp. 624-636).
- Krunic, T. & Ruic-Dimitrijevic, L. (2007). Condition of web accessibility in practice and suggestions for its improvement. *Informing Science: The International Journal of an Emerging Transdiscipline, 15*, 71-89. Retrieved: December 13, 2007, from the World Wide Web: <http://inform.nu/Articles/Vol10/ISJv10p071-089Krunic299.pdf>
- Liu, H. (2003). *Development of an online course using a modified version of keller's personalized system of instruction*. Unpublished doctoral dissertation, the Faculty of the Virginia Polytechnic Institute and State University, Virginia.
- Liu, P. & Ku, H. (2003). Developing peer feedback strategies for a learning environment. In G. Richards (Ed.), *Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2003* (pp. 1701-1702).
- Lockwood, S. (2002). *A comparison of academic success in web-based versus campus-based courses in the computer information systems - programmer/analyst associate degree program at Wisconsin Indianhead Technical College New Richmond*. Unpublished doctoral dissertation, Wisconsin Indianhead Technical College, New Richmond.
- Masuyama, K. & Shea, A. (2004). Another year of successful integration of technology: A case study of a first-year Japanese language course. In *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2004* (pp. 1506-1511).
- Mishra, S. & Juwah, C. (2006). Introduction. In C. Juwah (Ed.). *Interactions in online education: Implications for theory & practice*. London: Routledge.
- Moore, M. (1989). Three types of interaction. *The American Journal of Distance Education, 3* (2), 1-17. Retrieved: June 26, 2007, from the World Wide Web: [http://www.ajde.com/Contents/vol3\\_2.htm#editorial](http://www.ajde.com/Contents/vol3_2.htm#editorial)
- Morehead, T. (2001). Instructional strategies for using chat rooms. Retrieved: June 26, 2008, from the World Wide Web: [http://fp.uni.edu/its/et/tlt/olt/chat\\_rooms.htm](http://fp.uni.edu/its/et/tlt/olt/chat_rooms.htm)
- Nasser, R. & Abouchedid, K. (2000). Attitudes and concerns towards distance education: The case of Lebanon. *Online Journal of Distance Learning Administration, 3*(4), 1-8. Retrieved: October 16, 2006, from the World Wide Web: <http://www.westga.edu/%7Edistance/ojdl/winter34/nasser34.html>
- Pallant, J. (2005). *SPSS Survival manual: A step by step guide to data analysis using SPSS version 12*. UK: Open University Press.
- Pellettieri, J. (2000). Negotiation in cyberspace: The role of chatting in the development of grammatical competence. In M. Warschauer & Kern, R. (Eds.), *Network-based language teaching: Concepts and practice*. UK: Cambridge University Press.
- Picciano, A. (2002). Beyond student perceptions: Issues of interaction, presence, and performance in an online course. *Journal of Asynchronous Learning Networks (JALN), 6*(1), 21-40. Retrieved: April 12, 2007, from the World Wide Web: <http://www.aln.org/publications/jaln/v6n1/v6n1picciano.asp>
- Piguet, A. & Peraya, D. (2000). Creating web-integrated learning environments: An analysis of WebCT authoring tools in respect to usability. *Australasian Journal of Educational Technology (AJET), 16*(3), 302-314. Retrieved: April 19, 2006, from the World Wide Web: <http://www.ascilite.org.au/ajet/ajet16/piguet.html>
- Prammanee, N. (2003a). Case study: Exploring student and instructor perceptions and interactions in online classes. In C. Crawford et al. (Eds.), *Proceedings of Society for Information Technology and Teacher Education International Conference 2003* (pp. 2473-2475).
- Prammanee, N. (2003b). Understanding participation in online courses: A case study of perceptions of online interaction. Retrieved: October 19, 2007, from the World Wide Web:

- <http://it.coe.uga.edu/itforum/paper68/paper68.html>
- Richards, L., Dooley, K., & Lindner, J. (2004). Online course design principles. In C. Howard, C., Schenk, K. & Discenza, R. (Eds.). *Distance learning and university effectiveness: Changing educational paradigms for online learning* (pp. 99-118). Hershey, PA: Information Science Publishing.
- Robertson, H. (2002). Interaction: What is it, and how can I include it in online instruction. Retrieved: June 07, 2006, from the World Wide Web:  
[http://www.indiana.edu/~istdept/R685molenda/interactions\\_in\\_online\\_instruction.pdf](http://www.indiana.edu/~istdept/R685molenda/interactions_in_online_instruction.pdf)
- Roblyer, M. & Wiencke, W. (2004). Exploring the interaction equation: Validating a rubric to assess and encourage interaction in distance courses. *Journal of Asynchronous Learning Networks (JALN)*, 8(4), 25-37. Retrieved: August 22, 2007, from the World Wide Web:  
[http://www.sloan-c.org/publications/jaln/v8n4/v8n4\\_roblyer.asp](http://www.sloan-c.org/publications/jaln/v8n4/v8n4_roblyer.asp)
- Samuel, R. & Abu Bakar, Z. (2006). The utilization and integration of ICT tools in promoting English language teaching and learning: Reflections from English option teachers in Kuala Langat District, Malaysia. *International Journal of Education and Development using Information and Communication Technology (IJEDICT)*, 2(2), 1-11. Retrieved: July 18, 2007, from the World Wide Web: <http://ijedict.dec.uwi.edu/viewarticle.php?id=161&layout=html>
- Schoenfeld-Tacher, R. & Persichitte, K. (2000). Differential skills and competencies required of faculty teaching distance education courses. *International Journal of Educational Technology (IJET)*, 2(1), 1-19. Retrieved: April 25, 2007, from the World Wide Web:  
<http://www.ascilite.org.au/ajet/ijet/v2n1/schoenfeld-tacher/index.html>
- Shoffner, M. (2007). Pre-service English teachers and technology: A consideration of Weblogs for the English classroom. *Contemporary Issues in Technology and Teacher Education*, 7(4), 245-255. Retrieved: May 16, 2008, from the World Wide Web:  
<http://www.citejournal.org/vol7/iss4/languagearts/article1.cfm>
- Shon, Y. & Lee, K. (2006). Checklist development of distance learning course for Korean kindergarten teachers. *The Journal of the Research Center for Educational Technology*, 2(1), 1-16. Retrieved: June 19, 2007, from the World Wide Web:  
<http://www.rctej.org/?type=art&id=4757&>
- Strambi, A. & Bouvet, E. (2003). Flexibility and interaction at a distance: A mixed-mode environment for language learning. *Language Learning & Technology*, 7(3), 81-102. Retrieved: August 19, 2007, from the World Wide Web: <http://lt.msu.edu/vol7num3/strambi/default.html>
- Sutton, L. (1999). Interaction. Retrieved: November 18, 2008, from the World Wide Web:  
<http://seamonkey.ed.asu.edu/~mcisaac/emc703/leah5.html>
- Telg, R. (2003). Instructional methods for distance education. Retrieved: May 18, 2007, from the World Wide Web: <http://edis.ifas.ufl.edu/WC026>
- Thorpe, M. & Godwin, S. (2006). Computer-mediated interaction in context. In L. Markauskaite et al. (Eds.), *Proceedings of the 23<sup>rd</sup> annual conference of the Australasian Society for Computers in Learning in Tertiary Education (ASCILITE): Who's learning? Whose technology? Sydney 3-6 December 2006*.
- Thurmond, V. (2003). Examination of interaction variables as predictors of students' satisfaction and willingness to enroll in future web-based courses while controlling for student characteristics. In C. Crawford et al. (Eds.), *Proceedings of Society for Information Technology and Teacher Education International Conference 2003* (pp. 528-531).
- Tu, C. & Corry, M. (2003). Building active online interaction via collaborative learning community. *Computers in the Schools*, 20(3), 51-59. Retrieved: May 22, 2007, from the World Wide Web:  
<http://jan.ucc.nau.edu/ct68/>
- Vrasidas, C. (2000). Constructivism versus objectivism: Implications for interaction, course design, and

evaluation in distance education. *International Journal of Educational Telecommunications*, 6(4), 339-362. Retrieved: March 17, 2007, from the World Wide Web:

<http://www.cait.org/vrasidas/pubs/continuum.pdf>

Wagner, E. (1994). In support of a functional definition of interaction. *The American Journal of Distance Education*, 8(2), 6-29.

Walls, C. (2005). Some strategies for balancing economies of scale and interaction in online/distance education courses. *e-Journal of Instructional Science and Technology (e-Jist)*, 8(1), 1-5. Retrieved: November 29, 2007, from the World Wide Web:

[http://www.usq.edu.au/electpub/e-jist/docs/vol8\\_no1/fullpapers/Celeste\\_Walls.pdf](http://www.usq.edu.au/electpub/e-jist/docs/vol8_no1/fullpapers/Celeste_Walls.pdf)

Wang, C. & Wang, Y. (2004). Integrating technology into ESL learning environment: Use process writing approach as an example. In C. Crawford et al. (Eds.), *Proceedings of Society for Information Technology and Teacher Education International Conference 2004* (pp. 1442-1447).

Wang, H., Gould, L. & Fulton, D. (2007). Bridge the virtual gap: Using new technology to enhance interaction in distance learning. *International Journal of Instructional Technology and Distance Learning*, 4(3), 1-8. Retrieved: March 17, 2008, from the World Wide Web:

[http://itdl.org/Journal/Mar\\_07/article05.htm](http://itdl.org/Journal/Mar_07/article05.htm)

White, C. (2003). *Language learning in distance education*. UK: Cambridge University Press.

Woods, R. & Ebersole, S. (2003). Using online community building strategies to enhance and extend learning in online courses – the “Communal Scaffold” as conceptual bridge. In C. Crawford et al. (Eds.), *Proceedings of Society for Information Technology and Teacher Education International Conference 2003* (pp. 2543-2546).

Yildiz, S. & Chang, C. (2003). Case studies of distance students' perceptions of participation and interaction in three asynchronous web-based conferencing classes in the U.S. *Turkish Online Journal of Distance Education (TOJDE)*, 4(2), 1-20. Retrieved: October 20, 2007, from the World Wide Web:

<http://tojde.anadolu.edu.tr/tojde10/articles/senem.htm>