FROM THE PERSPECTIVE OF COMMUNITY OF INQUIRY FRAMEWORK: AN EXAMINATION OF FACEBOOK USES BY PRE-SERVICE TEACHERS AS A LEARNING ENVIRONMENT

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ABSTRACT
Online and blended learning, developed with advances in technology, have gained relative importance in modern communities. In recent years, the concept of creating learning communities has been coined to increase effectiveness of these learning environments. Based on this concept, Garrison, Anderson, and Archer (2000) developed the Community of Inquiry Framework (CoI), which intends to create learning communities for students in online and blended learning environments to collaborate and interact with one another, and learning is based on educational experiences. CoI framework is based on three fundamental dimensions: social presence, cognitive presence, and teaching presence.

The purpose of this study is to examine the development of a CoI in face-to-face and blended learning contexts in relationship to students' academic success, satisfaction, and motivation. The study is conducted in an undergraduate course delivered in both face-to-face (control group) and blended (experimental group) formats. A pretest and posttest research model is used in the study. Additionally, content analysis is used to analyze students' postings on Facebook. The research group for this study consists of 109 students in the Department of Computer and Instructional Technology Education. According to the results of this study, there is no significant difference between academic success of students in control and experimental groups. Also, there is a significant difference in some categories of motivation, satisfaction, and CoI.

INTRODUCTION

Currently, the rapid and important developments in technology have affected modern society. These developments bring a necessity for society to better use, manage, understand, and evaluate technology. Education plays an important role to meet the diverse needs of learners and improve their performance levels. Therefore, educational institutions are expected to provide individuals with the use of technology to access information, produce new knowledge, and keep up with the new age. Distance education is a response to the needs and expectations of the community. The purpose of distance education is to educate people, who are aware of technological progress, critical thinking, problem-solving, and collaboration.

There are numerous variables that affect the formation of learning communities in blended and online learning environments. Those most commonly adopted are motivation and satisfaction (Lopez-Perez, Perez-Lopez, & Rodriguez-Ariza, 2011). Satisfaction is "an affective outcome indicating positive feelings and attitudes towards the quality of learning and learning environment" (Akyol, 2009, p. 7). Some studies show a relationship between student satisfaction and sense of community (Rovai, 2002; Shea, 2006; Shea, Li, & Pickett, 2006). Motivation is the energy and drive that lead students to learn, work effectively, and achieve their potential at school (Martin & Tracey, 2002). Also, motivation is an affective component and plays an important role in students' skills of critical thinking, learning strategies, and learning achievement (Tuan, Chin, & Shieh, 2005). It is stated a learning environment comprises teaching strategies, teaching methods, class activities, student-teacher and student-student interactions that influence an individual's motivation in learning (Brophy, 1998; Hanrahan, 1998; Pintrich & Schunk 1996).

It appears that besides the advantages it offers, there are also some problems of distance education. Moore (1993) defines transactional distance in distance education as the psychological and communication gaps that exist between learners and instructors besides physical distance. Recently, the Community of Inquiry model (CoI) has become popular to remove this gap for distance education and provide a sense for students to feel themselves in the real classroom.

THEORETICAL BACKGROUND

A community is defined as "a general sense of connection, belonging and comfort that develop over time among members of a group who share purpose and commitment to a common goal" (Conrad, 2005, p. 1). In a well-

developed learning community, students learn from their interactions with others, with objects of the effort, and from their own participation during the process (Riel & Polin, 2004).

Community of Inquiry framework was developed by Garrison, Anderson, and Archer (2000). In the CoI framework, which places emphasis on critical thinking and collaboration, learning is based on educational experience in online and blended learning environments. Community of Inquiry provides a well-structured model and a set of guidelines for the purpose of constructing meaningful and worthwhile knowledge (Akyol, 2009). Garrison et al. presented the CoI model to help identify and show the relationships between required elements for learners to have successful learning experiences (Garrison, Anderson, & Archer, 2001). In this view, learners collaboratively communicate during their educational experience to construct knowledge (Colt, 2008). "The Community of Inquiry model was specifically designed to guide the use of computer conferencing to support critical thinking in higher education" (Rourke, Garrison, Anderson, & Archer, 2001, p. 2). The fundamental assumption of the CoI model is social interaction among students and teachers provides deep and meaningful learning environments in higher education, which can be either online or face-to-face (Shin, 2008).

The CoI model assumes that deep and meaningful learning, particularly in online environments, takes place within the community through the interaction of three core elements (Tolu, 2010). As shown in Figure 1, these elements comprise social presence (participants seem like actual people), teaching presence (the design and development of learning experiences), and cognitive presence (the ability of learners to use online communication to construct meaning).

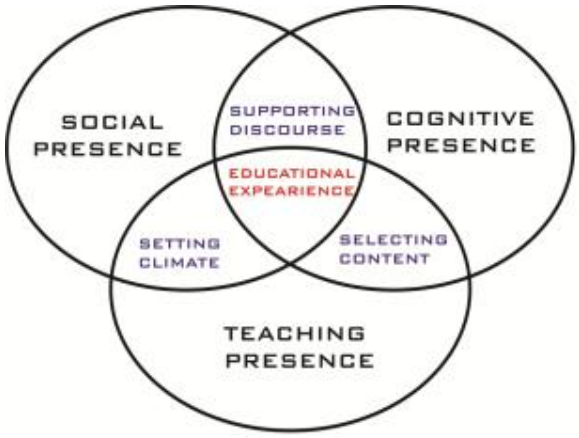

Figure 1. Community of Inquiry Model

Social Presence

Social presence is "the ability of learners to project themselves socially and emotionally in a community of inquiry" (Rourke et al., 2001, p. 3). It involves two important concepts—immediacy and intimacy. Immediacy is defined as the psychological proximity of the persons in communication. Intimacy is the perceived familiarity caused by social behaviors, such as body language, eye contact and smiling (Short, Williams, & Christie, 1976). In face-to-face learning, the persons in communication always convey and perceive positive, neutral, or negative levels of intimacy and immediacy through culturally-shared signs and codes, such as language choice, voice tone, body orientation, eye contact, and physical proximity (Tolu, 2010). Akyol (2009) states both intimacy and immediacy contribute to the development of social presence.

Social presence includes three essential categories—affective expression, open communication, and group cohesion. Affective expression is an initial stage of the course as a means of building trust and establishing oneself as a 'real person' (Bartruff, 2009). Affective expression refers to the emotional expressions within online environments, such as the use of emoticons, humor, and self-disclosure (Colt, 2008). Open communication develops awareness and acceptance of others' ideas with respect. Group cohesion starts to form through affective response and open communication (Akyol, 2009).

The main purpose of social presence is to improve cognitive presence and increase critical thinking through educational transactions and communications among peers enrolled in an online course (Lazarevic, 2011). Social presence is an important part of constructing cognitive presence because it is through interactions with other students and their ideas that new ideas can be formed (Harasim, Hiltz, Teles, & Turoff, 1996; Shin, 2008).

Cognitive Presence

Garrison (2007, p. 65) defined cognitive presence as "the exploration, construction, resolution and confirmation of understanding through collaboration and reflection in a community of inquiry." Garrison et al. (2001) operationalized cognitive presence through the Practical Inquiry model in terms of community of inquiry (Akyol, 2009).

The practical inquiry model was established to understand the development process of critical thinking to assess and investigate cognitive presence in an online learning environment (Maness-Gilliland, 2010). The practical inquiry model comprises four phases: 1) triggering event, 2) exploration, 3) integration, and 4) resolution (see Figure 2).

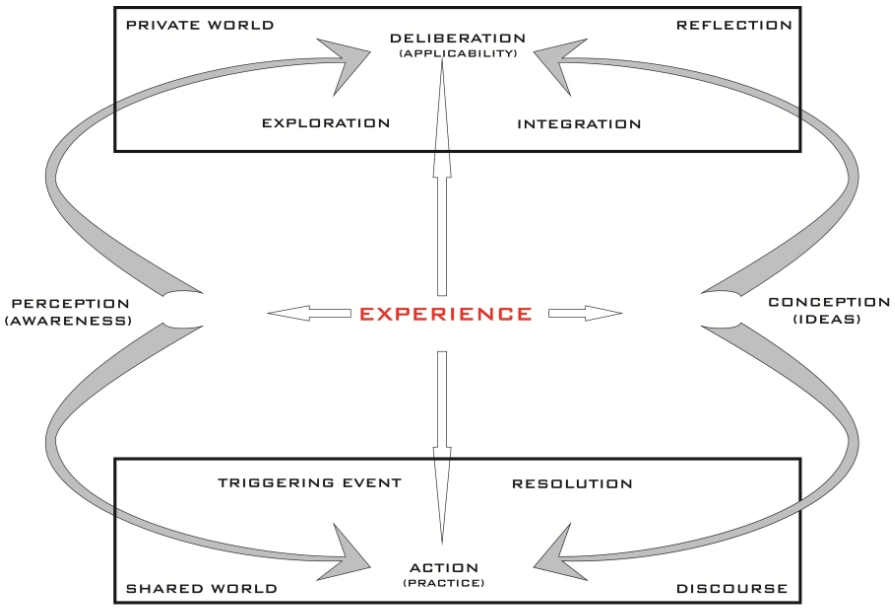

Figure 2. Practical Inquiry Model

- The first phase of the model is the triggering event, considered as the starting point of critical inquiry (Maness-Gilliland, 2010). In this phase, learners recognize a problem and develop a sense of puzzlement in the learning environment (Tolu, 2010).

- In the second phase, exploration, learners explore problems by asking each other brainstorming ideas, sharing experiences, and information, and adding to the knowledge established or expressed (Shin, 2008).

- In the third phase, integration, learners focus on making connections between ideas and developing possible solutions to construct meaning from the ideas developed in the exploration phase (Arbaugh, 2007).

- In the fourth phase, resolution, learners describe ways to test and apply knowledge created, and also apply the idea or knowledge to new situations (Tolu, 2010).

Teaching Presence

Teaching presence is defined as "the design, facilitation and direction of cognitive and social processes for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes" (Garrison & Anderson, 2003, p. 29). Anderson, Rourke, Garrison, and Archer (2001) prefer the term "teaching presence" rather than "teacher presence" in their research because teachers often collaborate to achieve this role. Students may provide such a role (Jinks, 2009). Teaching presence is "essential in balancing cognitive and social issues consistent with intended educational outcomes" (Garrison et al., 2000, p. 24). Teaching presence has three components: 1) instructional design and organization, 2) facilitating discourse, and 3) direct instruction.

Instructional design and organization includes setting the curriculum, defining goals and objectives, selecting suitable technology, designing methods for teaching and learning, setting time parameters, determining assessment procedures, defining lecture resources, and designing individual and collaborative activities (Garrison & Anderson, 2003).

Anderson et al. (2001) consider facilitating discourse as a critical component for maintaining student interest, engagement, and motivation during the course activities. Therefore, the instructor helps students identify areas of agreement and disagreement; seeks to reach an understanding; encourages, acknowledges, and reinforces student contributions; sets the climate for learning; draws in participants, prompting discussion; and assesses the efficacy of the process (Jinks, 2009).

The final component of teaching presence, direct instruction, looks to the instructor as a subject matter expert, providing intellectual and scholarly leadership through in-depth learning (Anderson et al., 2001). In direct instruction, the teacher presents the content and questions; focuses the discussion on specific issues; summarizes the discussions; confirms understanding; diagnoses misconceptions; injects knowledge from diverse sources; and responds to technical concerns (Anderson et al., 2001).

Purpose of the Study

The main purpose of this study was to examine the development of students' academic success, motivation, satisfaction, social presence, cognitive presence, and teaching presence in a face-to-face and a blended learning environment assisted by Facebook use.

For this purpose, the following research questions were examined by comparing the face-to-face course and the blended course in terms of posttest scores:

1) Is there a significant difference between the two groups in terms of academic success?
2) Is there a significant difference between the two groups in terms of motivation towards the course?
3) Is there a significant difference between the two groups in terms of social, cognitive and teaching presence?
4) Is there a significant difference between the two groups in terms of satisfaction in the education process?

In addition, the question, 'How do social, teaching, and cognitive presences develop on Facebook discussions in a blended course?' was answered through content analysis.

METHODOLOGY

Mixed methods research was conducted to examine the academic success, satisfaction, motivation, social presence, cognitive presence, and teaching presence of pre-service teachers in blended and face-to-face learning environments. In this section of the paper, research design, participants, research instruments, and experimental research procedures of the study are explained.

Research Design

Mixed methods research was used to provide depth and breadth to the study. An experimental pretest and posttest design with a control group was employed for this study. Furthermore, a content analysis of the discussions on Facebook was completed to calculate the frequencies and percentages for each category within teaching, social, and cognitive presences.

Participants

Participants were 109 students of the Computer and Instructional Technology Education Program in the Faculty of Education. Experimental and control groups were formed randomly. The achievement and motivation pretest, validity and reliability were confirmed, was applied to the students. There was no significant difference between control and experimental groups in terms of academic success and motivation. Thus, there were almost two equal study groups: 1) an experimental group comprised of 55 students and 2) a control group comprised of 54 students.

Research Instruments

In this study, the tools used to gather data included an achievement test, a motivation survey, a satisfaction survey, and a community of inquiry survey. Besides, students' discussions on Facebook were examined through content analysis.

Achievement test: The achievement test included 25 multiple choice test items developed by the researcher (Küçük, 2012). In the study, the analyses of the item discrimination index and the item difficulty index were conducted using ITEMAN software. According to the results of the analyses, five questions were eliminated from the test. A KR-20 reliability coefficient of .80 was obtained.

Motivation survey: Students' motivations towards the course were examined by using the Motivated Strategies for Learning Questionnaire (MSLQ). The questionnaire was developed by Pintrich, Smith, Garcia, and McKeachie (1991) and adapted into Turkish by Büyüköztürk, Akgün, Özkahveci, and Demirel (2004). The scale consisted of 31 items in the motivation subscale and 50 items in the learning strategies subscale. These subscales can be used singly or together, depending on the researcher's purpose (Büyüköztürk et al., 2004). Thus, the motivation subscale was used to determine the students' motivations towards the course. A single factor of the scale explained 56% of the total variance.

Community of Inquiry Survey: Students' social presence, teaching presence, and cognitive presence were examined by using the Community of Inquiry survey. This survey was developed by Arbaugh et al. (2008) and adapted into Turkish by the researcher (Küçük, 2012). The survey included a total of 34 items for teaching presence (13 items), social presence (9 items), and cognitive presence (12 items). The items were measured on a 5-point Likert-type scale, ranging from 1=Strongly Disagree to 5=Strongly Agree. Cronbach's alpha was 0.93 for teaching presence, 0.83 for social presence, and 0.92 for cognitive presence.

Satisfaction Survey: Students' satisfaction in the education process was examined by using Student Evaluations of Educational Quality (SEEQ) survey. This survey was developed by Marsh (1982, 1987) and adapted into Turkish by Özgüngör (2010). The scale consisted of 34 items and nine subscales. A single factor of the scale explained 80.42% of the total variance. Cronbach's alpha varied between .77 and .95 for the survey categories.

The development of students' social, cognitive, and teaching presences was examined on Facebook discussions through content analysis in the blended learning environment. The qualitative analysis was applied on three groups comprising of 13 students, who attended every assignment and provided deep discussions. To analyze the qualitative data, the coding schemes determined by Shea et al. (2010) were used.

Experimental Research Procedure

The study was conducted in blended and face-to-face learning environments with ICT students (Figure 3-4). Before the instruction, the researcher created a closed Facebook group, which gave the right of access only to the members of the experimental group. Group activities, sharing of lesson materials, and group discussions were conducted synchronously and asynchronously with this Facebook group throughout the course. Teaching strategies, methods, assessment techniques, and learning activities employed throughout the course were developed in accordance with the CoI framework. Thus, the course was designed to improve students' critical thinking, reflection, collaboration, and higher order thinking skills. In the blended learning environment, students studied in both the classroom environment and online through Facebook.

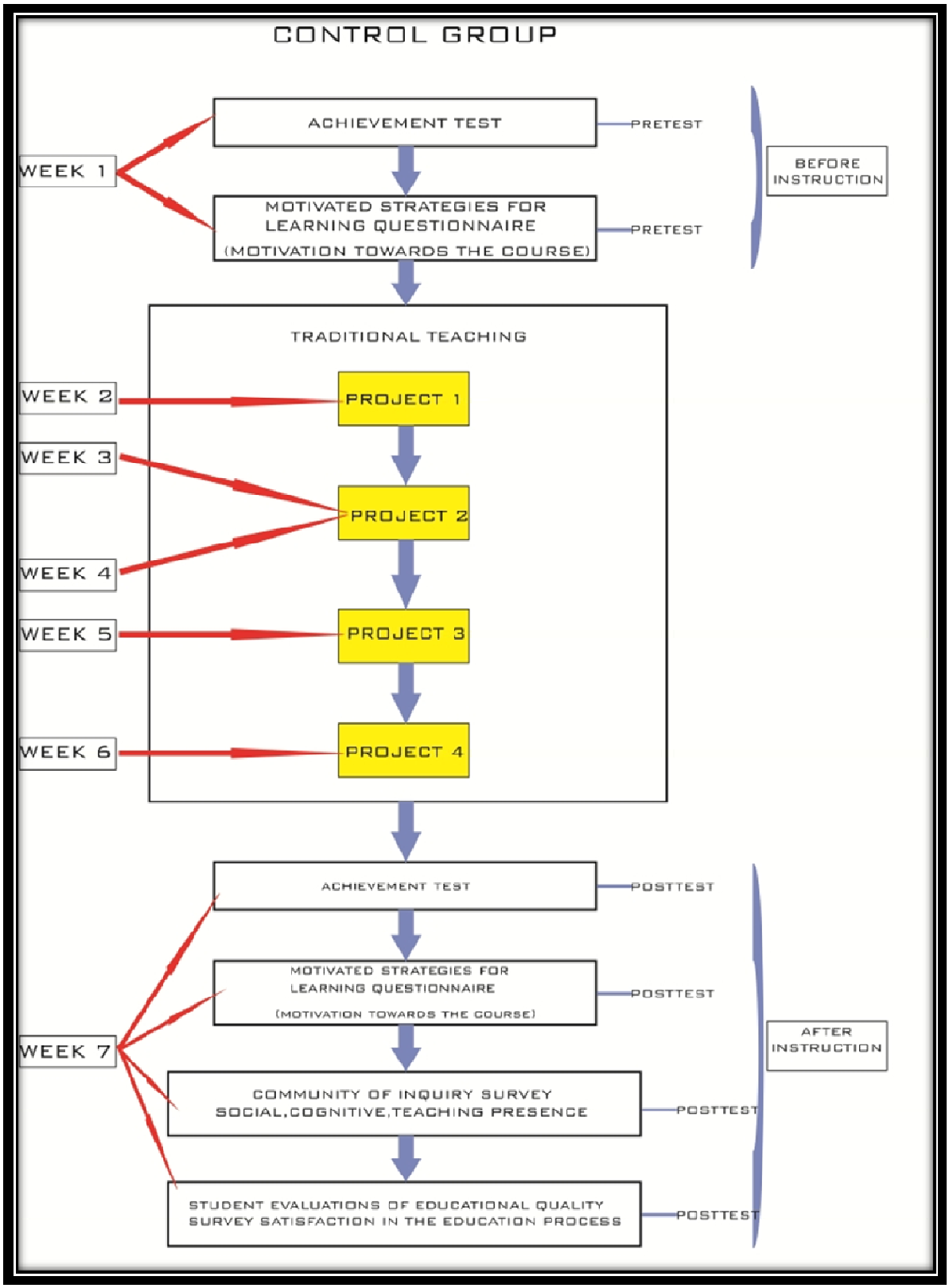

Figure 3. Experimental Process of Control Group

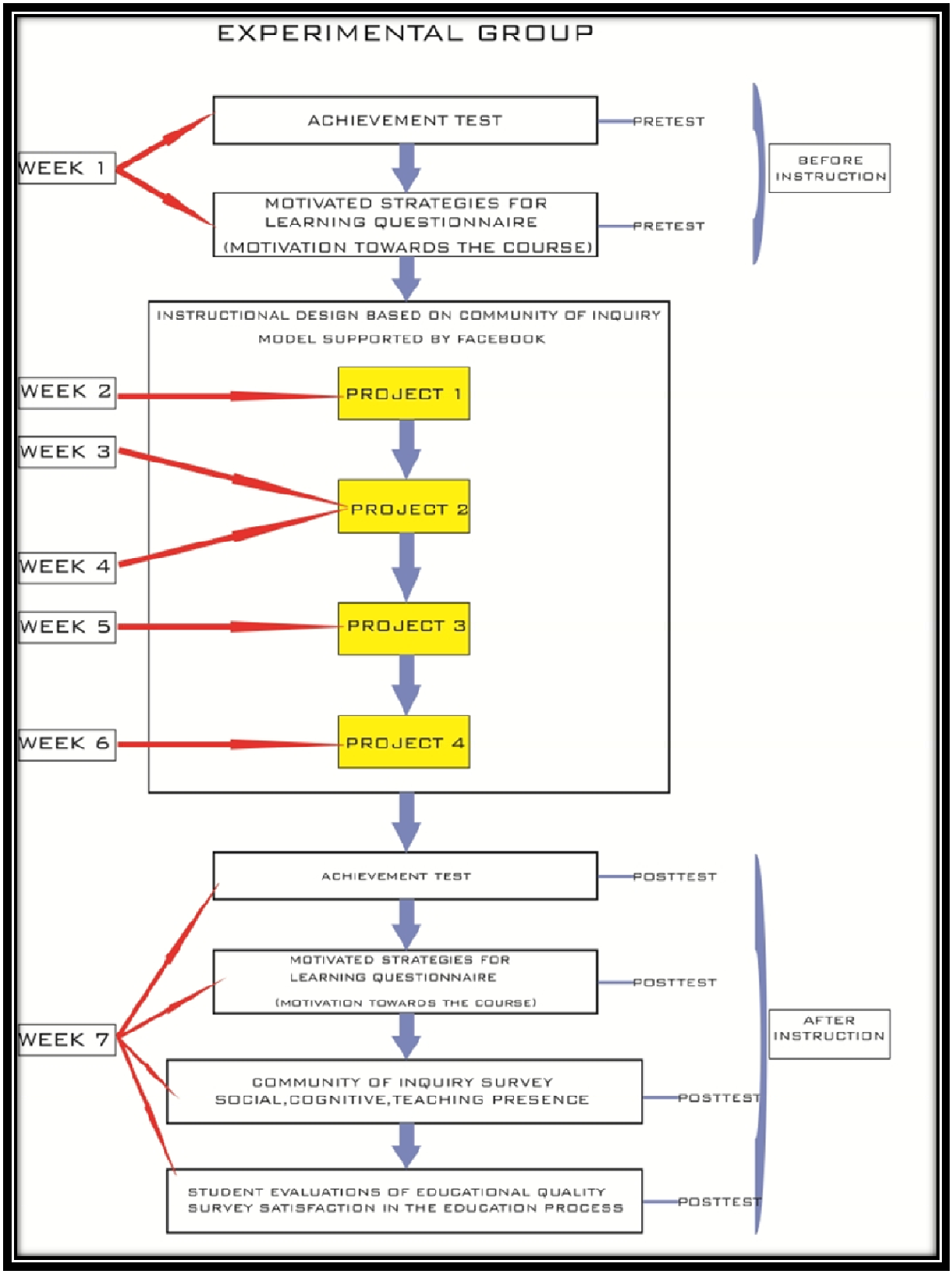

Figure 4. Experimental Process of Experimental Group

FINDINGS

Academic Success

In this study, an independent sample t-test was conducted to explore whether any statistically significant differences existed between the blended course (experimental group) and the face-to-face course (control group) in terms of academic success. Posttest results for academic success showed no significant difference between face-to-face and blended courses (t=.700, p>0.05).

Motivation Towards the Course

An independent t-test was applied to explore whether statistically significant differences existed between the blended course and the face-to-face course in terms of students' motivations towards the course. The analysis did not indicate any significant differences for *intrinsic goal orientation, control of learning beliefs, extrinsic goal orientation, task value,* and *test anxiety* categories for students' motivation between blended and face-to-face courses. However, the t-test yielded a significant difference for *self-efficacy for learning and performance* category of students' motivation between face-to-face and blended courses (t=2.356, p<0.05). Students in the control group ($\overline{X}$ =42.45) had higher levels of the self-efficacy for learning and performance than the ones in the experimental group ($\overline{X}$ =39.06).

Community of Inquiry Framework

In the study, independent t-tests were conducted to explore whether statistically significant differences existed between blended and face-to-face courses in terms of each element of community inquiry framework (social presence, cognitive presence, and teaching presence).

The independent t-tests applied to the categories of social presence (affective expression, open communication, and group cohesion) did not yield any statistically significant differences for *affective expression* and *open communication* between face-to-face and blended courses. However, the test results showed a significant difference between face-to-face and blended courses in terms of *group cohesion* (t=2.064, p<0.05). As the mean values for this category indicate, group cohesion was more frequent in the blended course ($\overline{X}$ =11.57) compared to the face-to-face course ($\overline{X}$ =10.74).

The independent t-tests applied to the categories of cognitive presence (triggering event, exploration, integration, resolution) did not yield any statistically significant differences between face-to-face and blended courses in terms of *triggering event, integration,* and *resolution*. However, the test results revealed a significant difference between face-to-face and blended courses in terms of *exploration* (t=2.030, p<0.05). As the mean values for this category indicate, the level of exploration was higher in the blended course ($\overline{X}$ =12.29) compared to the face-to-face course ($\overline{X}$ =11.43).

The independent t-tests applied to the categories of teaching presence (instructional design, facilitating discourse, and direct instruction) did not yield any statistically significant differences between face-to-face and blended courses in terms of the categories.

Satisfaction in the Education Process

The independent t-test was applied to explore whether the differences in students' satisfaction in the education process between the blended course and the face-to-face course were statistically significant.

The test results indicated no significant differences in terms of *learning/academic value, group interaction, individual rapport, breath of coverage, assignments,* and *overall* categories of students' satisfaction between face-to-face and blended courses. However, the t-test yielded significant differences for *enthusiasm* (t=3.075, p<0.05), *organization/clarity* (t=2.475, p<0.05) and *examinations* (t=2.162, p<0.05) categories of students' satisfaction between face-to-face and blended courses. As the mean values for these categories indicate, enthusiasm was higher in the face-to-face course ($\overline{X}$ =16.09) compared to the blended course ($\overline{X}$ =14.59). Besides, organization/clarity was higher in the face-to-face course ($\overline{X}$ =15.36) compared to the blended course ($\overline{X}$ =14.13). At the same time, examination was higher in the face-to-face course ($\overline{X}$ =12.16), compared to the blended course ($\overline{X}$ =11.35).

Content Analysis Results for Community of Inquiry Model

Students, who took the blended course, participated in weekly 'to do projects' discussions on Facebook. Transcripts were generated from these discussions. These transcripts were subjected to content analysis to examine the development of students' social, cognitive, and teaching presences considering the projects. The analysis involved the coding of 580 student postings for social, cognitive, and teaching presences (see Figure 5).

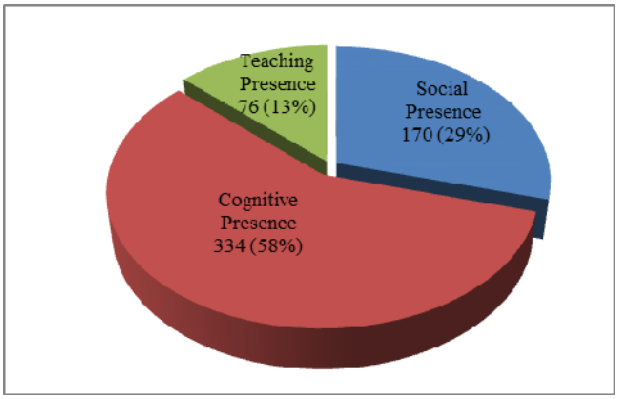

Figure 5. Number of Messages for Each Presence on Facebook

As seen in Figure 5, the highest number of postings was for cognitive presence. Teaching presence had the lowest percentage of postings (13%) among all postings throughout the course.

Content Analysis for Social Presence

Social presence was analyzed in the transcripts by coding for affective expression, open communication, and group cohesion categories. Table 1 illustrates the comparison of the coding results for the categories of social presence, according to the projects the students completed on Facebook.

Table 1. Comparison of Coding Results for Social Presence According to Projects

SOCIAL PRESENCE		Project 1	Project 2	Project 3	Project 4	TOTAL
Affective Expression	**Number of Codes**	17	17	11	16	61
	Percent of Codes	30.3%	42.5%	36.6%	36.3%	35.8%
Open Communication	**Number of Codes**	31	17	13	25	86
	Percent of Codes	55.3%	42.5%	43.3%	56.8%	50.5%
Group Cohesion	**Number of Codes**	8	6	6	3	23
	Percent of Codes	14.2%	15%	20%	6.8%	13.5%
TOTAL	**Number of Codes**	56	40	30	44	170
	Percent of Codes	32.9%	23.5%	17.6%	25.8%	100%

For all projects, the majority of the messages were coded as open communication (50.5%) (Table 1). The category of affective expression was coded as stable for all four projects. Although open communication decreased after Project 1, it increased in Project 4. Group cohesion considerably decreased after Project 3.

Content Analysis for Cognitive Presence

Cognitive presence was analyzed in the transcripts by coding for triggering event, exploration, integration, and resolution categories. Table 2 illustrates the comparison of the coding results for the categories of cognitive presence, according to the projects the students completed on Facebook.

Table 2. Comparison of Coding Results for Cognitive Presence According to Projects

COGNITIVE PRESENCE		Project 1	Project 2	Project 3	Project 4	TOTAL
Triggering Event	**Number of Codes**	31	11	9	7	58
	Percent of Codes	41.8%	10.6%	10.3%	10%	17.3%
Exploration	**Number of Codes**	33	47	55	62	197
	Percent of Codes	44.5%	45.6%	63.2%	88.5%	58.9%
Integration	**Number of Codes**	10	29	21	1	61
	Percent of Codes	13.5%	28.1%	24.1%	1.4%	18.2%

Resolution	**Number of Codes**	0	16	2	0	18
	Percent of Codes	0%	15.5%	2.2%	0%	5.3%
TOTAL	**Number of Codes**	74	103	87	70	334
	Percent of Codes	22.1%	30.8%	26%	20.9%	100%

The majority of the messages posted throughout the projects were coded as the exploration phase (58.9%) (Table 2). The triggering event considerably decreased after Project 1. Exploration increased steadily throughout the projects. The third phase of cognitive presence and integration increased in Projects 2 and 3, but it showed a sharp decrease in project 4. None of the messages were coded as resolution in projects 1 and 4. Besides, the rate of codes for resolution was low in projects 2 and 3.

Content Analysis for Teaching Presence

Teaching presence was analyzed in the transcripts by coding for design and organization, facilitating discourse, and direct instruction categories. Table 3 illustrates the comparison of the coding results for these categories of teaching presence, according to the projects the students completed on Facebook.

Table 3. Comparison of Coding Results for Teaching Presence According to Projects

TEACHING PRESENCE		**Project 1**	**Project 2**	**Project 3**	**Project 4**	**TOTAL**
Design and Organization	**Number of Codes**	7	2	3	3	15
	Percent of Codes	29.1%	10.5%	20%	16.6%	19.7%
Facilitating Discourse	**Number of Codes**	7	5	8	8	28
	Percent of Codes	29.1%	26.3%	53.3%	44.4%	36.8%
Direct Instruction	**Number of Codes**	10	12	4	7	33
	Percent of Codes	41.6%	63.1%	26.6%	38.8%	43.4%
TOTAL	**Number of Codes**	24	19	15	18	76
	Percent of Codes	31.5%	25%	19.7%	23.6%	100%

In all projects, the majority of the messages were coded as direct instruction (43.4%) (Table 3). Design and organization showed a decrease after Project 1. Facilitating discourse was coded almost at the same rate in Projects 1 and 2, but increased after Project 2. Direct instruction considerably decreased in Projects 3 and 4 compared to Projects 1 and 2.

DISCUSSION

The findings obtained from the academic success scale showed no significant difference between the academic success levels of the students in experimental and control groups. This occurred because the course in which the application was implemented mainly consisted of theoretical information. In a similar experimental study, Demirer (2009) stated no significant difference occurred between the academic success posttest scores of the students in experimental and control groups, but there was a significant difference in favor of the experimental group with respect to the training materials the students developed. In their study on blended learning environments, Garrison and Kanuka (2004) put forth that blended learning leads to an increase in student success and creates permanent learning experiences through providing rich learning environments. Horzum and Balta (2008) state in their study of students in blended and face-to-face learning environments in terms of several variables, blended environments provide more and permanent learning compared to other environments.

The results of these tests showed a significant difference for *self-efficacy for learning and performance* in favor of the control group. The high self-efficacy perceptions of the students in the control group can be explained because the students in the experimental group were anxious about the educational use of Facebook and blended learning at the beginning of the application. Kurbanoğlu and Takunyacı (2012) stated students, who had a low level of anxiety towards the subject, would have higher self-efficacy levels. Students' lack of experience with distance education prior to the application caused them to have problems in adapting to the process. The students showed they had a certain level of anxiety at the beginning of the application by uttering statements like "*Instructor, what did you mean by ….., what do we have to do?*" and "*How should we do Project 1?*" during the discussions they completed over Facebook. In the present study, although the clear and definite explanations from the teacher regarding the application decreased over time, to a certain extent, this anxiety could not be

completely eliminated. For this reason, it can be said the students' anxieties in the experimental group towards the process affected the results.

A significant difference was observed between the experimental and control groups in terms of *group cohesion*, one of the three categories of social presence. Group cohesion scores for the experimental group were determined higher compared to those for the control group. In online and blended learning environments, the sense of belonging to a group, low in the beginning, becomes stronger among the individuals over time (Akyol, 2009). The online discussions the members of the experimental group held over Facebook highly improved the students' interaction and communication skills, and the group members felt they were part of whole group. Student-student interaction, which maintains social presence as also stated by Moore (1989), showed a considerable increase owing to Facebook use. The students had the opportunity to communicate with their group members and discuss the course by means of Facebook. According to the results obtained through the analysis of the qualitative data, it was seen that students exhibited patterns of social presence in every project conducted in the blended learning environment. The students used a total of 170 codes concerning social presence during the online discussions over Facebook in four projects; that is, a student made an average of 12 statements. This case can be regarded as a predictor of social sharing and presence.

The data obtained from the community of inquiry scale did not reveal any significant differences between the students in face-to-face and blended learning environments in terms of the *triggering event*, *integration* and *resolution* phases of cognitive presence. Previous studies showed the level of cognitive presence rarely moves beyond the exploration phase (to integration-resolution) (Garrison et al., 2001; Fahy, Crawford, & Ally, 2001; Kanuka & Anderson, 1998; Meyer, 2004; Murphy, 2004; Vaughan & Garrison, 2005).

However, a significant difference was observed between the experimental and the control groups in terms of the *exploration* category of cognitive presence. *Exploration* phase scores for the experimental group were determined higher compared to those for the control group. The students in the experimental group completed their projects via Facebook caused a reasonable improvement in their exploration skills compared to the control group. The students individually and collaboratively searched for relevant material and ideas (Swan et al., 2008). The students achieved new information by sharing their ideas and experiences about this knowledge and resources. The results from the analysis of the qualitative data showed the students used a total of 336 codes concerning cognitive presence during the online discussions over Facebook in four projects; that is, a student made an average of 24 statements. Mazman (2009) noted one of the aspects that constitute the educational use of Facebook was "sharing resources and materials." The reasonably high rate of the exploration phase of cognitive presence observed in the results of the content analysis indicates the students shared information and materials as part of their educational use of Facebook and benefited from their content shared by the others.

The data obtained from the community of inquiry scale did not reveal any significant differences between the students in face-to-face and blended learning environments in terms of the *design and organization*, *facilitating discourse* and *direct instruction* categories of teaching presence. Teaching presence continues before teaching formally starts and during the educational process (Lazarevic, 2011). Teaching presence is closely related to instructional design. Instructional design plays a highly important role in the success of the distance education process and the realization of teaching presence (Winfield, Mealy, & Scheibel, 1998). The content of the course was taught to both learning groups, using the same teaching techniques by the instructor in a classroom environment. This shows the teaching strategies, methods, and learning activities determined in accordance with the community of inquiry model and applied in face-to-face and blended learning environments were effective and successful. It is seen that an online learning environment created through a successful instructional design was as effective as a face-to-face learning environment (So & Brush, 2008). The results of the analysis of the qualitative data demonstrated the students showed patterns of a teaching presence in every project conducted in the blended learning environment. The students used a total of 76 codes concerning teaching presence during the online discussions held over Facebook in four projects; that is, a student made an average of five statements. It was noted in various studies the reason for a teaching presence being coded less compared to other types of presences was students viewed a teaching presence as the responsibility and duty of the teacher only (Akyol, 2009; Rourke & Anderson, 2002; Shea et al., 2006).

The results of the tests showed a significant difference for *enthusiasm*, *organization/clarity* and *examinations* categories in favor of the control group. The constructivist approach was adopted for the course, designed in accordance with the community of inquiry model, which is also based on constructivism. Under the constructive learning model, interactive communications and media presentation provided with technology can help learners develop high-level thinking skills and deep learning (Leidner & Jarvenpaa, 1995). According to constructivist approach, students are placed at the center, and knowledge is made meaningful as the result of their own

activities and their interactions with the environment. For this reason, the teacher helps students construct knowledge through his role as a guide and mentor. İşman (2011) stated students take the role of instructor, one of the roles of the student in distance education, to help and support each other's learning through interacting with each other during the teaching process. In the present study, the analysis of the qualitative data shows students considered a teaching presence as the responsibility and duty of the teacher only. For this reason, it can be said the students had an expectation for the teachers to play an active role in the discussions during the experimental application. This can be regarded as the reason the experimental group students' viewed the teacher as less enthusiastic, who only guided and adopted a student-centered approach during the discussions they completed via Facebook.

Hara & Kling (2001) stated that students experienced several types of distress in distance education: anxiety, frustration and confusion. The high anxiety levels of the students in the control group at the beginning of the experimental application process and their lack of experience with distance education led them to become biased towards the instruction provided over Facebook. Bolliger & Halupa (2012) reported that the students who had less anxiety were more satisfied than the ones who had higher anxiety. Course quality is an important factor that influences learning outcomes and satisfaction in distance education (Piccoli, Ahmad, & Ives, 2001). Online interactive discussions, brainstorming, multimedia presentation, timely feedback, management of learning process were helpful for students in establishing learning models effectively and motivating continuous distance education (Piccoli et al., 2001). In the study, although all those details for the course were broadly outlined and everything proceeded according to course plan, the students' anxiety levels could not be completely eliminated since they worried about grades. This might have negatively affected the experimental group students' satisfaction with organization/clarity, which measures the clarity of the course content, materials, and organization.

Using different assessment methods in distance education courses causes students to think that a connection is provided between them and the instructor and their learning efforts are properly assessed (Sun, Tsai, Finger, Chen, & Yeh, 2008). In the present study, the students discussed the assigned projects in detail within their groups over Facebook, and finally sent the outcomes as a report to the instructor by e-mail. Also, the instructor gave feedback to the students whenever it is needed. Students' activities and processes might be corrected or developed through feedbacks for successful performance (Thurmond, Wambach, & Connors, 2002). As stated earlier, anxiety with technology can have a negative effect on student performance and satisfaction (Sun et al., 2008). The question "but everyone can see what I write here, so how will you distinguish those who know from others who do not?," which was one of the sources of students' anxiety and asked to the teacher over Facebook, clearly exhibits the anxieties of students regarding examinations. Despite all the explanations the instructor provided for course evaluation at the beginning of the term, it was not possible to eliminate these concerns completely. This might negatively affected the students' satisfaction with examinations.

CONCLUSIONS

The study has taken a step to understand importance of the community of inquiry development in learning environments. The issue of community of inquiry development of students in blended and face-to-face learning environments in general is not well documented. Thus, the study was performed to attempt to provide a bridge the information gap in the literature regarding community of inquiry development in these learning environments. The study was aimed to examine the development of students' academic success, motivation, satisfaction, social presence, cognitive presence and teaching presence in face-to-face and blended learning environments. The development of each presence in community of inquiry showed different progress in terms of projects in blended learning context. In this way, instructional design based on CoI framework played an important role in deep and meaningful learning. In future research, students' anxiety levels about online learning and students' attitudes towards educational use of Facebook can be examined. Also, the online learning environment can be compared to both face-to-face and blended learning environments.

NOTES

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