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# An Analysis of Learners' Attitudes toward Online Interaction in a Web-based Course

**Amjad Abuloum* and Husam Al-Khadash****

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***Abstract:*** *The purpose of this study was to measure learners' attitudes toward online interaction in a Web-based course. By measuring learners' attitudes, the study attempts to find whether online interaction promotes learning among learners. In view of that, the study focuses on the variables of gender, age, Grade-Point Average (GPA), years of experience with the Internet, and frequency of accessing the Web-based course. The study surveyed 440 students who were enrolled in an accounting Web-based course offered by the Department of Accounting at the Hashemite University. Students were taught in a flexible mode of instruction. A Likert-type instrument was designed to collect information about learner's attitudes toward online interaction in the Web-based course. In addition to descriptive analyses, a five-way ANOVA was conducted to answer the research questions in this study. The findings of the study indicated that overall students positively perceived that online interaction in the Web-based course promoted learning. Gender, age, GPA, and years of experience with the Internet were not significant factors. However, there were significant differences among levels of learners' frequency of accessing the Web-based course in regard to their attitudes toward online interaction. In general, learners who had accessed the Web-based course more frequently indicated significantly higher positive attitudes toward online interaction. In light of these findings, this study recommends that students enrolled in Web-based courses need to be encouraged to engage in all means of online interaction available in these courses in order to promote their learning.(**Keywords:** Web-based instruction; Electronic learning; Online interaction; Internet-based instruction; Internet )*

## تحليل إتجاهات المتعلمين نحو التفاعل الإلكتروني في مساق مبني على الإنترنت

**امجد ابو لوم**، كلية العلوم التربوية، الجامعة الهاشمية، الزرقاء، الأردن.
**حسام الدين الخداش**، كلية الاقتصاد، الجامعة الهاشمية، الزرقاء، الأردن.

***ملخص:*** *هدفت هذه الدراسة إلى قياس إتجاهات الطلبة نحو التفاعل الإلكتروني في مساق مبني على الإنترنت ، وبالتالي فقد سعت هذه الدراسة إلى تحديد ما إذا كان التفاعل الإلكتروني يعززتعلم هؤلاء الطلبة. وما إذا كان لعوامل الجنس والعمر والمعدل التراكمي وسنوات الخبرة السابقة في استخدام الإنترنت ومدى التردد على الموقع الإلكتروني للمساق الأثر في إتجاهات الطلبة نحو التفاعل الإلكتروني. شملت هذه الدراسة 440 طالباً ممن سجلوا مساق مبادىء محاسبة والذي طور الكترونياً وطرح عبر الانترنت . لقد عرض هذا المساق من قبل قسم المحاسبة في الجامعة الهاشمية ودرس بإستخدام أسلوب التعليم المختلط والذي يجمع التعليم التقليدي والتعليم الالكتروني معاً . وتم إعداد استبانة مطورة بإستخدام مقياس ليكرت لجمع البيانات اللازمة حول اتجاهات الطلبة نحو التفاعل الإلكتروني، وتم استخدام التحليل الوصفي وتحليل التباين الخماسي لتحليل هذه البيانات وللاجابة على أسئلة الدراسة. جاءت نتائج الدراسة لتظهر أن الطلبة اعتقدوا أن التفاعل الإلكتروني عزز تعلمهم. وأن ليس لعوامل الجنس والعمر والمعدل التراكمي وسنوات الخبرة السابقة في إستخدام الانترنت اثراً ملحوظاً على اتجاهاتهم نحو التفاعل الإلكتروني. وأظهرت النتائج أيضاً وجود فروق دالة احصائياً بين مستويات مدى تردد الطلبة على الموقع الإلكتروني بالنسبة لاتجاهاتهم نحو التفاعل الإلكتروني. وبشكل عام فإن الطلبة الذين ترددوا على موقع المساق بشكل أكبر هم الذين أبدوا اتجاهات ايجابية أكبر نحو التفاعل الإلكتروني. في ضوء هذه النتائج توصي الدراسة بضرورة تشجيع الطلبة المسجلين في المساقات المبنية على الإنترنت على الإنخراط في كل وسائل التفاعل الإلكتروني المتاحة في هذه المساقات لتعزيز تعلمهم.* (**الكلمات المفتاحية:** التعليم المبني على شبكة المعلومات، التعليم الالكتروني، التعليم بالإنترنت).

**Introduction :** Over the last decade, online instruction has become an integral part of the education agenda around the world. It uses the Internet and other information technologies to create educational experiences for learners (Horton, 2001). The importance of online instruction in education, especially higher education, springs from the fact that it offers a flexible educational environment, where instruction can happen anytime, anywhere, and increasingly, on-demand.

Several studies indicated that students taking online courses have similar test scores as students participating in traditional courses. For instance, studies conducted by Capper & Fletcher (1996), Moore & Thompson (1997), Morrissey (1998), Bradford (1999), Paskey (2001), Parker & Gemino (2001), Benbunan-Fich, Hiltz, & Turoff (2001), Tacker (2001), and Lynch (2002) to compare the effectiveness of online courses to that of face-to-face traditional courses led to the conclusion that online education is as effective as traditional classroom education.

Another study conducted by Navarro & Shoemaker (2000) concluded that online learners learn as well as or sometimes better than traditional learners, regardless of gender, ethnicity and academic background. Moreover, Hartman, Dziuban, & Moska (2000) found that in an

* Faculty of Educational Sciences, The Hashemite University, Zarqa, Jordan.
** Faculty of Economics, the Hashemite University, Zarqa, Jordan.

Asynchronous Learning Network (ALN) course there were lower withdrawal rates and higher success rates. Therefore, online instruction can be seen as a means of improving productivity, efficiency and interaction (Weller, 2002). Online interaction was the concern of the current study.

Online interaction among learners, between the learners and the instructors, and between the learners and the course content in Web-based classrooms differs substantially from that in traditional classrooms (Thurmond, 2003). Moore and Kearsely (1996) discussed three types of interaction which exist in Web-based courses: learner-content interaction, learner-instructor interaction, and learner-learner interaction. Much of the learner-content interaction happens through using a hypermedia text. Accessing content, displayed on Web-pages designed by the instructor, links embedded in these content Web-pages, and other Web-sites discovered by learners are considered part of learning (Thurmond, 2003). Learner-content interaction also happens through simulations, problem solving, testing, and experiential tasks. Learner-learner and learner-instructor interactions can be created through email, threaded discussions, chat, and conferencing (Marks, 1998).

In Web-based courses, online interaction is important to the learning process. According to Driscoll (1998), online interaction helps learners to develop application, analysis, synthesis, and evaluation skills. It also promotes diverse viewpoints and alternative ways of looking at problems (Driscoll, 1998). A major challenge for researchers and instructors is, therefore, to investigate online interaction and examine its effectiveness in promoting learning.

The purpose of this study was to measure learners' attitudes toward online interaction in a Web-based course. By measuring learners' attitudes, the study made an effort to find whether online interaction promotes learning among learners. In view of that, the study focused on the variables of gender, age, Grade-Point Average (GPA), years of experience with the Internet, and frequency of accessing the Web-based course to test whether these variables are significant factors in learners' attitudes toward online interaction.

**Statement of the Problem:** Because instructional delivery on the Internet in higher education in Jordan is such a new application, there is a dearth of existing body of research. There is a need for basic research in the delivery of web-based courses at the university level in Jordan.

Many educators believe that interaction is an essential component of the learning process. Jaffe (1997) stated that learning is essentially a social process that requires interaction for the purpose of expression, validation, and the development of the self as a knowledgeable learner. Accordingly, a reasonable task is to examine online interaction that occurs in web-based courses. A logical place to start is to survey the pioneering institutions in Jordan that have developed and delivered web-based courses to learn from their experiences and identify their concerns. The Hashemite University has been among the first institutions in Jordan that integrated web-based instruction into its educational settings. Therefore, this study came to explore learners' attitudes toward online interaction in a web-based course offered at the Hashemite University. For a better understanding, the study examined learners' attitudes as reflected by gender, age, GPA, years of experience with the Internet, and frequency of accessing the Web-based course.

**Research Questions:** This study was designed in an attempt to answer the following questions:

1. What are the attitudes of learners toward online interaction in a Web-based course?
2. Are there any statistically significant differences at ($\alpha$=0.05) in learners' attitudes toward online interaction in a Web-based course that are due to gender, age, Grade-Point Average (GPA), years of experience with the Internet, and frequency of accessing the Web-based course?

**Importance of the Study:** The findings of this study should help administrators and faculty in Jordanian institutions address implementation issues related to web-based delivery. The study provides valuable information for administrators on how to enhance the delivery of instruction in web-based courses. Faculty will also gain insights into how online interaction can be used with face-to-face instruction.

The study is evidence of how learners in a web-based course view online interaction and whether their gender, age, GPA, years of experience with the Internet, and frequency of accessing the Web-based course play a role in how they view that interaction.

**Limitations and Delimitations:** The limitations and delimitations of this study included the following:

1. The target population of the study was limited to students enrolled in the "Accounting Principles (1)" offered by the Department of Accounting at the Hashemite University in the second semester of the academic year 2003-2004.
2. The design of this study was survey research.
3. This study was delimited to the use of a survey instrument as the primary method of gathering data.

**Definition of Terms:** For the purpose of this study, the following defined terms are required:

**Attitude:** a learned predisposition to respond in a consistent manner to a given object or situation (Fishbein & Ajzen, 1975).

**Web-based courses:** courses that are mediated and supported by the attributes and resources of the Internet (Brooks, Nolan, & Gallagher, 2001).

**Online interaction:** electronic communication in web-based courses (Berge, 1999).

**Review of Literature:** Online interaction can be addressed through effective communication and discussion. These can be made available through two modes: synchronous and asynchronous. According to

Steiner (1995), synchronous instruction is when learners and instructors participate in instruction simultaneously and in "real-time." Common synchronous methods include chat sessions and video and audio conferencing. In addition to offering immediate communication, synchronous methods have the advantages of providing a greater sense of presence and generating spontaneity (Inglis, Ling, & Joosten, 1999). However, synchronous methods can be difficult to implement, as they may require more sophisticated end-user equipment and a high-speed Internet connection. Moreover, instructors may find it challenging to schedule convenient times for all learners to participate, due to work and/or family commitments, or learners may be in different time zones.

Asynchronous does not require simultaneous participation. Chute et al. (1999) defined asynchronous as "interaction between two or more people that is time-delayed, that is, separated by minutes, hours, or even days" (p. 219). Examples of asynchronous methods include e-mail and discussion forums. These methods are easy to implement and learners can practice at any time convenient for them. Discussion forums are often incorporated into a course to ensure learner participation (O'Reilly & Newton, 2001) and interaction.

Herring (1996) offered three main research issues that are considered the main distinctive characteristics of online communication or interaction: (1) lack of social cues which refers to anonymity created by less obvious social characteristics such as occupation, educational level, gender and race, (2) generation of social norms of interaction which refers to rules of behaviors created by members of an online community, and (3) unique conversational patterns similar to oral communications in many aspects although it uses written format (i.e., concise use of words, simplifying sentences, and emotional expressions). While Ong (1982) suggests that oral communication is different from written format, Condon & Cech (1996) conclude that computer-based synchronous communication does show similar language patterns of oral communication. However, all of the three distinctive characteristics of online communication can either promote or discourage collaboration, depending on contexts (Spears & Lea, 1992).

In the literature, some researchers showed evidence of the effectiveness of online interaction within Web-based courses (COX, 2004). For example, McDonald (2002) emphasized that online education with its group-based instruction and Computer Communication provides an opportunity for new development and understanding in teaching and learning. A study completed by Devlin and James (2003) in Australia concluded that the impact of multimedia and educational technology could provide some indication of improved student learning and interaction skills.

Some other researchers already have begun to look into various types and methods of Internet-based communication tools such as e-mail, chatting, discussion boards and other methods over the past decade (O'Reilly & Newton, 2001). It has been suggested that these Internet-based communication methods afford and limit people's behaviors in many different ways compared to traditional types of communication (e.g., face to face interaction). As mentioned previously, learner-content interaction promotes critical thinking and reasoning skills, and learner-learner and learner-instructor interactions bring about a shared learning environment (Sringam & Greer, 2002). In general, learner-instructor and learner-learner interactions have been found to be particularly useful for forming friendships, offering advice, empathy and encouragement to continue studying in the learning environment, overcoming isolation and engaging in mutual support with peers (O'Reilly & Newton, 2001).

In light of what's mentioned, online interaction available in Web-based courses has many benefits for education. It promotes critical thinking, reasoning skills, diverse viewpoints, and alternative ways of looking at problems. It is also useful for forming friendships, offering advice, empathy and encouragement to continue studying in the learning environment, overcoming isolation, and engaging in mutual support with peers. However, we may wonder whether achieving a satisfactory level of online interaction is linked to any of the learner's characteristics or experience in using the Internet.

Many studies (Jiang & Shrader, 2001; Koohang, 2004; Koohang & Durante, 2003; Lucy, 1993; Meisel & Marks, 1999; Naert, 1997) investigated the relationships between learners' perceptions toward using online instruction and variables like gender, age, Grade-Point Average (GPA), users' experience in using the Internet, and frequency of accessing the Web-based course. But, to the best of the researchers' knowledge, there is a dearth of research available on the relationship between learners' attitudes toward online interaction and such variables. This is the main reason for conducting this study.

However, gender differences have been reported in the literature as affecting perceptions in general (Hackett, Mirvis, & Sales, 1991). Consequently, gender was included as a matter of understanding if differences of perceptions toward online instruction and online interaction occurred between male and female respondents. Experience with the Internet was included because research has documented the relationship between experience and user acceptance of technology in general (Koohang, 1989). The more experience a user has with technology, the more he or she tends to accept it. Therefore, a user's acceptance may in turn promote learning.

According to Lucy (1993), some significant relationships exist between learners' attitudes towards computers, computer experience, and computer communication. She concluded that positive attitudes towards computers could be predicted by learners' amount of prior experience with computers and that

male learners were more likely to have positive opinions of computers than their female counterparts. A similar result was found by another study done in 1997 by Naert. In the same trend, a number of other studies did not find any relationship between gender and learners' attitudes toward computers (Meisel & Marks, 1999; Koohang & Durante, 2003; Koohang, 2004).

**Methodology**

**Population and Sample:** The population of this study was all the undergraduate students enrolled in the Accounting Web-based during the second semester of the academic year 2003-2004. The entire population, which consisted of 500 students, was selected as a sample for the study. Among these, 60 students were excluded because they were used in establishing the validity and reliability of the instrument. The rest of students (440) made the actual sample for the study. A description of the sample at the different levels of the independent variables is displayed in Table 1.

**Table 1:** Frequency and Percentage of Students by Levels of the Independent Variables (N=440)

| Independent Variable (IV) | Levels of IV | N | Percentage |
|---|---|---|---|
| **Gender** | | | |
| | Male | 225 | 51.1 |
| | Female | 215 | 48.9 |
| | Total | 440 | 100 |
| **Age** | | | |
| | Less than 20 years | 319 | 72.5 |
| | 20 years and above | 121 | 27.5 |
| | Total | 440 | 100 |
| **Years of Experience with the Internet** | | | |
| | Less than 2 years | 256 | 58.2 |
| | From 2 to 4 years | 127 | 28.9 |
| | Greater than 4 years | 57 | 13.0 |
| | Total | 440 | 100 |
| **Grade-Point Average (GPA)** | | | |
| | Less than 2.5 | 93 | 21.1 |
| | From 2.5 to 2.99 | 139 | 31.6 |
| | 3 or above | 208 | 47.3 |
| | Total | 440 | 100 |
| **Frequency of Accessing the Web-based Course** | | | |
| | Seldom or Never | 50 | 11.4 |
| | Once every two weeks | 56 | 12.7 |
| | Once a week | 93 | 21.1 |
| | Once every two days | 116 | 26.4 |
| | More than once a day | 125 | 28.4 |
| | Total | 440 | 100 |

Of the 440 students who make up the sample of the study, 225 were males (51.1 percent of the total sample) and 215 (48.9 percent of the total sample) were females. Initially, students' ages varied in four categories: 319 students (72.5 percent) who were less than 20; 111 students (25.2 percent) who were between the ages of 20-22; 8 students (1.8 percent) who were between the ages of 23-25; and only 2 students (0.5 percent) who were over 25. To get more stable results, the last three categories of age were merged into one category that contained 121 students (27.5 percent) who were 20 years of age and older. Students' years of experience with the Internet varied in three categories: 256 students (58.2 percent) with 1-2 years of experience; 127 students (28.9 percent) with 3-4 years of experience; and 57 students (13 percent) with over 4 years of experience. As for students' GPA, it initially varied in 5 categories: 15 students (3.4 percent) whose GPAs were less than 2.00; 78 students (17.7 percent) whose GPAs were between 2.00 and 2.49; 139 students (31.6 percent) whose GPAs were between 2.50 and 2.99; 196 students (44.6 percent) whose GPAs were between 3.00 and 3.69; and 12 students (2.7 percent) whose GPAs were between 3.70 and 4.00. To get more stable results, the first two categories were merged into one category that contained 93 students (21.1 percent) whose GPAs were less than 2.50. Similarly, the last two categories were merged into one category that included 208 students (47.3 percent) whose GPAs were 3.00 or above.

Finally, students' frequency of accessing the web-based course varied in six categories: 16 students (3.6 percent) who never accessed the web-based course; 34 students (7.7 percent) who were rarely accessing the course; 56 students (12.7 percent) who were accessing the course once every two weeks; 93 students (21.1 percent) who were accessing the course once a week; 116 students (26.4 percent) who were accessing the course once every two days; and 125 students (28.4 percent) who were accessing the course more than once a day. Similar to what we did to the age categories, the first two categories of the frequency of accessing the web-based course ("Never" and "Seldom") have been merged into one category that included 50 students (11.4 percent) who rarely or never accessed the web-based course, see Table 1.

**The Web-based Course:** The present study took place in a Jordanian university that has sought to incorporate Web-based learning into its conventional face-to-face instruction. The project started back to the summer of the year 2003 by an intensive, well prepared workshop on developing Web-based courses. Around 25 highly-motivated instructors from different departments were selected to be trained on various techniques and methods used in designing Web-based courses. The short-term objective of the workshop was to prepare courses that can be taught in a flexible (mixed) mode, which consists of both classroom face-to-face instructions and completely online instructions. Courses designed in this mode move a significant portion of the learning activities from the classroom to the Web. The instructor and the learners have the advantages of real-time exchange in scheduled classes but have the benefit of continuing the discussion and assignments in the spaces between meetings. The workshop resulted in a number of Web-based courses that formed the core of a promising electronic learning project at the Hashemite University. Equipped with these courses, most of the instructors who successfully finished the workshop were well-trained and eager to go through a new experience of teaching.

The Web-based course that was selected for this study was the Accounting Principles (1) course, which was offered by the Department of Accounting at the Hashemite University in the second semester of the academic year 2003-2004. All sections of the course

were taught in the flexible mode by two instructors who participated in the above-mentioned workshop. Blackboard Learning and Community Portal System™, an authoring environment that utilizes asynchronous (Bulletin, e-mail and discussion boards) and synchronous (Chat) communication tools, were used to deliver the Web-based course. Face-to-face lectures of three-class hours per week were supplemented by a variety of Web-based materials including an extensive collection of interactive, collaborative practice materials, an extensive set of PowerPoint slides available as a supplement to the textbook, and extensive files of repeatable practice quizzes. As part of the assessment, students were required to log into Blackboard and complete weekly assignments that were designed to foster students' relationship with the e-course. Daily participation in electronic discussion forums and chat rooms was also required from students.

**The Instrument:** An instrument was designed to collect information regarding the independent variables (age, gender, GPA, years of experience with the Internet, and frequency of accessing the Web-based course) and the dependent variable (learners' attitudes toward online interaction in the Web-based course). The survey, displayed in Appendix A, consisted of two sections. The first section "General Information" was designed to gather information about the five independent variables. Based on attitude questionnaires used in other studies (Basile & D'Aquila, 2002; Marcheggiani, Davis, & Sander, 1999; Williams & Pury, 2002; Koohang & Durante, 2003; Koohang, 2004), the second section "Attitudes toward Online Interaction in the Course" was developed to measure learners' attitudes toward online interaction in the Accounting Web-based course using twelve items that cover three main areas of online interaction: (1) Learner-to-instructor interaction, (2) Learner-to-learner interaction, and (3) Learner-to-content interaction. Since the concern of this study was the overall online interaction, items of this section were listed without explicit specification for the areas they cover. On a Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree), students were asked to rate their agreement with the items, which were worded positively. A higher score on these items indicates more favorable attitudes toward online interaction in the Web-based course. For a list of these items, please see Appendix A.

The instrument went through two stages of validity verification. In the first stage, the survey items were submitted to a panel of four instructional technologists from four Jordanian universities. The panel's task was to rate each item for clarity and usefulness in measuring learners' attitudes toward online interaction in the web-based course. Based on the panel's recommendations and suggestions, necessary changes were made to the survey. The second stage began three weeks prior to the end of the semester during which the study was conducted. The survey was administered to a randomly selected sample of 20 students who were enrolled in the web-based course. These students, who were later excluded from the sample used in the study, were asked to rate the survey items for clarity of expression. Based on students' feedback, a final version of the survey was prepared.

The internal consistency of the instrument was determined two weeks prior to the end of the semester using a sample of 40 students (22 females and 18 males) who were studying in the "Accounting Principles (1)" web-based course. This sample of students was also excluded from the sample used in the study itself. The calculated coefficient alpha reliability for the attitudes scale (section two) was .85. This figure suggests that the instrument is suitable to measure learners' attitudes toward online interaction in the web-based course.

In order to collect data on the variables under study, the instrument was handed to students during the last week of the semester.

**Data Analysis:** To answer the research questions, the following statistical analyses were utilized:

- Descriptive analysis to compute frequencies, means, percentages, and standard deviations for variables and items of the attitudes scale.
- Five-way Analysis of Variance (with no interaction) to determine whether there are any statistically significant differences in attitudes toward online interaction due to gender, age, GPA, years of experience with the Internet, and frequency of accessing the Web-based course.

Using data collected by the instrument, the researchers employed the SPSS statistical package to carry out the above analyses.

**Results of the Study**

**Descriptive Analysis:** Table 2 shows the means and standard deviations of learners' attitudes toward online interaction at the different levels of the five independent variables (gender, age, Grade-Point Average (GPA), years of experience with the Internet, and frequency of accessing the Web-based course). According to the table, males and females have close mean values of attitudes (3.86, 3.90, respectively). Similarly, the two categories (levels) of age seem to show close mean values of attitudes. As for the categories of years of experience with the Internet, one can notice that there is a relatively slight increase in the mean values of attitudes as we move from a category with a less number of years of experience toward a category with a higher number of years of experience. As for the three categories of GPA, the table shows that the "From 2.5 to 2.99" category has a lower mean value of attitudes than the other two categories that relatively seem to have close mean values. In regard to the frequency of accessing the Web-based course, one can notice that as we move from a category with a less frequency of access into a category with a higher frequency of access, the mean values of learners' attitudes toward online interaction tend to increase accordingly.

**Table 2:** Means and Standard Deviations of Learners' Attitudes by Levels of Independent Variables (N=440)

| Independent Variable (IV) | Levels of IV | N | Mean | SD |
|---|---|---|---|---|
| **Gender** | | | | |
| | Male | 225 | 3.86 | .790 |
| | Female | 215 | 3.90 | .767 |
| | Total | 440 | 3.88 | .779 |
| **Age** | | | | |
| | Less than 20 years | 319 | 3.89 | .765 |
| | 20 years and above | 121 | 3.84 | .816 |
| | Total | 440 | 3.88 | .779 |
| **Years of Experience with the Internet** | | | | |
| | Less than 2 years | 256 | 3.86 | .772 |
| | From 2 to 4 years | 127 | 3.90 | .793 |
| | Greater than 4 years | 57 | 3.94 | .781 |
| | Total | 440 | 3.88 | .779 |
| **Grade-Point Average (GPA)** | | | | |
| | Less than 2.5 | 93 | 3.92 | .778 |
| | From 2.5 to 2.99 | 139 | 3.81 | .773 |
| | 3 or above | 208 | 3.90 | .784 |
| | Total | 440 | 3.88 | .779 |
| **Frequency of Accessing the Web-based Course** | | | | |
| | Seldom or Never | 50 | 3.12 | .726 |
| | Once every two weeks | 56 | 3.86 | .892 |
| | Once a week | 93 | 3.86 | .852 |
| | Once every two days | 116 | 4.02 | .717 |
| | More than once a day | 125 | 4.07 | .754 |
| | Total | 440 | 3.88 | .779 |

**Results Related to Research Question (1)**

To answer the first research question regarding attitudes toward online interaction, learners in the Web-based course were asked to rate their response to twelve items. Table 3 displays the mean values and standard deviations for the twelve items of the attitudes scale. It is interesting to notice that all items had mean values greater than 3.70, indicating that overall learners tended to agree with all items. While items 3 and 11 had the highest mean values (4.08 and 4.06, respectively), items 8 and 7 had the lowest means (3.71 and 3.75, respectively). The rest of the items had mean values between 3.78 and 3.98. As shown in the table, the total mean score for all items was 3.88, indicating favorable attitudes toward online interaction in the Web-based course.

Frequencies and percentages of learners in the Web-based course reporting their responses to the twelve items of the attitudes toward online interaction are reported in Table 4. Eighty-four percent of learners strongly agreed or agreed that "they were able to direct their questions and concerns to the instructor online and at any convenient time." Around eighty-five percent of learners strongly agreed or agreed that "online interaction with the instructor helped them to ask questions they might not have asked otherwise."

**Table 3:** Means and Standard Deviations for the Attitudes Items (N=440)

| | Item | N | Mean | SD |
|---|---|---|---|---|
| 1. | I usually receive online feedback from the instructor about questions and concerns I post online. | 440 | 3.84 | .791 |
| 2. | I can direct my questions and concerns to the instructor online at any convenient time. | 440 | 3.98 | .760 |
| 3. | Online interaction with the instructor helped me to ask questions I might not have asked otherwise. | 440 | 4.08 | .783 |
| 4. | Through online interaction with other students, I can share ideas and concerns regarding this course. | 440 | 3.90 | .795 |
| 5. | Online interaction with others encourages me to learn more. | 440 | 3.93 | .753 |
| 6. | Online interaction with students and instructor helped me to learn the course material. | 440 | 3.83 | .771 |
| 7. | My interaction with the online course material helped me to understand what I learn. | 440 | 3.75 | .789 |
| 8. | Online interaction with students and instructor stimulates me to think about the course material in new ways. | 440 | 3.71 | .731 |
| 9. | Through online interaction with students and instructor, I can get help on topics that need more explanation to understand. | 440 | 3.85 | .775 |
| 10. | I feel the online interaction that takes place in this course will be reflected positively on my final grade in the course. | 440 | 3.82 | .826 |
| 11. | I feel the online interaction in this course will make a new experience for me that I have not gone through before. | 440 | 4.06 | .705 |
| 12. | I think my online interaction in this course has been more than any other face-to-face interactions I've had in other courses | 440 | 3.78 | .865 |
| | **Average** | **440** | **3.88** | **.779** |

5=Strongly Agree, 4=Agree, 3=Neither Agree nor Disagree, 2=Disagree, 1=Strongly Disagree

**Table 4:** Frequencies and Percentages of Learners' Attitudes

| | SA | | A | | N | | D | | SD | |
|---|---|---|---|---|---|---|---|---|---|---|
| | f | % | f | % | f | % | f | % | f | % |
| Item#1 | 108 | 24.5 | 216 | 49.1 | 95 | 21.6 | 21 | 4.8 | 0 | 0 |
| Item#2 | 123 | 28.0 | 246 | 55.9 | 50 | 11.4 | 20 | 4.5 | 1 | .2 |
| Item#3 | 157 | 35.7 | 219 | 49.8 | 50 | 11.4 | 12 | 2.7 | 2 | .5 |
| Item#4 | 116 | 26.4 | 240 | 54.5 | 70 | 15.9 | 13 | 3.0 | 1 | .2 |
| Item#5 | 108 | 24.5 | 254 | 57.7 | 70 | 15.9 | 8 | 1.8 | 0 | 0 |
| Item#6 | 96 | 21.8 | 241 | 54.8 | 87 | 19.8 | 16 | 3.6 | 0 | 0 |
| Item#7 | 95 | 21.6 | 243 | 55.2 | 66 | 15.0 | 36 | 8.2 | 0 | 0 |
| Item#8 | 82 | 18.6 | 263 | 59.8 | 76 | 17.3 | 19 | 4.3 | 0 | 0 |
| Item#9 | 105 | 23.9 | 248 | 56.4 | 64 | 14.5 | 23 | 5.2 | 0 | 0 |
| Item#10 | 123 | 28.0 | 227 | 51.6 | 16 | 13.9 | 29 | 6.6 | 0 | 0 |
| Item#11 | 142 | 32.3 | 235 | 53.4 | 51 | 11.6 | 12 | 2.7 | 0 | 0 |
| Item#12 | 114 | 25.9 | 200 | 45.5 | 73 | 16.6 | 50 | 11.4 | 3 | .7 |

SA=Strongly Agree, A=Agree, N=Neither Agree nor Disagree, D=Disagree, SD=Strongly Disagree

It is worth to mention that eighty-two percent of learners strongly agreed or agreed that "online interaction with others encouraged them to learn more." Similarly, eighty percent of learners strongly agreed or agreed that "through online interaction with students and instructor, they were able to get help on topics that needed more explanation to understand." Around eighty-five percent of the learners strongly agreed or agreed that "online interaction with the instructor helped them to ask questions they might not have asked otherwise." Eighty-four percent of the learners strongly agreed or agreed that "they were able to direct their questions and concerns to the instructor online and at any convenient time." Eighty-one percent of learners strongly agreed or agreed that "through online interaction with other students, they were able to share ideas and concerns regarding this course."

It is important to state that around eighty percent of the learners strongly agreed or agreed that "they felt the online interaction that took place in the course was going to be reflected on their final grades in the course." A close percentage of the learners (78%) strongly agreed or agreed that "online interaction with students and instructor stimulated them to think about the course material in new ways." A large percentage of the learners (around 86%) strongly agreed or agreed on the statement "I feel the online interaction in this course will make a new experience for me that I have not gone through before."

As for strong disagreement among learners, one can notice from Table 4 that relatively zero or close to zero percentages of learners strongly disagreed with all items. Percentages of disagreement among learners on the different items of the attitudes scale varied between two to eleven. In fact, the largest percentage of disagreement among the learners (11%) was with the item "I think my online interaction in this course has been more than any other face-to-face interactions I have had in other courses." Percentages of the learners who neither agreed nor disagreed with the different items of the attitudes scale varied between eleven and twenty-two.

**Results Related to Research Question (2)**

To answer the second research question regarding whether there are any significant differences in learners' attitudes toward online interaction that are due to gender, age, GPA, years of experience with the Internet, and frequency of accessing the Web-based course, a five-way analysis of variance (with no interaction) was conducted. In this analysis, the dependent variable was learners' attitudes toward online interaction. Gender, age, GPA, years of experience with the Internet, and frequency of accessing the Web-based course were used as independent variables. Each of gender and age had two categories (levels). GPA and years of experience with the Internet had the same number of categories (3 categories). The frequency of accessing the Web-based course had five categories. The results of the 2x2x3x3x5 ANOVA (with no interaction) are displayed in Table 5.

Inspection of Table 5 indicates that only one independent variable, frequency of accessing the Web-based course, contains a significant difference in learners' attitudes toward online interaction, $F(4,435)= 59.737$, $p<.001$. None of the rest of the independent variables (gender, age, GPA, and years of experience with the Internet) has proved to contain any significant differences in learners' attitudes (at .05 level of significance).

**Table 5:** Five-Way ANOVA of Learners' Attitudes (No Interaction)

| Source of Variation | SS | df | MS | F | Sig. F |
|---|---|---|---|---|---|
| Gender | .029 | 1 | .029 | .011 | .916 |
| Age | .303 | 1 | .303 | 2.035 | .154 |
| Grade-Point Average (GPA) | .460 | 2 | .230 | 1.543 | .215 |
| Yrs of Experience with the Internet | .804 | 2 | .402 | 2.694 | .069 |
| Frequency of Accessing the Course | 35.642 | 4 | 8.910 | 59.737 | .000* |
| Explained | 37.239 | 10 | 3.724 | 24.966 | .000 |
| Residual | 63.990 | 429 | .149 | | |
| Total | 101.229 | 439 | | | |

*Significant at .001 level of significance

Because a significant difference was found in the five-way ANOVA, follow-up tests were conducted to evaluate pairwise differences among the means of the five categories (or levels) of the frequency of accessing the Web-based course variable. Since the test of homogeneity of variances was significant, $F(4,435)= 8.101$, $p<.001$, homogenous variances were not assumed and post hoc comparisons were conducted using the Dunnett's C tests, a test that does not assume equal variances. The results of these tests, as well as the mean differences between learners' attitudes toward online interaction for the five categories, are reported in Table 6.

**Table 6**: Mean Differences between Learners' Attitudes among Categories (Levels) of Frequency of Accessing the Web-based Course (I-J)

| Category (I) | SN | TW | OW (J) | TD | OD |
|---|---|---|---|---|---|
| Seldom or Never (**SN**) | --- | | | | |
| Once every two weeks (**TW**) | .74* | --- | | | |
| Once a week (**OW**) | .74* | 0 | --- | | |
| Once every two days (**TD**) | .90* | .16* | .16* | --- | |
| More than once a day (**OD**) | .95* | .21* | .21* | .05 | --- |

*The mean difference is significant at the .05 level.

Based on the data presented in Table 6, one can say that there were no significant differences in the means between TW and OW, and between TD and OD. However, there were significant differences in the means between SN and each of TW, OW, TD, and OD. Moreover, there were significant differences in the means between TW and each of TD and OD. Almost the same differences in the means were found between OW and each of TD and OD.

**Discussion and Conclusions**

In spite of current researchers' interest in the study of online interaction in Web-based courses, there is a dearth of research available on the relationship between learners' attitudes toward online interaction and learners' demographic variables (such as gender, age, GPA, etc.). This study sought to measure learners' attitudes toward online interaction in a Web-based course. By measuring learners' perceptions, the study attempted to find whether online interaction promotes learning among learners. The study also gave attention to the variables of gender, age, Grade-Point Average (GPA), years of experience with the Internet, and frequency of accessing the Web-based course to test whether these variables are significant factors in learners' attitudes toward online interaction in the Web-based course.

The descriptive results of this study indicated that overall learners positively perceived that online interaction in the Web-based course promoted learning among them. This valuable finding, which aligns with what Berge (1999) and Jaffe (1997) found, was exemplified by the result that above seventy-seven percent of the learners strongly agreed or agreed on the following points:

- Online interaction with others encouraged learners to learn more.
- Learners were able to direct their questions and concerns to the instructor online and at any convenient time.
- Through online interaction with students and instructor, learners were able to get help on topics that needed more explanation to understand.
- Online interaction with the instructor helped learners to ask questions they might not have asked otherwise.
- Through online interaction with other students, learners were able to share ideas and concerns regarding the course.
- Learners felt that online interaction in the course was going to be reflected on their final grades in the course.
- Online interaction with students and instructor stimulated learners to think about the course material in new ways.

Based on this finding, one can conclude that in order to promote learning in a Web-based course, students need to be encouraged to participate in online activities that enable interaction to occur. For example, students can participate in discussion boards, email, asynchronous conferencing, chatting, and listservs.

Another finding of the study was that gender, age, GPA, and years of experience with the Internet were insignificant factors in learners' attitudes toward online interaction in the Web-based course. Except for the years of experience with the Internet, this finding goes along with the findings of a number of relatively recent studies (Meisel & Marks, 1999; Koohang & Durante, 2003; Koohang, 2004). However, in regard to gender and years of experience with the Internet, this finding does not agree with the findings of Lucy's (1993) study perhaps because of the differences in the instruments employed in measuring attitudes. Based on this finding, the following conclusions can be drawn:

- Males and females in the web-based course equally perceived that online interaction promoted learning. This implies that the "Accounting Principles (1)" web-based course implemented by the Department of Accounting at the Hashemite University did not reflect any gender bias. Therefore, the structure of this course can be helpful in designing similar web-based courses.
- Learners of different ages equally perceived that online interaction promoted learning. However, since around seventy-two percent of the learners who participated in this study were less than 20 years of age, the influence of age might not have been tested adequately. Therefore, further examination of this variable is needed and is recommended for future studies.
- Learners with different GPAs equally perceived that online interaction promoted learning. Knowing that almost one half of the learners in this study had GPAs less than 3.00, it is of an interest for administrators and policy-makers to realize that online interaction in the web-based course promoted the learning of learners regardless of their GPAs.
- Learners with different numbers of years of experience with the Internet equally perceived that online interaction promoted learning. Surprisingly, this conclusion did not meet the authors' expectation. One reason for such a result could be that around fifty-eight percent of learners participating in this course had less than two years of experience with the Internet. Therefore, to study the influence of such a variable more adequately, we believe that further examination is needed.

This study also found that learners' frequency of accessing the Web-based course was a significant factor in learners' attitudes toward online interaction. In other words, depending on their categories of accessing the web-based course, learners differently perceived that online interaction promoted learning. To better understand the influence of these categories, post hoc comparisons were conducted. The results of these comparisons helped in forming the following conclusions:

- Compared to learners in the other categories, learners who "seldom" or "never" accessed the web-based course had the lowest level of attitudes toward online interaction. A possible reason for this could be that these learners did not benefit much from online interaction. However, since learners in this category made for around eleven percent of the whole sample, it is important to realize that the success of a web-based course may depend upon increased frequency of accessing that course.

- Learners who used to access the web-based course once every two weeks and those who used to access the course once a week equally perceived that online interaction promoted learning. One reason for such a result could be that discussion forums were due every two weeks. Therefore, it is likely that this gave some learners the chance to wait until the second week of each forum to access the course. It should be mentioned that learners in both categories had higher positive attitudes than those of the learners in the previous "Seldom or Never" category.
- Learners who used to access the web-based course once every two days and those who used to access the course more than once a day equally perceived that online interaction promoted learning. One possible reason for such a result could be that the class used to meet face-to-face every Sunday, Tuesday, and Thursday. Therefore, it is possible that some learners preferred to access the course on the day when they had no class. However, learners in both categories had the highest positive attitudes among all categories.

In general, learners who had accessed the Web-based course more frequently indicated significantly higher positive attitudes toward online interaction.

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## Appendix A
## The Survey Instrument

In this survey, there are two sections: (1) General Information; and (2) Attitudes toward Online Interaction in the Course.

**SECTION (1): General Information**

Please respond to the following items by circling the appropriate number:

1. **Your gender:**

(1) Male (2) Female

2. **Your age:**

(1) Less than 20 years (2) From 20 to 22 years
(3) From 23 to 25 years (4) Greater than 25 years

3. **Your Grade-Point Average (GPA):**

(1) Less than 2.00 (2) From 2.00 to 2.49
(3) From 2.50 to 2.99 (4) From 3.00 to 3.69
(5) From 3.70 to 4.00

4. **Your years of experience with the Internet:**

(1) Less than 2 years (2) From 2 to 4 years
(3) Greater than 4 years

5. **How frequently you accessed the web-based course:**

(1) Never (2) Seldom
(3) Once every two weeks (4) Once a week
(5) Once every two days (6) More than once a day

**SECTION (2): Attitudes toward Online Interaction in the Course**

Using the following scale, please indicate your agreement with each of the items that follow by circling the number that best describes your belief about online interaction in the Accounting Web-based course:

**Scale:**

5=Strongly Agree, 4=Agree, 3=Neither Agree nor Disagree, 2=Disagree, 1=Strongly Disagree

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. | I usually receive online feedback from the instructor about questions and concerns I post online. | 5 | 4 | 3 | 2 | 1 |
| 2. | I can direct my questions and concerns to the instructor online at any convenient time. | 5 | 4 | 3 | 2 | 1 |
| 3. | Online interaction with the instructor helped me to ask questions I might not have asked otherwise. | 5 | 4 | 3 | 2 | 1 |
| 4. | Through online interaction with other students, I can share ideas and concerns regarding this course. | 5 | 4 | 3 | 2 | 1 |
| 5. | Online interaction with others encourages me to learn more. | 5 | 4 | 3 | 2 | 1 |
| 6. | Online interaction with students and instructor helped me to learn the course material. | 5 | 4 | 3 | 2 | 1 |
| 7. | My interaction with the online course material helped me to understand what I learn. | 5 | 4 | 3 | 2 | 1 |
| 8. | Online interaction with students and instructor stimulates me to think about the course material in new ways. | 5 | 4 | 3 | 2 | 1 |
| 9. | Through online interaction with students and instructor, I can get help on topics that need more explanation to understand. | 5 | 4 | 3 | 2 | 1 |
| 10. | I feel the online interaction that takes place in this course will be reflected positively on my final grade in the course. | 5 | 4 | 3 | 2 | 1 |
| 11. | I feel the online interaction in this course will make a new experience for me that I have not gone through before. | 5 | 4 | 3 | 2 | 1 |
| 12. | I think my online interaction in this course has been more than any other face-to-face interactions I have had in other courses. | 5 | 4 | 3 | 2 | 1 |