SOCIAL NETWORKING SITES UTILIZATION FOR TEACHING AND LEARNING

A THESIS STUDY SUBMITTED TO
THE GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES
OF
MIDDLE EAST TECHNICAL UNIVERSITY

BY

DUYGU ALBAYRAK

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF DOCTOR OF PHILOSOPHY
IN
COMPUTER EDUCATION AND INSTRUCTIONAL TECHNOLOGY

FEBRUARY 2012

Approval of the thesis:

SOCIAL NETWORKING SITES UTILIZATION FOR TEACHING AND LEARNING

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ABSTRACT

SOCIAL NETWORKING SITES UTILIZATION FOR TEACHING AND LEARNING

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February 2012, 243 pages

The purpose of this study was to investigate students' social networking sites (SNSs) involvement, students' involvement of Facebook as course management system (CMS) in face-to-face course, students' acceptance of Facebook, students' motivations, students' achievements, and their relationships. The study, used Facebook as CMS, was conducted in a private university with 42 participants in two different freshman courses. Maximum variation sampling was employed in selecting 12 students for interview. Mixed method was employed as part of an action-research approach. Both quantitative and qualitative data collection methods were utilized to thoroughly analyze Facebook use as CMS. Quantitative data were collected through three questionnaires about Facebook acceptance, motivation to the course and involvement of Facebook and course Facebook page. The qualitative data were collected through both individual interviews and discussion posts of course Facebook page. The quantitative data analysis consisted of descriptive statistics, and correlation analyses. Coding schemes were used to both find the depth-of-discussion posts and convert qualitative data into quantitative data.

The results stated that students' SNSs involvement, students' acceptance of Facebook, students' motivations, students' achievements and their relationships were different according to the taken course. Possible reasons of the differences of utilization and engagement in the course activities were clarified in the study. Results support that students and instructors could benefit from Facebook usage in learning and teaching. Most of the participants believed the value of having CMSs in all courses. Moreover, they preferred Facebook as CMS to communicate easily, to increase their active participation and interactions in their courses.

Key words: Social networking sites, technology acceptance model, course management systems, instructional use of social networking sites

ÖZ

SOCIAL NETWORKING SITES UTILIZATION FOR TEACHING AND LEARNING

Albayrak, Duygu

Doktora, Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü

Tez Yöneticisi: Doç. Dr. Zahide Yıldırım

Şubat 2012, 243 sayfa

Bu çalışmanın amacı öğrencilerin sosyal ağ sitelerine (SAS) katılımı, Facebook'a yüzyüze bir derste ders yönetim sistemi (DYS) olarak katılımı, öğrencilerin Facebook'u kabullenmeleri, öğrencilerin motivasyonu, öğrencilerin başarıları ve bunlar arasındaki ilişkileri araştırmaktır. Facebook'u DYS olarak kullanan çalışma, iki farklı birinci sınıf dersinde 42 katılımcı ile özel bir üniversitede gerçekleştirildi. Görüşmeler yapılacak 12 öğrencinin seçiminde maksimum çeşitlilik örnekleme yöntemi uygulandı. Karma yöntem ilkeleri eylem araştırma yaklaşımının bir parçası olarak kullanıldı. Facebook'un bir DYS olarak kullanımının özenle incelenmesinde gerek nicel ve gerekse nitel veri toplama yöntemleri uygulandı. Nicel veri Facebook'u kabullenme, Facebook ve dersin Facebook sayfasına katılım ve ders motivasyonu anketleri aracılığıyla toplanıldı. Nitel veriler yüz yüze görüşme ve dersin Facebook sayfasındaki tartışma postlarının değerledirilmelerinden toplandı. Nitel veri analizi tanımlayıcı istatistik ve korelasyon analizlerini içerdi. Kodlama tabloları hem tartışma postlarının derinliklerinin bulunmasında hem de nitel verinin nicel veriye çevrilmesinde kullanıldı.

Çalışmanın sonuçları öğrencilerin SAS katılımı, öğrencilerin Facebook kabullenmesi, öğrencilerin motisvasyonu, öğrencilerin başarıları ve aralarındaki ilişkilerin alınan derse göre farklı oluğunu gösterdi. Farklılıkların olası nedenleri belirtilmiştir. Çalışma sonuçları öğrenci ve öğretmenlerin Facebook kullanımından öğrenme ve eğitim açısından yaralanabileceklerini göstermiştir. Katılımcıların çoğu tüm derslerde bir DYS olmasının değerine inandıklarını bildirdi. Bununla birlikte, Facebook'u kolay iletişim kurmak, aktif katılımlarını ve etkileşimlerini artıran bir DYS olarak tercih ettiler.

Anahtar Kelimeler: Sosyal ağ siteleri, teknoloji benimseme modeli, ders yönetim sistemleri, sosyal ağ sitelerinin eğitimde kullanımı

To my sister, father and mother…

ACKNOWLEDGEMENTS

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LIST OF ABBREVIATIONS

ATU: Attitude Toward Use

BIU: Behavioral Intention to Use

CGPA: Cumulative Grade Point Average

CMS: Course Management System

CTIS 151: Introduction to Programming

CTIS 163: Discrete Mathematics

CTIS: Computer Technology and Information Systems

EGO: Extrinsic Goal Orientation

F2F: Face to Face

GPA: Grade Point Average

IGO: Intrinsic Goal Orientation

PEU: Perceived Ease of Use

PU: Perceived Usefulness

SE: Self Efficacy

SN: Subjective Norm

SNS: Social Networking Site

TAM: Technology Acceptance Model

TPB: Theory of Planned Behavior

TRA: Theory of Reasoned Actions

TV: Task Value

CHAPTER 1

INTRODUCTION

This section presents background of the study, purpose of the study, the research questions, the significance of the study and the definitions of the key terms used in the study.

1.1   Background of the Study

Researchers and academicians have been interested in the role of technology and social networking in educational setting to make students more active and involved in course and course related activities. Course Management Systems (CMSs) are used to increase students' social interaction and involvement in the course activities. However, users (such as students, instructors) may reject using CMS. One of the well known reasons of this situation is that the users did not accept the technology. As a result, researchers continue to find a technology that is accepted by both instructors and students to use as CMS such as Social Networking Sites (SNSs) or a way to increase the acceptance of today's CMSs. The number of related research in the literature shows that there is great attention to the use of SNSs in higher education.

The use of SNSs is nowadays an important issue of the higher educational researches (Boyd, & Ellison, 2008) since not only SNSs such as Facebook and MySpace have become popular among students of all ages (Acquisti & Gross, 2006; Ajjan & Hartshorne, 2008; Cain, 2008; Farmer, Bruckner, Cook, & Hearing, 2009; Subrahmanyam, Reich, Waechter, & Espinoza, 2008) but also they may offer workspaces to facilitate information sharing, communication, and social interaction

among participants, students and instructors (Griffith & Liyanage, 2008; Liccardi et al., 2007; Harris & Rea, 2009; Jones, Johnson-Yale, Millermaier, & Pérez, 2008; Malcolm, 2005; Santos, Hammond, Durli, & Chou, 2009)

SNSs, also named as online social networking (OSN), can be defined as virtual places that are used to communicate, share and discuss ideas. Academicians have started to question and explore how SNSs can be used for academic purposes since SNSs have exploded over the past few years. However, the extent of adoption and perception of SNSs for academic purposes is not readily known (Carosu & Salaway, 2009). Carosu and Salaway (2009) stated that students use SNSs mostly to communicate with their classmates. However, the students in their study showed that they liked the idea of interacting with the instructors and the teaching assistants using the same SNS mechanisms as classmates and friends (Carosu & Salaway, 2009).

Nowadays, students come to universities with experience on SNSs. Especially, interacting with online SNSs is a daily activity for college students (Baatarjav, Phithakkitnukoon & Dantu, 2008; Carosu & Salaway, 2009; Debatin, Lovejoy, Horn, & Hughes, 2009; Ellison, Steinfield, & Lampe, 2007). Clearly, there is a need to analyze whether SNSs can be employed as CMS in teaching and learning in blended learning.

Dunlap and Lowenthal (2009) pointed out the importance of social process of learning and how we can employ SNSs to provide space and opportunities which can be employed in social activities in teaching and learning. The social activities or social interactions that occur among students, their peers and instructors could play an important role in the learning process. Therefore, the reasons or possible determinants of the interactions in SNSs, more specifically in Facebook should be analyzed. Some of determinant of the activities in Facebook can be the students' acceptance of Facebook, students' motivation, and students' achievements. This leads to the questions of whether students' acceptance of Facebook, students' motivation, and students' achievements contribute to students' involvements in

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Facebook in teaching and learning processes. It also raises questions about the relationships between students' motivation and students' involvement in the course Facebook page.

Hence, from empirical standpoint, some questions yet to be addressed are:

1. Does students' acceptance of Facebook have a relationship with the level of their involvement in course online social networking?
2. Does students' involvement in course online social networking contribute to their achievements?
3. Are students' motivations related to their involvement on the course Facebook page?
4. How do students with different motivation and achievement levels use course Facebook page?

Therefore, there is a need to analyze the relationship between students' acceptance of Facebook, students' motivation, students' involvement in Facebook and students achievements to determine Facebook utilization in face to face (F2F) courses and how those factors are related to one another.

1.2   Purpose of the Study

The purpose of this study was to examine relationships between SNSs involvement or SNSs utilization, students' acceptance of SNSs, students' involvement of Facebook as CMS in face-to-face course, students' motivation, and students' achievements in teaching and learning. Based on collected data, determinants of SNSs utilization were also investigated.

The aim of this study was to understand and explain;

1. The importance of determinants (perceived ease of use, perceived usefulness, attitudes toward use, facilitating conditions and subjective norms) in the students' intention to use SNSs as CMS in the blended courses.

2. The relationships between course SNSs' involvement, and students' motivation, students' achievement, SNSs acceptance.

1.3 Research Questions

The research questions that guide this study are as follows;

RQ1. What are the students' Facebook acceptance and course Facebook involvement levels?

RQ2. Is there a relationship between students' Facebook acceptance (perceived ease of use, perceived usefulness, attitudes toward use, social norm, and behavioral intention to use) and student involvement in course Facebook page (time spent, number/type/depth of the posts)?

RQ3. Is there a relationship between students' motivational profiles (self-efficacy, intrinsic goal orientation, extrinsic goal orientation and task value) and student involvement in course Facebook page (time spent, number/type/depth of the posts)?

RQ4. Is there a significant relationship between students' achievement (course grade and CGPA) and course Facebook involvement (time spent, number/type/depth of the posts)?

RQ5. Is there a significant relationship between Facebook involvement (time spent) and Course Facebook involvement (time spent)?

RQ6. How do students compare Facebook, course Facebook page and Moodle?
  6.1 How do students compare Facebook and course Facebook page utilization?

6.2 How do students compare course Facebook page and Moodle in face-to-face (F2F) course?

Research questions can be studied in five related parameters: students' Facebook acceptance, students' motivation, students' achievement, course Facebook involvement and Facebook involvement presented in Figure 1.

```
┌─────────────────────────────┐
│ Facebook Acceptance         │
├─────────────────────────────┤
│ Perceived Ease of Use       │
│ Perceived Usefulness        │
│ Attitudes Toward Use        │
│ Facilitating Conditions     │
│ Subjective Norms            │
│ Behavioral Intention to Use │
└─────────────────────────────┘

┌─────────────────────────────┐
│ Motivation                  │
├─────────────────────────────┤
│ Self-Efficacy               │
│ Intrinsic Goal Orientation  │
│ Extrinsic Goal Orientation  │
│ Task Value                  │
└─────────────────────────────┘

┌─────────────────────────────────────┐
│ Course Facebook Involvement         │
├─────────────────────────────────────┤
│ Time spent in course Facebook page  │
│ Type of Posts (discussion, video…)  │
│ Number of Posts                     │
│ Depth of the Discussion Posts       │
└─────────────────────────────────────┘

┌─────────────────────────────┐
│ Achivement                  │
├─────────────────────────────┤
│ Course Grade                │
│ CGPA                        │
└─────────────────────────────┘

┌─────────────────────────────┐
│ Facebook Involvement        │
├─────────────────────────────┤
│ Time spent in Facebook      │
└─────────────────────────────┘
```

Figure 1: Research Questions Related Parameters

1.4   Significance of the Study

Some researchers believe that SNSs must be addressed and employed in education to see their impact on teaching and learning (Ellison, Steinfield & Lampe, 2007; Harris & Rea, 2009; Santos, Hammond, Durli, & Chou, 2009). However, after an extensive review of literature review, there are not enough empirical researches that have been found to identify what the effects of SNSs in education and the determinants of utilization of SNSs in teaching are. The results of this study might be helpful to evaluate and clarify the effects of SNSs in education and some factors of using SNSs which may have a connection with the achievement of students.

One important reason for this study is that, currently, the relationships between students' acceptance of SNSs in F2F course, SNSs involvement, motivation and achievement are not clear. Researchers have conducted numerous research studies to state the factors influence on SNS use, how students use SNS and social uses of Facebook. The literature has focused on the usage differences in SNSs. In contrast, the involvement and usage in academic purposes and the correlation between students' acceptance of SNSs, SNSs involvement, students' motivation and achievement in learning and teaching have not been studied. There is a need on possible academic uses of SNSs (Bosch, 2009). Furthermore, how the impact of students' with different motivational profiles and involvement of SNSs related to students' achievement has not been studied before. In this study, the researcher aimed to examine the relationship among students' involvement of course Facebook page, students' motivation and students' achievements.

Motivational theorists have focused on explaining students' behaviors, activity choice, engagement and performance in the majority of educational researches (Meece, Anderman, & Anderman, 2006). This study is relevant since it uses motivational theories to explain how students with different motivation profiles behave in Facebook environment and what are their choices, achievements and the relationship between students' choices and their achievements. In this study,

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researcher aimed to provide details about how students with different motivation profiles behave in Facebook environment and what are their choices, achievements and the relationship between students' choices and their achievements. By considering the result of the study, the relationships, instructional designers might design more effective F2F courses via Facebook as CMS.

It would be interesting and essential to explore how students with different motivation profiles participate in SNSs, and to see if students' involvement is different depending on their motivation level. It is also important to explore if the different involvements in SNSs and students with different motivation profiles have made any distinction on their achievements.

Astin's (1999) Theory of Student Involvement has been used in a variety of ways to frame educational researches. Nowadays, educational researchers investigate and explore the ways of assessing different forms of involvement such as involvement in SNSs. Using SNSs as learning management system in F2F courses, this research might contribute to the literature in this area. Moreover, with this study, one of Astin's questions, "What are the ideal combinations of different kinds of involvement in facilitating the maximum amount of learning?" might be answered by explaining how Facebook can be utilized in F2F courses.

The results of this study might clarify the factors (e.g. students' motivation, students' achievements, students' acceptance of SNSs and students' involvements to SNSs) to increase utilization of SNS in F2F courses. The findings of this study can be used in creating hybrid courses by using SNSs as CMSs. Moreover, the result of this study may provide information about current SNS usage of the instructors and students in course related activities.

SNSs are different from CMSs, as they tend to be much focused and lack the personal interaction and less networking capacity (Brady, Holcomb & Smith, 2010). As a result, using SNSs as CMS in F2F courses might likely to increase student

engagement and extent learning beyond the boundaries of the classroom. With this sense, the result of this study might be helpful to identify whether the utilization of SNSs as CMSs can increase the student engagement and students' involvement in out of classroom activities.

Brady, Holcomb & Smith, (2010) emphasized that there is currently little research which specify the educational benefits of SNSs utilization. The results of the study can help instructors to discover beneficial or negative relationships between the use of SNSs and the student's achievements and learning. Moreover, this study aims to discover and investigate unknown educational benefits of SNSs by employing Facebook as CMS. CMSs are used to increase interaction of students outside the classroom in F2F courses. However, students mostly did not prefer to use CMSs for discussion and communication purposes. This study results might be helpful to understand whether the reason is that CMSs are different software which students did not use in their daily lives by using Facebook which students use as daily.

This study is important to the field of instructional design because it explored how the utilization of SNS may be beneficial to increase collaboration, communication, and interaction in F2F courses. Moreover, instructional designers will see an example of how SNSs can be utilized in F2F courses. The results of this study are also crucial for both instructional designers and practitioners to make clear the expectations of students from a CMS. The results of this study might demonstrate instructional designers and practitioners might recognize students' comparison of Moodle and Facebook as CMS.

This study observes how the students' at Computer Technology and Information Systems (CTIS) Department of Bilkent University are spending on SNSs and identifies their online social networks. These observations may be used by both the CTIS faculty members and practitioners as guidelines for making decisions on how to use SNS in their courses. Since the data gathered from this study might facilitate to discover the successful strategies of using Facebook as CMS in F2F courses. This

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knowledge may assist both instructional designers and practitioners in designing their courses via Facebook.

1.5   Definition of Concepts and Terms used in the Study

In this section of the study, some terms are defined according to their meaning used in this research. These terms are;

CGPA: Cumulative Grade Point Average used for educational ranking and evaluation method. It is one of the student parameters.

Course Management System (CMS): is a software program or integrated platform that contains a series of web-based tools to support a number of activities and course management procedures (Vovides Y. et al, 2007). In the study, Facebook will be used as CMS.

Facebook: is a social networking site, in which users can connect with friends and co-workers in different networks and places.

Hybrid Course: The course is a mixture of traditional teaching environments with element of e-learning. Instructors who teach in class courses may choose to use "blended" approach by utilizing the CMS as a tool to deliver additional or supplementary course materials to the students. This teaching method is usually called "blended learning" and the courses are called "hybrid courses" (Vovides Y. et al, 2007).

STARS_DAIS: Student Department Academic Information System by which transcript of the students can be viewed.

Technology Acceptance (TAM): is a model that explains the key constructs essential to accept a new technology.

Perceived usefulness of SNSs: is the degree to which a student believes that using SNSs would enhance his/her course related performance in a F2F course.

Perceived ease of use of SNSs: is the degree to which a student expects that using SNSs would be free to effort. In other words, using SNSs as a CMS in F2F courses is easy to use in terms of using the site and handling environmental issues.

CHAPTER 2

LITERATURE REVIEW

Literature reviews in research are conducted for different reasons. The primary purpose of this chapter is to provide background information to explain current research and to provide theoretical background for subsequent research regarding this thesis subject. The chapter aims to describe what is meant by SNSs, to discuss the features, barriers and roles of SNSs in empowering universities to adopt themselves for the demands of the 21st century. It also explains the possible factors that determine the SNSs utilization, theories that construct the theoretical framework of the study. Finally, a summary of literature review is provided.

2.1 Online Social Networking - Social Networking Sites

A large and growing body of literature in both academic and practitioner journals has been inspired by the concept of SNSs. SNSs is a Web 2.0 technology. Web 2.0 technologies includes blogs, wikis, SNSs, social bookmarks, instant messaging, Internet telephony and video sharing sites. Similar to other Web 2.0 technologies, such as wikis and blogs, SNSs encourage more active user involvement opportunities (Baltacı-Göktalay & Ozdilek, 2010). SNSs are distinguished from other virtual forms of communities by enabling the users to articulate and make visible their social connections. There are a variety of SNSs such as Facebook, Myspace, LinkedIn, Friendster and Twitter. SNSs are different in their features and type of users (Boyd & Ellison, 2007). Facebook and MySpace, used among students, are the most popular two SNSs (Cain, 2008; Harris & Rea, 2009; Santos, Hammond, Durli & Chou, 2009). Facebook is a synthesis of many Internet-based communication tools that are

previously disconnected to use (Greenhow & Robelia, 2009; Heiberger & Harper, 2008).

Users of SNSs can establish social networks to stay in touch with their friends, colleagues and family (Ajjan & Hartshorne, 2008; Boyd & Ellison, 2007). Moreover, SNSs are used for making plans, new friends, sharing and uploading photos, videos, and links.

With the help of SNSs, users can create their own personal profiles (Ajjan, & Hartshorne, 2008; Kord, 2008). Profiles are composed of set of personal information such as name, e-mail, birthday, location and interests (Boyd & Ellison, 2007; Kord, 2008). The visibility of a profile varies by site and according to user permission (Boyd & Ellison, 2007). Body and Ellison (2007) presented the features and history of SNSs by discussing key changes and developments. They also summarized existing scholarship concerning SNSs.

2.2   Facebook

Facebook was initially designed for college students in 2004 by Mark Zuckerburg who developed it as an online dating website (Kord, 2008; Boyd & Ellison, 2008). By September 2006, registration to Facebook had expanded to everyone (Figure 2).

From its creation in 2004 to today, Facebook has grown rapidly and added lots of features. According to Facebook statistics (2011), Figure 2 shows timeline of important dates and events of Facebook.

March — Expand from Harvard to Stanford, Columbia and Yale

February — Mark Zuckerberg and co-founders launch Facebook from their Harvard dorm room

June — Move its base of operations to Palo Alto, Calif

September — Groups application is added
The Wall is added as a Profile feature

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May — Support more than 800 college networks

August — Change name to Facebook from thefacebook.com

September — Expand to add high school networks

October — Photos is added as an application
Facebook begins to add international school networks

05

May — Expand to add work networks

April — Facebook Mobile feature launches

September — News Feed & Mini-Feed are introduced. Expand registration to anyone

August — Facebook development platform launches. Notes application is introduced.

November — Share feature added on Facebook, simultaneously launched on over 20 partner sites

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February — Virtual gift shop launches as a feature.

May — Launch Marketplace application for classified listings & Facebook Platform

April — Facebook updates site design and adds network portals

July — Acquire startup Parakey

October — Launch Facebook Platform for Mobile & expand advertising deal to cover international markets

November — Launche Facebook Ads

07

January — co-sponsors Presidential Debates with ABC News

February — Launch in Spanish and French

March — Update privacy controls to include Friend List privacy and launches in German

April — Launch Facebook Chat and releases Translation application to 21 additional languages

December — Connect becomes generally available

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January — CNN Live/Facebook integration

February — Join OpenID board and "Like" feature added

June — Launch Facebook Usernames

August — Acquire FriendFeed

September — Reach over 300 million active users

December — Reach over 350 million active

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February — Reach over 400 million active users

July — Launch beta Questions

July — Reach over 500 million active

August — Launch Places

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July — Reach over 750 million active users

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Figure 2: Timeline for Facebook

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By July 2011, according to Facebook statistics (2011), Facebook became one of the most popular SNSs for college students with over 750 million active users (using the site in the last 30 days) and it is still growing. Table 1 presents the number of active Facebook users.

Table 1: Number of Active Users of Facebook

Month	# of Active Users
December 2004	Nearly 1 million
December 2005	More than 5,5 million
December 2006	More than 12 million
April 2007	20 million
October 2007	Over 50 million
August 2008	Over 100 million
January 2009	Over 150 million
February 2009	Over 175 million
April 2009	Over 200 million
July 2009	Over 250 million
September 2009	Over 300 million
December 2009	Over 350 million
February 2010	Over 400 million
July 2010	Over 500 million
July 2011	Over 750 million

According to Socialbakers, Turkey Facebook Statistics, Penetration and Demography, there are total 29.951.960 Facebook users in Turkey (http://www.socialbakers.com/facebook-statistics/turkey). 63% of these users are male, while 37% of them are female. Figure 3 presents user age distribution on Facebook in Turkey. The sample in this study focuses on the undergraduate university students which mostly fall into age 18-24. According to Figure 3, this age group composes the largest portion of the population, 33%.
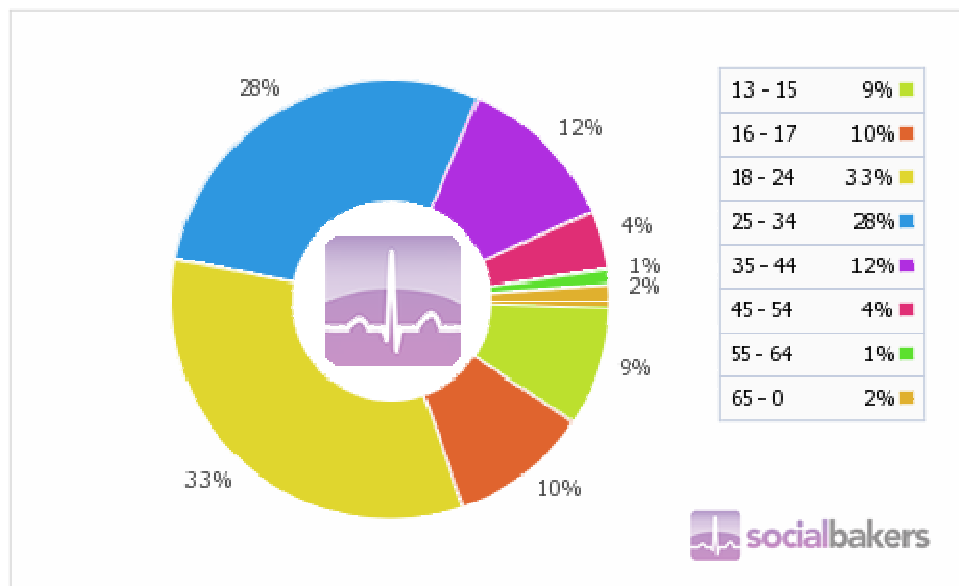
Figure 3: Age Distribution of Facebook Users in Turkey (source: http://www.socialbakers.com/facebook-statistics/turkey, 18 August 2011, 23:06)

Facebook provides personalized profiles which allow its users to communicate, create a friend list, photo albums, send messages, chat, write comments on wall, join groups, create new groups, pages, share views in group discussions, play games etc. (Mazman & Usluel, 2010; Ulrike, Arjan, & Zaphiris, 2009). There are also other features like video calling, events, questions, and notes. Facebook profiles of every user have information about the person, his/her interest, posts such as status updates. The list of Facebook friends is the users who can interact and view the activities of the user.

Facebook pages, which were introduced in November 2007, allowed users to have a profile page on Facebook related to their businesses. Facebook pages are similar to a user's profile. The page behaves like a friend of the users who liked it. The page users receive updates from the page.

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2.3 College Students, Technology and Social Networking Sites

Today, SNSs has grown in popularity among students. Pfeil, Arjan, and Zaphiris (2009) investigated 6000 MySpace user profiles with the goal of identifying and analyzing age differences and similarities. They conducted quantitative analysis with Linguistic Inquiry Word Count tool developed by Pennebaker, Francis, and Booth (2001). The result of their study stated that the older people prefer to use MySpace to connect with their friends to a lesser extent than teenagers. According to the Pefil, Arjan and Zaphiris (2009) study, unlike older people, social capital of younger people is larger in size and homogenous concerning the age distribution of friends.

2.4 Social Networking Sites in Education

College students have grown up using the newest technologies as quickly as they are introduced to the market (Kord, 2008). As a result, there are numerous numbers of researches that examined how and when the new technology was used by students and appropriate utilization of the new technology in teaching and learning. Jones, Johnson-Yale, Millermaier, and Pérez (2008) conducted an online survey to college students at two-year and four-year public and private colleges and universities in United States to determine college students' academic uses of and attitudes towards the Internet. The major trends that were discovered showed a slight decline in using e-mail to contact professors and overall rise in students' perception of Internet as having a positive impact on their educational experience.

To explore the disruptive nature and opportunity of social networking for higher education, Jones, Blackey, Fitzgibbon, and Chew (In Press) employed both quantitative and qualitative research methods. They preferred quantitative paradigm, web-based questionnaire to investigate the pattern of social software usage of learners while they used a qualitative paradigm, interviews to clarify students' attitudes towards social software for learning. Moreover, there was a guideline about using social software for learning. From social learning perspective, knowledge

constructed while students are engaging in activities and participating in interactions with other students, and/or instructors (Hill, Song & West, 2009). Social learning influenced by several factors such as context, culture, community and learner characteristics (Hill, Song & West, 2009).

Web 2.0 technologies (e.g. SNSs) can be used in social learning processes. Ajjan and Hartshorne (2008) studied the faculty's awareness of the benefits of Web 2.0 to supplement in-class learning and better understand faculty's decisions to adopt these tools using the decomposed theory of planned behavior (DTPB) model. The participants of their study were for all clinical, visiting, assistants, associate, and full professors at a large university in the southeastern United States. Result of Ajjan and Hartshorne study are important to the current research, because it provides evidence of the pedagogical benefits of Web 2.0 applications. Most of the important and related results of the study were about social networks, viewed as useful tool for improving student satisfaction in courses and blogs, viewed as the most useful Web 2.0 application to improve student learning.

To answer which Web 2.0 tools are expected by the students on technology-based learning environment, Cavus and Kanbul, conducted a research in Turkey and their study's results showed that learning management systems (LMSs) were the tool that was expected by the students to be the most effective web 2.0 tools (Cavus & Kanbul, 2010). The participants specified ability to access lecture notes anytime any where is the most important feature (4.93 out of 5) (Table 1. in Cavus & Kanbul, 2010). The second most important attribute was authorization (4.88). Opportunity to get into on-line communication with teachers and to show students' own performances were the next desirable attributes with 4.70. All these four items can be part of SNSs to be used in education.

From its creation to today, Facebook has gained an exponential growth and popularity. Many faculty members are not as knowledgeable as college students

(Roblyer et al, 2010). However, academicians have interested in evaluating its challenges and opportunities to both teaching and learning.

The limited researches were done to understand the students' experience on SNSs and to identify the distinction between the students' current usage of SNSs. One of the descriptive studies, to provide information about the use of the SNSs by college students was Pempek, Yermolayeva, and Calvert's (2009). Pempek, Yermolayeva, and Calvert's (2009) study focused on 92 undergraduates (60 females; mean age = 20.59 years, SD=1.07) from two psychology classes at a private university in a large metropolitan area. Participants completed a diary like measure to report daily time use and an activity checklist was used to assess participants' use of Facebook. Results show that students were observing rather than posting content on Facebook and the amount of time spending on Facebook on a given day varied greatly.

Pempek, Yermolayeva, and Calvert's (2009) study reported that students used Facebook mostly for social interaction with friends that they have an offline relationship and they create or join groups but rarely participate in those groups. This result is parallel to the result of Burhanna, Seeholzer, and Salem's (In Press) study. In Burhanna, Seeholzer, and Salem (In Press) study, information was gathered through both the focus group interviews and a brief survey from undergraduates at Kent State University to understand the student use and familiarity with selected Web 2.0 sites. The results showed that the participants used only SNSs frequently and they separated educational and social spaces in the SNSs. Moreover, participants described educational topics on Facebook as fun while they saw instructor-organized groups as formal.

Similar to the result of both Pempek, Yermelayyeva and Calvert (2009) and Burhanna, Seeholzer, and Salem (In Press) studies, the result of Santos, Hammond, Durli, and Chou, (2009) study was also showed that SNSs were popular among most of the students and students used these sites to keep in touch with friends. Santos, Hammond, Durli, and Chou, (2009) employed both quantitative and qualitative

analysis of University students (13 undergraduate from a teaching-training Institute in Singapore and 22 Masters students in Education at a Brazilian University) focusing on to what extent university students are using SNSs to engage in study-related activities and whether they benefit from these exchanges. Santos, Hammond, Durli, and Chou (2009) suggested that there is a place for SNSs in education. Since their study results showed that many students believed that they benefited from exchanges in the SNSs.

Selwyn (2009) is another study that examines the educational use of Facebook. According to Selwyn (2009), one of the main educational benefits of SNSs results due to their support for interaction learners between learners facing the common dilemma of negotiating their studies. Selwyn (2009) study results illustrated how Facebook walls were valuable means of information exchange between students.

Similar to Selwyn (2009), Mazman and Usluel (2010) were also examined the educational use of Facebook. Mazman and Usluel (2010) stated the users' satisfaction, motivation or social presence as important factors affecting Facebook adoption in educational purposes to have effective and active learning. Moreover, their study results showed that Facebook utilization in education has positive relationship with its use for communication, collaboration and resource or material sharing.

In addition to the studies that examine the educational benefits of SNSs, there are studies investigating both perspectives and perceptions of SNSs utilization for educational purposes. Roblyer et al. (2010) study examined how likely higher education faculty are to use Facebook for either personal or educational purposes. The results of their study showed that students are much more likely than faculty to use Facebook and are significantly open to the possibility of utilization Facebook for educational purposes.

Similar results were found in the study done in Turkey. Tiryakioğlu and Erzurum conducted a survey with 67 professors from different academic titles. The results of their study suggest that ¾ of instructors have Facebook accounts (Tiryakioğlu & Erzurum, 2010). They found no differences between female and male participants' attitudes toward Facebook. They found that the two thirds of the faculty think that Facebook has a potential to contribute social interactions among students as well as to communicate between the students and the professors. On the other hand, professors elder than 45 years old stated that they did not believe in the value of Facebook utilization in education (Tiryakioğlu & Erzurum, 2010, p. 137). According to Gülbahar, Kalelioğlu & Madran (2010) in Tiryakioğlu & Erzurum (2010) university students continue to re-access learning process over the web.

In addition to Tiryakioğlu & Erzurum (2010), Kert & Kert studied usage potential of SNSs for educational purposes in Turkey (Kert & Kert, 2010). They surveyed students to collect the students' views on educational use of SNS. The majority of the samples, 91.2%, were composed of male students. According to the study, majority of the students 288, out of 303 male and 27 female students, 288 use SNS to communicate with their friends, 239 students to find their friends. The sample in the study was composed of randomly selected high school students from the same school.

In addition, the study conducted by Baltacı-Goktalay & Ozdilek that examined the pre-service teachers' perceptions about Web 2.0 technologies in their learning process, and to understand their acceptance levels and attitudes towards these technologies (Baltacı-Goktalay & Ozdilek, 2010). The findings of their study state that use of social networking (including Facebook and MySpace) is 20.8%, which comes after other Web 2.0 technologies, instant messaging (27.4%) and Internet telephony (22.3%).

With similar purpose, Büyükimdat et al.'s (2011) study examined the pre-service information technology teachers' Facebook usage and their perspective about

Facebook as a professional development tool in Turkey. Communication, sharing and socializing capacity of Facebook were stated as an important professional development tool. Moreover, their study results showed that in Turkey, pre-service teachers are aware of the benefits of the Facebook utilization on education. Similarly, Tınmaz (2011) study results demonstrated that Facebook is perceived as a usable tool having a potential in instruction. The participants in Tınmaz's (2011) study believed that Facebook can be a good learning and teaching tool with the help of its features such as videos, feed, wall posts and chat. Moreover, they stated Facebook as reliable tool to access on information.

2.5 Course Management Systems

In the literature, LMS is used inappropriately as CMS that "are used primarily online or blended learning supporting the placement of course materials online, associating students with courses tracking student performance, storing student submissions an mediating communication between students as well as their instructors" (Watson & Watson, 2007). According to Watson and Watson (2007), CMS and LMS have some of same functionality but CMS and LMS also have different functionalities as presented in Table 2 (Carliner, 2005). Moodle and Blackboard, that are CMSs, are examples of confusion of LMSs and CMSs in the literature.

Learning Management System (LMS) is a general term used to describe computer systems that incorporate providing instruction, tracking achievement and managing resources for individual students and an organization (Watson, Lee & Reigulth, 2007). LMSs have capacity to construct virtual learning environments for F2F learning environments and are even used for fully online virtual universities (Coates, James & Baldwin, 2005). Results of Yıldırım et al. (2009) indicated that LMSs were used for instruction, data management, assessments and communication. Moreover, the information-age functions of LMS, and limitations and benefits of LMSs were summarized by Yıldırım et al. (2009).

Table 2: Summary of Differences among LMSs and CMSs (Carliner, 2005)

Functions	CMS	LMS
Support for ongoing classroom courses	✓	
Enrollment		✓
Automatically generated confirmation notes		✓
Course catalog		✓
Skills management list		✓
Checks for prerequisites before allowing enrollment		✓
Seamless link to e-learning		✓
Automatically generated follow-up correspondence		✓
Grade book	✓	
Administers tests and quizzes	✓ (with some limitations)	✓
Automatically transfers completion information to the permanent record		✓
Discussion board for between-class "conversation"	✓	Sometimes

A CMS can basically be defined as a software program, containing a series of web-based tools to support a number of teaching, learning and course management procedures. Most use of CMSs is to enhance regularly scheduled F2F classes (Morgan, 2003). CMSs are tools that focus on the management of one or more individual courses by an instructor (Watson, Lee & Reigeluth, 2007).

Over the past eight years, CMS systems, considered critical software for both colleges and universities, have developed quickly (Cole & Foster, 2008). The CMSs, being utilized in education in different forms, are evolving. A CMS can be used as a supplement to the traditional classroom curriculum, i.e., as an electronic repository of course materials (Vovides et al, 2007). Traditional instructional activities such as

presenting information, managing course materials, and collecting and evaluating student work can be completed online using a CMS that is often used as a platform to support hybrid or blended online F2F courses. The variety of functions and features of CMS should provide more choices and increase the use of the system (Yueh & Hsu, 2008).

Most used features of CMS are publishing syllabus, sending e-mails and providing soft copy of lecture notes or readings while the communicative and interactive features and tools of CMS are mostly unused (Kvavik et al. 2004; Morgan, 2003; Yueh & Hsu, 2008).

Table 3 shows the students perceptions of CMS benefits of features in Kvavik et al, 2004. The results show if the students believe the benefit of the feature of CMS, they used it more and learning occurred more.

Table 3: Ranked Students Perceptions of CMS Benefits (Kvavik et al, 2004, p.71)

Features Used	Learning	Rank	Management	Rank
Sharing materials with students	52.8%	1	30.8%	6
Track grades	47.9%	2	80.3%	1
Faculty feedback on assignments	42.3%	3	27.0%	8
Sample exams online	42.0%	4	38.4%	4
Online readings	37.8%	5	42.0%	3
Turn in assignments	35.9%	6	34.6%	5
Syllabus	27.3%	7	28.6%	7
Online quizzes	26.8%	8	54.0%	2
Online discussions	22.5%	9	17.5%	9

Common CMSs in higher education environment include, but are not limited to, WebCT/Vista, Balckboard, QuestionMark, WebMCQ, WebCMS, LearningSpace,

eCollege, Desire2Learn, Angel, METU-Online, Moodle, TeleTOP and eCollege. Most CMSs today include content organization and presentation, communication and student assessment tool, gradebooks and classroom material and activities management (Kvavik, Caruso & Morgan, 2004).

Nowadays, one of the most commonly used CMS is Moodle (modular object oriented developmental learning environment), a free learning management system enabling the creation of powerful, flexible and engaging online courses and experiences (Romera et al, 2008). Moodle is the only open source system available that has complete features for educational use since there are educators in developer team. That is the advantage of an educator driven versus market driven system. Cole (2005) compared some of the features in two leading commercial CMSs, (Blackboard and WebCT) with Moodle in Table 4.

Table 4: Feature Comparisons of CMSs (Cole 2005, p.6)

Feature	Blackboard	WebCT	Moodle
Upload and share documents	Y	Y	Y
Create content online in HTML	N	Y	Y
Online Discussions	Y	Y	Y
Grade discussions / participation	N	Y	Y
Online Chat	Y	Y	Y
Student peer review	N	N	Y
Online Quizzes / Surveys	Y	Y	Y
Online Gradebook	Y	Y	Y
Student submission of documents	Y	Y	Y
Self-assessment of submission	N	N	Y
Student workgroups	Y	Y	Y
Lessons with paths	Y	Y	Y
Student Journals	N	N	Y
Embedded glossary	N	N	Y

Student submission of documents, self-assessment submission, student journals and embedded glossary features exists only in Moodle but not in Blackboard and WebCT.

Miller-Cochran S.K. and Rodrigo R.L (2008) examined the reasons why the some elements of the design seem to work well for some students while other elements don't. In ECAR study done by Kvavik R. B. et al. (2004) pointed out "Students do have a sharp sense of knowing which courses used discussions well and which did not". Students may conclude this result by looking at their previous experiences by considering the course content or the instructors' properties. This shows that there are some factors that influence the use of CMS and students may use that info and decide in which course the use of discussion tool of CMS is most suitable. This point should be researched. Currently, most CMS research has analyzed how and why individual CMS features are used, instead of analyzing how and why multiple features are used (Malikowski, 2008).

The adoption of CMSs for web-based instruction continues to increase in universities to raise the effectiveness of the courses. The reason of the increase is both due to technological and educational reasons that the Internet are the potential democratize education, lower costs and ultimately improve the quality of courses and also curriculums (Bennett & Bennett , 2003). Moreover, Bennett and Bennett (2003) stated that students can have and experience education by using internet, similar to the F2F, traditional one. As a result, researchers focused to find the effective ways in utilizing CMSs in courses. Furthermore, they examined the most important reasons of using CMS to support traditional courses. According to Yueh and Hsu (2008), utilization of CMSs in university courses increases the accessibility, flexibility, and choices for interactivity. To promote collaborative learning, to enhance critical learning environment and to give equal opportunity to the students are some of the reasons of utilization of CMSs (Dabbagh, 2000). Similar to Dabbagh (2000), Vovides et al. (2007) stated that CMSs can support learner centered activities and change the instructor's role as a facilitator and coordinator in the learning process.

According to Kültür and Williams (2008), CMSs create a learner centered environment that results in active construction of knowledge by the help of peer to peer and student to teacher interactions.

To monitor student activities and to identify potential problems in the learning process stated as another reason of CMSs utilization by Mazza and Dimitrova (2007). Romero, Ventura and Garcia (2008) added that "CMSs lets instructors to distribute information to students, produce content material, prepare assignments and tests, engage in discussions, manage distance classes and enable collaborative learning with forums, chats, file storage areas, news services, etc".

Some of the past studies (Shaw & Venkatesh, 2005; Lee, 2005; Bradford, Poriello, Balkon & Backus, 2007) agreed that CMSs most probably encourage and increase student motivation to the course. Furthermore, some other studies (Ushida, 2005; Carty, 2007) stated that motivation is the most important factor in utilization of online systems such as CMSs.

The reasons of CMS utilization can be summarized as follows. With CMS:

- Transmission of knowledge teaching model provides more interactive student learning.
- Communications is easy, quick and possible at any time.
- Students can easily access the resources. Since all sources are available in one location and at any time.
- Different learning styles can be easily supported.
- Instructor role is changed as a coordinator, and facilitator of the learning process.

The results of Yueh and Hsu (2008) suggested that one of the barriers limiting CMS use at universities is the fear of technology. Moreover, they also stated that it is possible to design a LMS and CMS to meet the needs of faculty members without extensive computer skills.

Another problem of using CMS is stated by Mazza and Dimitrova (2007) as the students may feel isolated due to the limited contact with the instructor and other students, can get disorientated in the course hyperspace, may lose their motivation, and often find it difficult to manage without appropriate institutional support and technical supports which is also a problem for instructors with limitted technical information.

Kvavik et al, (2004) stated that most of the students identified access problem as a barrier to classroom technology use. Many students who use the Internet at home via modem report that service is slow and downloading large files is annoying and time-consuming.

It is strange that in ECAR studies done by Kvavik et al., (2004) stated: "Students don't read other student's responses, only those posted by the faculty member. They write responses in order to fulfill the participation requirements of the class". This situation is also barrier to increase the use and effectiveness of discussions and forums. Moreover, the interaction between the students cannot be established.

Nowadays, defining the factors that affect the use of CMS is an important issue. Knowing the factors that affect the use of CMS is an increasingly important source of competitive advantage for educationists. Wang et al. (2006) is one of the studies that defined and examined factors of Web-based learning environment. Learner attributes (e.g. interest, attitude or motivation), learning experiences (such as misconceptions, mental models or alternative mental structures), and learning styles are considered a valid predictor of success in a Web-based learning environment (Wang et al., 2006).

Another study examining the factors that affect the utilization of CMSs is Bennett and Bennett (2003). According to Bennet and Bennet (2003), relative advantage, trialability, observability, complexity, compatibility are factors that influence the

adoption rate of technology, specifically the CMS. Similarly, the study of Malikowski et al., (2006) investigated how the adoption of individual features was influenced by factors that are external to a faculty member. These external factors were class size, the college in which a class was offered, and the level of the class. Findings showed that the college in which a class was offered was the only external factor that showed a statistically significant relationship to the adoption of individual CMS features. For instance, faculty members in a college of social science adopted a CMS quiz more than other faculty members, and faculty members in a college of education adopted CMS discussions more than faculty members in other colleges. Surprisingly, class size or level showed no significant relationship to the adoption of specific CMS features.

With similar purpose, Kvavik et al., (2004) summarized the factors that affect the use of information technology, specifically CMS. The factors examined, in this study are gender, major, level of students (senior or freshman), and age. Moreover, technological skill levels of the students were also examined in the study, the result showed that the strongest factor for course management systems is Institution and the next strongest factor is the major (business). They also stated that students use IT primarily to manage coursework, communications and entertainment. Students' skill with software applications varies significantly and is very much influenced by the requirements of their major.

Brady, Holcomb and Smith (2010) stated that CMS such as Moodle and Blackboard tend to be much focused and lack the personal contact and networking capacity that SNSs offers. Moreover, they emphasized that in contrast CMSs that are class centered, SNSs are user centered and have the potential to increase student engagement by encouraging personal interactions. Table 5 presents the comparison of SNS and CMS tools.

Table 5: Comparisons of SNS and CMS Tools (Brady, Holcomb & Smith, 2010)

Tools	SNS	Traditional CMS
Forum	√	√
Blog	√	√
Media Sharing	√	
Messaging	√	√
Wiki		
RSS	√	
Chat	√	√
Calendar	√	√
Tagging	√	
Own Brand & Visual Design	√	
Real-time Activity Stream	√	
Groups	√	
Friends	√	
Profile Sharing	√	
File Sharing		√

2.6   Computer Mediated Communication

Romiszowski and Mason (2004) defined computer-mediated communication as "the process by which people create, exchange and perceive information using network telecommunication systems that facilitate encoding, transmitting and decoding messages". According to constructivism, students should be encouraged to construct their own knowledge. Computer-mediated communication effectively supports constructivist theory due to emphasis on access to resources and extent of collaboration between students promoted through the utilization of discussion boards (Romiszowski & Mason, 2004). According to constructivist theorists, learning is a social process and it occurs through interactions and sharing information with each other (Ajjan & Hartshorne, 2008). Some researchers have examined to

constructivism particularly Vygotsky's social constructivism to understand and evaluate the potential benefits of peer collaboration in SNS.

Greenhow and Robelia (2009) indicated that students use their online social network for their social learning functions and they were engaged in communicative and creative activities (Greenhow & Robelia, 2009). For a better understanding of conceptual frameworks, both for old and new literacies and SNSs, the readers may refer to (Greenhow & Robelia, 2009).

One example research that used social constructivism to show the benefits of peer collaboration in Web 2.0 application was Ajjan and Hartshorne (2008) by employing Technology Acceptance Model (TAM) of Davis (1989). Ajjan and Hartshorne (2008) pointed out that Web 2.0 application such as SNSs and wikis provide places for collaboration and sharing of information to support the networks needed for social and active learning. Result of Ajjan and Hartshorne (2008) study was proved that the use of Web 2.0 technologies has significantly improved learning and teaching in higher education. This study will research utilization of SNSs in F2F courses to see the factors that impact on creating an interactive, collaborative learning experience for students in a media that the students are familiar with. The study will also examine the effects of created learning environment on learning process or outcome. Moreover, Ajjan, and Hartshorne (2008) stated that SNSs can be used to supplement F2F instructions to create interactive and collaborative learning environments which students are familiar with.

Vygotsky's social constructivism emphasizes the social aspects of the theory. Therefore, teacher and peers take on an extra role in learning. Online learning environments can be considered cultural tools that aid interaction (Lavin & Claro, 2005). Various types of information sharing and collaboration opportunities for learning processes are available with SNSs.

Using multiple modes of representation, collaboration opportunities, experience with multiple perspectives, learner centered, learner relevant, and social negotiation of online tools or environments can be stated as some of the guidelines and suggestions about creating constructivist learning environments (Cunningham, Duffy & Knuth, 1993; Jonassen, 1991; Jonassen, 1994). This study will adopt some of them in SNSs.

College students are now using SNSs to help in their academic studies for group (Griffith & Liyanage, 2008). The various networks and social structure established within SNSs can help to support further interaction between instructor and student (Griffith & Liyanage, 2008).

Since 2004, social computing with the elements of Web 2.0 has aroused interests in learning and collaborations, especially in the areas of peer learning and collaborations (Ryberg & Christiansen, 2008). In their study that examined a social networking site, they defined development in accordance with Vygotsky's concept of the zone of proximal development, and learning in accordance with Wnger's concepts of communities of practice. Ryberg and Christiansen's study also depicts related theoretical frameworks including Vygotsky's sociocultural theory. Internet communications have been said to be antisocial as compared to face-to-face communications, yet the online communication can be more friendly, social and intimate than face-to-face communications (Walther & Parks, 2002 in Greenhow & Robelia, 2009). Computer-mediated communication scholars have demonstrated the potential for online social interactions to improve self presentation, relational maintenance and social binding (Greenhow & Robelia, 2009, p.1133).

2.7 Theoretical Perspectives and Framework

Given the focus of the study on examining whether SNSs has a place in teaching and learning, Theory of Technology Acceptance (TAM), Theory of Planned Behavior

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(TPB), Astin's Involvement, and Motivation theories provided theoretical bases for this study.

This study has an important assumption that utilization of a technology which is accepted by students may solve the problems of CMSs such as increasing the interaction and involvement of out-of classroom activities on CMS. Therefore, TAM and TPB theories are essential to provide better understanding and explanation of different factors and determinants of accepting the technology utilization.

Second important element of this study is to identify the involvement of students on course Facebook page. Astin's involvement theory is important to provide deeper understanding of student involvement on course Facebook page.

Motivation theory is another theory which is one of the most cited theoretical frameworks. It is used to clarify whether different motivational profiles have central role in the involvement of out-of classroom activities on course Facebook page. Moreover, motivation is listed in the major factors of students' achievements.

Analyzing SNSs through these theoretical lenses should provide valuable description for the relationship between motivation, achievement, involvement of SNSs, usage of SNSs and college student learning. In the following sections these theories will be focused.

2.7.1   Technology Acceptance Model (TAM)

Many researches have done to predict and explain user behavior to the new technology with studied and proposed models and theories for technology acceptance. Each of these theories has proposed different factors and determinants that play important roles in the new technology utilization. TAM of Davis (1989) has been accepted, applied, examined and extended as one of the most powerful model to

examine the acceptance of new information technology (Ammenwerth, Iller, & Mahler, 2006; Fetscherin & Latteman, 2008; Gefen & Straub, 1997; Kültür, 2009; Lee, Kozar & Larsen, 2003; Rosen and Sherman, 2006; Shen & Eder, 2008)

TAM of Davis (1989) analyze why users accept or reject a system. According to the TAM model, the user acceptance of information technology is determined by two constructs: perceived usefulness (PU), and perceived ease and use (PEOU) (Davis, 1989; Lee, Kozar & Larsen, 2003; Quin, Kim, Tan & Hsu, 2009; Rosen & Sherman, 2006). PEOU and PU are defined in Table 6. Both constructs themselves depend on design features of the system (Figure 4).

Table 6: Definition of Constructs of TAM Model

Beliefs of TAM	Definition
Perceived Usefulness (PU)	"The degree to which a person believes that using a particular system would enhance his/her job performance" (Davis, 1989, p. 320)
Perceived Ease of Use (PEOU)	"The degree to which the prospective user expects the target system to be free of effort" (Davis, 1989, p. 320)

Davis (1980) figured out the parameters and factors of TAM as in Figure 4 where arrows represent causal relationships and X_i sare the design features. According to Davis (1980) model users attitude towards using a system was hypothesized to be a major determinant of whether or not user actually uses the system (technology). Moreover, attitude towards using is a function of PU and PEOU.
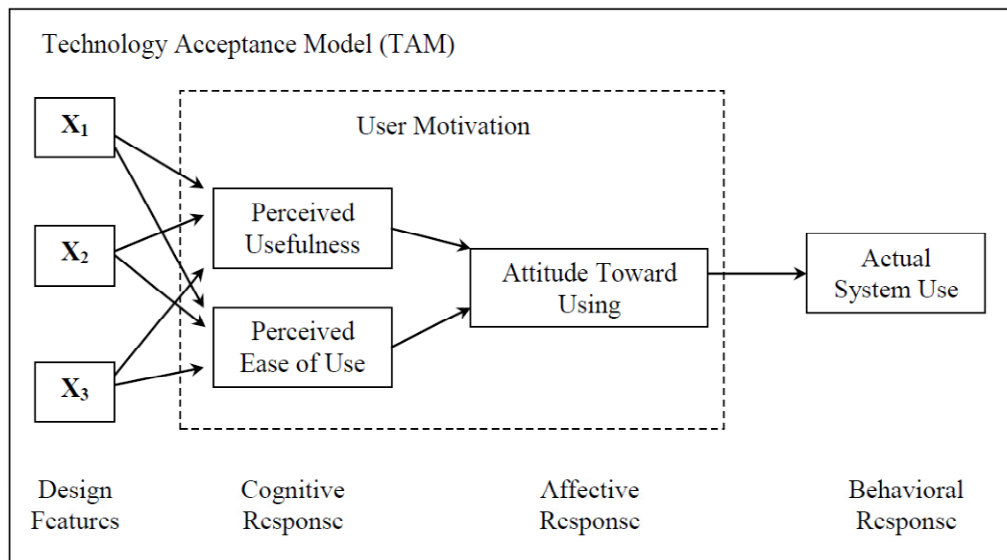
Figure 4: Technology Acceptance Model (Davis, 1980, p. 24)

TAM model was extended and adopted by other researches related to the technologies used in different purposes and areas. From 1986 to 2003, process of TAM was investigated by the study of Lee, Kozar and Larsen (2003) and in this study, researches (101 articles published by leading journals and conferences) done in this period were examined and grouped into four periods as introduction, validation extension and elaboration of TAM (Figure 5).
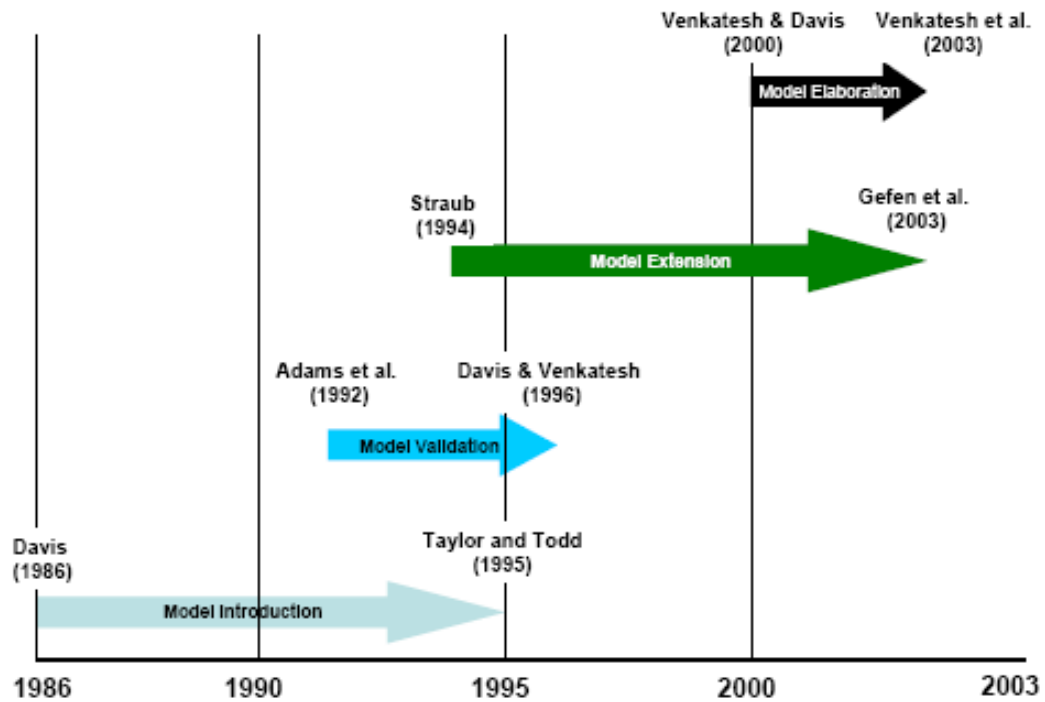
Figure 5: Chronological Process of TAM (Lee, Kozar & Larsen, 2003 p. 755)

Davis (1989) suggested that numbers of external variables related to the design of features, should be examined and introduced into TAM. Quin, Kim, Tan and Hsu (2009) investigated the determinants of user acceptance of SNSs with the external variables privacy concern and social influence into TAM.

Lai and Li (2005) applied TAM in the context of Internet baking acceptance. Their findings stated that TAM was invariant to gender, age and IT competency in Internet baking acceptance. Another research that adopted TAM to better analyze the socio-organizational-technical factors that influence IT adoption was Ammenwerth, Iller, and Mahler (2006). According to Ammenwerth, Iller, and Mahler (2006) existing framework of TAM was failed to include an important factor, the interaction between user and task, which is important in clinical information systems adoption.

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Another extended TAM was constructed in Fetscherin and Lattemann (2008) study to observe the factors influencing user intention and acceptance of Virtual Worlds. By means of survey data with 249 users from Second Life, their study results showed that traditional models of TAM have to take community factors into account in the context of Virtual Worlds.

Factors of educational information technology utilization has also been investigated and discussed in educational context to examine, introduce and modify TAM in teaching and learning processes such as Huang, Yoo and Chai (2008). Huang, Yoo and Choi (2008) investigated the relationship between learning styles and utilization level of Web2.0 applications (Blog, WIKI, online social community/Facebook, online video sharing/YouTube, online video & audio conference/Skype, social virtual environment/Second Life) among college students by using TAM. Their results showed that the students with different learning styles perceive and utilize Web 2.0 applications differently. They stated that future studies should promote such relationship and create customizable Web 2.0 learning environment guideline to address different learning needs.

Another study that examined factors for utilization of information and communication technology (ICT) in Turkey was conducted by Usluel, Aşkar and Baş (2008). They examined the relationship between ICT facilities, perceived attributes, and ICT usage for higher education. The study results indicated that there was a positive effect between ICT facilities and perceived attributes.

Lee et al.'s study (2003) examined students' attitudes toward using the technology by utilizing TAM. Their study showed that initial expectation of students affected by the perceptions of, attitude toward and use of the system. Moreover, in the social network analysis, their results demonstrated that student's attitude change was significantly influenced by other students' attitude change.

Mazman and Usluel (2009) examined the SNSs diffusion in educational field. According to their study results, social factors, perceived ease of use, perceived usefulness and innovativeness were constructs of TAM that effect adoption process of Facebook in education.

According to Sledgianowski and Kulviwat (2008), intention to use a technology, proposed by TAM, is significantly influenced by the user's beliefs of PEOU and PU of the technology such as SNSs. Moreover, their study which showed that playfulness was the strongest factor to use SNSs is consistent with Rosen and Sherman (2006) study. Rosen and Sherman (2006) proposed a new research model for acceptance of social networking websites (hedonic information systems). Similar to Rosen and Sherman's (2006) study, Shen and Eder's (2008) study proposed a research model based on the TAM and extended factors such as perceived enjoyment of participating in the virtual world.

Different than the studies that examined the factors for TAM, Kiraz and Ozdemir (2006) pointed that existence of technology does not assure its usage in educational purposes. They emphasized that all models of technology acceptance were focused on technology related factors. As a result, they focused on educational ideologies that might have different effects on technology acceptance.

According to literature, that used extended or modified model of TAM, PEOU and PU are the most common construct variables for technology adoption and acceptance.

2.7.2   Theory of Planned Behavior (TPB)

TPB was proposed in 1991 by Ajzen to predict a variety of intensions and behaviors (Teo, 2010). TPB is an extension of theory of reasoned actions (TRA). According to TPB, an individual's behavior can be explained by his/her behavioral intention influenced by attitude toward the behavior (ATU), subjective norms (SN) and

perceived behavioral control. Figure 6 demonstrates the structural diagram of TPB. The intention is the most important and powerful predictor of behavior (Teo, 2010).
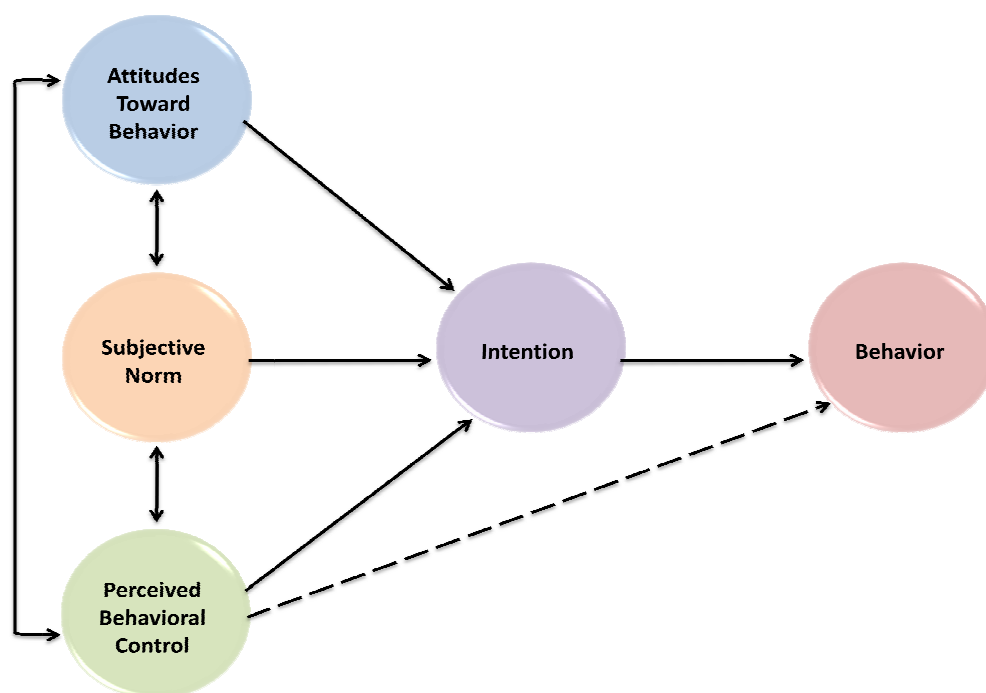
Figure 6: Theory of Planned Behavior (Arjen, 1991 p. 182)

The intention construct is the fundamental to TPB similar to the TRA. SN, the last construct added to TRA, is the weakest predictor of intention (Armitage & Conner, 2001) while facilitating conditions (FC) is a key factors influencing the use of instructional technologies in teaching (Groves, & Zemel, 2000).

Ajzen (2002) stated that behavior of a person is guided by behavioral, normative and control beliefs. Behavioral beliefs, the likely outcomes of the behavior and the evaluation of these outcomes, have a positive or negative impact on the attitude toward the behavior while normative beliefs bring about subjective norms and control beliefs produce perceived behavioral control.

According to Cook, Moore and Steel (2005), TPB can be considered as successful model of attitude-behavior relationship due to ability of predicting and explaining human behavior. Some of the researches pointed out that TAM neglects some factors that may be important predictors of information technology and system utilization (Luarn P. & Lin H., 2005). Table 7 shows the additional constructs of TPB to TAM.

Table 7: Definition of Constructs of TPB Model

Beliefs of TPB	Definition
Attitude Towards Use (ATU)	"One's positive or negative feelings about performing a behavior such as using technology" (Teo, 2010, p. 3)
Facilitating Conditions (FC)	"Factors in the environment that shape a person's perception of ease or difficult of performing a task" (Teo, 2010, p. 5)
Subjective Norm (SN)	"A person's perception that most people who are important to him or her think he should or should not perform the behavior " (Teo, 2010, p. 4)
Behavioral Intention to Use (BIU)	"The function of three determinants: attitude, subjective norms and perceived behavioral control" (Lee & Tsai, 2010 p. 603)

Mathieson (1991) stated three main differences between TAM and TBP as

1. *Degree of generality:* TPB employs specific beliefs to each situation. As a result, TAM is easier to apply diverse user context than TBP.

2. *Absence of Social Variable in TAM:* TPB explicitly include social variables while TAM does not. According to Davis (1989) social norms are independent outcomes.

3. Treat Behavioral Control Differently

2.7.3   Involvement Theory

Understanding the factors that contribute academic success is essential to design more effective learning environments. One of the important factors that determine the academic success of learner is the level of involvement in academic activities.

Astin's (1999, p. 519) Involvement Theory can go over the main five basic postulate as:

1. *Involvement requires physical and psychological energy*: Involvement refers to the investment of physical and psychological energy in various objects;

2. *Involvement occurs along a continuum:* Regardless of its object, involvement occurs along a continuum – that is different student's manifest different degrees of involvement in a given object, and the same student manifests different degrees of involvement in different objects at different times;

3. *Involvement has both quantitative and qualitative features:* Involvement is based on both quality (whether the students review and comprehend reading assignment or simply stare at the textbook) and quantity (how many hours the students spend studying) of degrees of commitment;

4. *Development is proportional to quantity and quality of involvement:* The amount of student learning and development associated with any educational program is directly proportional to the quality and quantity of student involvement in that program;

5. *Educational effectiveness is related to capacity to increase involvement:* The effectiveness of any educational policy or practice is directly related to the capacity of that policy or practice to increase student involvement.

Active participation of student in learning process is emphasized by Astin's theory of involvement (Astin, 1999). According to the Astin's theory, student characteristics such as gender, academic preparation should be examined to see if there is a relationship between the students' characteristics with the different forms of involvement. Moreover, Astin wants researchers to examine if specific type of

involvement produces different outcomes for different types of students. Theus (2009) investigated the relationship between student background characteristics and involvement in college activities, especially those related with technology, contribute to their academic growth and development in general education and use of computers at community colleges. Theus (2009) stated that student characteristics have an impact on their levels of involvement.

Astin's (1999) Theory of Student Involvement has been used in a variety of ways to frame educational researches. Based on a framework that uses the Astin's theory of involvement, Heiberger and Harper (2008) explored current and potential uses of Facebook to increase college student involvement. Heiberger and Harper (2008) pointed out that Facebook is a vehicle for achieving the goal of maximizing communication with college students, student affair staff.

Astin's Theory of Involvement is also employed by Kord (2008) to examine the relationship between online social networking (such as Facebook) and academic and social integration and intentions to re-enroll for first-year freshmen residential students at Middle University. The participants of Kord (2008) study were 696 residential first year students. Kord (2008) stated that online social networking was a negative influence on the student academic experience.

Another educational research that used Astin's Theory of Involvement to frame the study was Flowers (2004) with the aim of investigating the extent to which student involvement experiences impacted education outcomes for African Americans in college. The result of this study showed that both in-class and out-of class experiences positively impacted development of African Americans student in college.

According to Astin's Theory, student's engaging in Facebook can be considered as a form of involvement. In this research, Facebook was used as a medium for achieving the goal of maximizing both interaction and communication of F2F courses and the

amount of time and effort spend on Facebook for course related activities were described and measured as a component of Facebook utilization by considering the Astin's notion of involvement (Figure 1). Astin's Student Involvement Theory serves as the bridge in connecting SNSs involvement and learning in F2F courses.

2.7.4 Motivation Theory

A large and growing body of literature in both academic and practitioner journals has been inspired by the concept of motivation. Although motivation can basically be defined as a desire to achieve a goal, following is a list of such definitions:

> "Motivation is the forces that account for the arousal, selection, direction, and continuation of behavior." (Li & Pan, 2009, p. 123).

> "Motivation is the performance of an activity." (Teo, Lim & Lai, 1999, p. 26).

> "Motivation is defined as an academic enabler." (Linnenbrink & Pintrich, 2002, p. 313).

> "Motivation is the process whereby goal-directed activity is instigated and sustained." (Pintrich & Schunk, 1996, p. 4).

> "The Latin root of the word "motivation" means "to move"; hence, in this basic sense the study of motivation is the study of action. Modern theories of motivation focus more specifically on the relation of beliefs, values, and goals with action." (Eccles & Wigfield, 2002, p.110).

Pintrich P. (2003) stated that the student motivation appears as the central research subject in the content of learning and education. Li and Pan (2009) conducted a survey to reveal the relationship between motivation and achievement. The result of their study showed that interest plays an important role and high achievers, having greater integrative motivation than lower ones, have a strong sense of achievement. Furthermore, Li and Pan (2009) stated that instrumental motivation influences both high and low achiever.

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Brookhart and Durkin (2003) emphasized the importance of student motivation and learning variables in the cognitive psychology literature since these variables may operate differently for each classroom assessment. Due to the importance of motivation in education, researchers focused on the development and use of new instructional interventions and innovative technological tools to deal with student's motivation problems. Furthermore, Mazer, Murphy and Simond (2007) stated that using Facebook is perceived by students as an attempt to foster positive relationship with them. As a result, using Facebook may have positive effects on important learning outcomes by increasing the student motivation (Mazer, Murphy & Simond, 2007).

Aydin, Uzuntiryaki and Demirdöğen (2011) examined the relationship between motivational and cognitive strategies. Their study results showed that task value was a positive and important predictor of learning strategies. This means that if a student believes that the course material is important, then s/he has a tendency to use more learning strategies.

Mayer (2007) summarized four views of motivation that are related to the academic achievement as motivation based on

- *Interest:* Students work hard when they believe in the importance of learning
- *Self-efficacy:* Students work hard when they recognize themselves as capable of doing well.
- *Attribution:* Students work hard when they consider that their effort will pay off.
- *Achievement goals:* Students work hard when their goal is to understand the material.

Meece, Anderman and Anderman (2006) pointed out the importance of influence of classroom environments not only on students' academic engagement and achievement, but also on their motivation and their self-perceptions. In their study,

they used the achievement goal framework for examining the influence of different classroom and school environments on children's development as learners.

Study of Dawson, Macfadyen and Lockyer (2009) demonstrated that a student's motivation for learning explained in terms of student preferred achievement orientation. According to Dawson, Macfadyen and Lockyer (2009), educators can better identify the underlying motivations driving student participation in learning process by understanding student's achievement orientation. Similar to Dawson, Macfadyen and Lockyer (2009) study, Maehr and Midgley (1991) study employed goal orientation theory. Their study suggested how the school can be redesigned to enhance student motivation and learning by the help of goal theory.

Another research that examined the relationship between students' motivation and achievement was Bruinsma (2004). The expected relationship was found between students' expectancy, values and the deep information processing approach, which did not affect students' academic achievement.

According to Ajjan and Hartshorne (2008) SNSs could be used to establish academic connections, to increase and encourage motivation, cooperation, and collaboration in F2F courses in higher education.

2.8   Summary of Literature Review

The purpose of literature chapter is to supply both background information to explain current research and theoretical background for subsequent research regarding this thesis subject. The first part of this literature review chapter has provided an overview of existing literature related to SNSs including specific information on utilization of students. The second part has supplied outline history of the development of Facebook from its creation in 2004 to today by including statistics and research related use of Facebook in education. Third section of literature review chapter has presented literature on technology and SNSs use of college students.

Fourth part has presented literature on SNS in education. Fifth section has supplied uses of LMS and CMS and their limitations. Literature related to computer mediated communication was presented as sixth part of the literature review. Final part of literature review has explained theories that construct the theoretical framework of the study. This summary of literature review chapter has been organized around according to the themes mentioned in the sections of literature review chapter.

Web 2.0 technologies such as blogs, wikis, SNSs encourages more active user involvement. SNSs, that can be used to communicate with friends, colleagues and family (Ajjan & Hartshorne, 2008; Boyd & Ellison, 2007), are used for sharing and uploading photos, videos and links. Facebook, one of the most popular SNSs with over 750 million active users in July 2011 (Chain 2008; Harris & Rea, 2009; Santos, Hammond, Durli & Chou, 2009), was designed in 2004 by Mark Zuberburg (Boyd & Ellison, 2008; Kord, 2008). College students, more knowledgeable than many faculty members, have grown up using Facebook. As a result, there are numerous numbers of researches that studied how and when Facebook was used by college students. The limited researches were done to understand the factors of utilization of Facebook in teaching and learning. However, academicians have interested in evaluating its challenges and opportunities to both teaching and learning.

CMSs have been considered as important software for both colleges and universities to support teaching and learning processes in F2F courses. Most used features of CMSs are publishing syllabus, and providing soft copy of lecture notes or readings while the communicative and interactive features and tools of CMS are mostly unused (Kvavik et al. 2004; Morgan, 2003; Yueh & Hsu, 2008). Nowadays, Moodle which has become one of the most used CMSs has complete features for educational use by including educators in developer team. Past literatures pointed out that there are some factors that influence the use of CMS and these factors should be researched to cope with the barriers limiting CMS use and to increase and establish active student involvements. Brady, Holcomb and Smith (2010) declared that SNSs are user centered and have the potential to increase student engagement by its

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communication and networking capacity. Therefore, SNSs can be employed to solve the problems of CMSs.

According to Romiszowski and Mason (2004), computer-mediated communication effectively supports constructivist theory due to emphasis on access to resources and extent of collaboration between students promoted through the utilization of discussion boards. Vygotksy's social constructivism and computer-mediated communication have been examined to understand and evaluate the potential benefits of peer collaborations in SNS. However, further studies to discover dynamics of SNSs utilization on learning and as a mean of computer-mediated communications are needed.

TAM and TPB used to predict and explain user behavior to the new technology with proposed different factors and determinants that play important roles in the new technology utilization. The factors of utilization of new educational technologies has been investigated and discussed in educational context. The relationship between utilization of Web 2.0 applications and learning styles was investigated among college students by using TAM and the results of Huang, Yoo and Choi (2008) stated that further studies should be made to promote and create customizable Web 2.0 learning environments guideline to address different learning needs. Moreover, in social network analysis, employing TAM, Lee et al. study's (2003) results showed that student's attitude significantly affected by their friends attitude. According to literature, PU and PEU are the most common construct variables for technology adoption and acceptance. Understanding the determinants of utilization of SNSs such as Facebook will be important to predict and explain the role of SNSs in both teaching and learning processes.

Similar to understanding utilization factors of new technology, understanding the factors contributing academic success is important to design more effective learning environments. One of the most important factors determining the academic success of learners is defined as the level of involvement in academic activities as declared in

Astin's theory of involvement. According to Astin theory of involvement, researchers should examine if specific type of involvement produces different outcomes for students with different characteristics. Nowadays, by employing Astin's theory of student involvement, educational researchers investigate and explore the ways of assessing different forms of involvements such as involvement in SNSs. Heiberg and Harper (2008) have explored current and potential utilization of Facebook to increase college involvement of college students. In their study, Facebook is pointed as a vehicle for achieving the goal of maximizing communication between students and student affairs staff. Astin's Student Involvement Theory serves as the bridge in connecting SNSs involvement and learning in F2F courses.

According to Printrich (2003), the student motivation appears the critical research topic in the context of learning and education. Due to the importance of motivation in education, researchers focused on the development and use of new instructional interventions and innovative technological tools to deal with motivation problems of students. Using Facebook may have positive effects on important learning outcomes by increasing the student motivation (Mazer, Murphy & Simond, 2007). According to the results of Ajjan and Hartshorne (2008) study, SNSs could be employed to set up connections, to raise and encourage student motivation, cooperation, and collaboration in F2F courses in higher education.

CHAPTER 3

METHODOLOGY

This chapter includes the purpose and research questions of the study, the design of the study, the research participants, the procedure used in the study, data collection and instruments, data collection, data collection process, validity and reliability, data analysis, role of the researcher, assumptions and finally the limitations.

3.1   Purpose and Research Questions

The purpose of this research was to investigate the students' SNSs involvement or SNSs utilization, the students' SNSs involvement, students' involvement of Facebook as CMS in face-to-face course, students' acceptance of Facebook, students' motivations, students' achievements, and their relationships at a private university in Ankara. The research questions guided the study were:

RQ1. What are the students' Facebook acceptance and course Facebook involvement levels?

RQ2. Is there a relationship between students' Facebook acceptance (perceived ease of use, perceived usefulness, attitudes toward use, social norm, and behavioral intention to use) and student involvement in course Facebook page (time spent, number/type/depth of the posts)?

RQ3. Is there a relationship between students' motivational profiles (self-efficacy, intrinsic goal orientation, extrinsic goal orientation and task value) and student involvement in course Facebook page (time spent, number/type/depth of the posts)?

RQ4. Is there a significant relationship between students' achievement (course grade and CGPA) and course Facebook involvement (time spent, number/type/depth of the posts)?

RQ5. Is there a significant relationship between Facebook involvement (time spent) and Course Facebook involvement (time spent))?

RQ6. How do students compare Facebook, course Facebook page and Moodle?
    6.1 How do students compare Facebook and course Facebook page utilization?
    6.2 How do students compare course Facebook page and Moodle in face-to-face (F2F) course?

3.2 Design of The Study

This study is an action research with mixed design methodology, in which both quantitative and qualitative approaches were employed and combined into the research methodology of a single study (Tashakkori & Teddlie, 1998).

Action research is a type of research performed by practitioners into their own practices to solve problems and to improve their practices (Bogdan & Biklen, 2007; Corey, 1954; Kemmis, 2007; Mckay & Marshall, 2002). In this dissertation, action research approach was applied to collect and analyze the data. The researcher was an insider in this research. She has been an instructor at CTIS department of Bilkent University since 1997. She has used different CMSs such as Moodle, Blackboard, and METU Online in lectures both as a student and an instructor. From her

experiences with CMSs, she believed that existing CMSs are not accepted by students, and they are not used effectively and interactively in daily life of students. Therefore, to solve problems such as lack of communication and interaction, she started to use Facebook as CMSs in her F2F courses. Moreover, the researcher aims to gain further insights and generate knowledge in utilization of SNSs for educational purposes.

According to Mckay and Marshall (2002), there are two ways of approaching action research. Figure 7 presents the approach used in this study which is declared as the accepted way of approaching action research in Mckay and Marshall (2002). In this approach, the possibility of finding solution for a real world problem situation might initiate and form research interest and research questions. Through informed action and reflection, suitable problem solving and research results are reached (Mckay & Marshall, 2002).
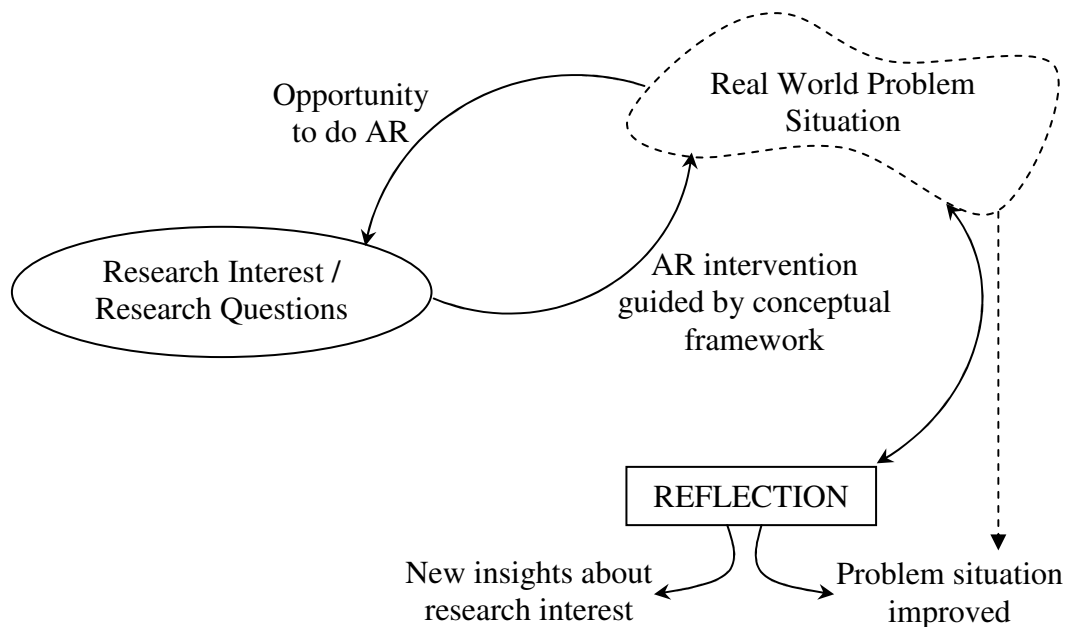
Figure 7: Approach to Action Research (Mckay & Marshall, 2002 p. 223)

Action research is an iterative process that is a cycle of problem identification, diagnosis, planning intervention and evaluation of the results of action (Avison, Lau, Myers & Nielsen, 1999; Brydon-Miller, Greenwood, & Maguire, 2003; Cassel & Johnson, 2006). In the first utilization of CMSs, the researcher used Facebook group as CSM in CTIS 154 – Discrete Mathematics II course. However, in this utilization, she saw that Facebook groups did not behave like a Facebook friend. The wall posts of groups did not appear on the members' home page. This was a barrier to increase communication between the students since there were not notifications of activities done on Facebook group. Students should enter the Facebook group to see the activities which is similar to the cases in CMSs.

In the second iteration, pilot of the study, researcher employed Facebook page as CMS in CTIS 488 – Data Analysis course to solve the lack of notification problem of the first iteration. Other activities such as sharing video, discussing, adding events, etc were same with the previous utilization. The actual study was similar with the pilot study.

For further iteration, the researcher continues to utilize Facebook as CMS in the courses she instructed. The differences of this utilization are

1. *Continuation of Utilization:* Researcher continues to use previous semester Facebook page for the courses to see continuation of the utilization of previous semester students and the interaction between previous semester students with the new students.

2. *Integration of Facebook page with Moodle:* Researcher continues to use integration of Moodle and Facebook page to solve presentation problem of resources. Moodle can be used for sharing resources in an organized way, whereas Facebook can be used particularly to support communication, interaction and social activities.

The main reason to employ mixed method approach is to take advantages of both quantitative and qualitative research methods according to the situations and the needs. Table 8 lists some other reasons for utilizing both quantitative and qualitative research method in this study.

Table 8: Reasons for Used Research Method

Research Method	Reason for Using
Quantitative	• To describe briefly the data collected from questionnaires descriptively that is important to understand utilization of SNSs, Facebook involvement and course Facebook involvement. • To answer the research question with quantitative research method.

Qualitative	• To give details of quantitative results.
	• Some of the research questions cannot be answered with quantitative research methods.
	• According to McMillan and Schumacher (1993), qualitative designs are most dominantly used
	    – in explanatory research
	    – when little documentation is available and maintained to describe and analyze a situation or event.

Creswell and Plano-Clark (2006) classified mixed method designs into four major types as

1. Triangulation designs,
2. Embedded designs,
3. Explanatory designs, and
4. Exploratory designs.

The research study employed both triangulation and explanatory method type of mixed method design according to the research questions.

The results of different forms of data collection were interpreted together. This type of mixed method design, in which quantitative data and quantitative data are analyzed separately and the results of quantitative and qualitative findings are compared and combined for validation, is called as triangulation type (Creswell & Plano-Clark, 2006).

To deeply explain the result of quantitative data, qualitative data were collected after gathering quantitative data. This type of mixed method design, in which quantitative data is more emphasized than qualitative data, is called as explanatory type (Table 9).

Table 9: Definitions of the Employed Mixed Method Design

Method	Definition
Triangulation	The results of quantitative and qualitative forms of data collections are interpreted together to validate and compare quantitative findings with qualitative ones (Plano-Clark, Huddleston-Casas, Churchill, Green, and Garrett, 2008).
Explanatory	Used qualitative data to expand on or explain findings of quantitative data.

Creswell & Plano-Clark (2006) listed the convergence model, the data transformation model, the validating quantitative data model and multilevel model as the four variants of triangulation design.

The researcher collected and analyzed quantitative and qualitative data separately on the same phenomenon and then the different results were converged during interpretations to compare result and to validate, to confirm quantitative results with qualitative finding. Moreover, in the analysis of depth of post, the qualitative data were transformed into quantitative type by using coding scheme. These quantified post scores were then analyzed with quantitative data, using correlations to identify

the relations. As a result, in this study researcher employed both the convergence model and the data transform model of triangulation model.

The convergence model and the data transform model of triangulation designs were figured on Creswell and Plano Clark's (2006) as in Figure 8.

a. Convergence Model

b. Data Transformation Model (Transforming Qual data into Quan)
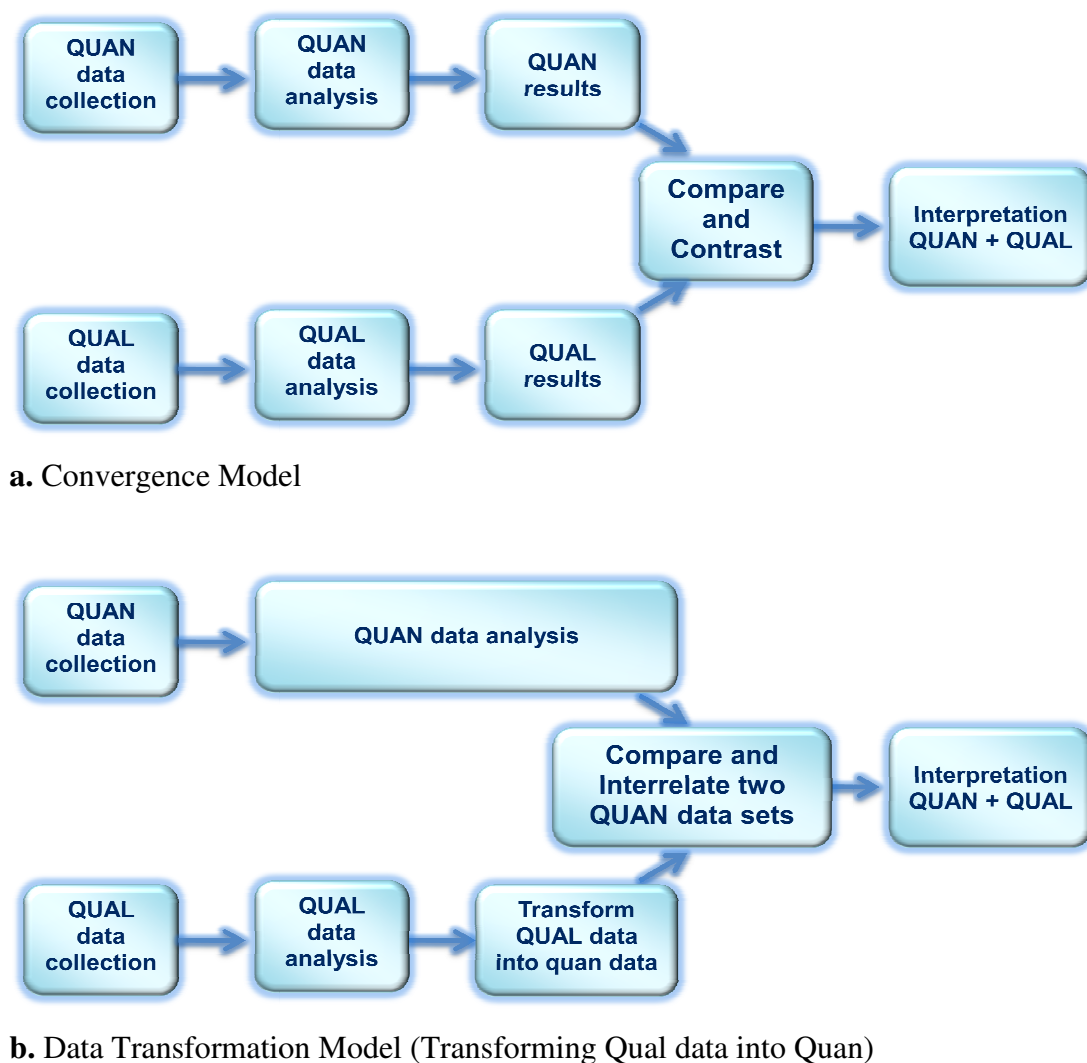
Figure 8: Triangulation Design (Creswell & Plano-Clark, 2006 pp. 63-64)

3.3 Participants of the Study

In this study, convenience sampling was used. 42 freshmen students enrolled in the study. CTIS 163 (Discrete Mathematics) and CTIS 151 (Introduction to Programming) courses were selected for the study. The study was conducted in CTIS department of a private university in Ankara, Turkey.

The department is a four year education program that prepares individuals to the software industry and aims to provide its students a promising career by providing high level education of information, computer and communication technologies. The courses in the current curriculum can be grouped into following categories (Number of courses in that category): Information Technology and Information Systems (17), Analytical Thinking and Problem Solving (3), Management (3), Communication-Research Analysis Skills and Technical Electives (14). The department currently has about 400 students, employs 15 instructors and 4 assistants. Most of the faculty members are using Moodle to support F2F courses.

CTIS 151 course has 8 hours per week: 4 lecture, and 4 lab hours. The subjects covered in the course are: Syntax and semantics of programming languages. Programming style. Program debugging and testing. Data representation, simple arithmetic expressions, decision and control statements. Arrays. Introduction to standard libraries, structured and modular programming technique will be introduced along with the usage of C language. During spring 2011, 35 students of CTIS 151 enrolled in the study. CTIS 151 was three sections on spring 2011 and only one of the sections was instructed by the researcher.

CTIS163 is a 4 hours lecture per week course. It focuses on the construction and computation of objects. As an introductory discrete mathematics course it covers: Logic and proof, graph theory, Boolean algebra, theory of trees, combinational circuits, automata theory, grammars and languages. 29 students from CTIS 163 were

involved in the study. CTIS 153 was two sections on spring 2011 and all sections were instructed by the researcher.

These courses were conveniently selected. The students were given 5% participation grade in each course. In CTIS 151 participation point was given based on *class participation*, while in CTIS 163 it was given based on *the course Facebook page involvement*.

Table 10 presents the demographics information about the participants. The subjects of this study consisted of 42 freshman students in CTIS during spring 2011. 35 (83.33%) of the participants took CTIS 151 while 29 (69.05%) of them took CTIS 163. Among the 42 students included in the study, 22 (52.38%) of them took both CTIS163 and CTIS151 courses. 13 (30.95%) of them took only CTIS151, while 7 (16.67%) of them took only CTIS163. Figure 9 presents the distribution of participants according to the courses.

Table 10: Demographics and Distributions According to the Courses

Enrolled Courses	Number of Students			Range	
	Female	Male	Total	Age	Enrolled Credits
Only CTIS 151	15.4 % (2)	84.62% (11)	13	20 - 28	10 - 25
Only CTIS 163	14.3% (1)	85.71% (6)	7	19 - 22	8 - 22
Both CTIS 151 & CTIS 163	9.1% (2)	90.91% (20)	22	19 - 25	12-23
Total	11.9% (5)	88.1% (37)	42	19 - 28	8 - 25
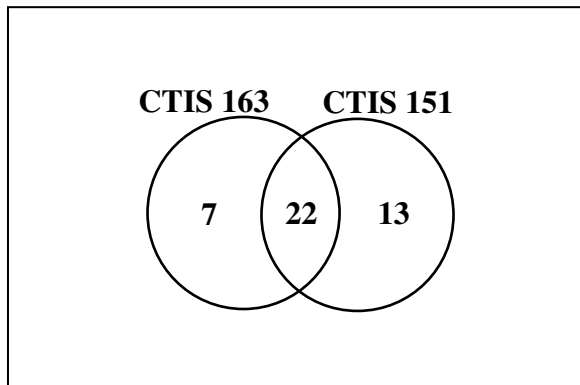
Figure 9: Participants' Course Enrollments

Interview Participants

Table 11 presents the distribution details of interviewees according to the courses taken. Among 42 students, 12 students who have different achievements (course total grade out of 100) levels, and motivations (self-efficacy, intrinsic goal orientation, extrinsic goal orientation and task value) to the course were selected through maximum variation sampling. The aim of using maximum variation was to

- sample heterogeneity.
- maximize diversity relevant to students' achievement levels, students' motivation to the courses and students involvements on course Facebook page.
- have representative sample.

Table 11: Distribution of Interviewees According to Courses Taken

Enrolled Courses	Number of Interviewee
Only CTIS 163	3
Only CTIS 151	3
Both CTIS 151 and CTIS 163	6
Total	12

Table 12 and Table 13 show the motivation and achievement levels of interview participants according to the courses taken.

Table 12: Motivation and Achievement Levels of Interviewees in CTIS 151

Interview Participants	Motivation				Achievement		
	SE	INT	EX	Task	Course Grade	GPA	CGPA
R2	4.13	4.25	6.00	5.83	C-	2.19	2.13
R4	6.50	7.00	4.75	7.00	C	2.32	2.16
R5	2.88	6.50	5.00	5.17	F	1.77	1.77
R6	5.00	6.00	6.50	5.67	F	0.86	1.42
R7	1.50	3.25	7.00	3.17	FX	0.80	1.13
R8	1.00	1.00	7.00	1.00	F	1.02	1.59
R9	7.00	5.25	3.25	7.00	B	2.99	2.99
R11	5.13	5.50	6.25	4.67	D	1.03	1.58
R12	5.38	5.75	6.00	6.00	F	1.78	2.20

Table 13: Motivation and Achievement Levels of Interviewees in CTIS 163

Interview Participants	Motivation				Achievement		
	SE	INT	EX	Task	Course Grade	GPA	CGPA
R1	6.13	6.25	6.00	6.33	A	2.43	2.41
R3	6.63	4.00	6.00	5.00	D+	1.45	1.95
R4	5.88	6.25	5.75	6.00	B	2.32	2.16
R5	5.63	5.75	4.50	6.67	C+	1.77	1.77
R6	3.13	3.75	6.25	2.50	D	0.86	1.42
R7	3.88	5.00	7.00	4.17	F	0.80	1.13
R8	6.25	7.00	7.00	7.00	C-	1.02	1.59
R9	5.63	3.75	1.00	7.00	B+	2.99	2.99
R10	4.13	5.00	7.00	5.33	B	3.00	2.94

Figure 10 shows the distribution of participants' achievement, total grade according to the course. Red data points are the interviewed students.
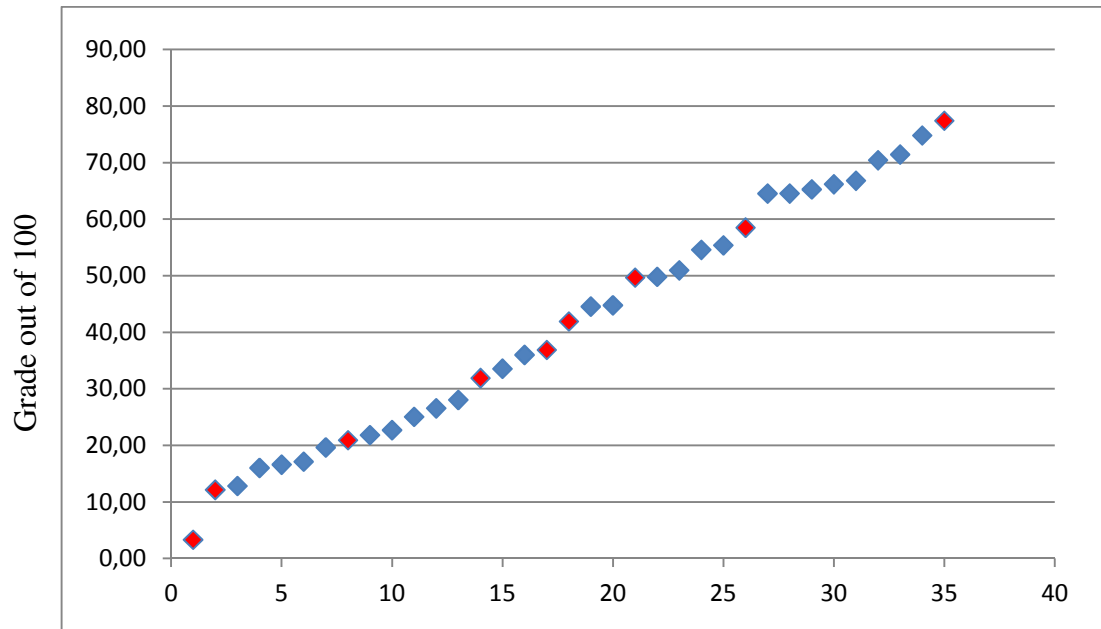
(a) In CTIS 151 – Introduction to Programming Course
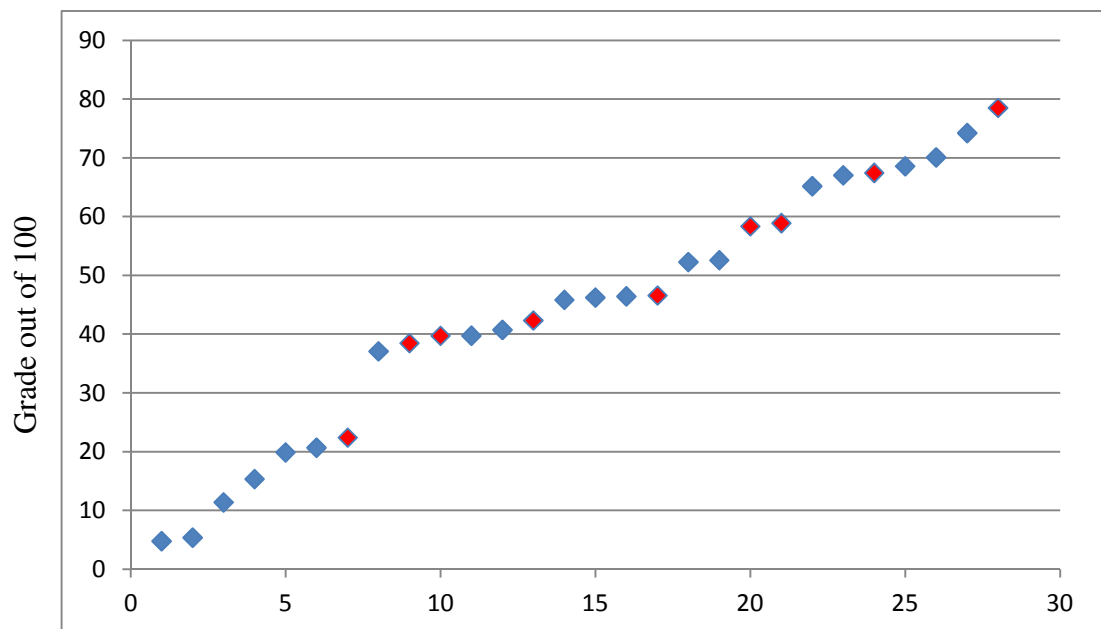
(b) In CTIS 163 – Discrete Mathematics Course

Figure 10: Distribution of Participants' Course Achievements

Figure 11 illustrates the distribution of participants' self-efficacy scores according to the course. Red data points are the interviewed students.
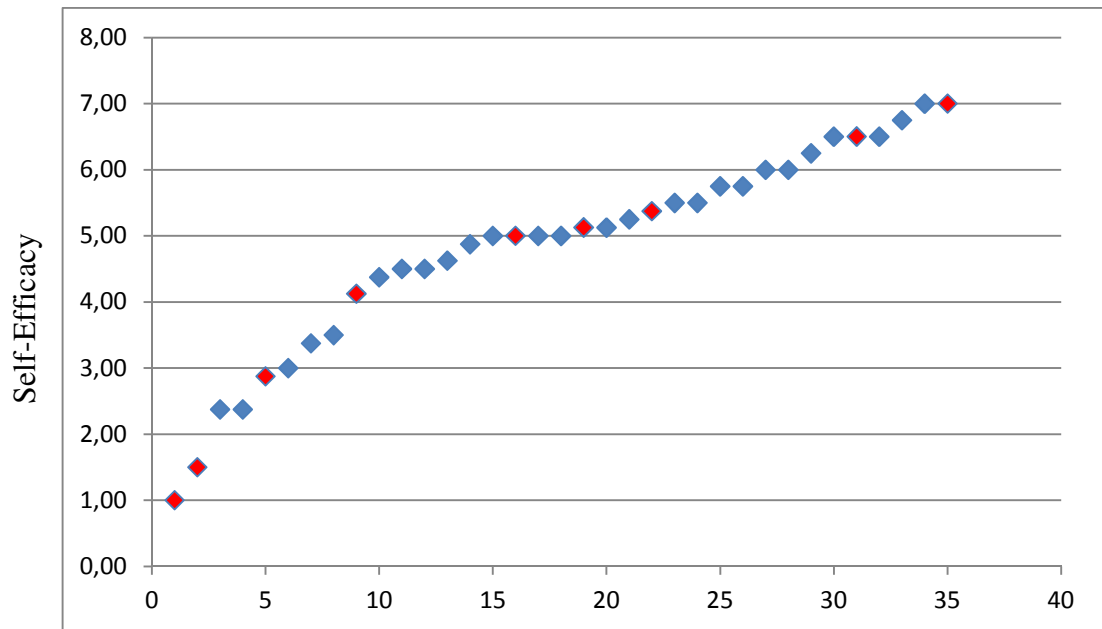
(a) In CTIS 151 – Introduction to Programming Course
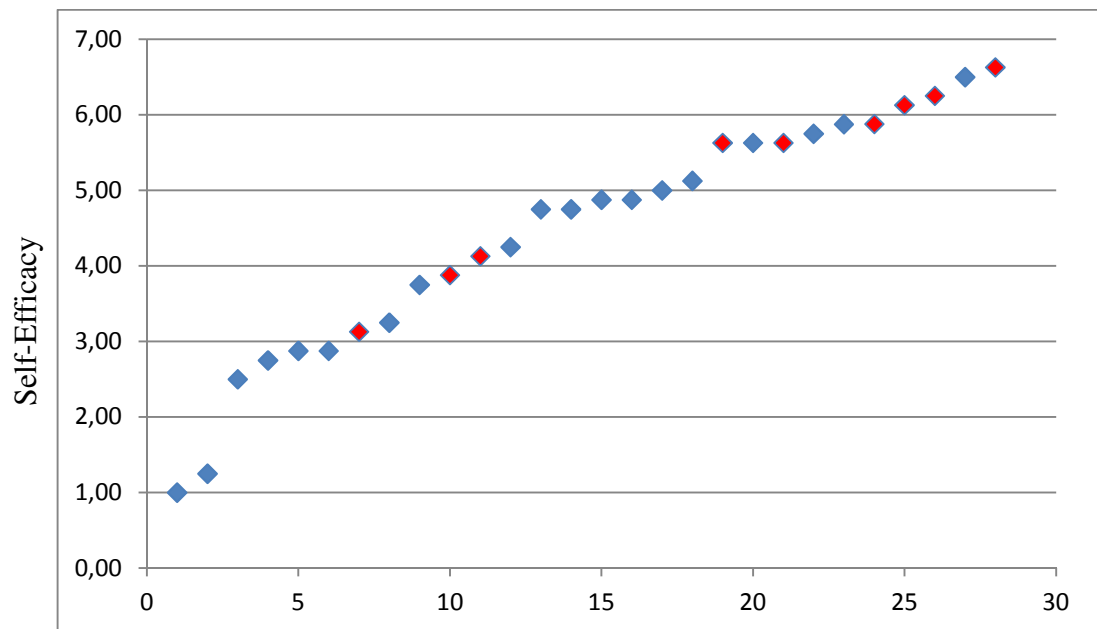
(b) In CTIS 163 – Discrete Mathematics Course

Figure 11: Distribution of Participants' Self-Efficacy Scores

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Figure 12 demonstrates the distribution of participants' intrinsic motivation scores according to the course. Red data points are the interviewed students.
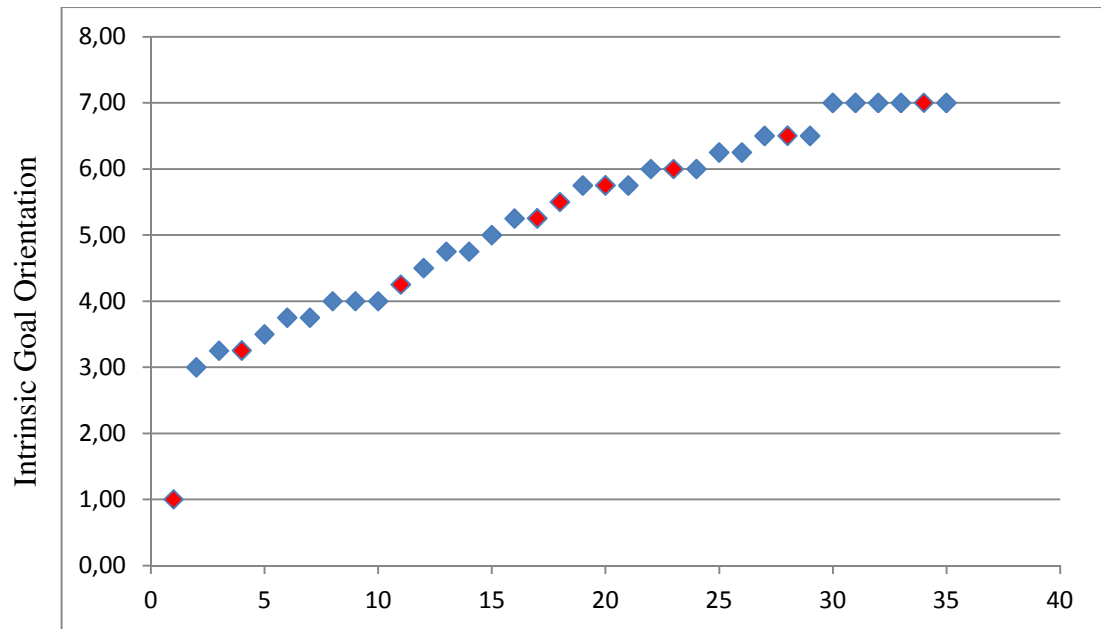
(a) In CTIS 151 – Introduction to Programming Course
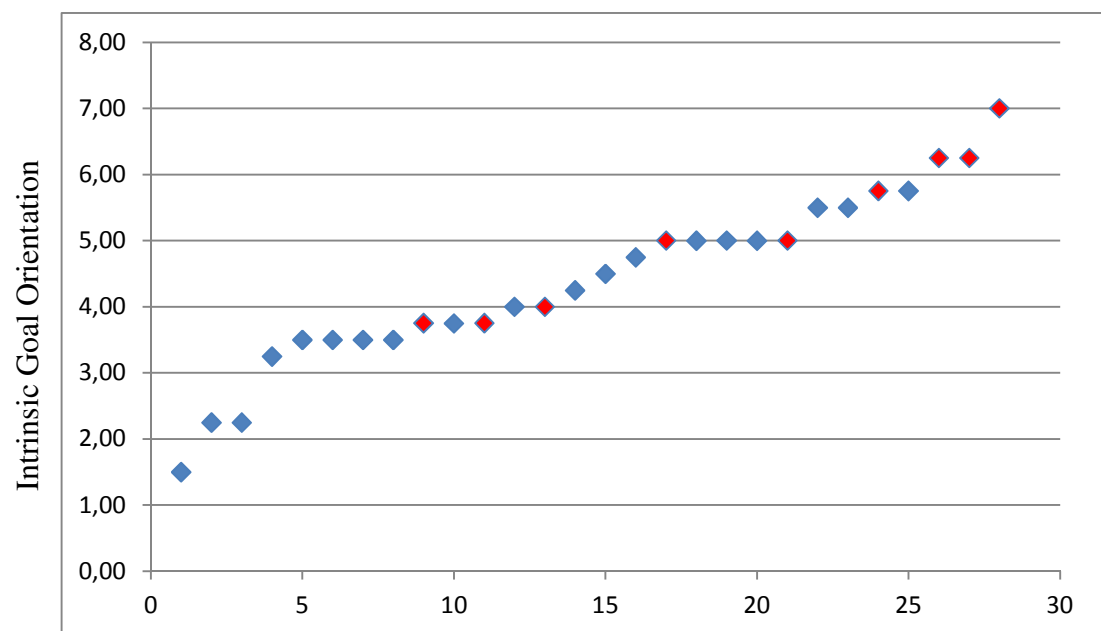
(b) In CTIS 163 – Discrete Mathematics Course

Figure 12: Distribution of Participants' Intrinsic Motivation Scores

Figure 13 presents the distribution of participants' extrinsic motivation scores according to the course. Red data points are the interviewed students.
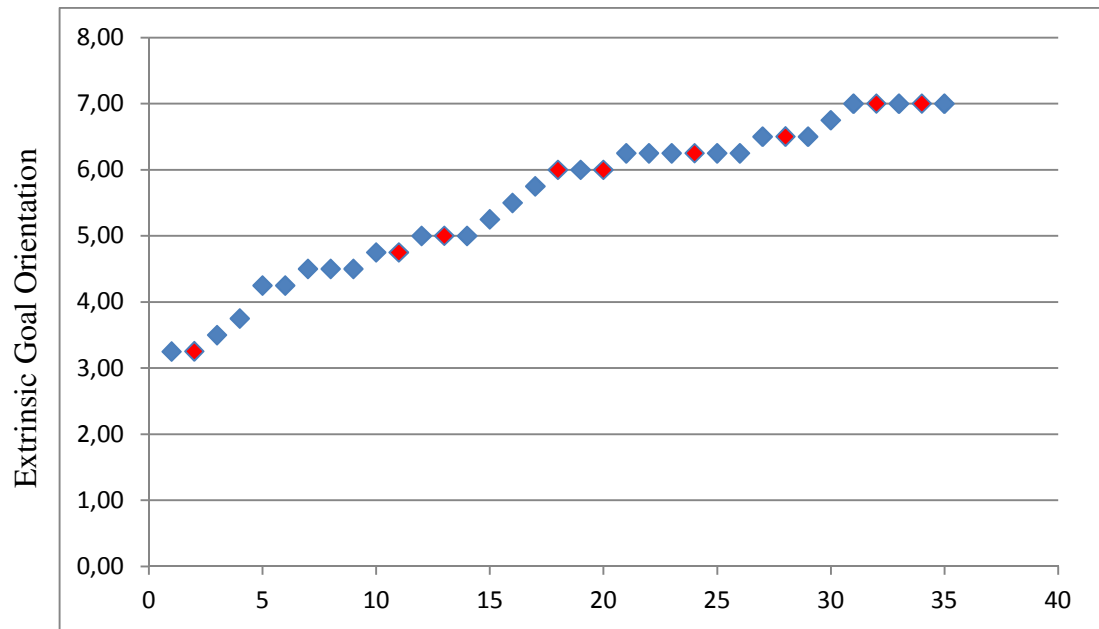
(a) In CTIS 151 – Introduction to Programming Course
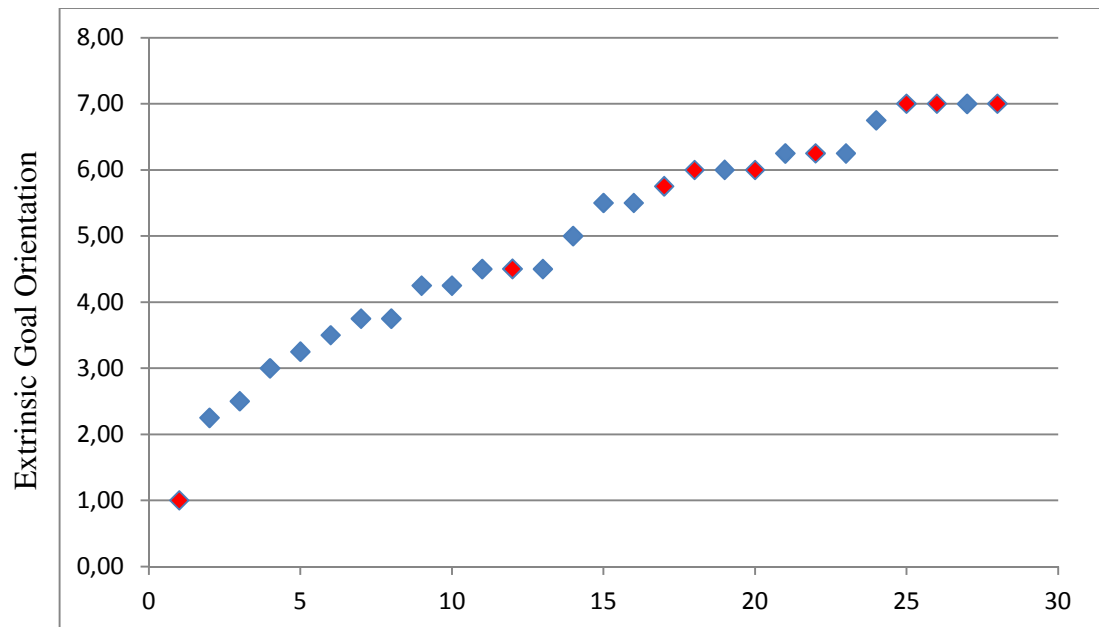
(b) In CTIS 163 – Discrete Mathematics Course

Figure 13: Distribution of Participants' Extrinsic Motivation Scores

Figure 14 shows the distribution of participants' task value scores according to the course. Red data points are the interviewed students.
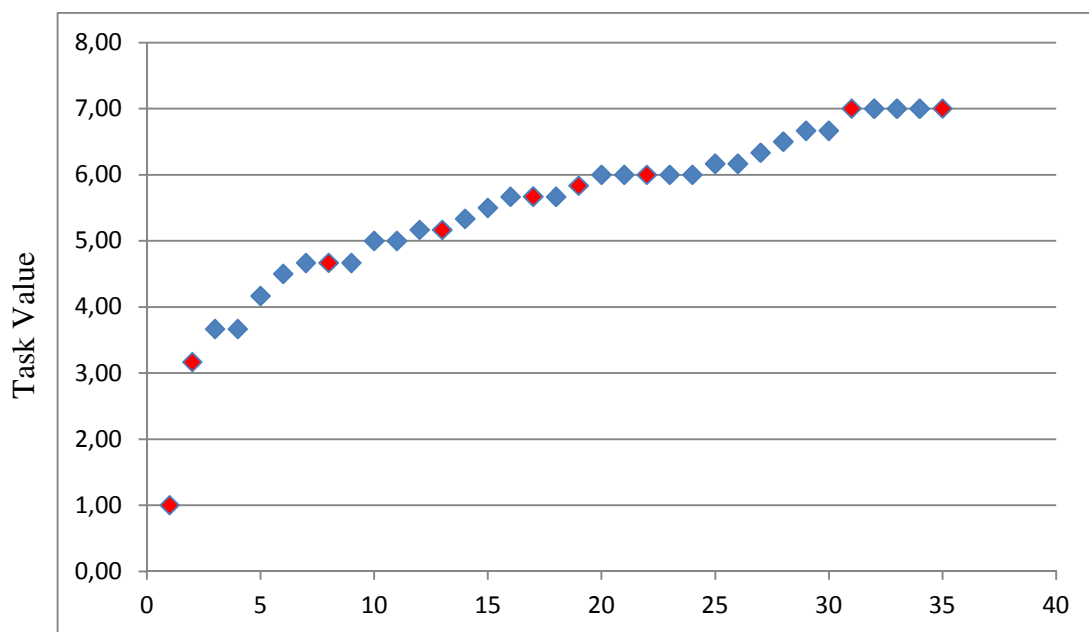
(a) In CTIS 151 – Introduction to Programming Course

(b)
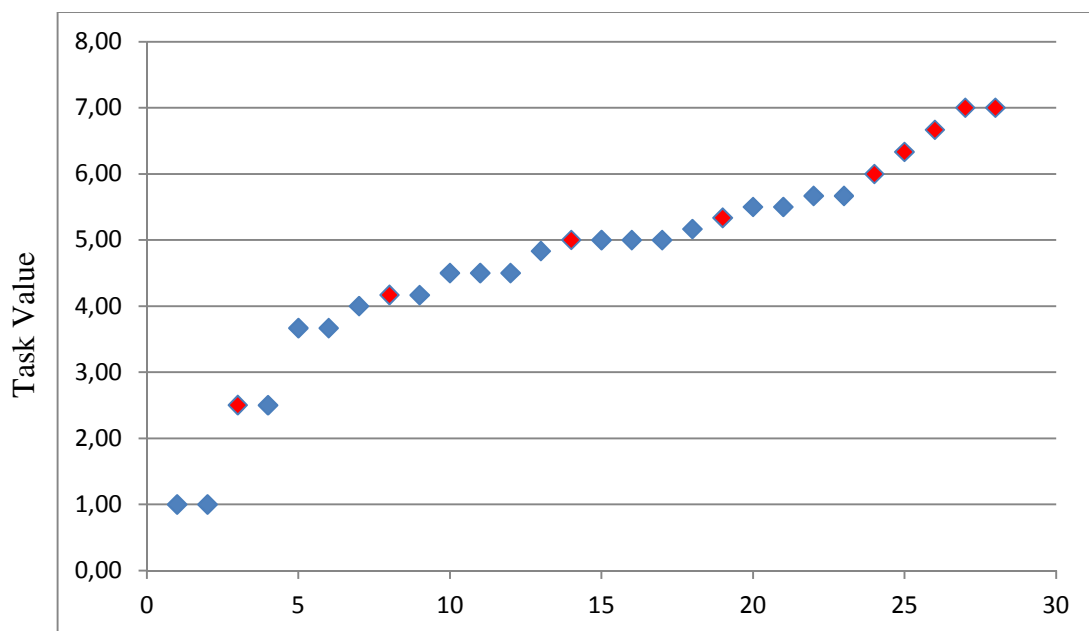
(b) In CTIS 163 – Discrete Mathematics Course

Figure 14: Distribution of Participants' Task Value Scores

3.4   Procedures of the Study

Major phases of the study consist of quantitative and qualitative phases. The data collection phases of the study can be divided as beginning, during and after the study. Phases of the data collection procedures are presented in Table 14.

Table 14: Data Collection Procedures of the Study

Phase of the Study	Data Collection Procedures
Beginning	• Motivated Strategies for Learning Questionnaire

During	• Facebook Utilization
	   o Sharing resources (video & documents) on the wall course Facebook page
	   o Opening discussions
	   o Announcing events
	• Demographic Information and Facebook Acceptance Questionnaire
	• Involvement Questionnaire

End	• Interview
	• Facebook Logs
	   o number of likes,
	   o number of discussion posts,
	   o number of comments
	   o depth of discussion posts

Both quantitative and qualitative phases of the study can be divided in minor phases that researcher followed. Figure 15 presents the time line for the procedures of the study.
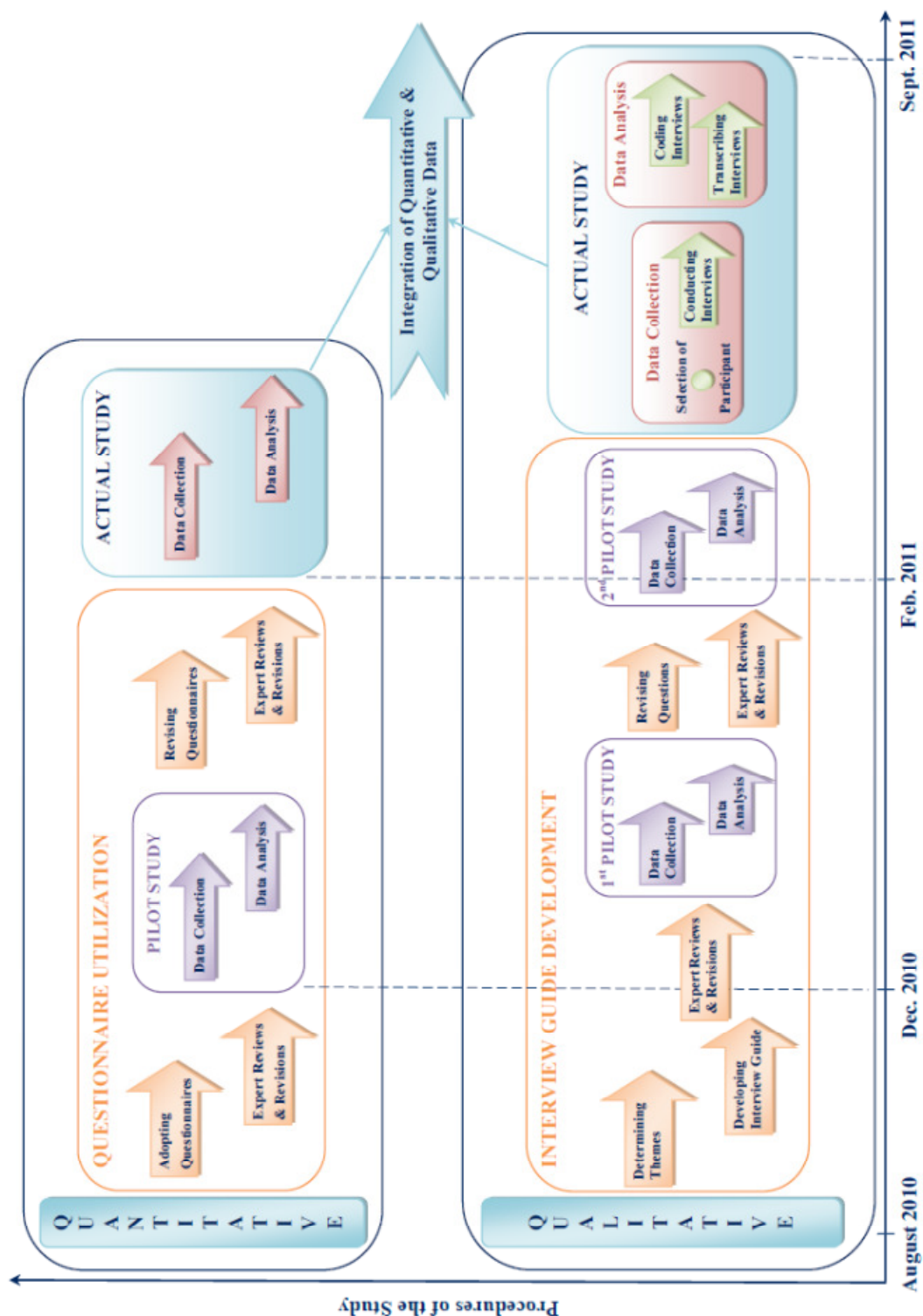
Figure 15: Timeline for Procedures of the Study

3.5 Human Subject Ethics

Before starting to collect data, the researcher applied to the Research Center for Applied Ethics (RCAE) to get permission for the questionnaires, interview questions and the informed consent document (Appendix A) from human subject ethics committee.

With the approval of human subject ethics committee (Appendix B – Form 1), the researcher visited the CTIS department chair and obtained verbal permissions for the data collection procedure while giving brief details about the study. The researcher also applied and obtained the official permission of the CTIS Department (Appendix B – Form 2). In addition to both human subject ethics committee and CTIS department permissions, the researcher also applied and obtained the approval for the provost office of Bilkent University (Appendix B – Form 3).

3.6 Utilization of Facebook as CMS

Facebook was used as CMS in two courses, CTIS 163 and CTIS 151. Course Facebook pages were created before the 1st hour of semester, spring 2011. First day of each section, the tentative outline (Appendix G) of the courses was distributed. In the outline, the name of the course Facebook page was specified. During the introduction of the lecture, information related to the course Facebook page and aim of utilization of course Facebook page as CMS were explained to the students. Students were informed that being a member of the page does not mean being a friend with the instructor. In the following two weeks, students were reminded that they should enroll to the course Facebook page to follow the activities done outside of the classroom.

Features used in course Facebook pages were
- info,
- Notification

- wall,

- event and

- discussion features.

Info page

The info page of the course Facebook pages were constructed when the course Facebook pages were created. Figure 16 shows the info page of course Facebook pages in which description of courses were publicized.

(a) Info page of CTIS 163

(b) Info page of CTIS 151

Figure 16: Info Page of both CTIS 163 and CTIS 151 Facebook Pages

Notification

As an instructor, I entered course Facebook page more than once a day, at least two times, in the morning and evening to follow students' activities on the course Facebook page and gave them feedback if necessary. Sometimes, mostly in the evening some of my students asked questions related to the course by using chat screen of Facebook. Notifications of Facebook were very helpful to follow the things done on course Facebook page. Except the discussion posts, for all other activities done in the course Facebook page, members of the course Facebook page had notification. Figure 17 presents an example notification.
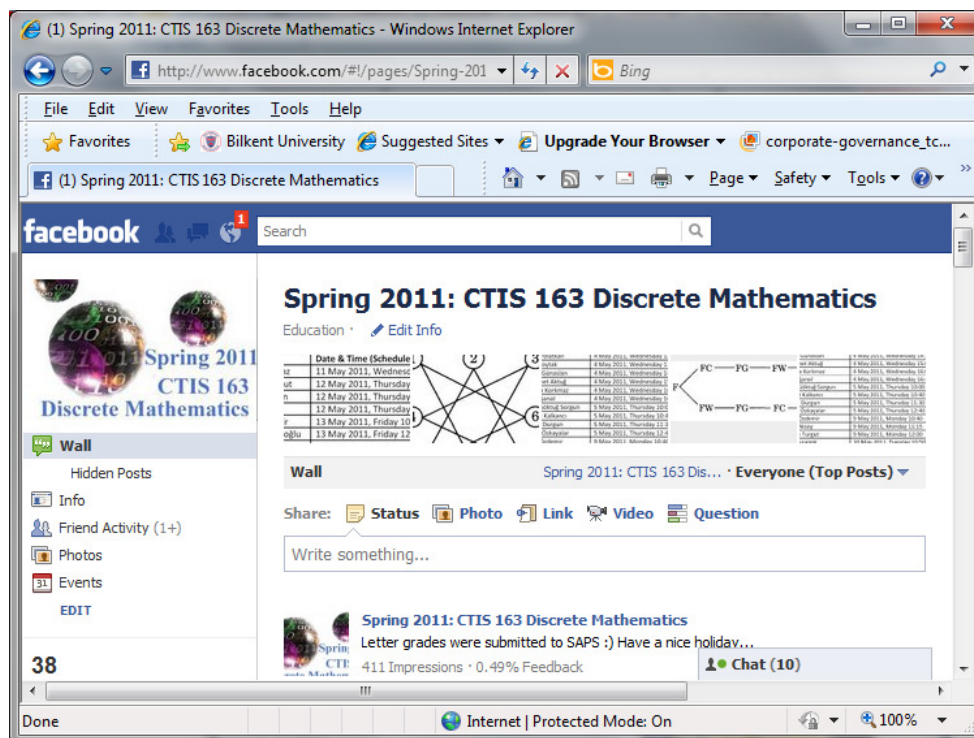
(a) Closed unread Notification
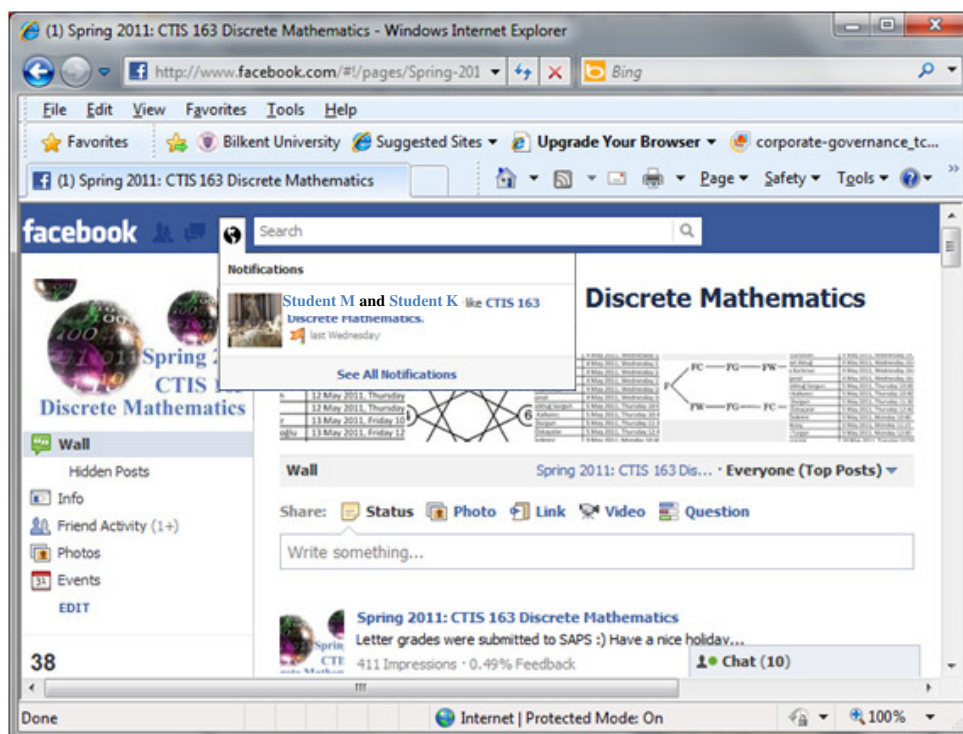
(b) Open – Viewed Notification

Figure 17: Notification of Facebook pages

Wall

As an instructor, aim of using Facebook is to increase students' interest to the subjects and make them more active outside of the classroom. Therefore, I shared interesting resources; mostly videos on the wall related to subject especially in the beginning of the semester and when interactivity on the page decreased. The Wall of course Facebook pages was used to share resources and announcements. Example sharing can be seen in Figure 18.
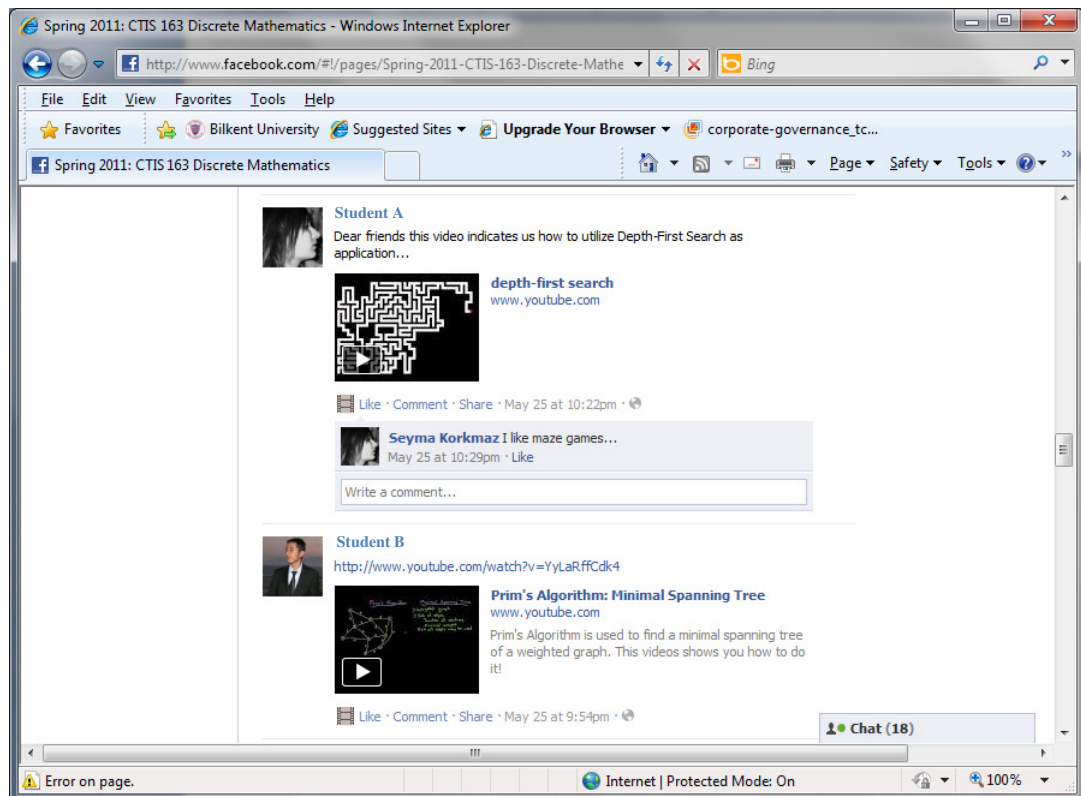
(a) Example of Shared Videos by Students from the Wall of CTIS 163 Facebook page
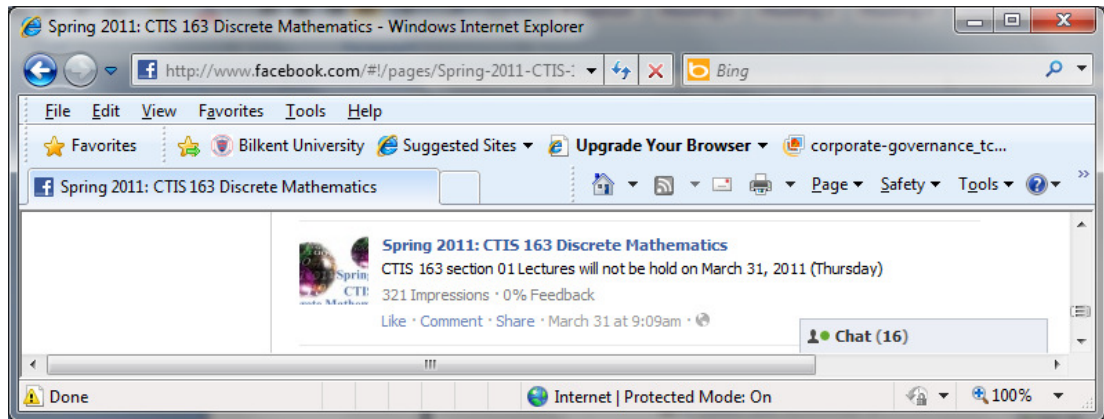
(b) Example Announcement from the Wall of CTIS 163 Facebook page
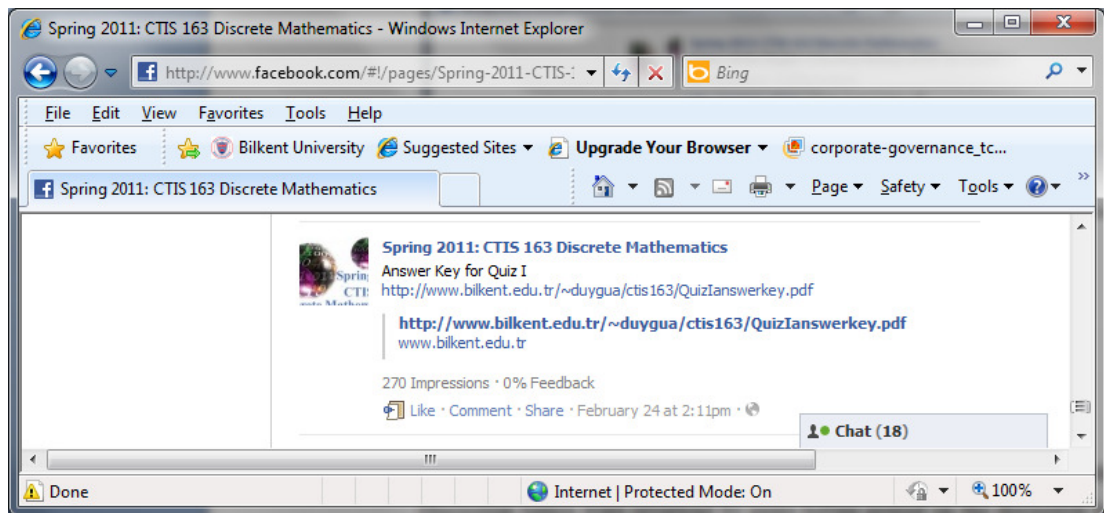
(c) Example of Shared pdf Document from the Wall of CTIS 163 Facebook page

Figure 18: Example of Wall Sharing's

Events

Events of course Facebook page was used to announce exams. Notifications of events were helpful for the members to remind the exam details. Figure 19 shows the past events of the CTIS 163.

Figure 19: Event page of CTIS 163 Facebook page

Discussions

Discussion application was uploaded on the pages before the beginning of the semester. Discussion subject related to the chapter was published on the course Facebook page at the end of each chapter. From discussion board of the page you can see the information of both discussion and latest post on the discussion page. Figure 20 presents the discussion board of course Facebook page.
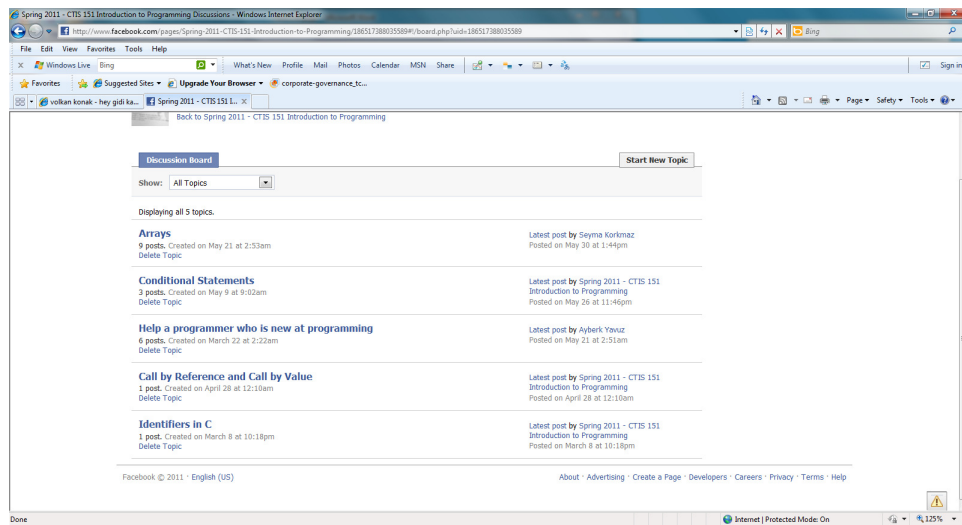
Figure 20: Discussion Board of CTIS 151 Facebook page

In Introduction to Programming course, there were 5 discussion topics, 4 of them initiated by instructor and one of them was initiated by a student. However, In CTIS 163 – Discrete Mathematics course, there were 10 topics, six of them initiated by the instructor.

Students in both courses were informed about the value of involving in discussion posts. Unlike CTIS 151, in CTIS 163 students were aware of having bonus from involving discussions. Moreover, in both courses first exams, there were questions that can be solved if the discussion questions were answered. After exams, this situation was explained and emphasized in the lectures when solving the exam questions.

During the online discussion, the instructors examined the students' post and if there were some misunderstandings or some special subjects mentioned related to the course content, instructor asked questions to guide the students to see incorrect points or to lead students to discuss or judge their post. Moreover, the aim of the instructors' questions was to discuss the related course subject by the relating the subjects of the course and to open a new, related discussion.

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Figure 21 presents an example one of the discussion question and some of the students' responses.

Figure 21: Discussion page of CTIS 151 Facebook page

3.7 Data Collection and Instruments

In this study data were collected through both quantitative and qualitative methods.

3.7.1 Quantitative Data Collection and Instruments

Quantitative data collection instruments are Motivated Strategies for Learning questionnaire (MSLQ), Demographic Information and Facebook Acceptance questionnaire, Involvement questionnaire, and course Facebook logs. Table 15 presents details of the questionnaires used in the quantitative part of the study.

Table 15: Quantitative Part Instrument Details

Questionnaires	Quantitative Data	Adopted From	# of Items
MSLQ	Motivation	Sungur (2004)	26
Demographic Info. & Facebook Accp.	Demographic Information	Kord (2008) & Kültür (2009)	7
	Facebook Acceptance	Teo (2010)	17
Involvement in SNSs	Facebook Involvement	Kord (2008) & Astins (1999)	12
	Course Facebook Involvement	Kord (2008) & Astins (1999)	10

Motivated Strategies for Learning Questionnaire
MSLQ has 26 items used to measure self-efficacy (eight items), intrinsic goal orientation (four items), extrinsic goal orientation (four items), task value (six items) and effort regulation (4 items) levels of participants.

MSLQ was originally developed by Pintrich, Garcia and McKeachie (1991). Participants rated themselves on a seven-point likert scale from "not all true of me" (indicating 1) to "very true of me" (indicating 7). In pilot study, the MSLQ of Pintrich et al (1991) was employed. However, in the actual study, Turkish version of

MSLQ (Appendix E), translated by Sungur (2004), was adapted to make it more understandable. In the actual study, only MSLQ was administered online to collect the data.

The internal consistency for MSLQ scales ranged from .62 to .89 in Sungur (2004). The study's alpha reliability estimates for the MSLQ scales were within acceptable ranges with the exception of Scale 5: Effort Regulation which had a low reliability of .43, a bit higher than that of Pilot Study. This Scale was made up of four items, two of which were reverse coded. Due to the low reliability, Effort regulation scale was removed from the study. The respective alpha reliabilities for the original scale and the pilot study are presented in Table 16.

Table 16: Alpha Reliabilities for Motivated Strategies for Learning Questionnaire

MSLQ Scales	Cronbach's Standardized Alpha Reliability					
	# of Items	Items Comprising	Original MSLQ	Turkish MSLQ	Pilot Study	Actual Study
Scale 1: Self-Efficacy	8	1-8	.93	.89	.79	.96
Scale 2: Intrinsic Goal Orientation	4	9-12	.74	.73	.57	.84
Scale 3: Extrinsic Goal Orientation	4	13-16	.62	.54	.56	.81
Scale 4: Task Value	6	17-22	.90	.62	.91	.94
Scale 5: Effort regulation	4	23-26	.69	.62	.37	.43

Demographic Information and Facebook Acceptance Questionnaire

Demographic Information and Facebook Acceptance questionnaire has 24 items (Appendix D). Seven of them were related to demographic information of participants and 17 items were used to measure Facebook acceptance levels of participants. Facebook acceptance items were used to measure perceived usefulness (three items), perceived ease of use (three items), attitudes toward using (four items),

facilitating conditions (three items), subjective norms (two items) and behavioral intention to use (two items) Facebook.

The instrument was piloted with 35 senior students during Fall 2010 semester in CTIS 488 (Data Analysis) course. Comments written on the questionnaires, the researcher's observation and feedback from some of the participants were used as a basis for revising the instruments before starting the real study. Four questions related to the demographic information of the participants were removed from the Demographic Information and Facebook Acceptance questionnaire. In the actual study these data were gathered from information technology system used by the university.

Even though the online version of Demographic Information and Facebook Acceptance questionnaire was prepared, it was not employed online in the study. Since collecting the response of online MSLQ took too much time.

Cronbach's coefficient alpha test was used to review the internal consistency of the instruments. The internal consistency for The Facebook Acceptance Questionnaire employed theory of planed behavior (TPB) scaled, for composite reliability to be adequate, a value of 0.70 and higher was used in Teo (2010). The study's alpha reliability estimates for the Facebook acceptance questionnaire were within the acceptable ranges from 0.70 to 0.90. The internal consistency in terms of Cronbach's alpha was 0.90, 0.83, 0.87, 0.82, 0.80 and 0.70 for perceived ease of use, perceived usefulness, attitudes toward using, facilitating conditions, social norms and behavioral intention to use respectively. The details of the respective alpha reliabilities and the corresponding items for the pilot study and actual study are presented in Table 17.

Table 17: Alpha Reliabilities for Facebook Acceptance Scale

Facebook Acceptance Scales	Cronbach's Standardized Alpha Reliability			
	# of Items	Items Comprising	Pilot Study	Actual Study
Scale 1: Perceived Usefulness (PU)	3	1-3	.94	.90
Scale 2: Perceived Ease of Use (PEU)	3	4-6	.81	.83
Scale 3: Attitudes Toward Use (ATU)	4	7-10	.87	.87
Scale 4: Facilitating Conditions (FC)	3	11-13	.74	.82
Scale 5: Subjective Norm (SN)	2	14-15	.92	.80
Scale 6: Behavioral Intention to Use (BIU)	2	16-17	.83	.70

Involvement Questionnaire

The involvement questionnaire (Appendix F) used to determine the participants' involvement to both SNSs and course Facebook involvement. It was adopted from Kord (2008) & Astins (1999). It has total 22 questions including 12 questions for Facebook involvement and 10 questions for course Facebook pages involvement. According to the pilot study results, there was not any problem with the Facebook involvement questionnaire.

3.7.2   Qualitative Data Collection and Instruments

Qualitative data were collected by interviews and discussion post on course Facebook pages.

Interviews

After an extensive literature review, the interview protocol was designed into Turkish, and it was checked for clarity and context-specificity by help from experts. There are 29 major questions with their subquestions in the interview schedule (Appendix C).   Individual interviews were used to collect data about how the students are using SNSs (eight questions), how the students utilize SNSs as a CMSs

(eight questions), comparison of utilization of CMSs (Moodle) with SNSs (Facebook) in F2F course as a CMSs (nine questions), and comparison of traditional courses not using CMSs with the courses using SNS as CMS (four questions).

The interview protocol was developed while the literature review was in process. The research questions, literature reviewed in chapter two, contextual analysis and five expert reviews were the bases while drawing up the framework of the schedule. The first draft of the interview protocol was tested by a pilot study. The first pilot study was done during Fall 2011 with 35 students in CTIS 488 Data Analysis course, all students were interviewed to see if there were any question that was not understandable by the interviewees, and to test if the desired depth of qualitative data can be collected with the interview protocol. According to the results, students did not have any problem in the interview and understand the questions. Moreover, the questions were suitable to collect qualitative

After piloting the interview protocol, it was again reviewed by four graduate students, peers in the class discussion sessions of a course related to qualitative research methods in education. As a result of class discussion sessions, there was no change in the interview protocol. The second review of interview schedule was done by an expert in the field of qualitative research. According to the review comments of the expert, four questions were added to the interview protocol related to comparison of courses that were not used any CMS and courses that employed CMSs such as Moodle or Facebook as the last section and last four questions of the interview protocol.

To test results of expert reviews, second pilot study was done with two students of 1st pilot study participants. According to the first interviewee answers, two questions were added to the interview protocol on CMSs utilization. Eighth and ninth questions of the interview protocol were added to explore whether the continuation of utilization of CMSs is important and useful for participants or not.

Inter-coder reliability of interview coding was done by a peer. The longest interview was coded by a peer who had experience on coding in her Master thesis. The inter-coder reliability of the interview was .73 and it was acceptable. Inter-coder reliability scores were calculated by using Miles and Huberman's (1994) formula that is

$$reliability = \frac{number\ of\ agreements}{total\ number\ of\ agreements + disagreements}$$

Discussions Posts

Total number of discussion subject in CTIS 151 was five with 11 student discussion posts. In CTIS 163, total number of discussions subject was 10 with 32 discussion post of students. Table 18 demonstrates the details of discussion posts according to courses.

All of the discussions questions reviewed by a peer who gave the courses more than once as an instructor to see if the subjects were suitable and meaningful for discussing according to the course content.

Table 18: Number of Discussion Posts according to Course

Course Name	Initiator	# of Discussion Subject	# of Discussion Post
CTIS 151	Instructor	4	11
	Student	1	9
CTIS 163	Instructor	6	49
	Student	4	15

3.8 Data Collection Process

Quantitative Data Collection Process

All questionnaires online forms were created by the help of Kwiksurveys. Only the Motivated Strategies for Learning Questionnaire was utilized by online on Kwiksurveys at the beginning of the study. Since completing the online questionnaire was taken too much time, except motivation questionnaire, all other questionnaires were conducted in a classroom setting by the researcher during the study.

After the study, quantitative data related to the involvement of course Facebook page were also found by using Facebook logs such as number of comments, number of likes, number of shared videos, number of shared documents and number of discussion involved, number of discussion posts, number of students' posts on discussions and number of instructors' post on discussions. They were founded by counting the posts on course Facebook pages.

Qualitative Data Collection Process

Semi-structured, face-to-face interviews were used to collect required data with 12 participants at the end the study. After the study, the researcher recorded all the interviews with a tape recorder. At the beginning of the interviews, permission to use audio tape recorder was taken from the participants. The purpose of the study was briefly explained to the participants, and they were informed that participation was voluntary.

All interviews were done individually in the researcher's office. The interviews took approximately 20 minutes. The individual interviews were conducted with selected students who have different level of Facebook acceptance, motivations and involvements. These students used Facebook as CMS at least in one of CTIS 151 and CTIS 163 courses by the researcher.

3.9 Data Analysis

Both quantitative and qualitative data analyses methods were used in the study. This section is divided into two parts for quantitative and qualitative phases of the study.

Quantitative Data Analysis

The data were entered from each of the questionnaire to the corresponding excel spreadsheet where the data were entered prior to transfer into the SPSS software. For those participants who did not participate in online social networking, the group of questions relating to online social networking that were skipped as per directed were also entered as missing.

SPSS statistical software version 15.0 was used to analyze the quantitative data. The quantitative data analysis consisted of descriptive statistics, and correlation analyses. In addition, internal consistency estimates were calculated for each item of both the Motivation scales and Teo's theory of planned behavior (TPB) scales used to determine Facebook acceptance of the participants.

Qualitative Data Analysis
Analysis of Interview Data

The study was conducted during spring 2011 with the students of CTIS 151 and CTIS 163. Data gathered through interviews was typed. The researcher transcribed at most 30 minutes long taped recorded interviews word by word.

The interview data were subjected to content analysis. All interview data were read through to identify meaningful units based on the research questions and was assigned descriptive codes to these units. The descriptive units that fit together were grouped in categories such as Facebook involvement, Facebook acceptance and comparison of CMSs and course Facebook page. Some of the predefined codes were not worked as stated in Miles and Huberman (1994).

The predefined coding categories were established during second pilot study and final coding categories after coding transcripts are shown in Table 19. These categories were used to identify the main themes present in the interview data. All interview data were re-examined and restructured according to the specified themes. The thematic coding was used to identify the general themes of the data.

Table 19: Coding Categories of Interview

Predefined Coding Categories	Final Coding Categories after Coding
Facebook Involvement	**Facebook Involvement**
Frequency of Use	Frequency of Use
Time Consuming	Time Consuming
Frequency of Use (M)	Frequency of Use (M)
	Frequency of Use (C)
Type of Post	Type of Post
Sharing	Sharing
Sharing Video	Sharing Video
Sharing Photo	Sharing Photo
Sharing Links	Sharing Links
Sharing Document	Sharing Document
	Sharing Posts
Viewing	Viewing
Viewing Video	Viewing Video
Viewing Photo	Viewing Photo
Viewing Post	Viewing Post
	Viewing Comments
	Viewing Events
Writing Comments	Writing Comment
Writing Wall	Writing Wall
Reading Comment	Reading Comments
Discussions	Discussions
	Discussion (M)
Playing Game	Playing Game
Searching Net	Searching Net
Following	Following

Table 19 (continued): Coding Categories of Interview

Predefined Coding Categories	Final Coding Categories after Coding
Communication	Communication
Face-to-Face	Face-to-Face
Real Time	Real Time
Facebook Acceptance	**Facebook Acceptance**
Attitude towards use	Attitude towards use
	Like
	Boring
	Privacy
Perceived Usefulness	Trust
Satisfactory	Perceived Usefulness
	Satisfactory
	Facebook vs Course Facebook
Motivation	**Motivation**
Extrinsic Motivation	Extrinsic Motivation
Finding Friends	Finding Friends
Friend Encouragement	Friend Encouragement
	Trend - Popularity
	Intrinsic Motivation
Success	Curiosity
	Success
	Interest
Comparison of Different CMSs Utilization	**Comparison of Different CMSs Utilization**
CMSs vs Traditional (F2F)	CMSs vs Traditional (F2F)
Facebook vs Moodle	Facebook vs Moodle
Moodle Utilization	Moodle Utilization
Continuation of Utilization	Continuation of Utilization
Guiding and Helping	Guiding and Helping

Data Analysis of Discussion Posts

Discussion posts of course Facebook page were analyzed to *categorize* the post by using a coding scheme adapted from   & Dabbagh (2005) and to *measure* the depth of post by using a coding scheme adapted from Cho and Jonassen (2002). The categories and explanation of them are presented in Table 20.

Table 20: Categories for Coding Discussion Post of Students (Gilbert & Dabbagh, 2005)

Category	Definition
Reading Citation	Citation of readings, e.g. The student cites the article, book chapter or resource when making a point.
Content Clarification	Personal interpretation of the content or content knowledge compression, e.g. Paraphrasing concept or principles in one's own word.
Prior Knowledge	Prior knowledge and outside resources, e.g. The student uses prior knowledge or outside resources to support a statement or an understanding.
Real World Example	Personal experience, professional/academic experiences. Providing examples that demonstrate the application of knowledge to a real word.
Abstract Example	Use of analogies, metaphors or philosophical interpretations to support one's understanding of a concept or principles.
Making Inference	Going beyond information given. Beyond comprehension, analysis, synthesis, evaluation-adding or constructing new knowledge.

Depthness of discussion posts were analyzed by using a coding scheme adapted from Cho and Jonassen (2002). The model identifies five major components of argument including claims, grounds, warrants, backing and rebuttals. All of the discussion posts were coded for the appropriateness of each category and then were coded in accordance with the quality measures. Each message was coded by the researcher by using the scoring Table 21 to determine the depth, quality of post. The individual

scores were calculated by summing the number of points achieved in each argumentation category (claims, grounds, warrants, backing and rebuttals).

Table 21: Rubric for Assessing the Depth of students' Discussion Post (Cho & Jonassen, 2002)

	Quality	Criteria
Claims	6	The student states generalizations that are related to the proposition and which are clear and complete.
	4	The student states generalizations that are related to the propositions, but the assertions are not complete. Enough information is available to figure out the student's intent, but much is left to the reader to determine.
	2	The student makes generalizations that are related to the proposition, but the assertions lack specificity or offer unclear referents. The student leaves much for the reader to infer in order to determine the impact of the claim.
	0	No claim related to the proposition or unclear assertions.
Grounds	6	The supporting data are complete, accurate, and relevant to the claim.
	4	The data offered are relevant but not complete. The student leaves much for the reader to infer from the data. The student may have offered the data without the complete citation, which would allow the reader to determine the reliability of the data as evidence. The student may offer data, which are not complete enough to allow the reader to determine their significance.
	2	The data or evidence are weak, inaccurate, or incomplete. For example, a. an attempt at using a general principle without establishing the truth of the principle; b. the use of examples from personal experience which are not generalizable; c. the citation of data when no source is identified; and d. the use of obviously biased or outdated material.
	0	No supporting data are offered or the data are not related to the claim.

Table 21 (continued): Rubric for Assessing the Depth of students' Discussion Post (Cho & Jonassen, 2002)

	Quality	Criteria
Warrants	6	The student explains the data in such a way that it is clear how they support the claim.
	4	The student explains the data in some way, but the explanation is not linked specifically to the claim.
	2	The student recognizes a need to connect the data to the claim and states some elaboration of data, but the student fails to make the connection. Or most rules and principles are not valid or relevant.
	0	No rules and principles are offered
Backing	6	The student states correct, relevant, and specific sources of warrants.
	4	The student states correct, relevant sources of warrants but the sources are very general, not specific.
	2	The student states incorrect, irrelevant sources of warrants.
	0	No sources of warrants are given.
Rebuttals	6	The student states complete and systematic identification of constraints of solutions.
	4	The student identifies constraints of solutions but the constraints are not sufficient.
	2	The student offers few constraints of solutions but the constraints are not elaborated.
	0	No recognition of constraints of solutions.

Inter-coder reliability of coding was done by two peers. All discussion posts of each course were coded by peers who gave the courses more than once as an instructor and worked with the researcher on the suitability of the discussion questions.

Inter-coder reliability scores were calculated by using Miles and Huberman's (1994) formula that is

$$reliability = \frac{number\ of\ agreements}{total\ number\ of\ agreements + disagreements}$$

The inter-coder reliabilities of this study were acceptable ranges from .96 to .98. Table 22 presents the details of result of the inter-coder reliability.

Table 22: Inter-coder Reliabilities of Qualitative Data Instruments

Coding	Inter-coder Reliability
Discussion Posts of CTIS 151	96%
Discussion Posts of CTIS 163	98%

3.10 Validity and Reliability

All of the study instruments were checked for validity, and reliability perspectives. Validity and reliability of data collection instruments and the study can be different for quantitative and qualitative approaches. In this study, mixed-method research, quantitative and qualitative approaches were employed. This part is divided into two parts according to quantitative and qualitative parts of the study.

Validity and Reliability for Quantitative Data Collection of the Study
The following strategies were used to provide validity and reliability of quantitative data collection instruments;

- Items and scales of the questionnaires were adopted from previous studies. Therefore, content validity and reliability of the questionnaires were supported.

- Each of the items and instructions in the instruments were reviewed by experts to support content validity.

- The pilot study was conducted both to test the questionnaire items and to check reliability of the questionnaires. The reliability of the questionnaires was checked by calculating the Cronbach's alpha coefficients for both pilot and the actual study.

- In addition to the researcher, three experts tested the system and reviewed the online motivation questionnaire to maintain valid data entry.

Validity and Reliability for Qualitative Data Collection of the Study

The following strategies were used to provide validity and reliability of qualitative data collection instruments;

- Two pilot studies were conducted to test both the interview questions and interview process.

- Depth interviewing was used as a data collection method. A semi-structured interview protocol was designed, piloted and improved with the help of peers and experts' opinion in the field to check the meaning and wording. Moreover, necessary improvements were made to the interview protocol after the second pilot interview.

- To assure content validity, the interview protocol was reviewed by five experts. Peer reviews were employed in both coding and interpretation phases. The data and the codes were also be checked by another qualitative researcher using a peer checking process. The interpretations of data were discussed with a peer who could also provide insights about interview data.

- All interviews were recorded with the consent of interviewees by using an audio device. The researcher transcribed all interviews herself that enabled her to listen to the interviews more times when necessary.

- The coding reliabilities of both interviewees and depth of discussion posts were checked by inter-coder reliability.

- The researcher used triangulation by using different methods. Both interviews and questionnaires were carried out to enrich the data to discover probable commonalities, inconsistencies or contradictions as suggested by Mathison (1998).

3.11 Role of the Researcher

The researcher was an insider in this research. The researcher is an instructor in CTIS department of Bilkent University since 1997. She has used different CMSs such as Moodle, Blackboard, and METU Online in lectures as a student and an instructor. She is still not certain about existing of a CMS that is accepted by students, and used effectively in everyday life of students. However, nowadays she searches for a CMS that is accepted and used effectively the course related activities by students. Therefore, she chooses action research in order to both take an action and practice about utilization of SNSs in F2F courses as CMS.

The researcher had two years experience of using Facebook as CMSs in five different courses, she instructed, named as CTIS 151: Introduction to Programming, CTIS 153: Discrete Mathematics I, CTIS 154: Discrete Mathematics II, CTIS 163: Discrete Mathematics and CTIS 488: Data Analysis.

3.12 Assumptions

The assumptions of the study are:

1. Some of the instruments were adopted from previous studies' instruments with the assumption that the validity of the instrument will be higher.

2. Data collection instruments in English would not cause problems since the medium of instruction in the University is English.

3. The factors that might not be covered by the quantitative phase would be covered by the qualitative phase.

4. Qualitative phase of the study would increase the validity of the quantitative phase of the study.

5. It was assumed that holding interviews with 12 out of 42 the respondents would be satisfactory to reach the aims of qualitative part of the study.

3.13 Limitations

The limitations of this study are;

1. The data were collected only from 1st year students of the university. This can be a limitation in sampling. There were a few reasons underlying this limitation. Compared to the universities in other developed countries, the rate of using SNSs as CMS was not clear and low in Turkish universities. In these limited number of appropriate course in the university level, the number of instructors who used or at least had tried to use SNSs as a CMSs was limited to the study sample during spring 2011 or low.

2. The subject of this study was limited to 42 freshman students during 2011 spring semester. Their experiences and expectations may not reflect the typical students enrolled in state or private university in Turkey or in other countries. Therefore, the results may not be reliable if generalized beyond students enrolled in a similar situation.

3. The validity of the responses to the instruments used in the study was limited to the honesty of the participants.

4. Validity of the results of the qualitative phase is limited to the interpretation skills of the researcher.

5. The qualitative results of this study are limited with the perceptions of the students taking the CTIS 163 and CTIS 151 courses during spring 2011.

6. In this study, there was only one researcher and all interviews and discussions posts were coded by the researcher. In other words, researcher was alone in the coding phases. However, inter-coder reliability and peer reviews were used to test and increase the reliability of all coded documents and interviews.

7. One of the motivation scales, effort regulation was excluded from the factors of the study due to the low reliability coefficients in both pilot and actual study.

CHAPTER 4

RESULT

This chapter presents the findings of the study concerning the research questions stated in the previous chapters. The study results were presented in the order of the research questions. In each part, both quantitative and qualitative data are presented together. Interview results are given in terms of general patterns emergent among the interviewees.

For participation to the course Facebook page 5 points were given to the students in CTIS163, and for class participation, 5 points were given to the students in CTIS151. Therefore, the findings for both courses were provided in separate tables in the following sections.

4.1   Students' Facebook Acceptance and Course Facebook Page Involvement Levels

4.1.1   Participants Demographics about Facebook and Facebook as CMS

Preferences of Social Networking Site

From Facebook acceptance questionnaire results, 92.9% (N = 39) of the participants involved in SNSs, and 7.1% (N = 3) of the participants did not use SNSs. All of the participants who used SNSs stated Facebook, with 95.2%, as the most popular and preferred SNSs. Based on the percentage of participants (95.2%) admitted their participation, SNSs is popular among the study participants.

The interview results also show that interviewees do not vary much in their views of most popular and preferred SNSs as Facebook. All of the interviewees reported that they use Facebook and half of the interviewees declared that they also used Twitter. One of the interviewee declared that he used more than three SNSs including Facebook and Twitter. Moreover, all interviewees indicated that they used Facebook more than the other SNSs.

Preferences of Social Networking Site Friends

The number of online friends and group affiliations preferences of participants were taken from questionnaires and widely varied. The data representing measures of central tendency for online friends and group members are presented in Table 23. Participants' average number of online friends was 315. The data showed that participants were mostly using SNSs to stay connected with their current and past friends (see Table 23).

Table 23: Social Networking Sites Friends

N = 42	Measures of Central Tendency			
	Missing	Range	Mean	SD
Total Friends	3	40-650	314.79	140.36
Bilkent University Friends	4	10-350	101.08	74.25
Family Friends	4	2-50	16.26	14.94
High School Friends	4	4-200	75.34	55.60
Other College Friends	4	0-300	63.08	63.16
Bilkent University Profs & Staff	4	0-60	7.08	12.65

Perceived Role of Social Networking Site

The descriptive statistics from questionnaires for the variables measuring the perceived role and importance of SNSs are presented in Table 24. As presented in Table 24, majority of participants (76.2%, n = 32) had not missed classes because of online social networking. 78.5% (n = 33) of the participants believed that SNSs allowed them to keep in contact with high school friends and other college friends. The 54.8% (n= 23) of participants were neutral that SNSs was important to their college academic experience. 38.1% (n = 16) of participants were also neutral that SNS allowed them both to express themselves and to stay in touch with their family. Many of the participants (42.8% n = 18) disagreed or strongly disagreed that SNS allowed them stay in touch with their family.

Table 24: Perceived Importance of Social Networking Sites

Descriptive Statistics					
	Percentage (Frequency)				
N = 42	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I have missed classes because I was doing Online Social Networking	4.8% (2)	4.8% (2)	14.3% (6)	31.0% (13)	**45.2%** **(19)**
Online Social Networking allows me to keep in contact with high school friends and friends from other colleges.	31.0% (13)	**47.5%** **(20)**	14.3% (6)	7.1% (3)	0/0% (0)
Online Social Networking is important to my college Academic Experience	11.9% (4)	9.5% (4)	**54.8%** **(23)**	19.0% (8)	4.8% (2)
Online Social Networking allows me to express myself	9.5% (4)	31.0% (13)	**38.1%** **(16)**	16.7% (7)	4.8% (2)
Online Social Networking allows me to stay in touch with my family.	7.1% (3)	11.9% (5)	**38.1%** **(16)**	21.4% (9)	21.4% (9)

Similar to the quantitative results, all of the interviewees confirmed that they used Facebook to keep in touch with friends. Interviewees' preferences of first communication channel were widely varied. However, if Facebook was not the first one, then it was the second channel to communicate with their friends. All of the

interviewees emphasized that their friends were different from them and they used Facebook habitually to communicate.

Furthermore, interview results pointed out that communication medium of interviewees noticeably changed due to the features offered by Facebook. Three (25%) of the interviewees declared that Facebook took the place of MSN. Moreover, one of the interviewees defined Facebook as a different way of real time communication application in which group of people can communicate together at the same time.

To communicate with their instructor, interviewees preferred Facebook and e-mail. Some of the interviewees claimed communication with phone as private. Therefore, they did not choose to use phone to contact with their instructor. Some of the interviewees stated that they did not use e-mail account of university, since they did not trust the safety of university e-mails. One of them believed that their messages read by authorities of university. The following quotations illustrate the perspective of interviewees about using Facebook to communicate with their instructor;

> R2: *"I always prefer to talk face-to-face since we are always in school. However, I may be far away from school or I may be sick at that time Facebook is becoming a very big advantage in communication… With Facebook, I can reach my instructor easily and send my message…"*

> [*"…ben yüzyüze konuşmayı herzaman tercih ederim sonuçta her dakika okula gidip geliyoruz ama dediğim gibi sonuçta ben uzakta olabilirim yada hasta olabilirim hakikaten o zaman Facebook çok büyük bir avantaj haline geliyor... İletişim için gerçekten avantaj haline geliyor. Sizi orada çok rahat size ulaşabilirim ve mesajımı iletebilirim."*]

> R3: *"I don't know how often do you (instructor) check your e-mail? but I can reach you comfortably with Facebook"*

> [*"Maili ne kadar sıklıkla kontrol edresiniz sık sık ediyorsunuz ama Facebooktan yani daha rahat ulaşabilirim yani size"*]

R8: "Definitely I did not call by phone, because it is private. Facebook is community…from Facebook since after 10 minutes, then you get the answer… "

[*"Hocam telefonunuzu kesinlikle aramam. Çünkü o sizin şimdi yaa Facebook bir community oluyor ama telefon private… Facebook'tada çünkü şimdi yazıyorsunuz bir bakıyorsunuz 10 dakikada hoca cevap vermiş"*]

Similar to the quantitative data results which stated that 42.8% (n=18) of participants were disagreed or strongly disagreed that they used Facebook to stay in touch with their family, the most (99.67%, n = 11) of interviewees stated that they did not prefer Facebook to communicate with their family. However, one of the interviewees stated that when the frequency of his communication with his family was decreased, their family found him on Facebook and they had chat on Facebook.

According to quantitative data in which 40.5% of participants either agreed or strongly agreed that SNS allows them to express themselves. One of the interviewee stated that he can express himself more in SNSs than in real life. He, member of more than two SNSs, enrolled the discussions on CTIS 163 course Facebook page.

4.1.2 Facebook Acceptance

The variables used to measure students Facebook acceptance were perceived usefulness (PU), perceived ease of use (PEU), attitudes toward use (ATU), facilitating conditions (FC), subjective norms (SN) and behavioral intention to use (BIU).

Table 25 presents interpretation for the range of five-point likert scales items of Facebook acceptance scales.

Table 25: Descriptive Statistics of Facebook Acceptance Scales

Range	Interpretation
1.00 – 1.80	Strongly Disagree
1.81 – 2.60	Disagree
2.61 – 3.40	Neutral
3.41 – 4.20	Agree
4.21 – 5.00	Strongly Agree

Based on the interpretation for the range of five-point likert scales items of Facebook acceptance scales, the overall mean of the participants was at agreed level on the perceived ease of use, facilitating conditions and behavioral intention to use items while the means were neutral on perceived usefulness, attitudes towards use and subjective norms. Facebook acceptance of overall participants, in CTIS 163 and CTIS 151, were similar accept facilitating condition scale on which mean score for CTIS 151 was at neutral level while that of CTIS 163 was at agreed level. The descriptive statistics of Facebook acceptance scales are shown in Table 26. The standard deviations range from 0.76 to 0.96 indicating a narrow spread around the mean.

Table 26: Descriptive Statistics of Facebook Acceptance Scales

Facebook Acceptance Scales		Statistics of Scales		
		N	Mean	SD
Perceived Usefulness (PU)	Overall	42	3.01	.95
# of item = 3	CTIS 163	29	3.20	.79
	CTIS 151	35	2.92	.90
Perceived Ease of Use (PEU)	Overall	42	3.89	.84
# of item = 3	CTIS 163	29	3.89	.78
	CTIS 151	35	3.82	.87
Attitudes Toward Use (ATU)	Overall	42	3.36	.90
# of item = 4	CTIS 163	29	3.38	.87
	CTIS 151	35	3.35	.95
Facilitating Conditions (FC)	Overall	42	3.45	.76
# of item = 3	CTIS 163	29	3.55	.79
	CTIS 151	35	3.36	.70
Subjective Norm (SN)	Overall	42	3.02	.96
# of item = 2	CTIS 163	29	3.09	.97
	CTIS 151	35	2.97	.95
Behavioral Intention to Use (BIU)	Overall	42	3.64	.91
# of item = 2	CTIS 163	29	3.57	.89
	CTIS 151	35	3.59	.91

Perceived Usefulness of Facebook (Facebook Acceptance)

Participants' perceived usefulness of Facebook was measured through five-point likert scale items that were adopted from the theory of planned behavior items. The descriptive statistics for items measuring participants' perceived usefulness of Facebook according to the taken course are presented in Table 27 and Table 28.

Even though overall mean scores in both courses were at neutral level (*M = 3.20 in CTIS 163* and *M = 2.92 in* CTIS 151*)* about perceived usefulness items, participants in CTIS 163 have higher means score than that in CTIS 151.   The 27.5% of

participants (n = 8) in CTIS 163 either disagreed or strongly disagreed that Using Facebook improved their work while 37.1% of participants (n = 13) in CTIS 151 disagreed or strongly disagreed that Using Facebook improved their work. The data showed that 44.8% participants (n = 13) in CTIS 163 and 34.3% (n = 12) participants in CTIS 151 were neutral on the item which is "using Facebook will increase my effectiveness". 34.5% (n = 10) participants in CTIS 163 and 40.0% (n = 14) participants in CTIS 151 believed that "using Facebook will increase my productivity".

Table 27: CTIS 163Participants' Perceived Usefulness of Facebook

N = 29	Percentage (Frequency)					Central Tendency	
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	*M*	*SD*
Using Facebook improve my work	6.9% (2)	13.8% (4)	**51.7%** **(15)**	24.1% (7)	3.4% (1)	2.97	0.91
Using Facebook will enhance my effectiveness	10.3% (3)	31.0% (9)	**44.8%** **(13)**	10.3% (3)	3.4% (1)	3.34	0.94
Using Facebook will increase my productivity	6.9% (2)	34.5% (10)	**41.4%** **(12)**	13.8% (4)	3.4% (1)	3.28	0.92
Overall	8.0% (7)	26.4% (23)	**46.0%** **(40)**	16.1% (14)	3.4% (3)	3.20	0.79

Table 28: CTIS 151Participants' Perceived Usefulness of Facebook

N = 35	Percentage (Frequency)					Central Tendency	
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	*M*	*SD*
Using Facebook improve my work	2.9.% (1)	14.3% (5)	**45.7%** **(16)**	25.7% (9)	11.4% (4)	2.71	0.96
Using Facebook will enhance my effectiveness	2.9% (1)	**34.3%** **(12)**	**34.3%** **(12)**	17.1% (6)	11.4% (4)	3.00	1.06
Using Facebook will increase my productivity	0.0% (0)	**40.0%** **(14)**	34.3% (12)	17.1% (6)	8.6% (3)	3.06	0.97
Overall	1.9% (2)	29.5% (31)	**38.1%** **(40)**	20.0% (21)	10.5% (11)	2.92	0.90

The interviews supplied different results from quantitative results. Facebook was declared as useful by all of the interviewees. One of the interviewee who started to use Facebook with CTIS 163 course did not say anything about the usefulness of Facebook but she mentioned mostly usefulness of course Facebook page. All of the other interviewees claimed that Facebook is a new useful means of online communication that helps to communicate particularly with their high school friends, as the following quotation illustrates,

> R1: *"I found my secondary school friend by the help of Facebook; it is a different communication environment that we can see each other. It is useful in that sense…"*

> [*"…mesela benim ortaokul arkadaşlarımla çok uzaklaştık ortaokuldan sonra ama Facebook sayesinde onları buldum, onlarla bir ortam oluşturduk, onlarla görüşüyoruz falan öyle bir yararı oldu"*]

> R4: *"In terms of communication, Facebook is quite useful for me… Normally, in real life I am not as social as on Facebook. I feel more comfortable and I share more things on Facebook."*

> [*"İletişim açısından benim için bayağı bi faydalı aslında …Normalde gerçek hayatta bu kadar sosyal değilim ama Facebook'un içinde daha bir rahat oluyorum daha çok şey paylaşıyorum insanlarla"*]

> R5: *"I usually prefer phone to communicate with a person who is far away from me. Facebook is different than phones, you can communicate with many people at the same time. In real life, it is difficult to become together with that many people…"*

> [*"Genellikle telefondan hani uzak olduğu zaman ama Facebook'unda hani ayrı bir havası yani nasıl diyim sonuçta biçok insanla aynı anda iletişime geçebiliyorsun o güzelliği var. Hani o tarz için biraz daha böyle aktif olabilmek için hep arkadaş grubunla hani falan ama diğer zamanlarda yada real hayatta o kadar insanı bir araya toplayamıyorsunuz sonuçta."*]

> R11: *"... I can say that communication is a good point of Facebook especially with friends who you have not seen for a long time."*

> [*"…Çok uzun zamandır görmediğim arkadaşlarımla özellikle. O açıdan iyi bir iletişim diyebilirim yani Facebook"*]

All of the interviewees believed and also mentioned usefulness of course Facebook pages as to

- communicate with instructor, their classmates, and students in different sections of the course,
- make the subjects more clear,
- increase their interest,
- make them more active and so on.

The following quotations illustrate the students' perspective about usefulness of course Facebook page

> R1: "Instead of course Facebook discussions, if we discussed chessboard example in the lecture, most probably no one can understand it. I believed that with both visual ads on Facebook and discussion questions, it was more meaningful... I believed that course Facebook page was helpful for us... Not me but some of my friends, not interested in the course, liked, followed, and viewed some shared resources. I saw them involving the activities on course Facebook page...".

> ["Chessboard örneği vardı. Onu normal derste yani anlatsak kimse anlayama bilirdi. Ama orada şekillerle ve discussion sorularıyla daha mantıklı olduğunu düşünüyorum ben doğrusu. Başka Görsel boyutu tabii kesinlikle...ilgisi olmayan dersle ilgisi olmayan arkadaşlarımın orada daha çok ilgilendiklerini görüyorum mesela. Ben olmasamda onlar öyle. Hani kendileri derste hiç birşey yapmadıkları halde gidiyorlar orada en azından şaka usulüde olsa birşeyleri beğeniyorlar, gidip birşeyleri okuyorlar yada uğraşıyorlar birşeylerle Facebook sayfası o yüzden gayet iyi yani"]

> R2: "...With the help of course Facebook page, I found friends from other sections and formed my project group members for information technology course. Course Facebook page was helpful to get to know people in your department."

> ["Dersin Facebook sayfasınında hani ne şekilde kullanıyorum yeni arkadaşlar hani diğer sectionlardaki arkadaşları edinme açısından çünkü mesela bu şimdi yine bir tane proje oldu o arkadaşlarımı oradan hani o sayfa çok yararlı oluyor oradan kimin kim oluğunu buluyorum. Böylece kendi bölümdeki tanımadığım arkadaşlarımıda tanımış tanışmış oluyorum bu sayede."]

R6: "Following discussions helped me a lot…"

[*"Takip ettiğim için bana cok faydası oldu"*]

R1: "…. For example, I had homework from English course and when I was bored due to homework, I continued to find answers to discussion questions. Moreover, when I was dealing with the discussions or other course related issues, my friends could communicate with me and I could see the notification of chat screen at the bottom since I was on Facebook"

[*"Mesela son discussion soruları yani paylaşılan sorular ben yaklaşık 4-5 gündür onun üzerinde çalışıyorum sürekli birşeyler alıyorum kaydediyorum falan mesela ingilizceden ödevim var canımı sıkıyor giriyorum o matematik soruların kopyalıyorum google da bakıyorum. Başka bir şekilde deftere bakıyorum falan öyle bir yararı oldu. Hani Facebooktayım zaten yapacak birşey yok arkadaşlarım yazarsa altan yazar ben bu arada o soruları çözeyim diyorum"*]

Perceived Ease of Use (Facebook Acceptance)

Participants' perceived ease of use of Facebook was measured through five-point likert type items that were adopted from the theory of planned behavior items. The descriptive statistics for items measuring participants' perceived ease of use of Facebook according to the taken course are presented in Table 29 and Table 30.

Overall mean scores in both courses were at agreed level about perceived ease of use items. Participants in CTIS 163 (*M = 4.31*) have higher means than that in CTIS 151 (*M = 4.29*). Many of participants (55.1%, n = 16 in CTIS 163 and 62.9%, n = 17 in CTIS 151) agreed or strongly agreed that their interactions with Facebook were clear and understandable. Most of the participants (82.7%, n = 24 in CTIS 163 and 82.8%, n = 29 in CTIS 151) also agreed or strongly agreed that they found Facebook easy to use. Relatively small percentage (10.3% in CTIS 163 and 17.2% in CTIS 151) stated that they did not find Facebook easy to use to do what they want it to do.

Table 29: CTIS 163 Participants' Perceived Ease of Use of Facebook

N = 29	Percentage (Frequency)					Central Tendency	
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	*M*	*SD*
My interaction with Facebook is clear and understandable	24.1% (7)	**31.0%** **(9)**	**31.0%** **(9)**	13.8% (4)	0.0% (0)	3.66	1.01
I find it easy to get Facebook to do what I want it to do.	20.7% (6)	**37.9%** **(11)**	31.0% (9)	10.3% (3)	0.0% (0)	3.69	0.93
I find Facebook easy to use	**51.7%** **(15)**	31.0% (9)	13.8% (4)	3.4% (1)	0.0% (0)	4.31	0.85
Overall	32.2% (28)	**33.3%** **(29)**	25.3% (22)	9.2% (8)	0.0% (0)	3.89	0.79

Table 30: CTIS 151 Participants' Perceived Ease of Use of Facebook

N = 35	Percentage (Frequency)					Central Tendency	
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	*M*	*SD*
My interaction with Facebook is clear and understandable	20.0% (7)	**42.9%** **(15)**	22.9% (8)	11.4% (4)	2.9% (1)	3.66	1.03
I find it easy to get Facebook to do what I want it to do.	20.0% (7)	**34.3%** **(12)**	25.7% (9)	14.3% (5)	2.9% (1)	3.56	1.08
I find Facebook easy to use	**51.4%** **(18)**	31.4% (11)	11.4% (4)	5.7% (2)	0.0% (0)	4.29	0.89
Overall	30.8% (32)	**36.5%** **(38)**	20.2% (21)	10.6% (11)	1.9% (2)	3.82	0.87

Attitudes Toward Use (Facebook Acceptance)

Participants' attitudes toward use of Facebook were measured through five-point likert type items that were adopted from the theory of planned behavior items.

As presented in Table 31 and Table 32, overall mean scores in both courses were at neutral (*M = 3.38 in CTIS 163* and *M = 3.35 in* CTIS 151*)* level about attitude

toward use of Facebook items (see Table 31 and Table 32). Except for the item, "I look forward to those aspects of my life that require me to use Facebook", for which in both courses the mean scores were at neutral level, for all other items in both courses the mean scores were at agreed level about items of attitude toward use of Facebook in both courses.

About 45% of participants in both courses were strongly agreed or agreed that Facebook makes life more interesting and they like using Facebook. In CTIS 163 (37.9%, n = 11) and in CTIS 151 (45.7%, n = 16) participants were strongly agreed or agreed that working Facebook is fun. None of the participants in both courses were strongly disagreed that they look forward to those aspects of their life that require them to use Facebook.

Table 31: CTIS 163 Participants' Attitudes Toward Use of Facebook

N = 29	Percentage (Frequency)					Central Tendency	
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	*M*	*SD*
Facebook makes life more interesting	20.7% (6)	24.1% (7)	**41.4% (12)**	13.8% (4)	0.0% (0)	3.52	0.99
Working with Facebook is fun	20.7% (6)	17.2% (5)	**44.8% (13)**	17.2% (5)	0.0% (0)	3.41	1.02
I like using Facebook	31.0% (9)	13.8% (4)	**41.4% (12)**	3.4% (1)	10.3% (3)	3.52	1.27
I look forward to those aspects of my life that require me to use Facebook	0.0% (0)	31.0% (9)	**44.8% (13)**	24.1% (7)	0.0% (0)	3.07	0.75
Overall	18.1% (21)	21.5% (25)	**43.1% (50)**	14.7% (17)	2.6% (3)	3.38	0.87

Table 32: CTIS 151 Participants' Attitudes Toward Use of Facebook

N = 35	Percentage (Frequency)					Central Tendency	
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	*M*	*SD*
Facebook makes life more interesting	20.0% (7)	25.7% (9)	**34.3% (12)**	17.1% (6)	2.9% (1)	3.43	1.10
Working with Facebook is fun	20.0% (7)	25.7% (9)	**31.4% (11)**	22.9% (8)	0.0% (0)	3.43	1.07
I like using Facebook	31.4% (11)	17.1% (6)	**28.6% (10)**	11.4% (4)	11.4% (4)	3.46	1.36
I look forward to those aspects of my life that require me to use Facebook	2.9% (1)	**34.3% (12)**	31.4% (11)	31.4% (11)	0.0% (0)	3.09	0.89
Overall	18.6% (26)	25.7% (36)	**31.4% (44)**	20.7% (29)	3.6% (5)	3.35	0.95

According to the quantitative results, at least 45.7% (n =16) in CTIS 151 and 31.0% (n = 9) in CTIS 163 were agreed or strongly agreed of all items related to attitude toward using Facebook. The interview results support quantitative results. Similar to the descriptive results, the interviewees liked using both Facebook and course Facebook pages. Seven (58.4%) of the interviewees claimed that they were using Facebook for fun. They declared their interests on course were positively affected by use of Facebook. Furthermore, six (50%) of the students stated that some of their friends who were not interested on the course, were interested in the course due to their interest on Facebook. Some of the comments of interviewee related to relation between their interests and use of Facebook were:

> R1: *"I saw my friends not interested in course interested course related things on course Facebook page…"*

> [*"ilgisi olmayan dersle ilgisi olmayan arkadaşlarımın orada daha çok ilgilendiklerini görüyorum mesela"*]

> R12: *"All of us on Facebook, therefore course Facebook page attracts more interest"*

> [*"Herkes Face'de bu yuzden daha fazla ilgi cekiyor"*]

R11:"… Since everyone was on Face, our interests to the course were increased"

[*"… Hepimiz Face'de oldugumuz icin ilgimiz daha fazla oluyor."*]

R1: "When you were searching answer of a discussion question on Face, you come across another question at that time you started to search for it then it would lead another one… Sometimes you saw the connection with other courses subject and understand the relationship between subjects, this increase your interest to the course…"

[*"Mesela discussion sorusu olduğunu düşünelim derste onu araştırıyorsunuz başka bir soru çıkıyor oraya yöneliyorsunuz oradan başka bir yere yöneldiğinizi görüyorsun mesela geçen o…"*]

Facilitating Conditions (Facebook Acceptance)

Participants' facilitating conditions of Facebook was measured through five-point likert type items that were adopted from the theory of planned behavior items. As presented in Table 33, overall mean for in CTIS 163 (*M = 3.55, SD = 0.79)* was at agreed level about facilitating conditions of Facebook items while in CTIS 151 (*M = 3.36, SD = 0.70)* the overall mean was at neutral level (See Table 34). The descriptive statistics for items measuring participants' facilitating conditions of Facebook according to the taken course are presented in Table 33 and Table 34.

None of the participants in both courses were strongly disagreed that when they need to help to use Facebook both guidance and a specialized instruction is available to help them. At least 45.7% of the participants in both courses were strongly agreed or agreed with the item that "When I need to use Facebook, a specific person is available to provide assistance".

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Table 33: CTIS 163 Participants' Facilitating Conditions of Facebook

N = 29	Percentage (Frequency)					Central Tendency	
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	*M*	*SD*
When I need to help to use Facebook, guidance is available to me.	10.3% (3)	37.9% (11)	**44.8% (13)**	6.9% (2)	0.0% (0)	3.52	0.79
When I need to use Facebook, a specialized instruction is available to help me.	17.2% (5)	**37.9% (11)**	**37.9% (11)**	6.9% (2)	0.0% (0)	3.66	0.86
When I need to use Facebook, a specific person is available to provide assistance.	20.7% (6)	27.6% (8)	**37.9% (11)**	6.9% (2)	6.9% (2)	3.48	1.12
Overall	16.1% (14)	34.5% (30)	**40.2% (35)**	6.9% (6)	2.3% (2)	3.55	0.79

Table 34: CTIS 151 Participants' Facilitating Conditions of Facebook

N = 35	Percentage (Frequency)					Central Tendency	
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	*M*	*SD*
When I need to help to use Facebook, guidance is available to me.	5.7% (2)	28.6% (10)	**54.3% (19)**	11.4% (4)	0.0% (0)	3.29	0.75
When I need to use Facebook, a specialized instruction is available to help me.	5.7% (2)	**48.6% (17)**	34.3% (12)	11.4% (4)	0.0% (0)	3.49	078
When I need to use Facebook, a specific person is available to provide assistance.	8.6% (3)	**37.1% (13)**	34.3% (12)	17.1% (6)	2.9% (1)	3.31	0.96
Overall	6.7% (7)	38.1% (40)	**41.0% (43)**	13.3% (14)	0.9% (1)	3.36	0.70

Subjective Norm (Facebook Acceptance)

Participants' subjective norm of Facebook items were measured through five-point likert type items that were adopted from the theory of planned behavior items.

Overall mean scores for both courses were at neutral (*M = 3.09 in CTIS 163* and *M = 2.97* CTIS 151*)* level about subjective norm of Facebook items according to interpretation of five-point likert scales. The descriptive statistics for items measuring participants' subjective norm of Facebook according to the taken course are presented in Table 35 and Table 36.

Similarly in both courses at least 40% of the students were neutral about the item "People whose opinions I value will encourage me to use Facebook". Even though the overall means in both courses were at neutral level about the item "People who are important to me will support me to use Facebook", CTIS 163 participants has higher mean score (*M=3.14*) then CTIS 151 participants (*M = 3.03*) (See Table 35 and Table 36).

Table 35: CTIS 163 Participants' Subjective Norm of Facebook

N = 29	Percentage (Frequency)					Central Tendency	
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	*M*	*SD*
People whose opinions I value will encourage me to use Facebook.	3.4% (1)	27.6% (8)	**44.8%** **(13)**	17.2% (5)	6.9% (2)	3.03	0.94
People who are important to me will support me to use Facebook	13.8% (4)	24.1% (7)	**34.5%** **(10)**	17.2% (5)	10.3% (3)	3.14	1.19
Overall	8.6% (5)	25.9% (15)	**39.7%** **(23)**	17.2% (10)	8.6% (5)	3.09	0.97

Table 36: CTIS 151 Participants' Subjective Norm of Facebook in

N = 35	Percentage (Frequency)					Central Tendency	
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	*M*	*SD*
People whose opinions I value will encourage me to use Facebook.	2.9% (1)	25.7% (9)	**40.0% (14)**	22.9% (8)	8.6% (3)	2.91	0.98
People who are important to me will support me to use Facebook	8.6% (3)	28.6% (10)	25.7% (9)	**31.4% (11)**	5.7% (2)	3.03	1.10
Overall	5.7% (4)	27.1% (19)	**32.9% (23)**	27.1% (19)	7.1% (5)	2.97	0.95

According to overall mean score indicated range, this is an interesting and somewhat surprising finding. Since the interview results showed that participants started to use Facebook with an extrinsic motivation mostly (*n = 11, 91.7%*) with their friends' encouragements, finding friends, and due to its popularity. Only one of the interviewee started to use Facebook since I used Facebook as CMSs in one of her course in the previous semester, Fall 2011.

In the interviews, to understand the reason of using Facebook, interviewees were asked about what motivated them to use Facebook. Based on the interview findings, extrinsic motivation related to subjective norms can be the major dimension of motivation. The following quotations illustrate the motivational factors of using Facebook,

> *R3: "I have been a member of Facebook since August of 2007. At first, I had heard Facebook from one of my friend before seeing his Facebook profile which seems to be something different. And then I became a member of Facebook…"*

> [*"Facebook işte ilk başta 2007 ben kullanmaya başladığımda ağustos ayıydı bir arkadaşımdan duymuştum ilk öncede onun profilini gördüm değişik birşey olarak geldi ondan sonrada bende üye oldum…"*]

> *R8: "My close friend suggested… He always mentions about Facebook. Always talking about the things that he saw and did at Facebook…"*

[*"Yakın arkadaşım önermişti. Hani böyle böyle çünkü o bahsediyordu sürekli Facebook'ta bunu gördüm şunu gördüm diye."*]

R9: "In general, due to my friends' usage and its popularity…"

[*"Genel olarak etraftaki kişilerinde kullanmasından dolayı popüleritesinden dolayı desem daha doğru olur"*]

R12: "I opened a Facebook account for discrete methematics course in the previous semester. Actually, I had an account since you wanted to use Facebook as CMS"

[*"Matematik dersi için açtım geçen dönem yoksa yoktu adresim yani accountum yoktu. Açıkçası sizin isteğiniz üzerine oldu biraz"*]

Behavioral Intention to Use (Facebook Acceptance)

Participants' behavioral intention to use of Facebook was measured through five-point likert type items that were adopted from the theory of planned behavior items.

As presented in Table 37 and Table 38, overall means for both courses were at agreed (*M = 3.57 in CTIS 163* and *M = 3.59 in* CTIS 151) level about behavioral intention to use of Facebook items. The majority of participants' (72.4%, n = 21 in CTIS 163 and 65.7%, n = 23 in CTIS 151) either agreed or strongly agreed that they will use Facebook in future. In CTIS 163, percentages of participants (41.4%, n = 12) agreed or strongly agreed in planning to use Facebook often were higher than percentages of participants (31.0%, n = 9) disagreed or strongly disagreed in planning to use Facebook often. Similarly in CTIS 151, 48.5 % (n = 17) of participants agreed or strongly disagreed in their plan to use Facebook often. A small number of the participants (25.8%, n = 9) disagreed or strongly disagreed that they planned to use Facebook often. The descriptive statistics for items measuring participants' behavioral intention to use Facebook according to the taken course are presented in Table 37 and Table 38.

Similar to the mean scores, the first item of behavioral intention to use (see Table 37 and Table 38) in questionnaire, stating that participants (41.4% in CTIS and 37.1% in CTIS 151) agreed that they will use Facebook in future in both courses. None of the interviewees complained about having a Facebook account and mentioned that he or she was planning to close his/her Facebook account. Moreover, the interviewee who opened the Facebook account to use it as CMS stated that she had friends and started to use Facebook for other purposes different than course related issues.

Table 37: CTIS 163 Participants' Behavioral Intention to Use of Facebook

N = 29	Percentage (Frequency)					Central Tendency	
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	*M*	*SD*
I will use Facebook in the future.	31.0% (9)	**41.4% (12)**	24.1% (7)	0.0% (0)	3.4% (1)	3.97	0.94
I plan to use Facebook often.	13.8% (4)	**27.6% (8)**	**27.6% (8)**	24.1% (7)	6.9% (2)	3.17	1.17
Overall	22.4% (13)	**34.5% (20)**	25.9% (15)	12.7% (7)	5.2% (3)	3.57	0.89

Table 38: CTIS 151 Participants' Behavioral Intention to Use of Facebook

N = 35	Percentage (Frequency)					Central Tendency	
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	*M*	*SD*
I will use Facebook in the future.	28.6% (10)	**37.1% (13)**	28.6% (10)	2.9% (1)	2.9% (1)	3.86	0.97
I plan to use Facebook often.	11.4% (4)	**37.1% (13)**	25.7% (9)	22.9% (8)	2.9% (1)	3.31	1.05
Overall	20.0% (14)	**37.1% (26)**	27.1% (19)	12.9% (9)	2.9% (2)	3.59	0.91

4.1.3   Course Facebook Involvement

The course Facebook involvement variables were time spent on the course Facebook page, number of likes, number of posts, number of comments, number of discussion comments, number of discussion involved and depth of discussion posts. The data, number of Course SNSs currently belong and Time spent on SNSs per day, were collected by questionnaires. The data demonstrated that participant's involvement in both CTIS 151 and CTIS 163 courses Facebook pages were capturing similar and a considerable amount of their time. The average amount of time spent daily was 49.41 minutes (0.82 hours) in CTIS 151 while the average amount of time spent daily was 50.89 minutes (0.85 hours) in CTIS 163. This mean time commitment to course Facebook page is greater than the time that students would spend attending classes per week, if enrolled in 4-credit hours. The descriptive statistics for involvement in course Facebook page are presented in Table 39 according to the taken course.

Table 39: Course Facebook page Involvement Variables

N = 42	CTIS 163 (N = 29)			CTIS 151 (N = 35)		
	Range	Mean	SD	Range	Mean	SD
Course SNSs Currently Belong	0-15	2.29	2.57	0-15	2.27	2.56
Time Spent per Day (in minutes)	2-180	50.89	50.53	10-180	49.41	47.63
Number of Like	0-16	3.72	5.18	0-1	.09	.28
Number of Post (Video or .pdf)	0-14	2.38	3.28	0-3	.11	.53
Number of Comment	0-21	3.62	5.16	0-0	.00	.00
Number of Discussion Comment	0-13	1.52	2.75	0-8	.37	1.50
Number of Discussion Involved	0-6	.79	1.32	0-2	.11	.40

The total number of discussions subjects in CTIS 163 ($f = 10$) is higher than that in CTIS 151 ($f = 5$). Topics and number of discussion posts (including the initiation

message of instructor) are presented in Table 40 and Table 41 according to the course.

Based on the data, number of responses in course Facebook pages according to the courses were different. Participants were more active and involved to the discussions of CTIS 163 course than that of CTIS 151. As presented in Table 40 and 41, number of discussion opened by instructor was smaller in CTIS 151 (N = 4) than that in CTIS 163 (N = 6). As an instructor, I planned to post same number of discussion subject in both courses. However, in CTIS 151, due to the lack of interaction in the posted discussion, we decided to give more time to the students.

Table 40: Discussion Subjects and Response Details of CTIS 163

Initiator	Discussion Subject	Post Date	# of Stud. involved	# of Post by	
				Stud.	Inst.
Instructor	Propositional Functions	10. 02. 11	3	4	2
	Logic	17. 03. 11	5	8	4
	Proofs and Their Uses	29. 03. 11	1	2	1
	Graph Theory	20. 04. 11	2	4	4
	Full Binary and Spanning Trees	28. 04. 11	2	12	1
	Why we learn Discrete Math	09. 05. 11	4	6	1
Student	Matrix	20. 03. 11	1	1	0
	Graph Theory	02. 04. 11	1	5	0
	Algorithms	21. 05. 11	5	6	0
	Course's Facebook Page	24. 05. 11	2	2	1

Table 41: Discussion Subjects and Response Details of CTIS 151

Initiator	Discussion Subject	Post Date	# of Stud. involved	# of Post by Stud.	# of Post by Inst.
Instructor	Identifiers in C	08. 03. 11	0	0	1
	Help a programmer who is new at programming	22. 03. 11	1	5	1
	Call by Reference and Value	28. 04. 11	0	0	1
	Conditional Statements	09. 05. 11	1	1	2
Student	Arrays	21. 05. 11	2	7	2

Four students responded to the involvement questionnaire as they didn't use course Facebook page. Three of them did not use Facebook also and they only took CTIS 151 course. However, the one using Facebook and who stated as not using course Facebook page was not only the member of CTIS 163 course but he also involved in some of the discussions at the beginning of the semester.

Table 42 and Table 43 present the descriptive statistics of mostly used and helpful part of course Facebook page according to the participants responses to the involvement questionnaire.

Table 42: Most used and helpful parts of CTIS 163 Facebook page

Descriptive Statistics					
N= 28	Missing	Discussions	Wall Post	Events	Other
Which part of the course Facebook page do you use Most? (Check one)	0.0% (0)	32.1% (9)	**50.0%** **(14)**	17.9% (5)	0.0% (0)
Which part of the course Facebook page is helpful the Most for you? (Check one)	0.0% (0)	**46.4%** **(13)**	**46.4%** **(13)**	7.1% (2)	0.0% (0)

Table 43: Most used and helpful parts of CTIS 151 Facebook page

Descriptive Statistics					
N= 31	Missing	Discussions	Wall Post	Events	Other
Which part of the course Facebook page do you use Most? (Check one)	3.2% (1)	25.8% (8)	**54.8%** **(17)**	16.1% (5)	0.0% (0)
Which part of the course Facebook page is helpful the Most for you? (Check one)	0.0% (0)	41.9% (13)	**48.4%** **(15)**	9.7% (3)	0.0% (0)

In course Facebook pages, wall posts were the resources shared on the wall such as videos and links of documents or web pages related to course. Similar to the involvement questionnaire results, in the interview, sharing/viewing video, documents and discussions part were referred as the mostly used and useful activities of course Facebook pages. The following quotations illustrate the views of students about both mostly used and helpful part of course Facebook page:

> R10: "… We were sharing videos and shared videos were very helpful for the subjects either we missed or we had difficulty in understanding …"

> ["Dersi takip etmeme sebeb oluyor yani. Derste mesela anlamadığım veya kacirdigimiz şeyleri oraya konulan örneklerle yada videolarla pekiştirebiliyorum"]

> R1: "We shared videos related to course subjects. Those videos can be helpful for a student who did not either listen carefully or concentrate on the lecture. Those videos make subject understandable for them with visual ads like graphics. Such as $K_{3,3}$, chessboard discussion example. None of us can understand the subject if we discussed that example in the lecture…"

> ["Dersin Facebook sayfasında mesela işlediğimiz konularla ilgili videolar paylaşabiliriz, o videolar belki hoca anlatımında derste iyi dinlememişlerdi yada olmamışlardı şey video seyrederek belki daha etkili olabilir arkadaşlarımız belki eğer grafiksel bir anlatım varsa onu paylaşabiliriz. Mesela geçen K3,3 örneği vardı Onu normal derste yani anlatsak kimse anlayama bilirdi. Ama orada şekillerle ve discussion sorularıyla daha mantıklı olduğunu düşünüyorum ben doğrusu"]

R5: "I believe the videos and discussions shared on course Facebook page, parallel to the lecture notes were useful with regular and active participation..."

["*Mesela bazı hani dersimizde paralel olarak giden bazı ders notları oluyor veya onun dışında bazı videolar oluyor, sorular yada discussionlar dediğimiz gibi hani onların yararlı olduğunu düşünüyorum ama tabii düzenli ve aktif olarak kullanılırsa yararlı olduğunu düşünüyorum her ne kadar hani karşı taraftan arkadaşlarımızdan düzenli paylaşımlar gelsede yani yararlı şeyler gelsede öğrencilerin kullanması gerekiyor bunu*"]

R4: "For example in CTIS 163 course, I have problems with a problem or a subject. I can solve the problem or understand the subject by viewing the shared video on course Facebook page...."

["*Mesela matematikte bir konuda sıkıntı çekiyorsam başka biri video paylaştıysa mesela sayfada o videoyu izleyerek o problemi çözebiliyorum*"]

Involved activities, type of posts may serve as an important reference point to defining the involvement of Facebook. Involvement to both Facebook and course Facebook page contain same kind of activities. All of the interviewees list the activities that they did as following their friends, sharing and viewing videos, photos, links, documents, and discussions. Writing on the wall, writing and reading comments can also be counted as activities performed by the respondents.

According to the interviewees, the mostly used activities were sharing, viewing videos, discussions and following what is going on the course page, while the rarely used one was sharing photo which they did in their Facebook profile but not in course Facebook page. The majority of interviewees were highlighted wall posts and discussions as not only the mostly used, but also valued activity in Facebook.

Only two of the participants declared that they did not attend and followed Facebook discussions. One of those students took only the CTIS 151 courses and other failed from both courses due to not attending. The other interviewees, majority, defined their use as at least following the discussions parts from both CTIS 163 and CTIS 151.

Depth of Post

The descriptive statistics for depth of discussion posts are presented in Table 44. Number of both discussion post (f = 32) and involved students (N = 13) in CTIS 163 are more than the number of both discussion post (f = 11) and involved students (N = 3).

Table 44: Descriptive statistics - Depth of Discussion post

Depth of Discussion Posts	Measures of Central Tendency		
	Range	Mean	SD
CTIS 163 with Number of Discussion Posts = 32 # of involved Students = 13	0 - 30	17..38	8.70
CTIS 151 with Number of Discussion Posts = 11 # of involved Students = 3	0 - 22	10.00	8.29

Discussion posts of course Facebook page were analyzed to measure the depth of post by using a coding scheme adapted from Cho and Jonassen (2002). Rubric used for finding the depthness of students' discussion post is presented in Appendix I. The model identifies five major components of argument including claims, grounds, warrants, backing and rebuttals. Total number of messages coded in each category for each group. Each message was coded by the researcher and a peer. After peer review of coding depth of post were calculated. The individual scores were achieved by summing the number of points achieved in each argumentation category (claims, grounds, warrants, backing and rebuttals).

As shown in Table 45 and Table 46, overall mean of each argument (3.38, 3.50, 3.50, 3.62 and 3.38 for claims, grounds, warrants, backing and rebuttals respectively) used to measure depthness of the discussion posts in CTIS 163 was higher than that (2.36, 2.36, 1.64, 1.82 and 1.82 for claims, grounds, warrants, backing and rebuttals respectively) in CTIS 151.

There were two posts in CTIS 163 discussion. Both of them were social interaction not related with the subject of the discussion. Therefore, they were not counted and scored as a discussion post. Unlike discussion post in CTIS 163, in CTIS 151 discussions, there was not any social interaction post. However, there were three discussion posts in CTIS 151, which got 0 from all categories of argumentation. Moreover, Table 45 and Table 46 show that in CTIS 151 only one discussion post having six points from all categories of argumentation whereas in CTIS 163 there were at least seven discussion posts having six from all categories of argumentation.

Table 45: Depthness of Discussion Posts in CTIS 163

| f = 32 | Percentage (Frequency) | | | | Central Tendency | |
N = 13	0	2	4	6	M	SD
Claims	6.3% (2)	**40.6% (13)**	31.3% (10)	21.9% (7)	3.38	1.9
Grounds	6.3% (2)	34.4% (11)	**37.5% (12)**	21.9% (7)	3.50	1.76
Warrants	6.3% (2)	34.4% (11)	**37.5% (12)**	21.9% (7)	3.50	1.76
Backing	9.4% (3)	25.0% (8)	**40.6% (13)**	25.0% (8)	3.63	1.86
Rebuttals	6.3% (2)	**40.6% (13)**	31.3% (10)	21.9% (7)	3.38	1.79

Table 46: Depthness of Discussion Posts in CTIS 151

f = 11	Percentage (Frequency)				Central Tendency	
N = 3	0	2	4	6	*M*	*SD*
Claims	27.3% (3)	27.3% (3)	**45.5.3% (5)**	0.0% (0)	2.36	1.75
Grounds	27.3% (3)	**36.4% (4)**	27.3% (3)	9.1% (1)	2.36	1.96
Warrants	**45.5.3% (5)**	27.3% (3)	27.3% (3)	0.0% (0)	1.64	1.75
Backing	**45.5.3% (5)**	18.2% (2)	36.4% (4)	0.0% (0)	1.82	1.89
Rebuttals	**45.5.3% (5)**	18.2% (2)	36.4% (4)	0.0% (0)	1.82	1.89

In CTIS 163, all discussion post was categorized at least under one of the categories; reading citation, content clarification, prior knowledge, real world example, abstract example and making inference. Unlike CTIS 163, in CTIS 151 there was one discussion post, which was not related to one of the discussion posts' categories. The descriptive statistics for categories for coding discussion posts according to the taken course are presented in Table 47 and Table 48.

As presented in Table 47 and Table 48, even though content clarification is the most used category (71.9% in CTIS 163 and 90.9% in CTIS 151) in discussion posts of both courses; utilization percentage in CTIS 163 is less than that in CTIS 151. In CTIS 163, there were not any posts that gave abstract example (use of analogies, metaphors or philosophical interpretations to support one's understanding of a concept or principles) (see Table 47). In CTIS 151, there were not any posts that cannot be categorized as reading citation, abstract example, and making inference (see Table 48).

Table 47: Categories Found for Discussion Posts in CTIS 163

Courses	Categories	Percentage (Frequency)		Central Tendency
		No	Yes	Mode
CTIS 163 f = 32 N = 13	Reading Citation	**84.4%** **(27)**	15.6% (5)	0
	Content Clarification	28.1% (9)	**71.9%** **(23)**	1
	Prior Knowledge	**62.5%** **(20)**	37.5% (12)	0
	Real World Example	**65.6%** **(21)**	34.4% (11)	0
	Abstract Example	**100%** **(32)**	0.0% (0)	0
	Making Inference	**90.6%** **(29)**	9.4% (3)	0

Table 48: Categories Found for Discussion Posts in CTIS 151

Courses	Categories	Percentage (Frequency)		Central Tendency
		No	Yes	Mode
CTIS 151 f = 11 N = 3	Reading Citation	**100%** **(11)**	0.0% (0)	0
	Content Clarification	9.1% (1)	**90.9%** **(20)**	1
	Prior Knowledge	**54.5%** **(6)**	45.5% (5)	0
	Real World Example	**81.8%** **(9)**	18.2% (2)	0
	Abstract Example	**100%** **(11)**	0.0% (0)	0
	Making Inference	**100%** **(11)**	0.0% (0)	0

4.2   Relationships between Facebook Acceptance and Involvement to Course Facebook Page

Pearson correlation was used to find out the relationship between Facebook acceptance and involvement. The Pearson correlation has two assumptions and all of them were tested.

- The variables of the study were normal distributed.
- The cases represent a random sample from the population.

The relationships between Facebook acceptance of students in CTIS 163 course and course Facebook page involvement variables are reported in Table 49. Significant correlations are noted in the table.

For CTIS 163 course, the findings for correlation between Facebook acceptance and involvement to course Facebook page indicated significant relationships for *Perceived Usefulness and Number of Like (r = + .52, n = 29, p < .01, two tails), Number of Discussion Posts (r = + .52, n = 29, p < .01, two tails), Number of Discussion Subject Involved (r = + .54, n = 29, p < .01, two tails)* (See Table 49). The results also showed significant relationships between *Attitude Toward Use and Number of Like (r = + .47, n = 29, p < .01, two tails).*

Table 49 shows that there were significant relationship between *Facilitating Conditions and Number of Like (r = + .49, n = 29, p < .01, two tails), Number of Discussion Posts (r = + .41, n = 29, p < .05, two tails)* in CTIS 163.

The findings also showed significant relationships between *Subjective Norm and Number of Like* (r = + .57, n = 29, p < .05, two tails), *Time Spend on Course Facebook page (r = + .38, n = 28, p < .05, two tails).* Furthermore, there were significant relationship between *Behavioral Intention to Use and Number of Like* (*r = + .61, n = 29, p < .01, two tails), Number of Comment* (r = + .45, n = 29, p < .05, two tails) in CTIS 163. However, there is no significant correlation between

Facebook acceptance variables and course Facebook involvement variables in CTIS 151 (see Table 50).

Table 49: Correlation between Facebook Acceptance and Course Facebook Involvement of CTIS 163

Facebook Acceptance & CTIS 163 course Facebook Page Involvement Variables						
Acceptance \ Involvement	# of Like	# of Post	# of Comment	# of Discussion Post	# of Subject involved	Time Spent on Course Facebook
PU Pearson Correlation	.523**	.277	.341	.522**	.540**	.344
Sig. (2-tailed)	.004	.146	.070	.004	.003	.073
N	29	29	29	29	29	28
PEU Pearson Correlation	.285	-.080	.183	.216	.126	.108
Sig. (2-tailed)	.134	.681	.341	.261	.515	.585
N	29	29	29	29	29	28
ATU Pearson Correlation	.472**	-.112	.089	-.108	-.030	.274
Sig. (2-tailed)	.010	.562	.645	.579	.875	.159
N	29	29	29	29	29	28
FC Pearson Correlation	.487**	.219	.318	.414*	.352	.290
Sig. (2-tailed)	.007	.254	.093	.025	.061	.134
N	29	29	29	29	29	28
SN Pearson Correlation	.568**	.224	.313	.282	.278	.380*
Sig. (2-tailed)	.001	.242	.099	.138	.143	.046
N	29	29	29	29	29	28
BIU Pearson Correlation	.606**	.271	.448*	.188	.240	.310
Sig. (2-tailed)	.000	.155	.015	.329	.210	.109
N	29	29	29	29	29	28

Pearson Correlation Sig. (2-tailed) * = $p < .05$, ** = $p < .01$
PU: Perceived Usefulness, PEU: Perceived Ease of Use, ATU: Attitude Toward Use, FC: Facilitating Conditions, SN: Subjective Norm, and BIU: Behavioral Intention to Use

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For CTIS 151, the correlations between Facebook acceptance variables and course Facebook involvement variables were not statistically significant. The correlations for Facebook acceptance and course Facebook involvement variables in CTIS 151 are shown in Table 50.

Table 50: Correlation between Facebook Acceptance and Course Facebook Involvement of CTIS 151

Facebook Acceptance & CTIS 151 course Facebook Page Involvement Variables						
Acceptance	Involvement	# of Like	# of Post	# of Discussion Post	# of Subject involved	Time Spent on Course Facebook
PU	Pearson Correlation	.179	.121	.079	.078	.165
	Sig. (2-tailed)	.304	.489	.650	.655	.394
	N	35	35	35	35	29
PEU	Pearson Correlation	.064	-.084	-.116	-.054	.030
	Sig. (2-tailed)	.718	.635	.513	.763	.876
	N	34	34	34	34	29
ATU	Pearson Correlation	.213	-.038	-.218	-.165	.170
	Sig. (2-tailed)	.220	.828	.208	.344	.378
	N	35	35	35	35	29
FC	Pearson Correlation	.136	.124	.074	.093	.215
	Sig. (2-tailed)	.437	.479	.672	.597	.263
	N	35	35	35	35	29
SN	Pearson Correlation	-.045	.065	.069	.123	.222
	Sig. (2-tailed)	.798	.711	.692	.481	.248
	N	35	35	35	35	29
BIU	Pearson Correlation	.084	-.112	.041	.092	.182
	Sig. (2-tailed)	.630	.521	.817	.597	.346
	N	35	35	35	35	29

Pearson Correlation Sig. (2-tailed) * = $p < .05$, ** = $p < .01$
PU: Perceived Usefulness, PEU: Perceived Ease of Use, ATU: Attitude Toward Use, FC: Facilitating Conditions, SN: Subjective Norm, and BIU: Behavioral Intention to Use

The correlations of Facebook acceptance and course Facebook page involvement in CTIS 163 and CTIS 151 were different. The only and important difference that may be the reason of dissimilar correlation results between the two courses was the bonus given for using course Facebook page. In CTIS 163 students got bonus from involvement to the course Facebook page.

Relationship between Depth of Post and Facebook Acceptance

In CTIS 163 course Facebook page, 13 students wrote 32 discussion posts for 10 discussion subjects. The relationships between Facebook acceptance in CTIS 163 course and depth of discussion posts are reported in Table 51. Significant correlations are noted in the table.

For CTIS 163 discussion posts, the findings for correlation between Facebook acceptance and depth of post indicated significant relationships for *Perceived Ease of Use and Rebuttals (r = + .41, n = 32, p < .05, two tails).* The results also showed significant relationships between *Attitude Toward Use and overall Depth of Discussion Posts (r = + .38, n = 32, p < .05, two tails), Claims (r = + .41, n = 32, p < .05, two tails), Grounds (r = + .37, n = 32, p < .05, two tails), Warrants (r = + .37, n = 32, p < .05, two tails), Rebuttals (r = + .39, n = 32, p < .05, two tails)* (see Table 51).

Table 51: Correlation between Facebook Acceptance and Depth of Discussion Post in CTIS 163

Discussion Posts Acceptance		Depth of Discussion posts	Claim	Grounds	Warrants	Backing	Rebuttals
PU	Pearson Correlation	.239	.266	.199	.199	.193	.305
	Sig. (2-tailed)	.187	.141	.276	.276	.290	.090
	N	32	32	32	32	32	32
PEU	Pearson Correlation	.348	.331	.318	.318	.309	.414*
	Sig. (2-tailed)	.051	.064	.076	.076	.086	.018
	N	32	32	32	32	32	32
ATU	Pearson Correlation	.380*	.408*	.369*	.369*	.315	.386*
	Sig. (2-tailed)	.032	.020	.038	.038	.080	.029
	N	32	32	32	32	32	32
FC	Pearson Correlation	.227	.258	.177	.177	.201	.288
	Sig. (2-tailed)	.212	.154	.334	.334	.269	.110
	N	32	32	32	32	32	32
SN	Pearson Correlation	.300	.346	.252	.252	.260	.346
	Sig. (2-tailed)	.096	.053	.164	.164	.151	.053
	N	32	32	32	32	32	32
BIU	Pearson Correlation	.052	.103	.026	.026	.037	.059
	Sig. (2-tailed)	.778	.574	.886	.886	.842	.750
	N	32	32	32	32	32	32

Pearson Correlation Sig. (2-tailed) * = p < .05, ** = p < .01
PU: Perceived Usefulness, PEU: Perceived Ease of Use, ATU: Attitude Toward Use, FC: Facilitating Conditions, SN: Subjective Norm, and BIU: Behavioral Intention to Use

In CTIS 151 course Facebook page, 3 students wrote 11 discussion posts for 5 discussion subjects. The relationships between Facebook acceptance in CTIS 151 course and Depth of discussion posts are reported in Table 52. Significant correlations are noted in the table.

The results of correlation analysis of CTIS 151 course Facebook page showed significant relations between *Attitude Toward Use and Grounds (r = + .70, n = 11, p*

< .05, two tails). The findings also showed significant relationship between *Behavioral Intention to Use and Grounds (r = + .66, n = 11, p < .05, two tails)* (See Table 52).

Table 52: Correlation between Facebook Acceptance and Depth of Discussion Post in CTIS 151

Discussion Posts Acceptance		Depth of Discussion posts	Claim	Grounds	Warrants	Backing	Rebuttals
PU	Pearson Correlation	.185	.199	.177	.239	.314	-.092
	Sig. (2-tailed)	.587	.557	.602	.479	.348	.787
	N	11	11	11	11	11	11
PEU	Pearson Correlation	.000	-.067	.050	-.056	-.140	.202
	Sig. (2-tailed)	1.000	.845	.885	.870	.682	.552
	N	11	11	11	11	11	11
ATU	Pearson Correlation	.557	.381	.698*	.538	.489	.382
	Sig. (2-tailed)	.075	.247	.017	.088	.127	.246
	N	11	11	11	11	11	11
FC	Pearson Correlation	-.344	-.307	-.377	-.392	-.451	-.020
	Sig. (2-tailed)	.300	.358	.253	.233	.163	.954
	N	11	11	11	11	11	11
SN	Pearson Correlation	.070	-.015	.135	.015	-.070	.238
	Sig. (2-tailed)	.838	.965	.693	.965	.838	.481
	N	11	11	11	11	11	11
BIU	Pearson Correlation	.560	.437	.661*	.585	.602	.224
	Sig. (2-tailed)	.073	.179	.027	.059	.050	.509
	N	11	11	11	11	11	11

Pearson Correlation Sig. (2-tailed) * = p < .05, ** = p < .01
PU: Perceived Usefulness, PEU: Perceived Ease of Use, ATU: Attitude Toward Use, FC: Facilitating Conditions, SN: Subjective Norm, and BIU: Behavioral Intention to Use

4.3   Relationship between Motivation and Involvement to Course Facebook Page

Descriptive Statistics for Motivation for both CTIS 163 and CTIS 151 Courses

The variables used the measure students' motivation were self efficacy for learning and performance (SE), intrinsic goal orientation (IGO), extrinsic goal orientation (EGO) and task value (TV). The descriptive statistics of the motivation scales are shown in Table 52 according to the courses taken. All means are above the midpoint of 4. The standard deviations range from 1.30 to 1.63, indicating a narrow spread around the mean. The descriptive statistics of motivation scales according to the course taken showed that participants' motivation means of all scales in CTIS 151 were higher than that in CTIS 163 (see Table 53).

Table 53: Motivation Variables for both CTIS 163 and CTIS 151 courses

Central Tendency		CTIS 163		CTIS 151	
Motivation Scales	# of item	Mean	SD	Mean	SD
Self Efficacy for Learning and Performance	8	4.46	1.54	4.82	1.53
Intrinsic Goal Orientation	4	4.39	1.30	5.20	1.47
Extrinsic Goal Orientation	4	4.94	1.63	5.53	1.15
Task Value	6	4.67	1.53	5.48	1.28

Participants' SE scales were measured through seven-point Likert type items that were adopted from Sungur (2004). The descriptive statistics for items measuring participants' SE according to the taken course are presented in Table 54 and Table 55. As presented in Table 55 and Table 56, the overall mean of participants in SE items were greater in CTIS 151 (*M = 4.82*) then in CTIS 163 (*M = 4.46*). Similar to the overall mean score, in all SE items, means of CTIS 163 participants were slightly lower than that of CTIS 151 participants.

Table 54: Descriptive Statistics - CTIS 163Participants' SE items in CTIS 163

N = 28	Percentage (Frequency)							Central Tendency
	Not at all true of me						Very true of me	
Self Efficacy Items	1	2	3	4	5	6	7	
I believe I will receive an excellent grade in this class.	10.7% (3)	10.7% (3)	**25.0% (7)**	17.9% (5)	21.4% (6)	3.6% (1)	10.7% (3)	M = 3.82 SD = 1.74
I'm certain I can understand the most difficult material presented in the readings for this course.	10.7% (3)	7.1% (2)	17.9% (5)	14.3% (4)	14.3% (4)	**21.4% (6)**	14.3% (4)	M = 4.36 SD = 1.92
I'm confident I can learn the basic concepts taught in this course.	7.1% (2)	0.0% (0)	14.3% (4)	10.7% (3)	17.9% (5)	**25.0% (7)**	**25.0% (7)**	M = 5.07 SD = 1.78
I'm confident I can understand the most complex material presented by the instructor in this course.	7.1% (2)	3.6% (1)	17.9% (5)	17.9% (5)	14.3% (4)	**25.0% (7)**	14.3% (4)	M = 4.61 SD = 1.77
I'm confident I can do an excellent job on the assignments and tests in this course.	3.6% (1)	7.1% (2)	17.9% (5)	10.7% (3)	25.0% (7)	**28.6% (8)**	7.1% (2)	M = 4.61 SD = 1.60
I expect to do well in this class.	7.1% (2)	10.7% (3)	14.3% (4)	17.9% (5)	21.4% (6)	**25.0% (7)**	3.6% (1)	M = 4.25 SD = 4.25
I'm certain I can master the skills being taught in this class.	7.1% (2)	3.6% (1)	10.7% (3)	17.9% (5)	21.4% (6)	**28.6% (8)**	10.7% (3)	M = 4.71 SD = 1.67
Considering the difficulty of this course, the teacher, and my skills, I think I will do well in this class.	7.1% (2)	3.6% (1)	17.9% (5)	**28.6% (8)**	21.4% (6)	14.3% (4)	7.1% (2)	M = 4.25 SD = 1.55
							Overall	M = 4.46 SD = 1.54

Table 55: Descriptive Statistics - Participants' SE items in CTIS 151

| N = 35 Self Efficacy Items | Percentage (Frequency) | | | | | | | Central Tendency |
| | Not at all true of me | | | | | | Very true of me | |
	1	2	3	4	5	6	7	
I believe I will receive an excellent grade in this class.	11.4% (4)	8.6% (3)	2.9% (1)	11.4% (4)	**42.9% (15)**	11.4% (4)	11.4% (4)	M = 4.46 SD = 1.79
I'm certain I can understand the most difficult material presented in the readings for this course.	11.4% (4)	5.7% (2)	8.6% (3)	8.6% (3)	**34.3% (12)**	8.6% (3)	22.9% (8)	M = 4.65 SD = 1.94
I'm confident I can learn the basic concepts taught in this course.	2.9% (1)	2.9% (1)	11.4% (4)	8.6% (3)	22.9% (8)	11.4% (4)	**40.0% (14)**	M = 5.40 SD = 1.70
I'm confident I can understand the most complex material presented by the instructor in this course.	5.7% (2)	5.7% (2)	20.0% (7)	2.9% (1)	**25.7% (9)**	17.1% (6)	22.9% (8)	M = 4.80 SD = 1.84
I'm confident I can do an excellent job on the assignments and tests in this course.	2.9% (1)	2.9% (1)	11.4% (4)	20.0% (7)	**31.4% (11)**	17.1% (6)	14.3% (5)	M = 4.82 SD = 1.47
I expect to do well in this class.	11.4% (4)	2.9% (1)	2.9% (1)	5.7% (2)	**45.7% (16)**	20.0% (7)	11.4% (4)	M = 4.77 SD = 1.72
I'm certain I can master the skills being taught in this class.	5.7% (2)	2.9% (1)	14.3% (5)	14.3% (5)	**25.7% (9)**	22.9% (8)	14.3% (5)	M = 4.77 SD = 1.65
Considering the difficulty of this course, the teacher, and my skills, I think I will do well in this class.	5.7% (2)	2.9% (1)	14.3% (5)	5.7% (2)	**31.4% (11)**	22.9% (8)	17.1% (6)	M = 4.91 SD = 1.66
							Overall	M = 4.82 SD = 1.53

The descriptive statistics for items measuring participants' IGO according to the taken course are presented in Table 56 and Table 57. Similar with SE items, the overall mean of participants in IGO items were greater in CTIS 151 ($M = 5.20$) then in CTIS 163 ($M = 4.39$). Similar to the overall mean score, in all IGO items, means of CTIS 163 participants were slightly lower than that of CTIS 151 participants. The smallest difference between the mean is 0.48 while the highest one is 1.08.

Table 56: Descriptive Statistics - Participants' IGO items in CTIS 163

N = 28	Percentage (Frequency)							Central Tendency
	Not at all true of me						Very true of me	
Intrinsic Goal Orientation Items	1	2	3	4	5	6	7	
In a class like this, I prefer course material that really challenges me so I can learn new things.	10.7% (3)	10.7% (3)	17.9% (5)	7.1% (2)	**28.6%** **(8)**	21.4% (6)	3.6% (1)	M = 4.10 SD = 1.77
In a class like this, I prefer course material that arouses my curiosity, even if it is difficult to learn.	7.1% (2)	21.4% (6)	7.1% (2)	10.7% (3)	**28.6%** **(8)**	17.9% (5)	7.1% (2)	M = 4.14 SD = 1.82
The most satisfying thing for me in this course is trying to understand the content as thoroughly as possible	7.1% (2)	3.6% (1)	14.3% (4)	**25.0%** **(7)**	**25.0%** **(7)**	14.3% (4)	10.7% (3)	M = 4.43 SD = 1.62
When I have the opportunity in this class, I choose course assignments that I can learn from even if they don't guarantee a good grade	0.0% (0)	3.6% (1)	14.3% (4)	21.4% (6)	**28.6%** **(8)**	14.3% (4)	17.9% (5)	M = 4.89 SD = 1.42
							Overall	M = 4.39 SD = 1.30

Table 57: Descriptive Statistics - Participants' IGO items in CTIS 151

N = 35	Percentage (Frequency)							
	Not at all true of me						Very true of me	Central Tendency
Intrinsic Goal Orientation Items	1	2	3	4	5	6	7	
In a class like this, I prefer course material that really challenges me so I can learn new things.	5.7% (2)	8.6% (3)	5.7% (2)	**25.7%** **(9)**	14.3% (5)	14.3% (5)	**25.7%** **(9)**	M = 4.80 SD = 1.84
In a class like this, I prefer course material that arouses my curiosity, even if it is difficult to learn.	5.7% (2)	5.7% (2)	5.7% (2)	14.3% (5)	20.0% (7)	20.0% (7)	**28.6%** **(10)**	M = 5.11 SD = 1.79
The most satisfying thing for me in this course is trying to understand the content as thoroughly as possible	5.7% (2)	2.9% (1)	5.7% (2)	5.7% (2)	11.4% (4)	**37.1%** **(13)**	31.4% (11)	M = 5.51 SD = 1.70
When I have the opportunity in this class, I choose course assignments that I can learn from even if they don't guarantee a good grade	2.9% (1)	2.9% (1)	14.3% (5)	8.6% (3)	8.6% (3)	**31.4%** **(11)**	**31.4%** **(11)**	M = 5.37 SD = 1.70
							Overall	M = 5.20 SD = 1.47

The descriptive statistics for items measuring participants' EGO according to the taken course are presented in Table 58 and Table 59. Similar with SE and IGO items, the overall mean of participants in EGO items were greater in CTIS 151 (*M = 5.53*) then in CTIS 163 (*M = 4.94*). Similar to the overall mean score, in all EGO items, means of CTIS 163 participants were slightly lower than that of CTIS 151 participants. The smallest difference between the mean is 0.39 while the highest one is 0.95.

Table 58: Descriptive Statistics - Participants' EGO items in CTIS 163

N = 28	Percentage (Frequency)							Central Tendency
	Not at all true of me						Very true of me	
Extrinsic Goal Orientation Items	1	2	3	4	5	6	7	
Getting a good grade in this class is the most satisfying thing for me right now.	7.1% (2)	3.6% (1)	10.7% (3)	7.1% (2)	14.3% (4)	21.4% (6)	**35.7% (10)**	M = 5.25 SD = 1.92
The most important thing for me right now is improving my overall grade point average, so my main concern in this class is getting a good grade.	7.1% (2)	10.7% (3)	10.7% (3)	0.0% (0)	14.3% (4)	14.3% (4)	**42.9% (12)**	M = 5.18 SD = 2.13
If I can, I want to get better grades in this class than most of the other students.	7.1% (2)	3.6% (1)	3.6% (1)	25.0% (7)	7.1% (2)	17.9% (5)	**35.7% (10)**	M = 5.18 SD = 1.89
I want to do well in this class because it is important to show my ability to my family, friends, employer, or others.	17.9% (5)	7.1% (2)	14.3% (4)	14.3% (4)	14.3% (4)	14.3% (4)	**17.9% (5)**	M = 4.14 SD = 2.12
							Overall	M = 4.94 SD = 1.63

Table 59: Descriptive Statistics - Participants' EGO items in CTIS 151

N = 35	Percentage (Frequency)							Central Tendency
	Not at all true of me						Very true of me	
Extrinsic Goal Orientation Items	1	2	3	4	5	6	7	
Getting a good grade in this class is the most satisfying thing for me right now.	0.0% (0)	0.0% (0)	2.9% (1)	17.1% (6)	22.9% (8)	25.7% (9)	**31.4% (11)**	M = 5.65 SD = 1.87
The most important thing for me right now is improving my overall grade point average, so my main concern in this class is getting a good grade.	0.0% (0)	2.9% (1)	11.4% (4)	8.6% (3)	22.9% (8)	11.4% (4)	**42.9% (15)**	M = 5.57 SD = 1.54
If I can, I want to get better grades in this class than most of the other students.	0.0% (0)	0.0% (0)	5.7% (2)	11.4% (4)	22.9% (8)	17.1% (6)	**42.9% (15)**	M = 5.80 SD = 1.28
I want to do well in this class because it is important to show my ability to my family, friends, employer, or others.	5.7% (2)	11.4% (4)	5.7% (2)	2.9% (1)	25.7% (9)	17.1% (6)	**31.4% (11)**	M = 5.09 SD = 1.93
							Overall	M = 5.53 SD = 1.15

According to the quantitative data collected from MSLQ, 35.7% (n = 10) of the participants in CTIS 163 and 31.4% (n = 11) of the participants in CTIS 151, stated that getting good grade, being successful in the course is the most satisfying thing for them. However, all interviewees stated that they did not use course Facebook page in order to be successful. Therefore, success cannot be counted as a motivational factor for utilization of course Facebook pages by the interviewees.

Except for one of the interviewees, who got the highest grade from CTIS 163, all interviewees did not suppose that their utilization of course Facebook page had an

important impact on their success. However, they declared the value of discussion and shared resources such as videos in their learning processes. Some of the remarks related to success as motivational factor are presented below.

> *R1: "I felt guilty that I missed the discussions at the beginning of the semester. If I attended those discussions, I believed that course Facebook page and discussion questions would be more effective on my success."*

> [*"Discussion sorularında yani ilk discussion sorularını kaçırdığım için kendimi suçlu hissedeceğim yani o soruları cevaplasam derslerime biraz daha etkili olacağını düşünüyorum"*]

> *R8: "When we are using the course Facebook page, our aim was not to let the instructor know I am studying and also not to be successful, but I am using the page to learn. If I know something wrong or I made a mistake, I know it will be corrected..."*

> [*"Çünkü öyle öğrenmeye çalışıyoruz yani Wikimediadan bakıyorsunuz işte matematikle ilgili Internet sayfalarından bakıyoruz anlamadığımız zamanda artık birazda hani katılalın birşey öğrenelim hani amaç sadece katılalımda hocanın gözüne görünelim değilde katılalım birşeyler öğrenelim hocada düzeltir zaten umuduyla bakıyoruz yani ters bir hocamız olmadığı içinde rahatça yazabiliyoruz için açıkçası şimdi ne yalan söyleyeyim"*]

> *R9: "I guess my performance was not too much affected. I don't think so..."*

> [*"Emin değilim çok bir yararı olduğunu düşünmüyorum"*]

> *R12: I don't think so*

> [*"Çok sanmıyorum hocam"*]

The descriptive statistics for items measuring participants' TV according to the taken course are presented in Table 60 and Table 61. Similar with all motivation scales, the overall mean of participants in TV items were greater in CTIS 151 ($M = 5.48$) then in CTIS 163 ($M = 4.67$). Similar to the overall mean score, in all TV items, means of CTIS 163 participants were slightly lower than that of CTIS 151 participants. The smallest difference between the mean is 0.53 while the highest one is 0.98.

Table 60: Descriptive Statistics - Participants' Task Value items in CTIS 163

N = 28	Percentage (Frequency)							Central Tendency
	Not at all true of me						Very true of me	
Task Value Items	1	2	3	4	5	6	7	
I am very interested in the content area of this course.	14.3% (4)	3.6% (1)	10.7% (3)	**25.0%** **(7)**	17.9% (5)	21.4% (6)	7.1% (2)	M = 4.21 SD = 1.81
I like subject matter of this course.	14.3% (4)	3.6% (1)	17.9% (5)	**25.0%** **(7)**	10.7% (3)	21.4% (6)	7.1% (2)	M = 4.07 SD = 1.82
I find the content of this course to be useful to me.	7.1% (2)	3.6% (1)	7.1% (2)	17.9% (5)	**28.6%** **(8)**	10.7% (3)	25.0% (7)	M = 4.89 SD = 1.77
I think the course material in this class is useful for me to learn.	7.1% (2)	3.6% (1)	7.1% (2)	17.9% (5)	**21.4%** **(6)**	**21.4%** **(6)**	**21.4%** **(6)**	M = 4.96 SD = 1.76
It is important for me to learn the course material in this class.	7.1% (2)	0.0% (0)	10.7% (3)	14.3% (4)	**28.6%** **(8)**	17.9% (5)	21.4% (6)	M = 4.96 SD = 1.69
Understanding the subject matter of this course is very important to me.	7.1% (2)	0.0% (0)	7.1% (2)	21.4% (6)	**25.0%** **(7)**	17.9% (5)	21.4% (6)	M = 4.96 SD = 1.67
							Overall	M = 4.67 SD = 1.53

Table 61: Descriptive Statistics - Participants' Task Value items in CTIS 151

N = 35	Percentage (Frequency)							Central Tendency
	Not at all true of me						Very true of me	
Task Value Items	1	2	3	4	5	6	7	
I am very interested in the content area of this course.	5.7% (2)	5.7% (2)	2.9% (1)	20.0% (7)	**25.7%** **(9)**	20.0% (7)	20.0% (7)	M = 4.94 SD = 1.68
I like subject matter of this course.	5.7% (2)	8.6% (3)	0.0% (0)	14.3% (5)	**34.3%** **(12)**	20.0% (7)	17.1% (6)	M = 4.91 SD = 1.67
I find the content of this course to be useful to me.	2.9% (1)	0.0% (0)	5.7% (2)	14.3% (5)	22.9% (8)	**28.6%** **(10)**	25.7% (9)	M = 5.42 SD = 1.42
I think the course material in this class is useful for me to learn.	2.9% (1)	0.0% (0)	2.9% (1)	5.7% (2)	20.0% (7)	28.6% (10)	**40.0%** **(14)**	M = 5.86 SD = 1.35
It is important for me to learn the course material in this class.	2.9% (1)	0.0% (0)	2.9% (1)	8.6% (3)	20.0% (7)	28.6% (10)	**37.1%** **(13)**	M = 5.77 SD = 1.37
Understanding the subject matter of this course is very important to me.	2.9% (1)	0.0% (0)	2.9% (1)	5.7% (2)	14.3% (5)	31.4% (11)	**42.9%** **(15)**	M = 5.94 SD = 1.35
							Overall	M = 5.48 SD = 1.28

Based on the collected data from motivation questionnaire, in all scales of the motivation (SE, IGO, EGO and TV) the overall mean of participants were greater in CTIS 151 then in CTIS 163. Similar to the overall mean score, in all motivational scales' items, means of CTIS 163 participants were slightly lower than that of CTIS 151 participants.

Relationship between Motivation and Course Facebook Page Involvement

The correlations between motivation of students to CTIS 163 course and course Facebook page involvement variables are reported in Table 62. Significant correlations are noted in the table. For CTIS 163, The findings for correlation between course Facebook involvement and motivation indicated significant relationships for *Number of Like and Extrinsic Goal Orientation (r = + .52, n = 29, p < .01, two tails).* The results also showed significant relationships between *Time Spend on Course Facebook Page and Intrinsic Goal Orientation (r = + .38, n = 28, p < .05, two tails)* (See Table 62).

Table 62: Correlation between Motivation and Course Facebook involvement in CTIS 163

Facebook Acceptance & CTIS 163 course Facebook Page Involvement Variables

		# of Like	# of Post	# of Comment	# of Discussion Post	# of involved discussions	Time Spent on Course Facebook
SE	Pearson Correlation	-.067	.040	.034	.189	.099	.144
	Sig. (2-tailed)	.733	.839	.862	.336	.615	.465
	N	28	28	28	28	28	28
IGO	Pearson Correlation	.315	.173	.308	.257	.254	.383*
	Sig. (2-tailed)	.103	.380	.111	.187	.193	.044
	N	28	28	28	28	28	28
EGO	Pearson Correlation	.413*	.228	.366	.181	.143	.242
	Sig. (2-tailed)	.029	.244	.055	.357	.469	.215
	N	28	28	28	28	28	28
TV	Pearson Correlation	-.010	.172	.152	.285	.235	.183
	Sig. (2-tailed)	.960	.381	.441	.142	.228	.350
	N	28	28	28	28	28	28

Pearson Correlation Sig. (2-tailed) * = p < .05, ** = p < .01
SE: Self-Efficacy, IGO: Intrinsic Goal Orientation, EGO: Extrinsic Goal Orientation and TV: Task Value

For CTIS 151, the correlations between motivation of participants and course Facebook involvement were not statistically significant. The correlations for motivation of participants and course Facebook involvement variables in CTIS 151 are shown in Table 63.

Table 63: Correlation between Motivation and Course Facebook involvement in CTIS 151

		# of Like	# of Post	# of Discussion Post	# of involved discussions	Time Spent on Course Facebook
SE	Pearson Correlation	-.193	-.047	.137	.147	-.230
	Sig. (2-tailed)	.266	.788	.433	.401	.231
	N	35	35	35	35	29
IGO	Pearson Correlation	.046	.188	-.025	-.002	-.028
	Sig. (2-tailed)	.793	.281	.887	.989	.884
	N	35	35	35	35	29
EGO	Pearson Correlation	-.120	.019	-.185	-.149	.002
	Sig. (2-tailed)	.493	.916	.287	.392	.992
	N	35	35	35	35	29
TV	Pearson Correlation	-.169	-.010	.074	.091	-.246
	Sig. (2-tailed)	.332	.953	.674	.605	.199
	N	35	35	35	35	29

Motivation & CTIS 151 course Facebook Page Involvement Variables

Pearson Correlation Sig. (2-tailed) * = p < .05, ** = p < .01
SE: Self-Efficacy, IGO: Intrinsic Goal Orientation, EGO: Extrinsic Goal Orientation and TV: Task Value

Relationship between Motivation and Depth of Posts

For CTIS 163, the correlations between motivation of participants and depth of discussion posts were not statistically significant. The correlations for motivation of participants and course Facebook involvement variables in CTIS 163 are shown in Table 64.

Table 64: Correlation between Motivation and Depth of Posts in CTIS 163

		Depth of Discussion posts	Claim	Grounds	Warrants	Backing	Rebuttals
SE	Pearson Correlation	.054	.024	.043	.043	.056	.099
	Sig. (2-tailed)	.775	.900	.823	.823	.770	.602
	N	30	30	30	30	30	30
IGO	Pearson Correlation	-.142	-.117	-.165	-.165	-.134	-.108
	Sig. (2-tailed)	.455	.538	.384	.384	.480	.569
	N	30	30	30	30	30	30
EGO	Pearson Correlation	-.286	-.236	-.316	-.316	-.243	-.284
	Sig. (2-tailed)	.125	.210	.089	.089	.197	.129
	N	30	30	30	30	30	30
TV	Pearson Correlation	.005	-.028	.012	.012	-.004	.033
	Sig. (2-tailed)	.978	.882	.948	.948	.985	.862
	N	30	30	30	30	30	30

Motivation & Depth of Posts in CTIS 163 course Facebook Page

Pearson Correlation Sig. (2-tailed) * = $p < .05$, ** = $p < .01$
SE: Self-Efficacy, IGO: Intrinsic Goal Orientation, EGO: Extrinsic Goal Orientation and TV: Task Value

The correlation between the relationships between motivation of students to CTIS 151 course and depth of posts are repotted in Table 65. Significant correlation is noted in the table.

For CTIS 151 course, a negative correlation between SE and grounds indicated that increased in students' SE, predicted poor grounds in discussion posts, $r = -.61, n = 11, p < .05$, two tails.

Table 65: Correlation between Motivation and Depth of Posts in CTIS 151

		Depth of Discussion posts	Claim	Grounds	Warrants	Backing	Rebuttals
		Motivation & Depth of Posts in CTIS 151 course Facebook Page					
SE	Pearson Correlation	-.526	-.419	-.614*	-.557	-.584	-.183
	Sig. (2-tailed)	.097	.200	.044	.075	.059	.591
	N	11	11	11	11	11	11
IGO	Pearson Correlation	-.318	-.290	-.344	-.368	-.430	.000
	Sig. (2-tailed)	.341	.387	.300	.266	.187	1.000
	N	11	11	11	11	11	11
EGO	Pearson Correlation	-.258	-.250	-.269	-.311	-.379	.043
	Sig. (2-tailed)	.443	.458	.423	.353	.250	.901
	N	11	11	11	11	11	11
TV	Pearson Correlation	-.291	-.272	-.311	-.342	-.407	.019
	Sig. (2-tailed)	.385	.418	.352	.303	.214	.955
	N	11	11	11	11	11	11

Pearson Correlation Sig. (2-tailed) * = p < .05, ** = p < .01
SE: Self-Efficacy, IGO: Intrinsic Goal Orientation, EGO: Extrinsic Goal Orientation and TV: Task Value

4.4 Relationship between Achievement and Involvement to Course Facebook Page

The variables used the measure students' achievement were CGPA and course grade out of 4.00. The descriptive statistics of the achievement are shown in Table 66 according to the courses taken.

Table 66: Achievement Variables in both CTIS 163 and CTIS 151

Central Tendency Achievement	CTIS 163 (N = 29)			CTIS 151 (N = 35)		
	Range	Mean	SD	Range	Mean	SD
Course Grade (out of 4.00)	0.00-4.00	1.68	1.38	0.00-3.00	1.07	1.13
CGPA (out of 4.00)	0.33-2.99	1.72	0.69	0.33-2.99	1.67	0.63

For CTIS 163, the findings for correlation between achievement and course Facebook involvement indicated significant relationships for *Grade and Number of Post (r = + .41, n = 29, p < .05, two tails), Number of Comment (r = + .42, n = 29, p < .05, two tails), Number of Discussions Post (r = + .41, n = 29, p < .05, two tails).* The findings also showed significant relationship between *CGPA and Number of Post (r = + .47, n = 29, p < .05, two tails), Number of Comment (r = + .44, n = 29, p < .05, two tails), Number of Discussion Post (r = + .56, n = 29, p < .01, two tails), Number of Involved Discussion (r = + .47, n = 29, p < .05, two tails).*

The correlation between the relationships between achievement of students in CTIS 163 course and course Facebook page involvement variables are reported in Table 67. Significant correlations are noted in the table.

Table 67: Correlation between Achievement and Course Facebook involvement in CTIS 163

		# of Like	# of Post	# of Comment	# of Discussion Post	# of involved discussions	Time Spent on Course Facebook
	Achievement & CTIS 163 course Facebook Page Involvement Variables						
Grade	Pearson Correlation	.278	.416*	.422*	.405*	.337	.111
	Sig. (2-tailed)	.144	.025	.023	.029	.074	.574
	N	29	29	29	29	29	28
CGPA	Pearson Correlation	.142	.469*	.443*	.555**	.464*	-.006
	Sig. (2-tailed)	.464	.010	.016	.002	.011	.975
	N	29	29	29	29	29	28

Pearson Correlation Sig. (2-tailed) * = p < .05, ** = p < .01

However, for CTIS 151, the correlations between achievement of students and course Facebook involvement were not statistically significant. The correlations for achievement of students and course Facebook involvement variables in CTIS 151 are shown in Table 68.

Table 68: Correlation between Achievement and Course Facebook involvement in CTIS 151

		# of Like	# of Post	# of Discussion Post	# of involved discussions	Time Spent on Course Facebook
	Achievement & CTIS 151 course Facebook Page Involvement Variables					
Grade	Pearson Correlation	-.203	-.210	.236	.167	-.025
	Sig. (2-tailed)	.242	.225	.172	.337	.898
	N	35	35	35	35	29
CGPA	Pearson Correlation	-.026	-.204	.227	.256	.084
	Sig. (2-tailed)	.884	.241	.190	.138	.665
	N	35	35	35	35	29

Pearson Correlation Sig. (2-tailed) * = p < .05, ** = p < .01

For CTIS 163, the correlations between achievement of students and depth of discussion posts were not statistically significant. The correlations for achievement and depth of discussion posts in CTIS 163 are shown in Table 69.

Table 69: Correlation between Achievement and Depth of Posts in CTIS 163

		Depth of Discussion posts	Claim	Grounds	Warrants	Backing	Rebuttals
CGPA	Pearson Correlation	.027	.012	-.001	-.001	.038	.082
	Sig. (2-tailed)	.884	.949	.994	.994	.836	.656
	N	32	32	32	32	32	32
Grade	Pearson Correlation	.185	.199	.143	.143	.179	.229
	Sig. (2-tailed)	.312	.275	.434	.434	.326	.207
	N	32	32	32	32	32	32

Pearson Correlation Sig. (2-tailed) * = p < .05, ** = p < .01

For CTIS 151, correlations between achievement of students and depth of discussion posts are repotted in Table 70. Significant correlations are noted in the table.

For CTIS 151 course, a negative correlation between that Grade out of 4.00 and grounds indicated that increased in the course grade, predicted poor grounds in discussion posts, *r = - .61, n = 11, p < .05, two tails.*

Table 70: Correlation between Achievement and Depth of Posts in CTIS 151

Achievement & Depth of Posts in CTIS 151 course Facebook Page

		Depth of Discussion posts	Claim	Grounds	Warrants	Backing	Rebuttals
CGPA	Pearson Correlation	-.418	-.355	-.473	-.461	-.510	-.080
	Sig. (2-tailed)	.201	.284	.142	.153	.109	.816
	N	11	11	11	11	11	11
Grade	Pearson Correlation	-.480	-.311	-.614*	-.449	-.383	-.383
	Sig. (2-tailed)	.135	.353	.044	.166	.245	.245
	N	11	11	11	11	11	11

Pearson Correlation Sig. (2-tailed) * = p < .05, ** = p < .01

4.5 Relationship between Time Spent on both Facebook and Course Facebook Page

The descriptive statistics for time spent on both Facebook and course Facebook page are shown in Table 71.

Table 71: Time spent on Facebook and Course Facebook pages

Course		Range	Mean	SD
CTIS 163 N = 29	Time Spent per Day on Facebook (in minutes)	20-390	121.55	100.85
	Time Spent per Day on course Facebook page (in minutes)	2-180	50.89	50.53
CTIS 151 N = 35	Time Spent per Day on Facebook (in minutes)	20-390	120.63	90.05
	Time Spent per Day on course Facebook page (in minutes)	10-180	49.42	47.63

The data showed that participant's involvement in SNSs was capturing a considerable amount of their time. For both courses, the average amount of time spent daily on Facebook was around 120 minutes (2 hours). This mean time

commitment to SNS is approximately equal to the time that students would spend attending classes per week, if enrolled in 10-credit course.

According to the responses in Facebook acceptance questionnaire, three participants out of 42 stated that they did not use SNSs. The results of Facebook acceptance questionnaire shows that the time spent on Facebook was vary between 20 to 390 minutes with $M = 116.28$ and $SD = 92.59$ minutes per day.

A correlation for the data revealed that time spent on Facebook and time spent on CTIS 163 course Facebook page were significantly related, $r = + .54, n = 29, p < .01, two tails$ (See Table 73).

However, for CTIS 151, the correlation between time spent on Facebook and course Facebook page were not statistically significant. The correlations for time spent on Facebook and time spent on course Facebook variables in CTIS 163 and 151 are shown in Table 72. Significant correlations are noted in the table.

Table 72: Time spent on Facebook and CTIS 151 Course Facebook pages

		Time Spent on Facebook
Time Spent on CTIS 163 course Facebook Page	Pearson Correlation	.542**
	Sig. (2-tailed)	.003
	N	29
Time Spent on CTIS 151 course Facebook Page	Pearson Correlation	.350
	Sig. (2-tailed)	.063
	N	32

** Correlation is significant at the 0.01 level (2-tailed).

According to the interviewees, the amount of time that the students reported spending on Facebook on a given day varied greatly as in the responses of questionnaire. The situation is the same for the frequency of use. Except for two of

the interviewees who declared that they used Facebook page two or three days in a week, all of the other interviewees affirmed that they used Facebook at least daily. The interviewee who started to use Facebook due to the discrete mathematics course and continued to use it with other purposes such as communicating with friends was also used Facebook as daily with approximately 20 minutes for purposes not related to the courses.

All interviewees thought that their friends spent more time on Facebook than them. Moreover, 58.33% (n = 7) believed that Facebook activities are time consuming. Therefore, they believed that they should somewhat restrict their use of frequency and the time they spent on Facebook. The quotations below from interviewees related to their beliefs about time spent on Facebook;

> R1: "… I thought Facebook completely as time wasting activity"

> ["…tamamen zaman kaybı oluğunu düşünüyorum"]

> R10: "If I did not limit myself, it seemed as wasting time…"

> ["Eğer ben hani kendimi sınırlamazsam bu sefer onlara zamana ayıramıyorum. Boşa geçmiş saatler gibi oluyor bu sefer"]

In both CTIS 163 and CTIS 151, the average amount of time spent daily on course Facebook page was around 50 minutes (0.83 hours) which is exactly equal to the time that students would spend attending classes per week, if enrolled in 5-credit course.

Unlike Facebook which was thought as a time consuming activities, 66.67% (N =8) of the interviewees claimed that using course Facebook page decreases waste of time to find important and useful resources with the help of shared videos and documents.

Only one of the interviewees who believed the value of shared resources claimed that he did not prefer to share resources since finding and sharing the resources on the

course Facebook page was wasting his time. Furthermore, he added that he was searching and finding resources related to the course. However, he did not share them on course Facebook page since he found sharing resources on course Facebook page as time consuming for him. The following quotations present his thought about finding, sharing recourses and time consumption;

> R9: *"My friends have the same, equal opportunities with me to search and find resources or answers of discussion questions why should I deal with summarizing answer and lose my time…"*

> [*"Cevabı bulduğumda orada bazen cevabı anlatım bir sayfa veya daha uzun sürebilir açıkçası onun özetini çıkartmaya üşeniyorum …Her insan kendi araştırabilir sonuçta bende olan imkan onlarda da var"*]

> R9: *"In general, when I found the answer, I didn't want to deal with summarizing the answer…"*

> [*"Yaa genelde bir sayfada cevabı bulduğumda orada bazen cevabı anlatım bir sayfa veya daha uzun sürebilir açıkçası onun özetini çıkartmaya üşeniyorum"*]

He was the student who had the highest grade in CTIS 151 and He also had a high letter grade in CTIS 163 course. He did not share any document but he had some discussion posts on CTIS 163 in which there was participation bonus.

4.6 Comparison of Facebook, Course Facebook Page and Moodle Utilization

4.6.1 Comparison of Facebook and Course Facebook Page Utilization

During the interviews researcher asked students to compare and contrast their daily use of Facebook and Facebook as CMSs. The comparison of the utilization can be examined under two categories as utilization rate, and utilized features.

Utilization Rate

During the interviews, researcher wanted the interviewees to rate their use of course Facebook page and Facebook from out of 5. Majority (n = 9) of interviewees believed that they did not use all features of Facebook. Moreover, they believed that their friend involved and used Facebook more than them. As a result they stated that they did not rate their Facebook usage as 5. Some comments of the interviewees related to their utilization rate of Facebook are:

> R1: *"Facebook has lots of features. However, we mostly used Facebook for fun and we did not involve most features."*
>
> [*"Yani çoğunlukla bir ton uygulama var biz daha çok eylence kısmına yöneldiğimiz için o uygulamaları kaçırıyoruz bazen"*]
>
> R2: *"I use very little. There are many applications that are newly released such as games I see all of my friends are playing games, sharing video; I did not have such habit*
>
> [*"Çok az kullanıyorum. Birde yani birçok uygulama var Facebookta yeni yeni mesela okey oyunları çıktı başka oyunlar çıktı. Arkadaşlarımı görüyorum hepsi ne biliyim okey oynuyorlar, videolar paylaşıyorlar benim mesela hiç öyle huyum yoktur."*]
>
> R4: *"I did not share every details of what I am doing moment by moment. I use less than that kind of people."*
>
> [*"yani sürekli diğer insanlar gibi her birşeyimi paylaşmıyorum. An ve an ne yaptığımı paylaşmıyorum twitter gibi değil yani. O insanlara göre daha az kullanıyorum"*]
>
> R12: *"I know a lot of people doing everything on Facebook. There are too many addicts who keep track of everything because I'm not so."*
>
> [*"Bir çok insan biliyorum çok fazla bağımlılar herşeyi takip ediyorlar herşeyi yapıyorlar orada öyle olmadığım için"*]

Majority of interviewees (66.67%, n = 8) rated same for their utilization of Facebook and course Facebook page, while two interviewees affirmed their utilization of Facebook less or more than that of course Facebook page. Utilization rates details for

Facebook and course Facebook page are shown in the Table 73. According to interview results, mean for utilization rate of Facebook (M = 3.75) is greater than that of course Facebook page (M = 3.50).

Table 73: Utilization Rate of Course Facebook Page and Facebook from Interview data

N = 12	Percentage (Frequency)					Central Tendency	
	1	2	3	4	5	M	SD
Course Facebook Page	8.3% (1)	0.0% (0)	33.3% (4)	**50.0% (6)**	8.3% (1)	3.50	1.00
Facebook	0.0% (0)	8.3% (1)	25.0% (3)	**50.0% (6)**	16.7% (2)	3.75	0.87

Similar to the interview results, quantitative data showed that mean of participants' Facebook utilization rates were higher than that of participants' course Facebook page utilization rates (See Table 74). According to quantitative data, 42.9% of the participants (n = 18) rated their use of Facebook as moderate. While 42.9% the participants (n = 18) rated their use of course Facebook page as low. Details of using rate of Facebook and course Facebook page are shown in the Table 74.

Table 74: Utilization Rate of Course Facebook Page and Facebook from Acceptance Questionnaire

Descriptive Statistics						
N = 42	Percentage (Frequency)				Central Tendency	
	None - 1	Low- 2	Moderate - 3	High - 4	M	SD
How would you rate your use of Facebook course page?	9.5% (4)	**42.9% (18)**	35.7 (15)	11.9% (5)	2.50	0.84
How would you rate your use of Facebook?	4.8% (2)	16.7% (7)	**42.9% (18)**	35.7% (15)	3,09	0.85

Utilized Features

According to interview results, both utilization of Facebook and course Facebook page contain similar activities. All of the interviewees confirmed that they employed similar features (e.g. sharing and viewing video, links, documents, writing and reading comments) on both Facebook and course Facebook activities. Different than Facebook, interviewees declared that they did not share photo on course Facebook page and they mostly used discussion part of course Facebook page. Moreover, all interviewees stated that they followed activities on course Facebook page by the help of notification, events and their home posts.

4.6.2   Comparisons of Course Facebook Page and Course Management System

The interviewees not only pointed that all courses should have a CMS but also suggested several common underlying reasons to use CMSs. First of all, they claimed that there was a lack of communication in a course without CMS. Secondly, the interviewees indicated that students pay less attention and ignore the course due to the lack of CMS. Third, they believed that students are more active in the courses with CMS. Finally, they stated that utilization of CMS increases and attracts students' interest. Following quotations illustrate and support the interviewees' views about having CMS;

> *R1: "All courses can use CMSs… independent from subjects…"*
>
> [*"Aslında tüm derslerde kullanılabilir yani... Konu bağımzsız..."*]
>
> *R2: "Of course, we always need to have a supporting system. Because we're not at school all times or we may have problems. At that time it is a very great advantage to reach course information from home"*
>
> [*"Tabiki her zaman destekleyen bir sistem olması gerekiyor çünkü her zaman okulda olamıyoruz yada problemler çıkabiliyor evimizdende ulaşmak çok büyük bir avantaj"*]
>
> *R7: "For example, I may not follow something in a lecture or I may not listen carefully. From CMSs at least I can learn the last assignment…"*

[*"Mesela derste takip edemediğim şeyler oluyor, yada belki dinlemedim yada gitmediğim dersim oluyor hani en azından son ödevi son texti öğrenebiliyorum."*]

R9: *"Obviously with CMSs, there were more active sharings."*

[*"aaa Paylaşım daha aktif oluyor açıkçası"*]

Utilization Rates of CMSs

According to both qualitative and quantitative data, participants had more courses on Moodle than on Facebook. From quantitative results, majority of the participants (61.9%, n = 26) used Moodle for more than two courses as a CMS. Moreover, majority of participants (76.2%, n = 32) stated that they used Facebook as CMS at least in one course. The interviewees also pointed out that they used Moodle more often than course Facebook page since they have more courses on Moodle than on Facebook. Furthermore, all of the interviewees stated that they were using Moodle at least in five courses in spring 2011, whereas they used Facebook as CMSs at most in two courses in the same semester. Table 75 presents the details of both central tendency and the percentage of number of courses that participants use Moodle or Facebook as CMSs.

Table 75: Use of Moodle and Facebook as CMS

N = 42	Percentage (Frequency)			
	None	One	Two	More than Two
In how many courses have you been used (or did you use) a course management system (e.g. Moodle)?	2.4% (1)	16.7% (7)	19.1% (8)	**61.9%** **(26)**
In how many courses have you been used (or did you use) Facebook as a course management system?	14.3% (6)	**38.1%** **(16)**	**38.1%** **(16)**	9.5% (4)

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Interview results showed that participants also started to use Moodle in English language preparatory program. This means that most (n = 11) of participants started to use Moodle one year earlier than course Facebook page.

During the interviews, researcher wanted interviewees to rate their use of Facebook, course Facebook page and Moodle from out of 5. Utilization rate of two interviewees were equal for course Facebook page and Moodle. Two interviewees declared the same rate for their utilization of Moodle and course Facebook page, while majority of (n = 7) of participants rated their utilization of course Facebook page more than that of Moodle.

The utilization rates from interview results and questionnaires were different. Participants utilization mean of Facebook (M = 3.50), according to interviews, were higher than that of Moodle (M = 2.67) (See Table 75). However, from questionnaire, participants utilization mean of Facebook (M = 2.50) were less than that of Moodle (M = 2.97) (See Table 76). From quantitative results, majority of the participants (61.4% n = 26) rated their use of both Moodle as moderate, while 35.7% (n = 18) of participants rated their use of course Facebook page as moderate. Details of utilization rate of Moodle, and course Facebook page from questionnaires page are shown in the Table 77.

Table 76: Utilization Rate of Course Facebook Page and Facebook from Interview data

N = 12	Percentage (Frequency)					Central Tendency	
	1	2	3	4	5	*M*	*SD*
Moodle	25.0% (3)	16.7% (2)	25.0% (3)	**33.3% (4)**	0.0% (0)	2.67	1.23
Course Facebook Page	8.3% (1)	0.0% (0)	33.3% (4)	**50.0% (6)**	8.3% (1)	3.50	1.00

Table 77: Utilization Rate of Course Facebook Page and Facebook from Acceptance Questionnaire

	Descriptive Statistics					
N = 42	Percentage (Frequency)				Central Tendency	
	None - 1	Low- 2	Moderate - 3	High - 4	*M*	*SD*
How would you rate your use of Moodle?	2.4% (1)	16.7% (7)	**61.4% (26)**	19.0% (8)	2.97	0.68
How would you rate your use of Facebook course page?	9.5% (4)	**42.9% (18)**	35.7 (15)	11.9% (5)	2.50	0.84

Preference of CMSs

The majority (n = 10) of the interviewees preferred Facebook as CMSs rather than Moodle. Only two of them favored Moodle. One of them took only CTIS 151. He stated that he didn't use course Facebook page and therefore his comparison might not be meaningful. The other one took both CTIS 163 and CTIS 151. He stated that he preferred Moodle due to presentation of resources. He declared that on the wall of course Facebook page, finding a specific, shared resource was painful if there were too many shared resources. It is interesting that one of the interviewees who rated utilization of course Facebook page less than Moodle preferred to use Facebook as CMSs. She took only CTIS 151 and she is the one who started to use Facebook since researcher used Facebook as CMS. The reasons for preferring Facebook as CMS were indicated by the interviewees as having user friendly interface, feeling more comfortable, increasing their interest, interactions and involvement in course related activities. Following quotations illustrate the reasons of preferring Facebook as CMS;

> R5: *"I would like to choose which one. I think I prefer Facebook. Since as I said before even an uninterested people such as me, might be more active in a social environment and I think social environment might help to achieve more active participation."*

> [*"Hangisini tercih ederim sanırım Facebook'u biraz daha tercih etmek isterim. Çünkü dediğim gibi ilgisiz insanın bile yaa kendimi örnek veriyorum*

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ilgisiz insanın bile biraz daha sosyal bir ortamda daha aktif katılımı sağlanabileceğini düşündüğüm için"]

R6: *"Actually, due to the visual aids and sharing video features of Facebook, I prefer Facebook. But Moodle also is a good system. However I still prefer Facebook."*

[*Aslında hani Facebook hem görsel hem de viedo paylaşımı olsun işte Facebook'taki görsellik daha fazla olduğu için Facebook'u tercih ederdim. Ama Moodle'da iyi bir sistem ama ben yinede Facebook'u tercih ederdim*]

R8: *I prefer Facebook because in Facebook, one feels more comfortable to share their comments than Moodle. I think with Moodle, we cannot communicate directly with our instructors by using a chat screen like on Facebook. On Facebook, when you were bored and have a problem related to the course, or when you have something to ask, you can chat and share the problem with your instructor."*

[*Facebook'u tercih ederim çünkü Facebookta insanlar daha rahat yorum yapabiliyorsunuz yani Moodle bana daha şey çünkü Moodle galiba hocalarla direk bir iletişimede geçemiyoruz alta Facebook gibi çıkmıyor bir Chat screen çıkmıyor burda yani hocaya gerektiği zaman canınız sıkkın olduğu zaman ders hakkında hani söylüyorsunuz, birşey çalışırken soruyorsunuz yeri geliyor muhabbet ediyorsunuz...*]

R10: *"I would prefer Facebook. On Facebook, I can involve discussions more, I can reach more documents such as academic articles and videos. Facebook is more comfortable environment with friends. On Moodle, one did not want to write what s/he wants to write due to the feeling of being followed. However, Facebook environment is more comfortable, you can answer without worrying giving wrong answer. Because you know that someone will correct you. This gives people confidence to share and write the comments."*

[*Ben Facebook daha çok tercih ederdim. Yaa daha fazla discussiona katılabiliyorum, daha fazla konuyla ilgili dokumanlara ulaşabiliyorum. İşte şeyler olsun akademik yazılar olsun işte videolar olsun. Arkadaşlarla daha böyle rahat bir ortam oluyor. Moodleda olunca sanki şey böyle gözetleniyor hissi oluyor insanlar çok fazla yazmak istediklerini yazamıyor. Ama Facede olunca işte daha böyle rahat birşekilde cevap verebiliyorsun yanlışta olsa birnin düzelteceğini biliyorsun çünkü buda insana daha bir güven veriyor hani yazıyım ben de katılıyım şeklinde*]

Interviewees declared that Facebook interface is more user friendly than Moodle. They implied that telling or requesting something from instructor on Facebook is painless and not a problem for them, but something that they can even imagine on Moodle. One of the interviewees stated that *"… I tried to contact my instructor via Moodle. I sent a message via Moodle to get immediate answer to my questions... I could not have a reply message. I am not sure whether my instructor got my messages or not."* [*"…Moodle'dan dersin hocasıyla iletişime geçmek istedim. Hocaya sorumlarımı anında cevap almak için Moodle'dan gönderdim… Cevap almadım. Mesajımı Hocanın alıp almadığından emin değilim."*].

Interviewees' comments emphasized that they feel more comfortable on Facebook than Moodle and find Moodle more formal than Facebook. One of the interviewees stated: *"I did not like Moodle page. It is related to the course. How can I say, Moodle seems to me as the school's page."* [*"Moodle'daki o sayfayı sevmiyorum. Dersle alakasıda var yani nasıl diyim orası okulun sayfası gibi geliyor bana"*]

The interviewees pointed out that they have a tendency to be follower rather than actively participate on Moodle. They implied that they are more active on course Facebook page. The following are some remarks about Moodle and their Moodle utilization.

> R5: *"How often I used Moodle. If there was homework, I use Moodle to upload or dowlaod it. Apart from that I do not use Moodle."*

> [*"Moodle hangi sıklıkla kullanıyorum. Ödevler olduğu zaman oradan download etmek için kullanıyorum yada ödev olduğu zaman oraya upload etmek için kullanıyorum. Onun dışında kullanmıyorum"*]

> R1: *"Actually, Moodle may have more features than we know. We are just looking our grades…"*

> [*"Moodle aslında belki bilmediğimiz çok özelliği var sadece biz notlara baktığımız için onları çözemiyoruz"*]

R4: "I use Moodle only to follow course schedule. There is not any other reason…I did not follow Moodle very often; I don't want to answer questions on Moodle… I don't like Moodle pages"

[*"Moodle dersin schedulenı takip etmek için başka başka yok galiba …Çok sıklıkla takip etmiyorum. Soru soruldu mu cevap veresim gelmiyor... Moodle daki o sayfayı sevmiyorum"*]

R11: "I did not share something on Moodle…"

[*"Hiç paylaşmadım…Hiç birşey eklemiyorum"*]

According to the interviewees, mostly used features of Moodle were uploading and downloading homework (n = 9), while that of course Facebook page were discussion, following viewing video, viewing documents and following what is going on the page (n = 9). Only one of the interviewee mentioned that she used discussion feature on Moodle.

Interview results also showed that the least used features of Moodle as discussion, viewing grade and viewing schedule (n = 1), while that of course Facebook page was sharing document, and writing comment (n = 5). Moreover, seven of interviewees listed sharing video and communication as involved features of course Facebook page. Table 78 presents the descriptive of utilized features of both Moodle and Facebook as a CMS.

Table 78: Utilized Features of Moodle and course Facebook Page

CMS	Feature	# of interviewees
Moodle	Upload Homework	9
	Download Homework	9
	Following	4
	Discussion	1
	Viewing Grade	1
	Viewing Schedule	1
Facebook	Discussion	9
	Following	9
	Viewing Video	9
	Viewing Document	9
	Sharing Video	7
	Communication	7
	Sharing Document	5
	Writing Comment	5

The main differences of utilization of Moodle and Facebook was specified as viewing video and involving to the discussions which are listed as the most used activity in the course Facebook page. Actually, interviewees were not sure if they can share video on Moodle. The following quotations illustrate the perspective of interviewees linked Facebook and Moodle utilization,

> R10: *"…We need to be more active in discussions. However, active participation is absent on Moodle… I share Video on both my Facebook and course Facebook page. I also write comments and like the sharings on Facebook… I didnit share video on Moodle"*

> [*"Yaa işte discussion bizim mesela daha aktif olarak yapmamız gereken birşey Moodleda bu biraz daha az eksik… yani oraya (course Facebook page) video koyuyorum kendi sayfama dersinkinede postta yazıyorum. Likede yapıyorum…. Moodleda video paylasmadim."*]

R3: "I didn't involve Moodle discussions... In fact, there is no longer discussion on Moodle..."

[*"Katilmiyorum…Discussion zaten artık Moodle da yok gibi birşey yani"*]

R11: "Moodle did not have the property related to video sharing…"… our instructors sometimes open discussions on Moodle and I did not attend them"

[*"Moodle'un video paylasma ozelligi yok... Moodle da discussion acan hocalarimiz oluyor ama ben katilmiyorum"*]

According to the interview results, another essential difference of utilization of Moodle and course Facebook page was that the features used on course Facebook page were need active involvement and interaction of students such as discussions, communication, sharing video, sharing document and writing comments.

Continuation and Guiding of Utilization

Guiding and helping to prospective students cannot be a case for Moodle utilization since all interviewees stated that they cannot reach the Moodle courses after the semester that they took. Reaching resources of the previously given courses is important in continuation of utilization, guiding and helping and/or getting help from other semester students. In Facebook, all of the interviewees intended to share their knowledge, experiences and resources with their friends and also with the prospective students of the course.

Moreover, most (n = 11) of interviewees declared that they will continue to use course Facebook page and they will first examine and search the course Facebook page when they need a resource related to the course subjects. Evoun though one of the interviewees stated that he would continue to use Facebook page but he would not prefer course Facebook page to find resources. It is interesting that the two students who did not prefer Facebook as CMS stated that they will continue to use Facebook and they will provide help and guide for prospective students.

4.7 Summary of Results

Table 79 presents the summary of the results according to the research questions.

Table 79: Summary of Results

Research Question	Data Analysis	Data Collection	Basic Findings
RQ1. What are the students' Facebook acceptance and course Facebook involvement levels?	Descriptive	Questionnaire & Interview	• Students were mostly using Facebook to stay connected with their current and past friends ***Facebook Acceptance*** • Facebook acceptance of overall participants, CTIS 163 and CTIS 151, were similar accept facilitating condition scale on The mean score for CTIS 151 was at neutral level while that of CTIS 163 was at agreed level. • All of the interviewees believed and also mentioned usefulness of course Facebook pages as to communicate with instructor, their classmates, and students in different sections of the course, make the subjects more clear, increase their interest, and make them more active. ***Facebook involvement*** • The total number of discussions subjects in CTIS 163 (f = 10) is higher than that in CTIS 151 (f = 5). • Based on the data, number of responses in course Facebook pages according to the courses were different. • In the interview, sharing/viewing video, documents and discussions parts were referred as the mostly used and useful activities of course Facebook pages. ***Depth of Post*** • Overall mean of each argument used to measure depthness of the discussion posts in CTIS 163 was higher than that in CTIS 151.

Table 79 (continued): Summary of Results

Research Question	Data Analysis	Data Collection	Basic Findings
RQ2. Is there a relationship between students' Facebook acceptance (perceived ease of use, perceived usefulness, attitudes toward use, social norm, and behavioral intention to use) and student involvement in course Facebook page (time spent, number/type/depth of the posts)?	Correlation	Questionnaire	*For CTIS 163 course* The findings for correlation between Facebook acceptance and involvement to course Facebook page indicated significant relationships for • *Perceived Usefulness and Number of Like, Number of Discussion Posts, Number of Discussion Subject Involved The results also showed significant* • *Attitude Toward Use and Number of Like* • *Facilitating Conditions and Number of Like, Number of Discussion Posts* • *Subjective Norm and Number of Like, Time Spend on Course Facebook page* • *Behavioral Intention to Use and Number of Like, Number of Comment* *For CTIS 151 course* There is no significant correlation between Facebook acceptance variables and course Facebook involvement variables in CTIS *Depth of Post in CTIS 163* The findings for correlation between Facebook acceptance and depth of post indicated significant relationships for • *Perceived Ease of Use and Rebuttals* • *Attitude Toward Use and overall Depth of Discussion Posts, Claims, Grounds, Warrants, Rebuttals* *Depth of Post in CTIS 151* The results of correlation analysis of CTIS 151 course Facebook page showed significant relations between • *Attitude Toward Use and Grounds* • *Behavioral Intention to Use and Grounds*

Table 79 (continued): Summary of Results

Research Question	Data Analysis	Data Collection	Basic Findings
RQ3. Is there a relationship between students' motivational profiles (self-efficacy, intrinsic goal orientation, extrinsic goal orientation and task value) and student involvement in course Facebook page (time spent, number/type/depth of the posts)?	Descriptive	Questionnaire & Interview	***Motivation*** • In all scales of the motivation (SE, IGO, EGO and TV) the overall mean of participants were greater in CTIS 151 then in CTIS 163. • All interviewees stated that they did not use course Facebook page in order to be successful. Therefore, success cannot be counted as a motivational factor for utilization of course Facebook pages by the interviewees.
	Correlation	Questionnaire	***For CTIS 163 course*** The findings for correlation between course Facebook involvement and motivation indicated significant relationships for • *Number of Like and Extrinsic Goal Orientation* • *Time Spend on Course Facebook Page and Intrinsic Goal Orientation* ***For CTIS 151 course*** The correlations between motivation of participants and course Facebook involvement were not statistically significant. ***Depth of Posts in CTIS 163*** The correlations between motivation of participants and depth of discussion posts were not statistically significant ***Depth of Posts in CTIS 151*** A negative correlation between SE and grounds indicated that increased in students' SE, predicted poor grounds in discussion posts

Table 79 (continued): Summary of Results

Research Question	Data Analysis	Data Collection	Basic Findings
RQ4. Is there a significant relationship between students' achievement (course grade and CGPA) and course Facebook involvement (time spent, number/type/depth of the posts)?	Descriptive	Questionnaire	• The variables used the measure students' achievement were CGPA and course grade out of 4.00. • Mean of participants' grades and GCPA were higher in CTIS 163 than in CTIS 151.
	Correlation	Questionnaire	*For CTIS 163 course* The findings for correlation between achievement and course Facebook involvement indicated significant relationships for • *Grade and Number of Post), Number of Comment, Number of Discussions Post.* • *CGPA and Number of Post, Number of Comment, Number of Discussion Post, Number of Involved Discussion* *For CTIS 151 course* The correlations between achievement of students and course Facebook involvement were not statistically significant *Depth of Posts in CTIS 163* The correlations between achievement of students and depth of discussion posts were not statistically significant *Depth of Posts in CTIS 151* A negative correlation between that Grade out of 4.00 and grounds indicated that increased in the course grade, predicted poor grounds in discussion posts
RQ5. Is there a significant relationship between Facebook involvement (time spent) and Course Facebook involvement (time spent))?	Descriptive	Questionnaire	The data showed that participant's involvement in SNSs was capturing a considerable amount of their time.
	Correlation	Questionnaire	*For CTIS 163 course* The correlation between time spent on Facebook and course Facebook page were not statistically significant. *For CTIS 151 course* The correlation between time spent on Facebook and course Facebook page were not statistically significant.

Table 79 (continued): Summary of Results

Research Question	Data Analysis	Data Collection	Basic Findings
RQ6. How do students compare Facebook, course Facebook page and Moodle? **6.1.** How do students compare Facebook and course Facebook page utilization?	Descriptive	Questionnaire & Interview	*Utilization Rate* • Majority of interviewees believed that they did not use all features of Facebook. Moreover, they believed that their friend involved and used Facebook more than them. • Majority of interviewees declared the same rate for their utilization of Facebook and course Facebook page, while 16.67 of participants affirmed their utilization of Facebook less or more than that of course Facebook page. • Similar to the interview results, quantitative data showed that mean of participants' Facebook utilization rates were higher than that of participants' course Facebook page utilization rates. *Utilized Features* • According to interview results, both utilization of Facebook and course Facebook page contain same kind of activities. All of the interviewees confirmed that they employed similar features (e.g. sharing and viewing video, links, documents, writing and reading comments) on both Facebook and course Facebook activities. Different than Facebook, interviewees declared that they did not share photo on course Facebook page and they mostly used discussion part of course Facebook page. • According to the interview results, the most important difference between Facebook and course Facebook utilization is the discussion part. Unlike Facebook, the discussion part of course Facebook page was stated as mostly used and useful part in both interviews and the involvement questionnaire.

Table 79 (continued): Summary of Results

Research Question	Data Analysis	Data Collection	Basic Findings
6.2. How do students compare course Facebook page and Moodle in face-to-face (F2F) course?	Descriptive	Questionnaire & Interview	The interviewees not only pointed that all courses should have a CMS but also suggested several common underlying reasons to use CMSs. First of all, they claimed that there was a lack of communication in a course without CMS. Secondly, the interviewees indicated that students pay less attention and ignore the course due to the lack of CMS. Third, they believed that students are more active in the courses with CMS. Finally, they stated that utilization of CMS increases and attracts students' interest.

Utilization Rate

- All of the interviewees stated that they were using Moodle at least in five courses, whereas they used Facebook as CMSs at most in two courses.
- Two interviewees (16.67%) declared the same rate for their utilization of Moodle and course Facebook page, while majority of (58.33%, n = 7) of participants rated their utilization of course Facebook page more than that of Moodle.
- The utilization rates from interview results and questionnaires were different. Participants utilization mean of Facebook, according to interviews, were higher than that of Moodle. However, from questionnaire, participants utilization mean of Facebook were less than that of Moodle.

Preference of CMSs

The majority (83.33%, n = 10) of the interviewees preferred Facebook as CMSs rather than Moodle. Only two of them favored Moodle.

Table 79 (continued): Summary of Results

Research Question	Data Analysis	Data Collection	Basic Findings
6.2. How do students compare course Facebook page and Moodle in face-to-face (F2F) course?	Descriptive	Interview	***Facebook vs Moodle*** • Interviewees declared that Facebook interface is more user friendly than Moodle. • Interviewees implied that telling or requesting something from instructor on Facebook is painless and not a problem for them, but something that they can even imagine on Moodle. • Interviewees' comments emphasized that they feel more comfortable on Facebook than Moodle and find Moodle more formal than Facebook. • The interviewees pointed out that they have a tendency to be follower rather than actively participate on Moodle. They implied that they are more active on course Facebook page. • According to the interviewees, mostly used features of Moolde were uploading and downloading homework (75.00%, n = 9), while that of course Facebook page were discussion, following viewing video, viewing documents and following what is going on the page (75.00%, n = 9). Only one (8.33%) of the interviewee mentioned that she used discussion feature on Moodle. • Interview results also showed that the least used features of Moodle as discussion, viewing grade and viewing schedule (8.33%, n = 1), while that of course Facebook page was sharing document, and writing comment (41.67%, n =5). Moreover, 58.88% (n = 7) of interviewee listed sharing video and communication as involved features of course Facebook page.

Table 79 (continued): Summary of Results

Research Question	Data Analysis	Data Collection	Basic Findings
6.2. How do students compare course Facebook page and Moodle in face-to-face (F2F) course?	Descriptive	Interview	***Facebook vs Moodle*** According to the interview results, another essential difference of utilization of Moodle and course Facebook page was that the features used on course Facebook page were need active involvement and interaction of students such as discussions, communication, sharing video, sharing document and writing comments ***Continuation and Guiding of Utilization*** • Guiding and helping to perspective students cannot be a case for Moodle utilization since all interviewees stated that they cannot reach the Moodle courses after the semester that they took. • Most of interviewees declared that they will continue to use course Facebook page and they will first examine and search the course Facebook page when they need a resource related to the course subjects.

CHAPTER 5

DISCUSSIONS AND CONCLUSION

This chapter is presented in five sections. The first section relates the major findings of the study to the literature presented in chapter two. The second section presents the major implications of the findings. The third section addresses the limitations of the study. The fourth section outlines potential research directions. The conclusion is presented in the fifth and final section of this chapter.

5.1 Students' Facebook Acceptance and Course Facebook Page Involvement Levels

According to the results of the study, Facebook acceptance levels of participants in both courses were similar. Except for *Behavioral Intention to Use*, in all construct of Facebook acceptance, participants in CTIS 163 have higher means score than those in CTIS 151. The difference in acceptance levels between participants may lead to some differences in results concerning their utilization of Facebook, and that may also affect the participants' utilization of course Facebook pages.

Both quantitative and qualitative results showed that majority of the participants found Facebook useful to communicate. This finding is also parallel to those of Ajjan and Harthsorne (2008), Body and Ellison (2007), Bosch (2009), Ellison, Steinfield, & Lampe, (2007) Hei-man (2008), Kert and Kert (2010), Kord (2008), Pempek, Yermolayeva, and Calvert (2009), and Tınmaz (2011) whose studies also

confirmed that SNSs were mostly used to stay in touch with friends and found as a useful tool to communicate among friends in different parts of the world.

Similar to Facebook, both quantitative and qualitative results showed that participants used course Facebook pages for communication purposes. This finding is parallel to those of Selwyn (2009) and Roblyer et al. (2010). With the utilization of Facebook as CMSs, all interviewees mentioned and emphasized the usefulness of course Facebook pages to communicate with the instructor, their classmates, and students in different sections of the course, to increase their interest and to make them more active.

Communicate with the instructor, their classmates, and students in different sections of the course: Communication between students and instructor plays an important role in student learning and teaching. Therefore, communication is a crucial part of the learning environment. According to Coates, James and Baldwin (2005) and Yıldırım et al. (2009), communication is one of the functions of CMSs. However, it was the least used feature of CMS (Kvavik et al. 2004; Morgan, 2003; Yueh & Hsu, 2008). This situation may destroy the out-of classroom communication as a decrease in interaction among students and instructors. However, the result of this study showed that there is a probability to increase the out-of classroom communication with the use of Facebook as CMS. At least, students believed that utilization of Facebook would increase their communication with both their peers (students taking the course in the same semester) and their instructor. The possible reasons for the students' believes for the increase in communication with Facebook utilization can be

- *Monitored by Authority:* Other CMSs such as Moodle involved students' life with their school life. Some of the interviewees mentioned that their use of Moodle or university e-mails can be viewed by school authorities. Therefore, they did not feel comfortable when they were using both Moodle and university's e-mail accounts. However, without fear of misunderstanding and

being monitored by an authority, they used course Facebook page for communication purposes.

- *Communication with Instructors*: As an instructor, we may not mostly use CMS for communication purposes in F2F courses. Some of the interviewees mentioned that they send some e-mails via Moodle to their instructors. However, they did not get any answer for their e-mails. They were curious about the source of the problem. It could be that the instructor did not use Moodle frequently or s/he read the mail but s/he did not give an answer. The problem could originate from Moodle that it did not work properly and the mail did not reach their instructor. They seemed they did not trust Moodle. Actually, those cases sometimes occur in Moodle. I heard this kind of complains from my colleagues, instructors. Interviewees also mentioned that when they used course Facebook page to communicate with me, they get immediate feedback and the reply.

The study results implied that utilization of SNSs, e.g. Facebook as CMSs, has a potential to increase out of classroom communication among instructors and students.

Increase their interest: According to the motivation theory, interest is important in learning. Most of the interviewees mentioned that sharing and activities on course Facebook pages increased their interests in the course and its content. This result is also important since it stated that the utilization of course Facebook pages may have an effect on students' motivation, and interest. According to Astin's (1983) postulates, by taking part in course Facebook page, students are showing interest in a form of involvement.

Make them more active: According to constructivist theory, learners should be active in learning process. From the qualitative results, Facebook as CMSs makes students more active. This result is parallel to that of Baltacı-Göktalay and Ozdilek, (2010) stating that SNSs encourage more active user involvement opportunities.

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Involvements to both Facebook and course Facebook page consisted similar activities. All of the interviewees listed the activities that they performed as following their friends, sharing and viewing videos, photos, links, documents, and discussions. Writing on walls, writing and reading comments can also be listed as the activities done by the respondents. Wall posts (e.g. Sharing/viewing videos, documents) and discussions part were referred to as the mostly commonly used and useful activities of the course Facebook page in both questionnaires and interviews. This data supports Hei-man (2008) who stated that the most used features on Facebook are the wall and messaging system. Hei-man (2008) also confirmed that the wall and messaging system are the users' first and routine activity when they login to Facebook. This is also parallel to the interview results of this study.

The quantitative and qualitative data showed that participant's involvement in both CTIS 151 and CTIS 163 courses' Facebook pages were taking similar and considerable amount of the participants' time. The result of this study supports Astins' first postulate. According to Astin's (1983) first postulate involvement refers to the general or specific investment of physical and psychological energy in various objects. This postulate was evidenced by the significant amount of time that participants' were spending on course Facebook pages per week. Involvement can be associated to variety of behaviors such as participating in, taking part in and taking interest in (Astin, 1983).

Students used and spent their time and effort to participate in course Facebook activities. According to the results of this study, the average time spent on course Facebook is greater than the time that students would spend attending classes per week if enrolled in a 4-credit course. Students' involvement in course Facebook page confirms Astin's postulate of investing physical and psychological energy into an object. Thus, the time spent by students in course Facebook pages can be considered as a form of involvement in which they use both their time and effort into developing out of classroom activities in their learning process. These findings support the

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notion that in order to increase the involvement of out of classroom activities and increasing the interactions among students and instructors, use of Facebook for academic purposes as CMS will continue to develop and evolve.

The study results showed differences in participant's utilization of discussion applications on their Facebook profiles and course Facebook pages. Actually, all of the interviewees did not list discussion in their daily life utilization of Facebook. However, from both quantitative and qualitative data, discussion was stated as the most commonly used and the most useful part of course Facebook pages. The past studies (Ajjan & Hartshorne, 2008; Boyd & Ellison, 2007; Kord, 2008) did not mention the discussion part as the mostly used part of Facebook. With the utilization of Facebook as CMS, discussion part of course Facebook page, becomes the most used part of course Facebook page.

One of the important results of this study was that participants did not involve in the discussion activities on Moodle. Moreover, some of them were not as knowledgeable about the functions of Moodle as they were in the course Facebook page. Some of the interviewees stated that in some of their courses, their instructors rarely used discussion parts, but they and their friends did not respond the discussions on Moodle. Mostly they did not follow and know if there was a discussion on Moodle. As an instructor, researcher started to use Facebook to increase the involvement of her students in out of classroom activities such as discussions. This means an increase in the interaction between the students let them think about the subjects and review and monitor what they learned in the classroom. According to constructivist theory, discussing subjects out of classroom is important both in learning process and learning environment. The study results pointed the chance of increase in the involvement of out of classroom discussions via course Facebook page. Easy access and availability of the discussions can be the reasons of involvement to the discussions. Moreover, utilization of course Facebook takes discussions into the students' daily life and this might be another reason for the change in the involvement of out of classroom discussions.

The number of students involved in a discussion topic was at most five out of 29 (17.24%) in CTIS 163 and two out of 35 (2.86%) in CTIS 151. The number of wall and discussion posts on the CTIS 163 Facebook page, were more than those on CTIS 151 Facebook page. Knowing the reasons of such involvement differences is important to increase the involvement of course Facebook activities in all courses. These results may be seen as conflicting with both involvement questionnaire results and interview results in which discussion part of course Facebook pages was the most commonly used and the most useful part of the pages in both course. Most of the students stated that they examined the content. However, they did not put their comments on the page. Following others comments and/or sharing was the general tendency of most of the interviewees in using Facebook. Therefore, the students may count such activity as involvement and using course Facebook page.

In the CTIS 151, towards to the end of the semester two students asked if they could discuss the discussion topic on course Facebook page; then, after taking my permission they started to involve in the discussions. Moreover, these students were involved in CTIS 163 discussions on course Facebook page during the whole semester. The reason of this difference in involvement to discussion can be

- CTIS 151 is a programming course. In the beginning of the semester, the subjects were not suitable for practicing in programming knowledge; instead they were more related to the philosophy of programming. Therefore, they could not involve in the discussions.

- In the beginning of the semester, students might not be knowledgeable enough or they might have difficulty in understanding the subject to write comments for discussion topics. Moreover, they might need time to make the subject clear and trust their knowledge and only after that they started to discuss subjects.

- Students might get used to the routine of the semester, or the work load of other courses might be less at the end of semester. Actually, Lab work loads in CTIS 151 were decreased in those weeks, close to the end of the semester.

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As a result, they might have time to involve in course Facebook activities such as discussions.

- Number of course hours and lab hours can be another reason. Students might discuss what they need during the lab sessions and they might not be in need of further discussions.

The study results showed some differences in the involvement of course Facebook pages according to courses. The possible reasons of the different rates of involvements in CTIS 163 and CTIS 151 can be listed as

- In CTIS 163 students have participation bonus (5 points) from course Facebook involvement while in CTIS 151 students have participation bonus from class participation. Participation bonus from course Facebook involvement can be the reason for the differences in the involvement.

- In addition to the participation bonus, some of the exam questions in both courses can easily be answered if the students examined and answered the discussion questions on the course Facebook page. These cases were emphasized to encourage students' involvements.

- All sections of CTIS 163 course were given by the researcher while only one out of three sections of CTIS 151 was given by the researcher. However, when CTIS 151 discussion posts were examined, most (2 out of 3) of the students who attended the discussions were not from the researchers' section. However, those students also took CTIS 163. Their behaviors were different according to the course. Unlike CTIS 151, in CTIS 163 they used wall of the course Facebook page, they shared resources on the wall, and wrote comments.

- Every week, students had four hour lab hours to practice what they learned in CTIS 151. In the two hours of lab hours, there was a quiz related to the previous weeks' subjects. Having lots of practice, and opportunity testing their knowledge may decrease the need for discussing the subjects. Those activities may cause students to believe that they understand the subject. Therefore, they did not prefer to spend time on discussing, searching and

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sharing things related to subjects. It is also possible that they simply could not find the time to do so.

5.2 Relationship between Facebook Acceptance and Involvement to Course Facebook Page

The correlation between Facebook acceptance and course Facebook page involvement changes according to the courses. In CTIS 163, there are significant correlations between

- *Number of Like* and *Perceived Usefulness*, *Attitude Toward Use*, *Facilitating Conditions*, *Subjective Norm*, *Behavioral Intention to Use*.
- *Number of Discussion Posts* and *Perceived Usefulness*, *Facilitating Conditions*
- *Number of Involved Discussions* and *Perceived Usefulness*
- *Time Spend on Course Facebook page* and *Subjective Norm*
- *Number of Comment* and *Behavioral Intention to Use*
- *Depth of Discussion Post* and *Attitude Toward Use*
    - *Claim* and *Attitude Toward Use*
    - *Grounds* and *Attitude Toward Use*
    - *Warrants* and *Attitude Toward Use*
    - *Rebuttals* and *Attitude Toward Use* and *Perceived Ease of Use*

In CTIS 151, "*Grounds*" were significantly correlated with *Attitude Toward Use* and *Behavioral Intention to Use*.

The results also stated that the more favorable *Attitude Toward Use*, *Subjective Norm*, and *Behavioral Intention to Use* Facebook, the stronger the students' intention to *like* the posts/sharings would be on course Facebook page. This result supports Arjen (1991) view which claimed that intentions to perform behaviors of different

kinds can be predicted with high accuracy from *Attitude toward Use*, *Subjective Norm*, and *Behavioral Intention to Use*.

On course Facebook page, students mostly preferred to like their close friends' posts. Moreover, when the wall posts examined to see who liked from whose posts it could be easily seen that same students liked with each others' sharings and comments. In other words, when friends thought that the video or sharing was related, helpful and useful for the course, the student tended to have the same idea and s/he preferred to show that by *liking* the shared posts. This can be the reason of significant relationship between *Number of Like* and S*ubjective Norms, Perceived Usefulness*.

In this study, researcher sometimes suggested for her students to examine the shared interactive exercises and videos in the lecture hours. She also *liked* some of the shared posts and comments of students on the course Facebook page. Moreover, she emphasized involving discussion by stating that there might be a question in the exams related to discussion topics on course Facebook page. According to Venkatesh and Davis (2000), if a superior or colleague advises that a system might be useful, a person may have a tendency to have same idea, and more likely to use the system. This can be the reason of significant relationship between *Perceived Usefulness and*. *Number of Like, Number of Discussion Posts, Number of Involved Discussions*.

The relationship between *Behavioral Intention to Use* and *Number of Like* can be explained by TAM and TPB, since according to Teo (2010), *Perceived Usefulness, Perceived Ease of Use, Attitude Toward Use, Facilitating Conditions, Subjective Norm* have a significant influence on Behavioral Intention to Use. Teo (2010) stated that these five variables contributed to 35% of variance in *Behavioral Intention to Use*. The correlation between *Behavioral Intention to Use* and *Number of Likes* can be the result of that contribution, since in this study all variables except *Perceived Ease of Use* were significantly correlated with N*umber of Likes* in CTIS 163.

In this study, there is a significant correlation between *Attitude Toward Use* and *Depths of Discussions Posts*. From these findings, we can say that most possible important indicator of depth of discussion post in course Facebook page can be *Attitude Toward Use*. In other words, if students have positive attitude to use Facebook, they most probably employ the course Facebook page to discuss deeply the subject of the course and have effective discussions. This result is similar to the results of Teo's (2010) study which indicated that *Attitude Toward Use* a technology or a system had the largest effect on the intention to use the technology. The relationship between *Attitude Toward Use and Depth of Discussion Posts* can be explained as largest since students did not prefer to use discussion parts of Moodle.. However, the results of the study showed that the relationship between *Attitude Toward Use* and *Number of Like, Depth of Discussion Post, Claim, Grounds, Warrants* and *Rebuttal* were significant in CTIS 163. Moreover, *Attitude toward Use* was also significantly correlated with *Grounds* and *Behavioral Intention to Use* in CTIS 151.

It is interesting that *Perceived Ease of Use* that declared as having an indirect medium affect on *Behavioral Intention to Use* (Teo, 2010) did not have a significant correlation on *Behavioral Intention to Use* in this study. However, Kültür (2009) declared that *Perceived Ease of Use* is one of the important factors related to the instructors' utilization of CMSs.

22 students (62.86% of CTIS 151 and 75.86 % of CTIS 163) took both CTIS 163 and CTIS 151 courses. However, their involvement pattern varied based on course. Involvement in any activity where students are allocating an average of more than two hours daily can have an impact on students' involvement in course related activities and their learning processes. Therefore, researchers who aim to contribute and to understand how we can benefit from students' involvement on Facebook may examine the reason of that difference. The possible reasons and the area to be searched can be if the course subject and the context such as number of course hours, having a bonus, lab, assessment, assignment in every week in a course may have an

impact on involvement to the course Facebook page. Clearly, there is a need for more research to be done on utilization of Facebook in teaching and learning.

The differences in the correlation results' dissimilarities between the courses could be caused by the different involvements in different courses. The most important differences of the courses are one of them is more practical and the other one is theoretical, having lab hours and the bonus given form participation to course Facebook involvements.

5.3   Relationship between Motivation and Involvement to Course Facebook Page

The descriptive results of motivation scales showed that CTIS 151 students slightly have higher means in all motivation scales than CTIS 163 students. When we compare descriptive of involvement to the course Facebook page with motivation of students, the situation is reversed, students involved noticeably more on CTIS 163 course Facebook page than CTIS 151 course Facebook page. These results are somewhat dissimilar to the results of past studies (Ushida, 2005; Carty, 2007) that the involvement to the CMSs or LMSs was the predictor of students' motivation to the course. However, there were also studies which declared that motivation was not the only factor that determines the involvement of the students to the course related activities. For example, Hanrahan (1998) stated that method of instruction and learning environment can be listed as factors that increase the learner participation.

The correlations between motivation and involvement to course Facebook page changes according to the courses. In CTIS 163, there are significant correlations between
- *Extrinsic Goal Orientation* and *Number of Like*
- *Intrinsic Goal Orientation* and *Time Spend on Course Facebook Page*

In CTIS 151, there is a negative correlation between *Self Efficacy* and *Grounds*.

The reasons of differences in correlations according to courses may be same with the reasons of differences in the correlation results' dissimilarities between Facebook involvement and Facebook acceptance. Since differences of courses might lead to the different involvement in course Facebook page.

In this study, correlation between *Extrinsic Goal Orientation* and N*umber of Like* can be caused by the subjective norms. When the details of N*umber of Likes* were examined, it can easily be seen that the students liked their close friends' posts in the course Facebook page. Moreover, having more N*umber of Likes* may be the results of bonus given to utilization of course Facebook page or the students may like posts of their closest friends. As it is discussed in the following pages, there is a significant correlation between course grade/ CGPA and number of post, comment and discussion posts.

Negru and Damian (2010) stated that extrinsic goal orientation and intrinsic goal orientation represent fundamental elements in the academic development of students. As a result, the relationship between *extrinsic goal orientation* and *number of like*, and between *intrinsic goal orientations* and *time spend* on CTIS 163 Facebook page might be an important indicator for students' academic developments.

Lyke and Kelaher Young (2006) stated that there is a significant relation between students' perception of classroom environments and students' *intrinsic goal orientation,* students' *extrinsic goal orientation*. Moreover, they stated that students with an *intrinsic goal orientation* tend to value deeper level of understanding of course related activities than those with an *extrinsic goal orientation*. Students do not need to use deep cognitive strategies when they "liked a post", this may be one of the reason of the correlation between *Extrinsic Goal Orientation* and *Number of Like*. However, spending time on course Facebook page might mean using deep cognitive strategies to understand the viewed and shared posts. This might highlight both the

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importance and the reason of the correlation between *Intrinsic Goal Orientation* and *Time Spend on Course Facebook Page* in CTIS 613.

According to Sungur (2004), intrinsic goal orientation is the students' reasons for doing a task. The intrinsically motivated students reasons might be the students' interest, curiosity to the course subject, course Facebook activities or enjoyment of the shared activities on course Facebook such as videos. As a result, they might spend more time on course Facebook page. When we compare the sharing on the course Facebook pages, in CTIS 151 number of sharings was considerably less than the number of sharings in CTIS 163 course Facebook page. As a result, there might not be an interaction and relation might not be observed in CTIS 151.

For CTIS 151 course, a negative correlation between *Self Efficacy* and *Grounds* indicated that increased in students' *Self Efficacy*, related poor *Grounds* in discussion posts. This means that if a student believes that s/he has a capability to learn or perform effectively, then s/he have a tendency to use fewer supporting data in the discussion posts or the supporting data are not complete, correct and related to the claim. This can be due to the fact that

- when students did not believe their capability and have less self efficacy, to be on the safe site they might need to support their point of view. As a result, they might be more careful about giving relevant and complete data. Moreover, they might not leave much for the reader to be sure about their answers.
- in CTIS 151, most of the discussion posts were in discussion initiated by students. As a result, students might only focus on giving the correct answer to their friends' question without supporting their views. They might ignore and they might not believe the value and importance of supporting their view when answering their friends' questions.

- Additionally, even their self efficacy was high they might not have paid attention to provide ground for their discussion sine there was no bonus or penalty for poor grounds in the course.

5.4 Relationship between Achievement and Involvement to Course Facebook Page

The correlations between achievement and involvement to course Facebook page changes according to the courses. In CTIS 163, there are significant correlations between

- *Grade* and *Number of Post, Number of Comment, Number of Discussions Post*
- *CGPA* and *Number of Posts, Number of Comments, Number of Discussion Posts, Number of Involved Discussions*

Having bonus might be the reason of correlation between achievement and involvement to the CTIS 163 course Facebook page. Moreover, students who understood the solution of some question in the discussions could easily solve some of the question in the exams that might have an impact on their grades. This is interesting since *depth of post* is not correlated with *students' achievements*. Students may learn the answer of the discussion questions from the friends' discussion posts and/or comments of their instructor. According to Astin (1999) theory of student involvement, the amount of student learning associated with an educational activity is directly proportional to the quality and quantity of student involvement. This study results showed the correlation between *students' achievement* and *quantity of students' involvement* (*number of discussion posts*, *number of involved discussions, number of comments,* and *number of posts*). Moreover, this correlation results pointed that successful students did not have too much number of like; instead they preferred to share resources and comments about course related activities in CTIS 163.

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However, in CTIS 151, the correlations between achievement of students and course Facebook involvement were not statistically significant. Actually, the most probable reason can be there was not too much sharing on the CTIS 151 course. This situation has an impact on the correlation results.

When we examine the correlation between achievement of students and depth of discussion posts, in CTIS 163, there was not statistically significant correlation. However, in CTIS 151, a negative correlation between that *Grade* and *Grounds* indicated that increase in the course grade, predicted poor grounds in discussion posts. This result is similar in the correlation between *Depth of Posts* and *Motivation.* The possible reasons of these dissimilarities in the correlations according to the course can be

- The involved subjects in the discussion of CTIS 151 were mostly initiated by students. As a result, students might share the discussion subjects that they already know the answer. This might results neglecting to support their views in order to have and construct a well defined ground in their discussion points.

- One of the interviewee stated that in CTIS 163 course, he was not afraid of writing wrong answer and sharing wrong ideas, actually he always preferred to share his view by knowing that his instructor will correct him and there was not any penalty for him. Moreover, he added that with this sharing, he would learn the correct answer since his instructor would immediately correct him. Furthermore, all of the interviewees emphasized the value of discussions and shared/viewed resources on the wall of the course Facebook page. However, they also declared that they did not involve in the course Facebook page in order to be successful, and they did not believe that their involvement affect their achievement.

5.5 Relationship between Time Spent on both Facebook and Course Facebook Page

A correlation for the data revealed that time spent on Facebook and time spent on CTIS 163 course Facebook page were significantly related. However, there was not a significant correlation between time spent on Facebook and course Facebook page in CTIS 151. The possible reasons of this dissimilarity in the correlations according to the course can be

- Students of CTIS 163 involved course Facebook page and spent more time than that of CTIS 151.
- In the interviews, students stated that they were using notification feature of Facebook. Moreover, on CTIS 163 Facebook page, there were more sharing than that on CTIS 151. This means that less notifications and less time needed to follow and involve activities on CTIS 151 Facebook page that on CTIS 163 Facebook page.

From interviews, most of the interviewees stated that they could follow course activities from their Facebook account home page by the help of Facebook notifications when they were using Facebook. Therefore, mostly they did not need to spend additional time to check what happened on course Facebook page or they did not worry about what was happening on Facebook when they were dealing with course related issues on course Facebook page.

Similar to the previous studies (Caruso & Salaway, 2009; Kord, 2008; Pempek, Yermolayeva & Calvert, 2009; Raacke & Bonds-Raacke, 2008), this study's results showed that participant's involvement in SNSs was capturing a considerable amount of their time. According to the findings of this study, we observed positive direct relationship between time spent on Facebook and time spent on CTIS 163 course Facebook page. This relation may be considered as valuable opportunities for instructors to attract students' attention, capture high potential time on Facebook to involve and be active out-of classroom activities.

5.6   Comparison of Facebook, Course Facebook page and Moodle

Comparison of Facebook and Course Facebook Page Use

Most of the interviewees (n = 11) stated Facebook as the most popular SNSs among them. Similarly, quantitative data results showed that 95.2% of participants acknowledged Facebook as both the most popular SNSs and the first preferences of them. This finding is parallel to those of Chain (2008), Harris & Rea (2009), Kord (2008), Santos, Hammond, Durli & Chou (2009), Tınmaz (2011) whose study results also demonstrated high percentage of Facebook participation.

All of the interviewees started to use Facebook with an extrinsic motivation such as friend encouragement, finding friends and due to its popularity. This data support Brocke, Richter and Riemer (2009) who identified two motives for the usage of SNSs concerning the social environments of users as curiosity and contact with friends. This study results also showed that participants mainly used Facebook to get in touch with people who s/he did not know from real world. Related researches on the utilization of Facebook have similar results about communication with people (Brocke, Richter & Riemer 2009; Ellison, Steinfield & Lampe 2007). Similar to the Brocke, Richter and Riemer (2009) this study results emphasized that subjective norms can be the major dimension of motivation to use Facebook.

All of the interviewees trust Facebook as a communication tool and stated that course Facebook page as a useful means of communication. Hence it can be concluded that course Facebook page creates an environment where both students and instructor could easily communicate. Moreover, it is important that according to the results of interviews, course Facebook page is defined nonthreatening and friendly environment. Certainly, this situation creates more supportive environment for out of classroom activities where students and instructors could communicate freely.

On the contrary time consuming belief about Facebook, all interviewee believe that course Facebook page reduces waste of time to find valuable and useful resources

related to course. Moreover, majority of the interviewees claimed that using course Facebook page decreases waste of time to find important and useful resources with the help of shared videos and documents. This result points out that students believed the value of course Facebook page. Moreover, this result shows that there might be a probability of increasing the students' involvement to the out-of-classroom activities via Facebook.

According to the interview results, the most important difference between Facebook and course Facebook utilization is the discussion part. Unlike Facebook, in course Facebook Pages, discussions were used. Moreover, discussion part of course Facebook page was stated as mostly used and useful part in both interviews and the involvement questionnaire. This is important since the aim of the researcher is to increase the interactivity and involvement of students in the out-of classroom discussion. This result shows that using Facebook might have a possibility to improve utilization of discussion parts of CMSs.

Comparison of Course Management Systems
The results of interviews show that all courses believed the value of having CMSs for every course independent from its subjects to have a communication platform and to attract and enhance their interest for the course.

The interview results of this study are parallel to past literatures, Yueh and Hsu, 2008; Kvavik et al. 2004; Morgan, 2003, stated that most used features of CMSs are publishing syllabus and providing soft copy of lecture notes or readings while communication and interactive features and tools of CMS are mostly unused.

Unlike Jones et al. (2009) which declared that students refuse to use social software for learning to separate life and studying, in this study, students believed the value of using Facebook as CMS. These findings support Bardy, Holcomb and Smith (2010); Roblyer et al. (2010); Tinmaz (2011); Lester and Perini (2010). Moreover, most of interviewees (83.33%, n = 10) preferred to use Facebook as CMSs rather than

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Moodle. Two of them, who prefer Moodle, complained about the difficulty of finding the specific resource on the wall since they were organized by posting time. This is an important problem since it is important to find a shared resource in CMS. However, except that two interviewees, none of the interviewees declared organizational problem in course Facebook pages. The reasons for that can be

- From those two interviewees, one of them did not use Facebook frequently. As results, when he entered to course Facebook page, it became difficult to both follow and find the resources shared on wall.

- However, if one uses Facebook frequently, notification will inform him/her about new shared post. The students might ignore the notifications and did not deal with what was shared. After that when they heard from their friends they might have difficulty to find that specific resources.

Whatever the reason is, accessing the resource on Facebook wall is a very important problem and it should be solved. One solution can be integrating Moodle and Facebook together as CMSs. Actually, the researcher will employ that integration in next iteration of her action research to solve presentation problem of resources. Moodle can be used for sharing resources in an organized way, whereas Facebook can be used particularly support communication, interaction and social activities.

Similar to Baltacı-Gökatalay and Ozdilek's study (2010) results declaring SNSs as encouraging more active user involvement, all of interviewees mentioned that course Facebook page was useful and make them active in the learning process. This result was supported by Ajjan and Hartshorne (2008) results which pointed out that SNSs are places for collaboration and sharing information to support active learning.

The results of this study provide qualitative evidence that student participations and interactions on SNSs make subjects more clear and understandable for students. This qualitative results support constructivist theorists that defined learning as a social process of interaction and sharing information with each other. Moreover, this results

support the view of Ajjan and Hartshorne about SNSs which can be used to supplement F2F courses to create interactive environments.

Interviewees listed the reasons of favor course Facebook page than Moodle as

- They have a tendency to be followers rather than to actively participate on Moodle.
- They are more active on course Facebook page than on Moodle.
- They were not aware of the capability of Moodle such as sharing video and discussions. However, they were aware of all capability of Facebook.
- They felt more flexible on course Facebook page than on Moodle.
- Communication is easier on course Facebook page than on Moodle.
- Course Facebook page is more user friendly than Moodle.
- Discussions were more interactive on course Facebook page than those on Moodle.

The results of this study show that Moodle does not meet the needs of both students as CMSs. The reasons listed above matched with the students' expectations from a CMS and their preferences of Facebook as CMS. This is important since some of the above reasons, such as increase interactivity, communication and active participation of students, were also aims of using CMSs. Moreover, the aim of the researcher is to find a CMS which is widely accepted and effectively used by students.

Goal of instructional designers is to have effective learning. Effectiveness of an instruction depends not only on the used media, but also on the instructional strategy, method that is used. To have a successful and effective instruction, the instructional design should be made carefully by thinking both instructional method and media. According to the study results, using Facebook as CMS in CTIS 163 increases the collaboration and interactions in out of classroom activities. However, the situation is not the same for CTIS 151. The course subject might influence the used instructional method and the utilization of the media. Since both medium and method affect learning. Media themselves do not improve learning as stated by Clark (1983). In

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addition, method without a good medium does not result in an efficient learning also. Kozma (1991) stated that some students would learn a particular task regardless of the medium; others would be able take advantage of a particular medium's characteristics to help construct knowledge. Therefore, to have an effective instruction, we should select a medium that suits both our instructional method and users (i.e. students and instructors) of the medium. In other words, instructional outcomes are affected both from instructional method and medium. As a result, Facebook might be a suitable medium for CMSs, however, appropriate instructional methods should be clarified and validated in further studies.

According to interviewees' results, continuation of utilization of CMS and guiding for new comers of the courses can be possible with course Facebook page but not with Moodle. Moreover, the findings stated that students were willing to continue utilize and help for other semester's students.

5.7   Implications and Suggestions for Practitioners

Even though the findings of this study cannot be generalized, the following implications and suggestions were made. Based on the findings, the following recommendations are offered to support a CMS that is accepted, involved and meet the needs of both instructors and students. Some of the recommendations have not been directly related to the above discussed subjects. However, they have been related with both the expectations and needs of students gathered through interviews.

Even though some or all of the findings of this study may not be generalized to all courses, CMSs and/or SNSs developers may judge some of these findings useful for improving and adding additional properties to their systems to support utilization of the system as CMS.

University administrators and department chairs should encourage faculty to employ and to experience SNSs to benefit utilization of SNSs in learning and teaching. It is better to know what is used and why it is used before actually utilizing and planning to use a technology.

SNSs enable communication among the students any time and any place. This opportunity results in forming virtual classes in which virtual classrooms are accessed as long as an online connection is available. The possibility to collaborate among the classmates can be further increased to other interested parties, thus new roles' anyone any role are added to teaching and learning processes that should be carefully studied by the practitioners. In traditional classroom environment, students are allowed to comment whenever they are given permission to talk. Online CMS enabled them to comment/answer questions whenever they want to and they are ready. SNSs, in addition to other CMSs, welcome a virtual environment where anyone interested to intervene with the class discussions globally.

As the study results implied there are potential capabilities of SNS that can be beneficial for both instructors and students to create an online classroom community and increase student-student and student-teacher interactions. Efforts should be made by practitioners to promote active learning through SNSs and to test the effectiveness of SNS for educational purposes. Some of the suggested ways to increase student's participation in out of classroom discussions on course Facebook page are

- Start to discuss the discussion subject first in the lecture hour and then let the students to discuss subject on the course Facebook page. In the lecture discussion, give some clues, and hints to increase their curiosity for the topic of the discussion.
- After posting the discussion topic, remind the subjects by talking about some of students' discussion comments and in the classrom let others to think about previous comments and discussion subject.

- Emphasize that they can be perform better in exams as a result of deep discussion of the subject, or they can be easily solved if the answers of the discussion questions were known.
- Let students feel free to make mistakes and state that the goal of discussions is to learn and make subjects clear and understandable.

Based on the results of this study, to increase the quality of discussions in course Facebook page, practitioners shoud give both informative and directive feedback to students and let them to
- concentrate on the discussion point, to write complete, accurate and relevant comments about the discussion.
- state generalizations that are related to the discussion question, their point of view and which are clear and complete.
- explain their views and answers in such a way that it is clear how the students support their claims.
- state correct, relevant, and specific sources of warrants.
- state complete and systematic identification of constraints of discussion question.

The study results showed significant relations between the number of like and extrinsic goal orientation. To take students' interests and to increase their curiosity, practitioners should ask further questions to the students about the resource or comment that they liked. The questions should be carefully selected to let students examine the shared resource and to let them judge what the shared resource is.

As suggestions based on the results of this study, practitioners are invited to use Facebook integrated to CMS, such as Moodle. Such integration will enable the students to navigate from Facebook pages to Moodle, which will provide easy access to course related contents to overcome resource finding in Facebook.

The study results showed that the only problem of course Facebook page was the difficulty of finding a specific resource on the wall. It would be more effextive if the necessary changes in the Facebook are done to solve this problem so that it can be used without a need of integration with any other CMS. Some of the recommendations to solve this problem are:

- Similar to photo albums, resources can be shared under folders
- A search option can be added to the wall posts according to title of the post, person, type of the posts or keywords.
- Wall posts can be sorted according to some characteristic of the posts such as type, date, name or person who published the post.
- Facebook developers may add a new ability to Facebook page walls for admins to design the wall page flexible and to cluster and organize the wall posts according to some characteristics of posts such as subject or weekly similar to the course outline. In other words, the wall of the Facebook page can be more easily modified and customized according to user needs.
- Like the communication between Twitter and Facebook, SNSs and CMS developers may design a property that enable SNS communicate with CMS. The communication between SNS and CMS enables users' updates in one system affect on both systems at the same time.

The result of this study showed that students' involvement to the course Facebook page was different according to courses. Involvement in the theoretical course was more than that in practical one. In the practical course, students have lab hours and more number of in-class activities. Therefore, they might be overloaded, and they might not be in need of course Facebook page involvement or not have time for other out-of classroom activities. I suggest that in all courses, start discussions in Facebook in the first weeks. Based on the course load and students' level of invovement in the discussions, SNS can be used just for communication purposes, sharing resources such as videos and documents or for all.

The findings on increased success of the students and bonus given to the students for involvement and positive impact of student's participation using Facebook on course success in CTIS 163, may suggest that the practitioners should assign participation grades for the courses similar to CTIS 163. To support students' participation, course specifications should also be taken into account. Some of the suggested ways to increase student's participation are to:

- Share videos related to course content,
- Share interactive and interesting exercises,
- Use Facebook material during in class courses,
- Respond to questions/sharings from the students as quick as possible.

5.8   Recommendations for Further Research

Based on the limited research that has been examined SNSs utilization in teaching and learning, there is a need for more thorough studies of both quantitative and qualitative influences on the university student experiences.

Considering the limited number of research studies related to utilization of SNSs as CMS to solve the problems of CMSs, new studies should be carried out to investigate how SNSs can be used in teaching and learning processes.

This study shows that many students felt they benefited from utilization of Facebook as a CMS and they preferred to use Facebook instead of Moodle as a CMS. Further research should investigate and can be conducted

- in depth how much learning happens with the utilization of SNSs and compare it with the situation of CMS,
- to examine the impacts of these same factors over time. Will learners become more likely to accept use SNSs for education when they are more familiar with the system?

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- to compare characteristics of early adopters of using SNSs as instructional technology versus late followers in order to understand impact of using SNSs on educational variables.
- to identify the characteristics of SNSs that may influence a faculty member's willingness to integrate it in teaching by drawing upon the diffusion of innovation.
- to identify variables regarding course, i.e. content (theoretical, practical), number of in-class activities, number of students in the classroom taking the course, number of instructors teaching the same course in different sections.
- to understand how faculty attitudes may help or hinder utilization of SNSs as CMSs.
- to identify how and why faculty member especially instructors utilize SNS and their perspectives about utilization of SNS for educational purposes
- to determine what is needed to develop and increase awareness among both students and instructors that SNSs may be used as a learning tool?
- to apply the theory of planned behavior to understand and predict student's intentions and behavior to use SNSs to supplement their in-class learning. After an analysis of the student data, it could then be compared with faculty expectations from SNSs use in an attempt to understand whether there are similarities or differences among the students and instructor and whether or not the same factors influence student and faculty use. Moreover, how instructors acceptance of utilization of SNSs for educational purposes affects students perspective or vice versa.
- To identify the differences or similarities of SNS utilization in the different levels such as freshman, sophomores and seniors.

Future research is still essential in order to discover the most effective methods of utilizing SNSs to improve teaching and learning productivity and to better support active, social, and engaging learning environments.

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APPENDIX A

INFORMED CONSENT DOCUMENT

I am a full time instructor at Bilkent University, Computer Technology and Information Systems (CTIS) department. I am requesting your participation in a research project being conducted in fulfillment of my dissertation requirement as a part of my doctorate program in the Graduate School of Natural Sciences of Middle East Technical University.

The Human Subjects Committee at Middle East Technical University, and CTIS Chairman (Mr. Erkan Uçar) of Bilkent University approved the distribution and use of this survey instrument. It is my hope that you will complete the survey; however, your participation is completely voluntary.

The following information is provided for you to decide whether you wish to participate in the present study. You should be aware that even if you agree to participate, you are free to withdraw at any time. If you do withdraw from this study, it will not affect your course grade.

Purpose of the Study: The purpose of this study is to examine relationships between Social Networking Sites (SNSs) involvement or SNSs utilization, students' acceptance of SNSs, students' motivation, and students' achievements in teaching and learning. Based on collected data, determinants of SNSs utilization will also be investigated.

Procedures: The questionnaire is being provided to the students of CTIS Department of Bilkent University in Turkey. The questionnaire will be distributed and collected

by the instructors of the courses that use Facebook in their lectures. All responses will be kept confidential and viewed only by the researcher, and members of the dissertation committee. Data will only be presented in the aggregate. Statistical analyses will be completed to assist in the development of conclusions.

Risks/Benefits: There are no risks associated with participation in this study. There are no direct benefits resulting from completion of the survey. However indirect benefits may be seen in future courses and best practices by higher education instructors and students. Analysis of this questionnaire will contribute to my doctoral research as well as eventually providing valuable information for university students and instructors.

Information to be Collected: Information to be collected will be provided strictly by you, the participant. Any information you wish not to provide can be left unanswered. Your name will not be associated in any way with the information collected about you or with the research findings from this study.

I would like to thank you in advance for your participation in this study it is sincerely appreciated. I recognize that your time is extremely valuable. Please be confident that the information you provide will be fully utilized and contribute significantly to the findings. If you desire to view the results of the study, please contact me and I will make them available.

Researcher Contact Information
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Phone: +90 (312) 290 5039   Fax: +90 (312) 266 5908
e-mail: duygua@bilkent.edu.tr

I have read the informed consent document of the study. My completion of the survey indicates permission to utilize the information I provide and I consent voluntarily to be a participant in this study.

Name of Participant   :

Signature of Participant   :

Date (Day/ month/ year)   :

APPENDIX B

APPROVAL FORMS
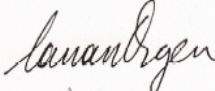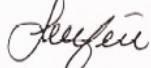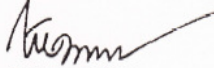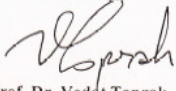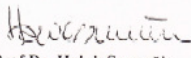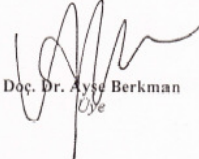
FORM 1: Human Subjects Ethics Committee Approval

O.D.T.Ü
FEN BİLİMLERİ ENSTİTÜSÜ
YÖNETİM KURULU KARARI

Tarih: 09.12.2010
Sayı: FBE: 2010/3

GÖREVLENDİRME VE İZİN

Bilgisayar ve Öğretim Teknolojileri Eğitimi EABD doktora programı öğrencisi Duygu Albayrak'ın 29 Kasım 2010 -30 Aralık 2011 tarihleri arasında "Sosyal Ağların Öğretim ve Öğrenmedeki Yeri " başlıklı araştırmasına ilişkin hazırlanan anketi Bilkent Üniversitesi Bilgisayar Teknolojisi ve Bilişim Sistemleri Bölümünde uygulama yapmak için görevlendirilme başvurusu incelenmiş; ilgili danışman görüşüne dayanarak adı geçen öğrencinin isteği doğrultusunda görevlendirilmesine oybirliği ile karar verilmiştir.

Prof. Dr. Canan Özgen
FBE Müdürü

Prof. Dr. Gürsevil Turan
FBE Müd. Yard.

Doç. Dr. Nil Uzun
FBE Müd. Yard.

Prof. Dr. Vedat Toprak
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Prof.Dr. Haluk Sucuoğlu
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Doç. Dr. Ayşe Berkman
Üye
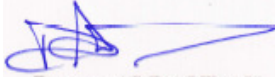
FORM 2: Bilkent University CTIS Department Approval

9. 12. 2010

Bilkent Üniversitesi Bilgisayar Teknolojisi ve Bilişim Sistemleri Bölüm Başkanlığına,

Ankara

Yürütmekte olduğum doktora çalışmasında sosyal ağların öğrenme ve öğretim sürecinde kullanımı konusunda araştırma yapmaktayım. Bu çalışmada Bilkent Üniversitesi, Bilgisayar Teknolojisi ve Bilişim Sistemleri bölümündeki öğrencilerinden hazırlamış olduğum anketler aracılığıyla veri toplamak istiyorum. Anket Çalışması sonucunda çıkan sonuçları irdelemek amacı ile anket dağıtılan öğrencilerle yüz yüze görüşme yapmayı planlıyorum. Etkin olarak veri toplamak için planladığım Aralık 2010 – Aralık 2011 dönemidir.

Hazırladığım anketin etik kurul onayı alınmış olup ilgili belge ve anketler ilişiktedir. Çalışmaya başlayabilmem için gereğinin yapılmasını saygılarımla arz ederim.

Duygu ALBAYRAK
Öğretim Görevlisi
Bilgisayar Teknolojisi ve Bilişim Sistemleri Bölümü
Tel:(312) 290 5039
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Uygundur
Gereği...

Erkan UÇAR
Bilkent Üniversitesi
CTIS Bölüm Başkanı

FORM 3: Bilkent University Provost Office Approval
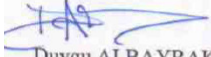
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22. 12. 2010

Bilkent Üniversitesi Rektörlüğüne,

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Uygundur.
23/12/2010

SSGM
Gereğ ricası ile.
23/12

BİLGİMİZE VE ASUNIN
SN. DUYGU ALBAYRAK'A
ULAŞTIRILMASI RİCASI İLE
23/12

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INTERVIEW PROTOCOL

Tarih ve saat (başlangıç - bitiş):   **Görüşmeci:**

GİRİŞ

Merhaba, adım Duygu Albayrak, Bilkent Üniversitesinde Bilgisayar Teknolojisi ve Bilişim Sistemleri bölümünde öğretim görevlisi olarak görev yapmaktayım. Yürütmekte olduğum doktora çalışmasında Sosyal Ağların Öğrenme ve Öğretim sürecinde kullanımı konusunda araştırma yapmaktayım. Bu nedenle sosyal ağ kullanımız hakkında bilgi edinmek istiyorum.

Görüşme sürecinde söyleyeceklerinizin tümü gizlidir. Bu bilgileri araştırmacılar dışında herhangi bir kimsenin görmesi mümkün değildir. Ayrıca araştırma sonuçlarını yazarken, görüştüğüm bireylerin isimlerini kesinlikle rapora yansıtmayacağım.

Başlamadan önce bu söylediklerimle ilgili belirtmek istediğiniz bir düşünce ya da sormak istediğiniz bir soru var mı?

Görüşmeyi izin verirseniz kaydetmek istiyorum. Bunun sizce bir sakıncası var mı? Bu görüşmenin yaklaşık 1 saat süreceğini tahmin ediyorum. İzin verirseniz sorulara başlamak istiyorum.

Sosyal Ağ Sitesi Kullanımı ile ilgili Sorular:

1. Facebook, Myspace, Twitter veya Xanga gibi online sosyal ağ sitelerini, kullanıyor musunuz?
   ALT Q1. Facebook, Myspace, Twitter veya Xanga gibi sosyal ağ sitelerinden herhangi birine üyesi misiniz?
   a. (üye değilse) Herhangi bir online sosyal ağ sitelesine neden üye olmadığınızı açıklayabilir misiniz?
   b. (bir zamanlar üye olan, fakat şimdi olmayan) Neden artık online bir sosyal ağ sitene üye olmadığınızı açıklayabilir misiniz?

(üye ise)

2. Ne kadar zamandır ve hangi sıklıkla Facebook kullanıyorsunuz?
   a. Facebookta genellikle (günlük veya haftalık) ne kadar zaman harcıyorsunuz?
   ALT Q2a. Facebookta günde toplam olarak ne kadar zaman geçiriyorsunuz?
   b. Facebooka hangi sıklıkla giriş yapıyorsunuz?
   ALT Q2b. Bir günde Facebooka kaç kez giriş yapıyorsunuz?

3. Sizi Facebook kullanmaya motive eden şeyler nelerdir?
   a. Facebookta neden bir profil oluşturdunuz?
   b. Facebookta profil sahibi olma amacınız nedir? Sizi Facebook sahibi olmaya yönlendiren deneyimiz neydi?

4. Neden Facebook kullanıyorsunuz?

5. Lütfen, Facebook'u nasıl kullanıdığınız ve Facebookta neler yapıtığınızı anlatırmısınız.
   a. Facebooka giriş yaptığınızda genellikler neler yaparsınız (mesaj kontrol, arkadaşlarımın profillerini bakmak)?
   b. Facebookta ne tür postlar paylaşırsınız?
   • Duvara yorum yazmak; içerik ekleyerek; fotoğraf ekleme; video ekleme; yeni bir tartışma konusu ekleyerek; aktivite ekleyerek.
   c. Facebook oturumu sırasında başka ne tür aktivitiler yaparsınız? (mesaj control, arkadaşlarımın duvarlarını incelemek, foto yüklemek, tartışma incelemek)

6. Facebook katılımını 5 üzerinden değerlendirirsen kaç verirsin? Neden?

7. Facebookta arkadaş olduğun kişilerle birincil iletişim kanalın nedir (e-posta, kişi, telefon)?

8. Facebook iletişim açısından kullanıcılarına nasıl yardımcı olur?
   a. Birlikte ders aldığınız arkadaşlarınızla Facebooku iletişim amaçlı nasıl kullanıyorsunuz?
   b. Akademik ve idari personel ile iletişiminde Facebooku nasıl kullanıyorsunuz?
   c. Başka üniversitelerdeki arkadaşlarınız ile iletişiminizde Facebooku nasıl kullanıyorsunuz?

Derste Sosyal Ağ Sitelerini Ders Yönetim Sistemi olarak Kullanımı ile ilgili Sorular:

1. Aldığınız derslerde Facebook sayfası olan oldu mu?

(Evet)

2. Ne kadar zamandır ve hangi sıklıkla derste Facebook kullandınız?
   a. Dersin Facebook sayfasında (günlük / haftalık) ne kadar zaman harcıyorsunuz?
   ALT Q2a. Dersin Facebook sayfasında bir günde toplam ne kadar zaman geçirirsiniz?
   b. Dersin Facebook sayfasınd hangi sıklıkla giriş yapıyorsunuz?
   ALT Q2b. Bir günde dersin Facebook sayfasına kaç kez giriş yapıyorsunuz?

3. Lütfen, dersin Facebook sayfasını nasıl kullanıdığınız ve dersin Facebook sayfasında neler yapıtığınızı anlatırmısınız.
   ALT Q3. Dersin Facebook sayfasını nasıl kallanıyorsunuz?
   • Duvara yorum yazmak; içerik ekleyerek, fotoğraf ekleme, video ekleme, yeni bir tartışma konusu ekleyerek; olay ekleyerek; duvarı inceleyerek; tartışmalara katlarak.
   a. Dersin Facebook sayfasında ne tür postları paylaşıyorsunuz?

4. Dersin Facebook sayfasını neden kullanıyorsunuz?
   ALT Q4. Dersin Facebook sayfasını kullanım amacınız nedir?

5. Dersin Facebook sayfası sana yardımcı oluyor mu?
   a. (evet) Dersin Facebook sayfası size nasıl ve ne ölçüde yardımcı oluyor?
   b. (hayır) Neden? Yardımcı olması gereken fakat eksik olduğunu düşündüğünüz noktalar neler?

6. Dersin Facebook sayfasına katılımını 5 üzerinden değerlendirirsen kaç verirsin? Neden?

7. Facebook ve dersin Facebook sayfasını kullanımını karşılaştır mısın?

8. Dersinde Facebook kullanan bir öğretmeninle nasıl iletişime geçersin? (telefon, e-posta, diğer)

Facebook ve Diğer Ders Yönetim Sistemlerini Karşılaştırma Soruları

1. Derste Moodle kullandınız mı?

(evet)

2. Ne kadar zamandır ve hangi sıklıkla derste Moodle kullandınız?

a. Dersin Moodle sayfasında (günlük / haftalık) ne kadar zaman harcıyorsunuz?
ALT Q2a. Dersin Moodle sayfasında bir günde toplam ne kadar zaman geçirirsiniz?

b. Dersin Facebook sayfasını hangi sıklıkla giriş yapıyorsunuz?
ALT Q2b. Bir günde dersin Moodle sayfasına kaç kez giriş yapıyorsunuz?

3. Lütfen, Moodle nasıl kullanıdığınız ve Moodle da neler yapıtığınızı anlatırmısınız.
ALT Q3. Moodle'u nasıl kallanıyorsunuz?

- yorum yazmak; içerik ekleyerek, fotoğraf ekleme, video ekleme, yeni bir tartışma konusu ekleyerek; olay ekleyerek; duvarı inceleyerek; tartışmalara katlarakç

a. Moodle'da ne tür postları paylaşıyorsunuz?

4. Moodle neden kullanıyorsunuz?
ALT Q4. Moodle kullanım amacınız nedir?

5. Moodle size yardımcı oluyor mu?
a. (evet) Moodle size nasıl ve ne ölçüde yardımcı oluyor?
b. (hayır) Neden? Yardımcı olması gereken fakat eksik olduğunu düşündüğünüz noktalar neler?

6. Dersin Moodle sayfasına katılımını 5 üzerinden değerlendirirsen kaç verirsin? Neden?

7. Derste Moodle ve Facebook kullanımını karşılaştırır mısınız?
a. Ders yönetim sistemi olarak Moodle veya Facebooktan hangisini kullanmayı tercih edersiniz? Neden?

8. Ders yönetim sistemlerini (Facebook veya Moodle) dersi aldığınız dönem sonrasında kullandınız mı?
a. (evet) Neden? Nasıl?

9. Derste öğrendiğin konularla ilgili problemin olduğunda ve konuyu hatırlamak için ders sonrasında ihtiyacın olsa Ders yönetim sistemlerini (Facebook veya Moodle) kullanır mısın? Nasıl?

Yönetim Sistemleri Kullanmayan Derslerdeki Uygulamalarla Karşılaştırma Soruları

1. Üniversite Eğitiminiz sırasında ders yönetim sistemi kullanımayan dersleriniz oldu mu?

2. Bu derslerinizin işleyişini derste Moodle veya Facebook kullanılan derslerin işleyişle karşılaştırırmısınız.
a. Benzerlik ve farklılıkları nelerdir?

3. Dersin konusunun ders yönetim sistemi kullanılmasıyla ilişkişi var mıdır?
   ALT Q4. Dersleri konusuna göre ayırıp bu konulardaki derslerde yönetim sistemi kullanılmalı diğerlerinde kullanılmasına gerek diyebilir miyiz? Neden? Nasıl?
   a. Dersin ders yönetim sistemi kullanılması gerektiren durumlar nelerdir?

4. Derste ders yönetimi kullanılmalı mıdır?
   a. Neden?
   b. Nasıl?
   c. Hangisini tercih edersin Moodle veya Facebook? Neden?

Çalışmamda bana yardımcı olduğunuz için çok teşekkür ederim.

APPENDIX D

DEMOGRAPHIC INFORMATION AND FACEBOOK ACCEPTANCE QUESTIONNAIRES

On average, how many Hours per Week do you spend STUDYING?   _____

In how many courses have you been used (or did you use) a course management system (e.g. Moodle)?

- ○ None
- ○ One
- ○ Two
- ○ More than Two

In how many courses have you been used (or did you use) Facebook as a course management system?

- ○ None
- ○ One
- ○ Two
- ○ More than Two

How would you rate your use of Moodle?

- ○ None
- ○ Low
- ○ Moderate
- ○ High

How would you rate your use of Facebook course page?

- ○ None
- ○ Low
- ○ Moderate
- ○ High

How would you rate your use of Facebook?

- ○ None
- ○ Low
- ○ Moderate
- ○ High

Facebook Acceptance

Circle the Response that describe your feelings about the statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. Using Facebook will improve my work.	5	4	3	2	1
2. Using Facebook will enhance my effectiveness.	5	4	3	2	1
3. Using Facebook will increase my productivity.	5	4	3	2	1
4. My interaction with Facebook is clear and understandable.	5	4	3	2	1
5. I find it easy to get Facebook to do what I want it to do.	5	4	3	2	1
6. I find Facebook easy to use.	5	4	3	2	1
7. Facebook makes life more interesting.	5	4	3	2	1
8. Working with Facebook is fun.	5	4	3	2	1
9. I like using Facebook.	5	4	3	2	1
10. I look forward to those aspects of my life that require me to use Facebook.	5	4	3	2	1
11. When I need help to use Facebook, guidance is available to me.	5	4	3	2	1
12. When I need help to use Facebook, a specialized instruction is available to help me.	5	4	3	2	1
13. When I need help to use Facebook, a specific person is available to provide assistance.	5	4	3	2	1
14. People whose opinions I value will encourage me to use Facebook.	5	4	3	2	1
15. People who are important to me will support me to use Facebook.	5	4	3	2	1
16. I will use Facebook in the future.	5	4	3	2	1
17. I plan to use Facebook often.	5	4	3	2	1

MOTIVATED STRATEGIES FOR LEARNING QUESTIONNAIRE

Cevap verirken aşağıdaki verilen ölçeği gözönüne alınız.

1. Beni hiç yansıtmıyor
7. Beni tam olarak yansıtıyor

Eğer ifadenin sizi
- hiç yansıtmadığını düşünüyorsanız, 1'i işaretleyiniz.
- Tam olarak yansıttığını düşünüyorsanız, 7'yi işaretleyiniz
- Bu iki durum dışında ise 1 ile yedi arasında sizi en iyi tanımladığını düşündüğünüz numarayı işaretleyiniz.

Unutmayın Doğru yada Yanlış cevap yoktur yapmanız gereken sizi en iyi tanımlayacak numarayı işaretlemenizdir.

	Beni hiç yansıtmıyor				Beni tam olarak yansıtıyor		
1. CTIS 163 – Discerete Mathematics dersinden çok iyi bir not alacağımı düşünüyorum.	1	2	3	4	5	6	7
2. CTIS 163 – Discerete Mathematics dersi ile ilgili okumalarda yer alan en zor konuyu bile anlayabileceğimden eminim.	1	2	3	4	5	6	7
3. CTIS 163 – Discerete Mathematics dersinde öğretilen temel kavramları öğrenebileceğimden eminim.	1	2	3	4	5	6	7
4. CTIS 163 – Discerete Mathematics dersinde, öğretmenin anlattığı en karmaşık konuyu anlayabileceğimden eminim.	1	2	3	4	5	6	7
5. CTIS 163 – Discerete Mathematics dersinde verilen sınav ve ödevleri en iyi şekilde yapabileceğimden eminim.	1	2	3	4	5	6	7
6. CTIS 163 – Discerete Mathematics dersinde çok başarılı olacağımı umuyorum.	1	2	3	4	5	6	7

		Beni hiç yansıtmıyor					Beni tam olarak yansıtıyor	
7.	CTIS 163 – Discerete Mathematics dersinde öğretilen becerileri iyice öğrenebileceğimden eminim.	1	2	3	4	5	6	7
8.	Dersin zorluğu, öğretmen ve benim becerilerim gözönüne alındığında, CTIS 163 – Discerete Mathematics dersinde başarılı olacağımı düşünüyorum.	1	2	3	4	5	6	7
9.	CTIS 163 – Discerete Mathematics dersinde yeni bilgiler öğrenebilmek için, büyük bir çaba gerektiren sınıf çalısmalarını tercih ederim	1	2	3	4	5	6	7
10.	CTIS 163 – Discerete Mathematics derslerinde öğrenmesi zor olsa bile, bende merak uyandıran sınıf çalışmalarını tercih ederim.	1	2	3	4	5	6	7
11.	CTIS 163 – Discerete Mathematics dersinde beni en çok tatmin eden sey, konuları mümkün olduğunca iyi öğrenmeye çalışmaktır.	1	2	3	4	5	6	7
12.	CTIS 163 – Discerete Mathematics dersinde, iyi bir not getireceğimden emin **olmasam** bile öğrenmeme olanak sağlayacak ödevleri seçerim.	1	2	3	4	5	6	7
13.	Benim için şu an CTIS 163 – Discerete Mathematics dersi ile ilgili en tatmin edici şey iyi bir not getirmektir.	1	2	3	4	5	6	7
14.	Genel not ortalamamı yükseltmek şu an benim için en önemli şeydir, bu nedenle CTIS 163 – Discerete Mathematics dersindeki temel amacım iyi bir not getirmektir.	1	2	3	4	5	6	7
15.	Eğer başarabilirsem, CTIS 163 – Discerete Mathematics dersinde sınıftaki pek çok öğrenciden daha iyi bir not getirmek isterim.	1	2	3	4	5	6	7
16.	CTIS 163 – Discerete Mathematics dersinde başarılı olmak istiyorum çünkü yeteneğimi aileme, arkadaşlarıma göstermek benim için önemlidir.	1	2	3	4	5	6	7
17.	CTIS 163 – Discerete Mathematics dersinin kapsamında yer alan konular çok ilgimi çekiyor.	1	2	3	4	5	6	7

	Beni hiç yansıtmıyor					Beni tam olarak yansıtıyor	
18. CTIS 163 – Discerete Mathematics dersindeki konulardan hoşlanıyorum.	1	2	3	4	5	6	7
19. CTIS 163 – Discerete Mathematics dersinde öğrendiklerimi başka derslerde de kullanabileceğimi düşünüyorum.	1	2	3	4	5	6	7
20. CTIS 163 – Discerete Mathematics dersinde ögrendiklerimin benim için faydali oldugunu düsünüyorum.	1	2	3	4	5	6	7
21. CTIS 163 – Discerete Mathematics dersindeki konuları öğrenmek benim için önemlidir.	1	2	3	4	5	6	7
22. CTIS 163 – Discerete Mathematics dersindeki konuları anlamak benim için önemlidir.	1	2	3	4	5	6	7
23. CTIS 163 – Discerete Mathematics dersine çalışırken kendimi çoğu zaman o kadar isteksiz ya da o kadar sıkılmış hissederim ki, planladıklarımı **tamamlamadan** çalışmaktan vazgeçerim.	1	2	3	4	5	6	7
24. CTIS 163 – Discerete Mathematics dersinde yaptıklarımızdan **hoşlanmasam bile** başarılı olabilmek için sıkı çalışırım.	1	2	3	4	5	6	7
25. Eger bir konu zorsa ya çalışmaktan vazgeçerim ya da yalnızca kolay kısımlarını çalışırım.	1	2	3	4	5	6	7
26. Konu çok sıkıcı olsa da, ilgimi **çekmese** de konuyu bitirene kadar çalışmaya devam ederim.	1	2	3	4	5	6	7

APPENDIX F

INVOLVEMENT QUESTIONNAIRE

Please answer the following questions relating to Online Social Networking

Do you use Online Social Networking websites such as **Facebook, Myspace or Xanga** (If answer **NO**, skip to **Section 2** of Survey)　　　○ Yes　　　○ No

What **Online Social Networking website** do you use the **Most**? (Check one)

- ○ FACEBOOK
- ○ MYSPACE
- ○ TWITTER
- ○ Other (Specify name)

＿＿＿＿＿＿＿＿＿＿

In a **NORMAL DAY**, how much **TOTAL TIME** per DAY do you spend on Online Social Networking websites? (If you use more than one online social networking website, add together the times from all online social networks that you visit on a daily basis)

＿＿＿＿＿ Hours

＿＿＿＿＿ Minutes

What is the **TOTAL** number of **FRIENDS** you currently have on Online Social Networks (including friends from high school, students at other colleges, and family members? ＿＿＿＿＿＿

Of your total number of Online Friends
- **a.** How many are **Bilkent University STUDENTS**? ＿＿＿＿＿＿
- **b.** How many are **FAMILY MEMBERS**? ＿＿＿＿＿＿
- **c.** How many are **OLD HIGH SCHOOL FRIENDS**? ＿＿＿＿＿＿
- **d.** How many are **STUDENTS AT OTHER COLLEGES**? ＿＿＿＿＿＿
- **e.** How many are **Bilkent University Professors, Instructors or Staff**? ＿＿＿＿＿＿

How many **ONLINE SOCAIL NETWORKING GROUPS** do you currently belong to? (For example, Dog Lovers, American student government association, Health challenge)

_____

Did you do **Any** kind of **ONLINE SOCIAL NETWORKING before** you came to college? (myspace.com; Xanga.com; facebook.com)

○ Yes   ○ No

Circle the Response that describe your feelings about the statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Online Social Networking is important to my college Social Experience	5	4	3	2	1
I have missed classes because I was doing Online Social Networking	5	4	3	2	1
Online Social Networking allows me to keep in contact with high school friends and friends from other colleges.	5	4	3	2	1
Online Social Networking is important to my college Academic Experience.	5	4	3	2	1
Online Social Networking allows me to express myself.	5	4	3	2	1
Online Social Networking allows me to stay in touch with my family.	5	4	3	2	1

Please answer the following questions relating to Online Social Networking in the course

Do you use **course Facebook page**. (If answer **NO**, you can stop answering the survey questions)

○ Yes   ○ No

Which part of the **course Facebook page** do you use **Most**? (Check one)

○ Discussions
○ Wall post
○ Events
○ Other (Specify name)

_____

In a **NORMAL DAY**, how much **TOTAL TIME** per DAY do you spend on **course Facebook page**?

——————— Hours

——————— Minutes

How many **Course ONLINE SOCAIL NETWORKING GROUPS** do you currently belong to?

———————————

Which part of the **course Facebook page** is helpful the **Most** for you? (Check one)

○ Discussions
○ Wall post
○ Events
○ Other (Specify name)

————————————

Circle the Response that describe your feelings about the statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I posted video and comments related to the course.	5	4	3	2	1
I answered other people's post and comments.	5	4	3	2	1
I used it to gain access to the course content outside sessions.	5	4	3	2	1
I posted discussion subjects.	5	4	3	2	1
I will continue to use the course Facebook page regularly now that the course has finished.	5	4	3	2	1

APPENDIX G

CODING SCHEME FOR ARGUMENTATION OF DISCUSSION POSTS

	Quality	Criteria
	6	The student states generalizations that are related to the proposition and which are clear and complete.
	4	The student states generalizations that are related to the propositions, but the assertions are not complete. Enough information is available to figure out the student's intent, but much is left to the reader to determine.
Claims	2	The student makes generalizations that are related to the proposition, but the assertions lack specificity or offer unclear referents. The student leaves much for the reader to infer in order to determine the impact of the claim.
	0	No claim related to the proposition or unclear assertions.
	6	The supporting data are complete, accurate, and relevant to the claim.
	4	The data offered are relevant but not complete. The student leaves much for the reader to infer from the data. The student may have offered the data without the complete citation, which would allow the reader to determine the reliability of the data as evidence. The student may offer data, which are not complete enough to allow the reader to determine their significance.
Grounds	2	The data or evidence are weak, inaccurate, or incomplete. For example, e. an attempt at using a general principle without establishing the truth of the principle; f. the use of examples from personal experience which are not generalizable; g. the citation of data when no source is identified; and h. the use of obviously biased or outdated material.
	0	No supporting data are offered or the data are not related to the claim.

	Quality	Criteria
Warrants	6	The student explains the data in such a way that it is clear how they support the claim.
	4	The student explains the data in some way, but the explanation is not linked specifically to the claim.
	2	The student recognizes a need to connect the data to the claim and states some elaboration of data, but the student fails to make the connection. Or most rules and principles are not valid or relevant.
	0	No rules and principles are offered
Backing	6	The student states correct, relevant, and specific sources of warrants.
	4	The student states correct, relevant sources of warrants but the sources are very general, not specific.
	2	The student states incorrect, irrelevant sources of warrants.
	0	No sources of warrants are given.
Rebuttals	6	The student states complete and systematic identification of constraints of solutions.
	4	The student identifies constraints of solutions but the constraints are not sufficient.
	2	The student offers few constraints of solutions but the constraints are not elaborated
	0	No recognition of constraints of solutions.

OUTLINE OF COURSES

Outline of CTIS 163

Course Code	CTIS 163
Course Name	Discrete Mathematics
Course Credit	4 (4 hour Lecture)
Instructors	**Duygu Albayrak** (sec: 01 & 02) **office: C212** **e-mail: duygua@bilkent.edu.tr** **http://www.bilkent.edu.tr/~duygua**
Description	This course focuses students on the construction and computation of objects. Designed as an introductory course in discrete mathematics, it serves a variety of majors, including mathematics, and computer science. Logic and proof. Elements of logic, mathematical induction and operations, relations and functions and counting methods. The course introduces algebra that directly applies to computer science. In addition to Boolean algebra, abstract data types are introduced as algebras and computational algebras. Topics include graph theory, Boolean algebra, theory of trees, combinational circuits, automata theory, grammars and languages.
Objective	To provide the student with a core mathematical terminology and concepts by emphasizing computer applications.
Text Book	Richard Johnsonbaugh, "Discrete Mathematics", Prentice Hall, 7th edition.
Other Materials	**Lecture Notes** **Reference Books:** - Melvin Hausner, "Discrete Mathematics", Saunder College Publishing Company. - John C. Molluzzo, Fred Buckley, "A First Course in Discrete Mathematics", Wadsworth Publishing Company. - Bernard Kolman, Robert C. Busby, "Discrete Mathematical Structures for Computer Science", Prentice-Hall Int.

Grading	Quizzes	30%
	Midterm	30%
	Final	40%
Important Note:	1. If you missed class more than 12 hours, you will get FX.
	2. Facebook Page - Spring 2011: CTIS 163 Discrete Mathematics
	3. 5% bonus will be given to participation on course Facebook page.

DETAILED COURSE OUTLINE

Week	Lecture Topics
Week 1 : Jan. 31 - Feb. 4	Information about the course Objective, Textbook, Grading Chapter 1: Sets and Logics 1.2 Propositions 1.3 Conditional Propositions and Logical Equivalence
Week 2 : Feb. 7 - Feb. 11	Chapter 1: Sets and Logics (Continue) 1.4 Arguments and Rules of Inference - Laws of Algebra of Propositions 1.5 Quantifiers 1.6 Nested Quantifiers Chapter 2: Proofs 2.1 Mathematical Systems, Direct Proof, and Counter examples 2.2 More Proof Methods: Proof by Contradiction, Proof by Contrapositive & Proof by Cases
Week 3 : Feb. 14 - Feb. 18	Chapter 2: Proofs 2.2 More Proof Methods: Existence Proof, Deductive Reasoning 2.4 Mathematical Induction
Week 4 : Feb. 21 - Feb. 25	Chapter 3: Functions 3.1 Functions - Graphs of Functions **Quiz I**
Week 5 : Feb. 28 - Mar. 4	Chapter 3: Functions (Continue) 3.3 Relations 3.4 Equivalence Relations 3.5 Matrices of Relations
Week 6 : Mar. 7- Mar. 11	Chapter 6: Counting Methods and Pigeonhole Principles 6.1 Basic Principles 6.2 Permutations and Combinations 6.5 Introduction to Discrete Probability 6.7 Binomial Coefficients and Combinatorial Identities

Week	Lecture Topics

Week 7 :
Mar. 14 - Nov. 18
	Chapter 8: Graph Theory
	    8.1 Introduction
	    8.2 Paths and Cycles
	    8.3 Hamiltonian Cycles and the TSP
	Midterm

Week 8 :
Mar. 21 - Mar. 25
	Chapter 8: Graph Theory (Continue)
	    8.4 A Shortest-path Algorithm
	    8.5 Representations of Graphs
	    8.6 Isomorphism of Graphs

Week 9 :
Mar. 28 - Apr. 1
	Chapter 8: Graph Theory (Continue)
	    8.7 Planar Graphs
	
	Chapter 9: Trees
	    9.1 Introduction to Trees
	    9.2 Terminology and Characterizations of Trees
	    9.3 Spanning Trees

Week 10 :
Apr. 4 - Apr. 8
	Chapter 9: Trees (Continue)
	    9.4 Minimal Spanning Trees
	    9.5 Binary Trees
	    9.6 Tree Traversals
	    9.8 Isomorphism of Trees

Apr. 11- Apr.15	**Spring Recess**

Week 11 :
Apr. 18 - Apr. 22
	Chapter 11: Boolean Algebras and Combinatorial Circuits
	    11.1 Combinatorial Circuits
	    11.2 Properties of Combinatorial Circuits
	    11.3 Boolean Algebras
	Quiz II

Week12 :
Apr. 25 - Apr. 29
	Chapter 11: Boolean Algebras and Combinatorial Circuits (Continue)
	    11.4 Boolean Functions and Synthesis of Circuits
	    11.5 Applications

Week 13 :
May 2 - May 6
	Chapter 12: Automata, Grammars, and Languages
	    12.1 Sequential Circuits and Finite-State Machines
	    12.2 Finite-State Automata

Week 14 :
May 9 - May 13
	Chapter 12: Automata, Grammars, and Languages (Continue)
	    12.3 Languages and Grammars
	    12.4 Nondeterministic Finite-State Automata
	Review

May 16 - May 27	**FINAL EXAMS**

Outline of CTIS 151

Course Code	CTIS 151
Course Name	Introduction to Programming
Course Credit	5 (4 hour Lecture + 4 hour Lab)
Instructors	Ayşın Örkçüoğlu (sec. 01/03) office: C213 e-mail: aysino@bilkent.edu.tr Duygu Albayrak (sec. 02) office: C212 e-mail: duygua@bilkent.edu.tr
Assistants	Hatice Yılmaz (sec. 01/02) office: C220 e-mail: yilmazh@bilkent.edu.tr Ceren Alparslan (sec. 03) office: C206 e-mail: cserim@bilkent.edu.tr
Description	An introduction to programming from both design and programming standpoints. Syntax and semantics of programming languages. Programming style. Program debugging and testing. Data representation. Simple arithmetic expressions, decision and control statements. Arrays. Introduction to standard libraries. Structured programming technique will be introduced along with the usage of C language.
Text Book	Problem Solving and Program Design in C, Jeri R. Hanly, Elliot B. Koffman, Addison Wesley, Sixth Edition, 2010
Other Materials	Lecture Notes Reference Book: C How to Program, Deitel & Deitel, Prentice Hall, Fifth Edition, 2007
IMPORTANT NOTES	1. Facebook page: Spring 2011-CTIS 151Introduction to Programming 2. Students who are absent in more than 12 lecture hours will not be allowed to take the rest of the exams, and will get an FX grade. 3. Students who are absent in more than 8 lab hours will not be allowed to take the rest of the lab quizzes, and will get 0 from Lab Work and Performance. 4. Some of the lecture quizzes will be pop-quizzes. 5. NO make-up will be given for lecture and lab quizzes. 6. 5% bonus will be given to class participation.

Grading

Lab Work	**20%**
Performance	**5%**
Lab Exam	**25%**
Lecture Quizzes	**10%**
Midterm	**15%**
Final	**25%**

Catalog

A	**90 – 100**
A-	**85 – 89**
B+	**80 - 84**
B	**75 - 79**
B-	**70 - 74**
C+	**65 - 69**
C	**55 - 64**
C-	**50 - 54**
D+	**45 - 49**
D	**40 - 44**
F	**0 - 39**

DETAILED COURSE OUTLINE

Week	Lecture Topics	Lab. Objectives

1
 	
Jan. 31 -
Feb. 04
	Information about the course
	    Objective
	    Textbook
	    Grading
	
	Introduction to Programming
	    Software Development Method
	Expressing Algorithms
	Introduction to Programming Languages
		NO LAB

2
 	
Feb. 07 -
Feb. 11
	Introduction to Computers
	    Computer Hardware
	    Computer Software
	Steps in Developing a C Program
	
	Structure of a C Program
	    Comments
	    Preprocessor Directives
	    Main Function Prototype
	    Variable Declarations
	Data Representation
	    Reserved Words, Identifiers, Variables
		NO LAB

3 **Feb. 14** **Feb. 18**	Data Types, Constants Declaration and Assignment Statements Arithmetic Operators (+, -, *, /, %) Arithmetic Expressions I/O Statements: **printf** and **scanf**	**Lab 1:** General Information. Learning the Structure of the Software (Visual C++) **NO LAB**

233

Week	Lecture Topics	Lab. Objectives
4 **Feb. 21 -** **Feb. 25**	Formatting Output Built-in Functions Boolean Operators Relational Logical Precedence of Operators Simple Boolean Expressions Compound Boolean Expressions	<u>**Lab 2:**</u> Getting acquainted with the development environment Running a simple C program <u>**Lab 3:**</u> Data Types, Constants, Arithmetic Operations
5 **Feb. 28 -** **Mar. 4**	Selection Structures Simple if Statement if … else Nested if Statement	<u>**Lab 4:**</u> Formatting Output, Built-in Functions, Arithmetic problems **Quiz 1**
6 **Mar. 7 -** **Mar. 11**	switch Statement Counter-controlled Repetition (**for** Loops) **LECTURE QUIZ**	<u>**Lab 5:**</u> Relational and Logical Operators, if and if…else Statements
7 **Mar. 14 -** **Mar. 18**	Increment – Decrement Operators Using for Loops Examples with for Loops Sentinel-controlled Repetition (**while** Loops)	<u>**Lab 6:**</u> Nested if Statement switch Statement **Quiz 2**
8 **Mar. 21 -** **Mar. 25**	Data Validation **do..while** Loops Nested Loops Loop Conversions Examples with Repetition Statements	<u>**Lab 7:**</u> Counter-controlled Repetition Sentinel-controlled Repetition <u>**Lab 8:**</u> Sentinel-controlled Repetition Data Validation
9 **Mar. 28 -** **Apr. 1**	Modular Programming Function Prototype void functions with no parameters void functions with parameters Functions that return a value Parameter Passing Formal and Actual Parameters Scope of Variables **MIDTERM**	<u>**Lab 9:**</u> Data Validation Nested Loops **Quiz 3**

Week	Lecture Topics	Lab. Objectives

10
 	
Apr. 4 -
Apr. 8
	Functions with Output Parameters
	    Pointers
	    Call by Value – Call by Reference
	
	File Operations
	    Opening, reading, writing, closing text
	    files
		Lab 10:
		Modular Programming
		
		Quiz 4

Apr. 11 - **Apr. 15**	**Mid Semester Break – No Classes**	

11
 	
Apr. 18 -
Apr. 22
	One-dimensional Arrays
	    Declaration, Assignment, Initialization
	    Parallel Arrays
	
	Operations on One-dimensional Arrays
	    Input / Output (getchar, putchar)
	    Counting
	    Find sum, average, min, max
		Lab 11:
		Functions with Output
		Parameters
		File Operations
		
		Quiz 5

12
 	
Apr. 25 -
Apr. 29
	One-dimensional Arrays and Functions
	    Arrays as Input Parameters
	
	One-dimensional Arrays and Functions
	    Arrays as Output Parameters
		Lab 12:
		One-dimensional Arrays
		Parallel Arrays
		
		Quiz 6

13 **May 2 -** **May 6**	Two-dimensional Arrays Declaration, Initialization, Operations Matrix Operations	**Lab 13:** One-dimensional Arrays and Functions **Quiz 7**
14 **May 9 -** **May 13**	Two-dimensional Arrays as Function Parameters Exercises with Two-dimensional Arrays Exclusive Type Conversion	**Lab 14:** Two-dimensional Arrays **Lab 15:** Two-dimensional Arrays and Functions **LAB EXAM**
May. 16 - **May. 27**	**Final Exams**	

SCREENSHOTS FROM COURSES ON FACEBOOK

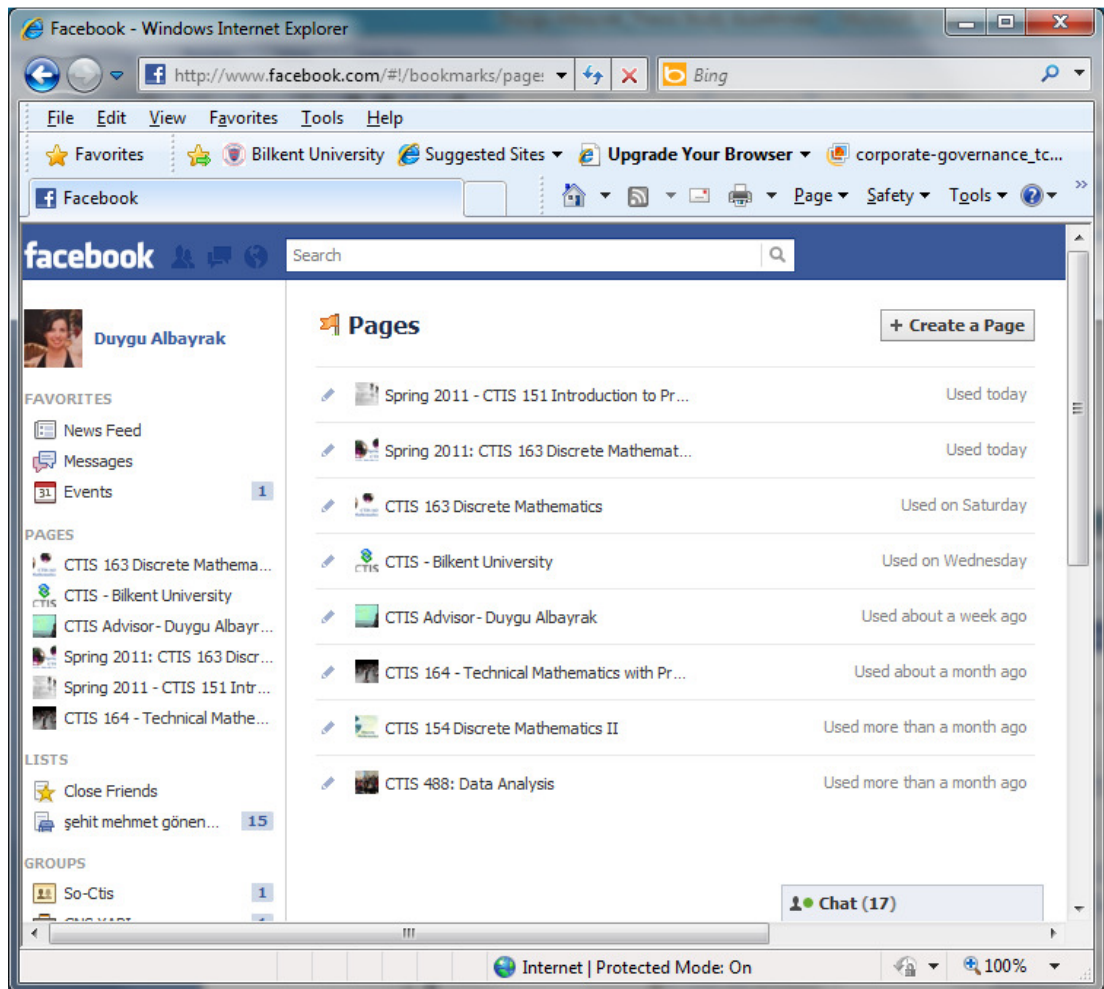### Screenshots from CTIS 163 Facebook Page

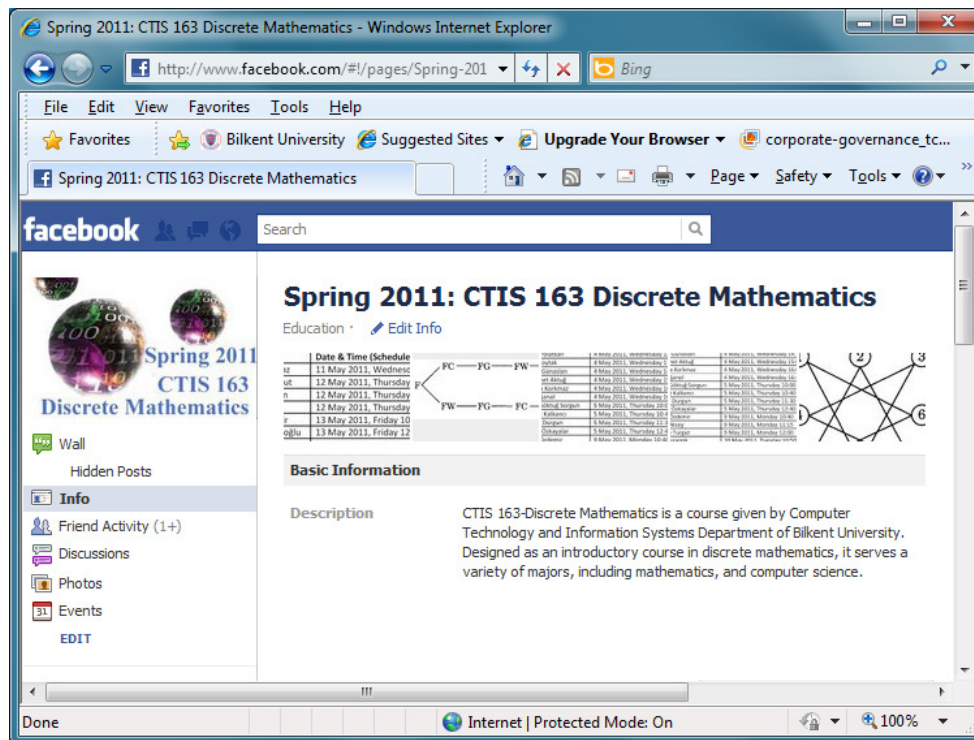**Figure 22:** The General Entrance of Facebook Pages of the Researcher

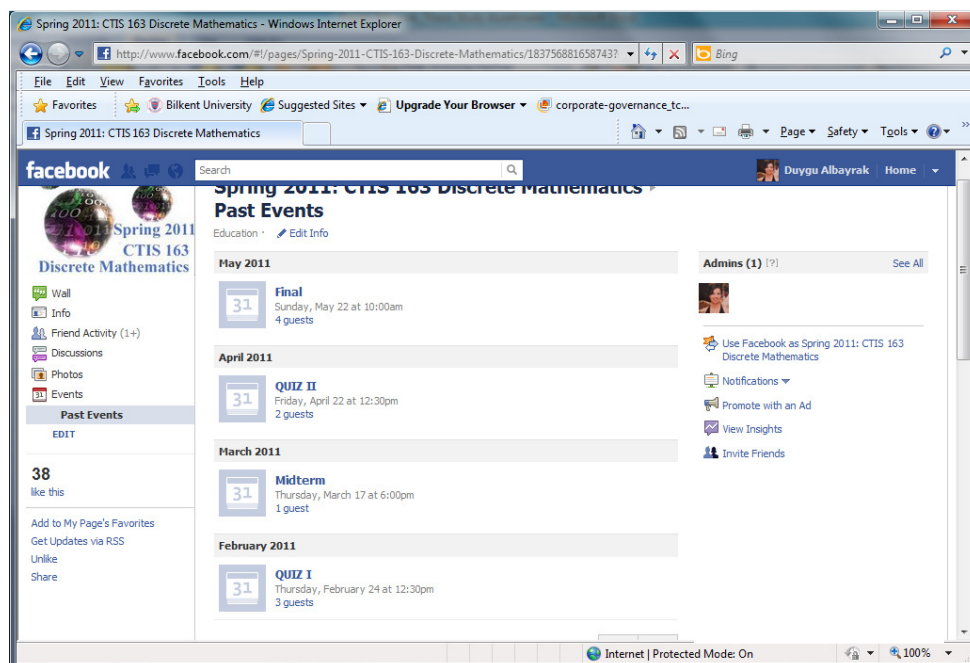**Figure 23:** Info Tab of CTIS 163 Facebook Page

Figure 24: Info Tab of CTIS 163 Facebook Page

Figure 25: Friends Activity Tab of CTIS 163 Facebook Page
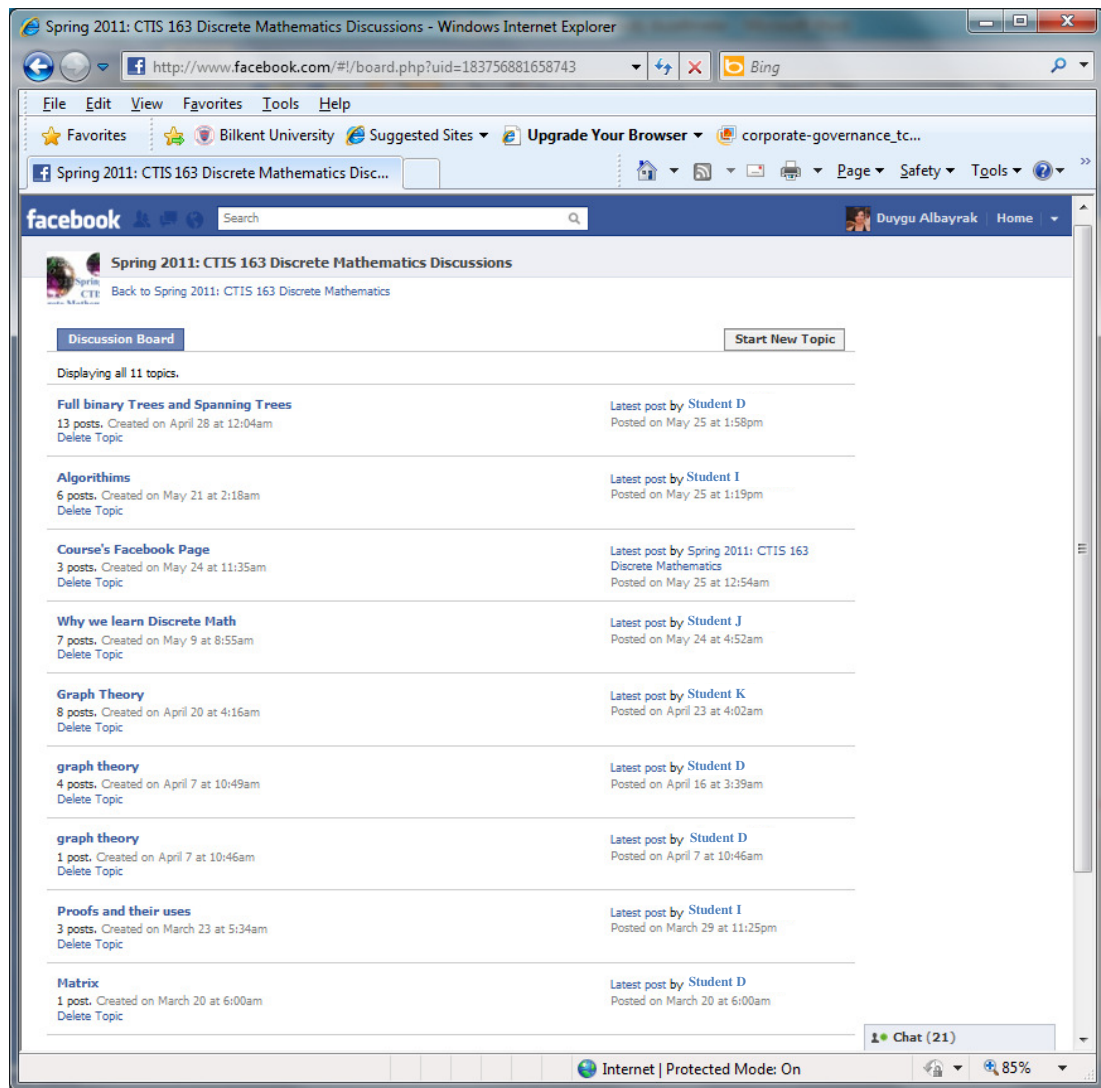

Figure 26: Photo Tab of CTIS 163 Facebook Page

Figure 27: Discussion Board of CTIS 163 Facebook Page

Figure 28: The General Outlook of CTIS 163 Facebook Pages Wall

CIRRICULUM VITAE

PERSONAL INFORMATION

Surname, Name: Albayrak, Duygu
Nationality: Turkish (TC)
Date and Place of Birth: 27 January 1973, Bandırma
Marital Status: Single
Phone: +90 312 290 5039
Fax: +90 312 290 5908
e-mail: duygua@bilkent.edu.tr

EDUCATION

Degree	Institution	Year
Ph.D. (incomplete)	METU Information Systems	-
MS	METU Physics	2000
BS (Double Major)	METU Physics	1997
BS	METU Physics Education	1997
High S.	Bandırma Şehit Mehmet Gönenç Lisesi	1990

WORK EXPERIENCE

Year	Place	Enrollment
1998 - present	Bilkent University, Computer Technology and Information Systems,	Instructor
Spring, 1998	METU, Physics	Teaching Assistant
1997 – 1998	Bilkent University, Computer Aided Accounting	Part-Time Instructor
1997 – 1998	United Nation	Part-Time Instructor
Spring, 1997	TED College	Trainee

FOREIGN LANGUAGES

Fluent English

PUBLICATIONS

Book Chapters

Albayrak D. (2002) Chapter: Vitamin İlköğretim Fen Bilgisi Öğretmen Kitabı: Durgun Elektrik ve Elektrik Akımı

Albayrak D. (2002) Chapter Review: Vitamin İlköğretim Fen Bilgisi Öğretmen Kitabı: Hareket

International Journal Papers

Albayrak, Ö., & Albayrak, D. (2009). The Impact of Software Development Companies' on Software Engineers' Responses to Incomplete Requirements. *International Journal of Information Studies, IJIS, Vol 1, No:4*, 273-280.

İşeri E., Albayrak D., & Gülen D, (2001). Electronic excited states of the CP29 Antenna Complex of Green Plants: A Model Based on Exciton Calculations. *Journal of Biological Physics 26:* 321-339. (SCI)

National Journal Papers

Büyükimdat K. M, Albayrak D., Erdoğmus U. F., Yıldırım S., Eryol G. & Ataman E. Y (2011). An Assessment of Facebook as a Professional Development Tool for Preservice Teachers. *Ahi Evran Üniversitesi Eğitim Fakültesi Dergisi Volume 12 Issue 2,* pp. 119-134.

Proceedings and Scientific Presentations (<u>International</u>, in English)

Yıldırım S., Erdoğmuş F., Köskeroğlu M., Albayrak D., Ataman E. Y. and Eryol G. (2010). An assessment of Facebook as a professional development tool for preservice teachers. *4th International Computer & Instructional Technologies Symposium (ICITS, 2010), Konya, 24-26 October 2010.*

Albayrak, Ö., Albayrak, D. & Kilic, T. (2009). Are Software Engineers's Responses to Incomplete Requirements Related to Project Characteristics?. *The Second International Conference on the Applications of Digital*

Information and Web Technologies (ICADIWT 2009), pp.124-129, London, August 2009

İşeri E., Albayrak D., & Gülen D. (2000) "Electronic excited states of the CP29 and LHCII antenna complexes of green plants", Photophysics and Photochemistry 2000, Costa do Estoril, Portugal, 18-21 October 2000.

İşeri E., Albayrak D., & Gülen D. (2000) "Chlorophyll transition dipole moment orientations and pathways for flow of excitation energy among the chlorophylls in CP29 and LHCII", 1st General Meeting of the ESF/ULTRA Programme, Coimbra, Portugal, 23-25 October 2000.

Proceedings and Scientific Presentations (<u>National</u>, in Turkish)

Çildan C., Ertemiz M., Küçük E., Tumuçin H. K. & Albayrak D. (2012) "Sosyal Medyanın Politik Katılım ve Hareketlerdeki Rolü" Akademik Bilişim 2012 Konferansı, Uşak, 1 February 2012.

Albayrak, Ö. & Albayrak, D. (2006) "Yazılım Mühendisleri Eğitiminde Açık ve Kapalı Kaynak Sınav Uygulamaları," EMO Yazılım Mühendisleri Eğitim Sempozyumu, İstanbul, 17 November 2006.

Albayrak D. (2003) "Uzaktan Eğitimin Etkinliğini Artırmaya Yönelik Bir Model", Bilişim Teknolojileri Işığında Eğitim (BTIE 2003), ODTÜ-Türkiye, 21-23 Mayıs 2003.

HOBBIES

Ballroom dancing, Swimming, Chess playing, Puzzle solving