COMMUNITY OF INQUIRY FRAMEWORK AS A PREDICTOR OF
SELF-REGULATED LEARNING IN
AN ONLINE CERTIFICATE PROGRAM

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ABSTRACT

COMMUNITY OF INQUIRY FRAMEWORK AS A PREDICTOR OF SELF-REGULATED LEARNING
IN AN ONLINE CERTIFICATE PROGRAM

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The primary purpose of this research is to shed light on the strength and direction of the relationship between community of inquiry and online self-regulated learning of adult learners enrolled in online Information Technologies Certificate Program (ITCP). This program which is carried out with the collaboration of Continuing Education Center and Computer Engineering Department in Middle East Technical University (METU)embodies synchronous and asynchronous communication methods over the Internet.

In line with the aforementioned purpose, three research questions are addressed. In the first question, it is investigated that to what extent learners' characteristics and COI presence predict their online self-regulated learning. In the second question, on the other side, it is explored that to what extent learners' characteristics and self-regulated learning predict their COI presences. The sample includes 92 participants who enrolled in this online program in 2014-2015. A quantitative data collection method is used by employing survey technique.

The major findings acquired from Spearman's Correlation, Pearson Correlation Analyses and Multiple Regression Analyses revealed that demographic variables including age and gender did not show any statistically significant correlation with both online self-regulated learning and community of inquiry presences. However, three presences: teaching presence, cognitive presence and social presence were found positively correlated with each other and self-regulated learning and its subscales, except environment structuring, displayed statistically significant, positive correlation with three presences. Finally, Multiple Regression Analyses unveiled that self-regulated learning was explained by higher levels of social presence. Similarly, social presence was significantly predicted by self-regulated learning and its subscales including task strategies, time management, help-seeking and self-evaluation.

Keywords: Community of Inquiry, Social Presence, Cognitive Presence, Teaching Presence, Self-regulated Learning.

ÖZ

BİR ÇEVRİMİÇİ SERTİFİKA PROGRAMINDA ÖZDÜZENLEYİCİ ÖĞRENMENİN YORDAYICISI OLARAK SORGULAMA TOPLULUĞU

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Bu çalışmanın temel amacı çevrimiçi Bilgi Teknolojileri Sertifika Programına (BTSP) katılan yetişkin öğrencilerin sorgulama topluluğu buradalıkları ile özdüzenleyici öğrenme yetenekleri arasındaki ilişkinin boyutunu ve yönünü incelemektir.BTSP, Orta Doğu Teknik Üniversitesi'nde Sürekli Eğitim Merkezinin ve Bilgisayar Mühendisliğinin ortaklığında yürütülen senkron ve asenkron iletişim özelliklerine sahip bir sertifika programıdır.

Belirtilen hedef doğrultusunda oluşturulan üç adet araştırma sorusu bu çalışmaya yön vermiştir.İlk araştırma sorusunda, öğrencilerin bireysel özellikleri, araştırma topluluğu buradalıkları ve çevrimiçi özdüzenleyici öğrenme davranışları arasındaki ilişkinin boyutu ve yönü incelenmiştir. İkinci soruda ise öğrencilerin araştırma topluluğu buradalıklarının çevrimiçi özdüzenleyici öğrenmeyi ne derecede yordadığı irdelenmiştir. Öte yandan üçüncü soruda, öğrencilerinçevrimiçi özdüzenleyici öğrenme davranışlarınınaraştırma topluluğu buradalıklarınıne derecede yordadığı araştırılmıştır. 2014-2015 yılında BTSP'ye kayıtlı 92 katılımcı bu çalışmanın örneklemini oluşturmuştur.Başvurulan anket tekniği ile nicel bir veri toplama gerçekleşmiştir.

Yapılan Spearman ve Pearson Korelasyon Testleri ve Çoklu Regresyon Analizleri göstermiştir ki, katılımcıların demografik özellikleri ne çevrimiçi özdüzenleyici öğrenme yeteneği ile ne de araştırma topluluğu buradalığı ile istatistiksel olarak anlamlı bir ilişki göstermiştir.Fakat bilişsel buradalık, toplumsal buradalık ve öğretimsel buradalık hem birbiri ile hem de ortam yapılandırma dışındaki çevrimiçi özdüzenleyici öğrenme davranışları ile pozitif ilişki gösterirmiştir. Son olarak, Çoklu Regresyon Analizi ise çevrimiçi özdüzenleyici öğrenmenin, toplumsal buradalık tarafından yordanabildiğini ortaya koymuştur.Benzer şekilde, toplumsal buradalık da görev stratejileri, zaman yönetimi, yardım arama ve öz değerlendirme gibi öz düzenleyici davranışlar tarafından açıklanabilmiştir.

Anahtar Kelimeler: Araştırma Topluluğu, Toplumsal Buradalık, Bilişsel Buradalık, Öğretimsel Buradalık, Çevrimiçi Özdüzenleyici Öğrenme.

To my beloved parents,

Mahi & Durmuş Başdoğan

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COI   Community of Inquiry

CP   Cognitive Presence

ITCP   Information Technologies Certificate Program

SP   Social Presence

SRL   Self-regulated Learning

TP   Teaching Presence

CHAPTER 1

INTRODUCTION

It is undeniable that technology is shaping the way people work and live profoundly. Parallel to progresses in technology, the field of education experience chance pertaining to instructional strategies, content delivery tools, assessment techniques, teaching and learning models. In essence, using technology for educational purposes is not a new phenomenon. A half-century ago it was initiated by radio, television and followed by electronic media and the rapid expansion of the Internet enhanced its scope. Currently, technology has been implemented in many forms such as videos, wiki sites, smartphones, tablets, podcasting, blogging, simulations and many others. However, among all forms of technology, online education has changed drastically the face of how education is delivered to students (Graber & Chodzko, 2014).

Along with the astonishing growth of Internet use, a tremendous trend towards online learning systems occurred all over the world (Herbert, 2006), and it is becoming a part of long-term strategy for most schools (Allen & Seaman, 2010). Students prefer this form of learning for many reasons like individualization, time, flexibility and low cost in relation to travel or relocation. More importantly, online learning sometimes can be considered as a necessity to be a lifelong learner and to acquire 21st century competencies. Deep understanding and ability of creative connections to build new insights, new understandings or new products are considered as 21st century competencies (Dumont & Istance, 2010). Therefore, the opportunity provided by online education enables people to acquire the necessary competencies in order to improve the quality of their present and future lives and, finally, to fulfil their aspirations.

Despite many advantages aforementioned earlier, considerable challenges also exist regarding online education. First and foremost, as Wolfe (2000) utters, online education programs assign more demands on students enrolled in online programs. Students are expected to have numerous lifelong learning skills and abilities like metacognition, time management, goal-setting, task planning, strategy selection, resource selection and evaluation (Grabinger & Dunlap, 2000). To put it differently, students should be self-regulated learners. Secondly, sense of isolation and loneliness is a common complaint in online learning due to the lack of face-to face contact. It is emphasized that when this feeling of isolation is combined with confusion, lack of guidance and anxiety, dropout becomes inevitable (King, 2002). Hence, the purpose of online learning should be to help learners become more successful and satisfied in the online platform.

Self-regulated learning has been receiving salient attention in the literature. It is crucial in not only traditional learning but also online learning since information era requires people who are autonomous in their own learning (Boekaerts et al., 2000). In the same fashion, Community of Inquiry Model (Garrison, Anderson, & Archer, 2000) including three constructs teaching presence, social presence and cognitive presence is crucial to diminishing the feeling of isolation, to produce better interaction and to enhance learning in online environments. Therefore, there are plentiful published studies in relation to self-regulated learning and Community of Inquiry Model in the literature. Current study will supplement this growing field of research by investigating the degree of self-regulation and community of inquiry presences of participants in an online certificate program.

In this chapter, background of the study, statement of the purpose, research questions, significance of the study, assumptions, limitations, definitions of key terms, overview of thesis and summary of the chapter are presented.

1.1 Background of the Study

Learners studying within contemporary academic contexts have experienced new challenges due to the development of Information Technology. These challenges include need of continuous updated training and fundamental skills such as

information searching, selection, evaluation and capability of self-regulation (Simão, Duarte, & Ferreira, 2008). In essence, mentioned skills are highly similar to the 21st century skills addressed by The Partnership for 21st Century Skills organization. The purpose of this organization is building a consensus about the nature and requirements for 21st century skills by synthesizing related research, insights and best practices. It emphasizes that students should have a metacognitive approach to think about how they learn and also control, monitor and evaluate their own learning progress (Partnership for 21st Century Skills, 2009a). That is to say, learners are expected to regulate their own learning process by analyzing their needs, selecting appropriate resources and transferring knowledge to distinct contexts. This expectation is valid not only for students but also for workers.

The enormous advances in technology have altered workplaces as well. Currently, adults are required to work in a vibrant, multitasking, multifaceted and technology-driven context; thus, adapting to changing needs and juggling multiple liabilities which are the features of employees that successful businesses place value (Stuart & Dahm, 1999). Hence, accessing new knowledge, using new technologies, rapidly processing information, making decisions and communicating effectively are the paramount features that workers should have. Herein lifelong learning appears as a central pillar of the new economy. 21st Century Skills for 21st Century Jobs Report (1999) outlines the shift in the worker, workplace and work characteristics parallel to the continuous change (Table 1).

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Table 1.1 Shift in the characteristics of worker, workplace and work (Stuart & Dahm, 1999)

Element	20th Century	21st Century
Workplace organization	• Hierarchical • Rigid • Specialized	• Flat • Flexible • Multi/cross-functional teams
Job design	• One job • Repetitive/standardized	• Many jobs • Multiple responsibilities
Employee skills	• Specialized	• Multi/cross-skilled
Workforce management	• Command/control systems	• Self-management
Communications	• Top down • Need to know	• Widely diffused • Big picture
Decision making responsibility	• Chain of command	• Decentralized
Direction	• Standard procedures	• Constant change
Worker autonomy	• Low	• High
Employee knowledge of organization	• Narrow	• Broad

It is not surprising that the shift in jobs requires additional education and training. Changing trends in business and technology is creating a competitive environment in which lifelong training becomes vital. Stuart and Dahm (1999) indicate that the fields ‒database administrating, computer engineering, and systems analysis- will require more education and training.

Parallel to aforementioned worldwide trends, in Turkey, the first online training called Information Technologies Certificate Program (ITCP) was launched in 1997 by Middle East Technical University (METU) (Yukselturk, 2010). The central purpose of ITCP was to fulfill the growing demand in the computer technologies field by providing online information technologies courses such as Computers

Systems and Structures, Computer Programming with Java I, Computer Programming with Java II, Operating Systems with UNIX, Data Structures and Algorithms with C++, Software Engineering, Database Management Systems and Computer Networks (Yukselturk, & Bulut, 2009). Nowadays, increasing number of universities are adopting e-learning in their on-campus and off-campus programs. The scope of the programs includes a vast area from in-service teacher training to undergraduate, master's, and doctoral degrees (Latchem et al, 2009). However, there is a lack of instructional design expertise for online programs (Aydin, Mutlu, & McIsaac, 2006). Understanding the characteristics of successful e-learners and requirements of effective e-learning environments plays a crucial role for achievement. Instructional Technology Council (2010) indicates that online learning environments require not only access to technology but also heavy workload and self-regulation. Additionally, it is stressed that teaching presence, cognitive presence and social presence are the necessary factors affecting students' behaviors to self-regulate their learning. Therefore, there is an ample amount of study demonstrating that self-regulation is gaining attention in the research about the community of inquiry model (Garrison & Akyol, 2013; Shea & Bidjerano, 2010).

The Community of Inquiry (CoI) framework was developed to examine the effective online learning environment in which deep and meaningful learning experiences take place (Garrison, Anderson, & Archer, 2000). In online environments, establishing a sense of community is needful for student achievement, satisfaction, interaction and also socialization (Wiesenfeld, 1996; Palloff & Pratt, 2007; Brindley, Walti, & Blaschke, 2009). CoI framework assumes that learning occurs within the community through the interaction of three overlapping constructs: teaching presence, social presence, and cognitive presence

Teaching presence refers to the selection, organization, designing, facilitation and direction of learning process to reach meaningful and educationally worthwhile learning outcomes (Anderson, Rourke, Garrison, & Archer, 2001). Hence, instructional design and organization, facilitating discourse and direct instruction are core techniques to create teaching presence in online learning environments. Social presence is described as the degree to which a person is perceived as 'real' in

mediated communication through use of indicators like emotional expression, open communication, and various means (Garrison et al., 2000). Cognitive presence finally maintains the extent to which participants are able to construct meaning through critical thinking and reflection (Garrison et al., 1999).

As for Self-regulated Learning (SRL), as it is stated earlier, the ability of self-regulation is considered one of the most salient competencies for the 21st century. Self-regulation is studied in a variety of non-educational domains such as emotion, chronic illness, smoking, exercise, eating and shopping (Boekaerts, Pintrich, & Zeidner, 2000) in order to analyze how individuals take an active, purposeful and reflective role in their own functioning or behavior. Similarly, in academic context, it aims to understand how students take an active role in maintaining their own academic functioning (Zimmerman & Schunk, 2001). Self-regulation emphasises the 'personal initiative, perseverance and adaptive skill' of the individual learner (Zimmerman, 2001). Hence, it has received considerable attention in the online learning field. It is seen as an indicator of improvement in achievement, satisfaction and engagement (Pintrich & DeGroot, 1990; Wolters, 2010; Boekaerts ve Corno, 2005).

Considering the solitary nature of online environments, individual's ability to direct and manage the learning process becomes significant. Students are, for instance, expected to set goals, have appropriate studying methods and effectively manage time and resources. To put it differently, they are required to have an active mind while intereacting with endless amounts of data in the online learning environment (Carrier, 1984). For these reasons, online environment is an ideal place to investigate the existence of SRL (Anderton, 2006).

Previous research unveils that students who are not capable of regulating their own learning in computer based learning environments have much less skills to acquire deep knowledge and conceptual understanding compared to their peers who have self-regulation. (Winne & Hadwin, 2008; Zimmerman, 2000; Shapiro, 2008). Additionally, Schunk and Zimmerman (1998) state as follows regarding self-regulation:

> "...In distance education, self-regulation seems critical due to the high degree of student independence deriving from the instructor's physical absence. In particular, we recommend research on the type of self-regulatory strategies that allow good distance learning" (p. 230).

Shea and Bidjerano (2010) signified the role of context on self-regulated learning in online collaborative environments. Therefore, they propose that self- and co-regulation can enhance the scope of CoI framework. In another study, Shea and et al. (2011) examined the student discussion forms and found students behaviors such as setting goal, time management and task division. These activities were viewed as the indicators of online learner self- and co-regulation. As a result, it was concluded that a forth construct -learner presence- should be added to the CoI framework. Learner presence is defined by researchers as the degree to which students in collaborative online educational environments are metacognitively, motivationally, and behaviorally active participants in the learning process. However, researchers Akyol and Garrison, who are eminent by their studies on CoI framework, oppose this idea and state that creation of a fourth presence would undermine the integrity of the CoI framework (2011). Instead of integrating a new presence, they focus on metacognition construct that has already existed at the intersection of the cognitive and teaching presence.

It apparently seems that self-regulated learning indicators and their relation with three Community of Inquiry presence is a debatable issue in the literature. Therefore this study may supplement the existing debate in online learning literature by investigating to what extent self-regulated learning predicts community of inquiry presences and vice-versa.

1.2 Statement of Purpose

Technology is a driving force in most sectors and field of education is one of them. With the increasing popularity of online delivery, many education institutions initiated to offer online full degree programs, courses, and training programs. Information Technologies Certificate Program (ITCP) launched in Turkey by the Middle East Technical University (METU) with the collaboration of METU

Computer Engineering Department and METU Continuing Education Center is pioneer in online training field. Like ITCP, all the online programs' purpose should be to help participants become more successful, self-regulated and social online learners. Self-regulated learning and Community of Inquiry are core issues in online learning environments to diminish the feeling of isolation, to increase autonomous learning, to produce better interaction and finally to enhance learning.

First and foremost, this study is expected to shed light on the strength and direction of the relationship between online self-regulated learning and community of inquiry in adult learners enrolled in an online certificate program. Additionally participant characteristics in relation to age, gender, previous attendance, the number of logins per week contributing to their teaching presence, social presence, and cognitive presence will be explored on one hand with self-regulated learning degree on the other. In line with this purpose, data are going to be gathered from students enrolled in online ITCP in a quantitative way.

1.3 Research Questions

As explained earlier, this study aims to identify the relationship between adult learners' characteristics in relation to age, gender, previous attendance, the number of logins per week, community of inquiry presences consisting of teaching presence, social presence, cognitive presence and online self-regulated learning including six subscales which are goal setting, environment structuring, task strategies, time management, help seeking and self-evaluation in an online instructional setting called Information Technologies Certificate Program (ITCP). The following research questions are going to guide the current research:

(1) What is the nature of relationship between learners' characteristics, COI presences and online self-regulated learning?

(2) To what extent do learners' COI presences predict their self-regulated learning?

(3) To what extent does learners' self-regulated learning predict their COI presences?

1.4 Significance of Study

In an information society, as Doyle (1994) suggests, learning how to learn is a key to success and life-long learning. This suggestion is valid in online learning programs. By the dramatic increase in the number of online learning programs, it seems essential to explore the features of effective online learning environment and successful participant characteristics. When the literature is reviewed meticulously, it is seen that self-regulated learning and Community of Inquiry framework have a significant place in the design and evaluation of online learning platforms.

The findings of current research will provide recommendations to guide students participating in an online course. If it is determined that certain learner characteristics such as the number of log in per week and self-regulation scores are correlated with achievement, administrators can make decisions regarding helping students in the implementation of self-regulated learning strategies for successful learning outcome.

Furthermore, the findings will help to evaluate the current situation of online ITCP. It is reported that about 35 % of this program participant did not complete program in the last three years (Yukselturk & Inan, 2006). In 2015 the percentage is approximately 41% which is a high rate. If it is determined that students' sense of teaching presence, social presence and cognitive presence is low, the instructional design methods may be altered to enhance learning and course completion rate.

1.5 Definitions of Key Terms

Community of Inquiry which is developed by Garrison, Anderson, and Archer (2000) has been widely applied to research on asynchronous learning environments is a framework suggesting that that learning occurs within a community through the interaction of three core constructs teaching presence, social presence, and cognitive presence.

Cognitive presence is a component of Community of Inquiry framework and refers to the extent to which participants are able to construct meaning through critical thinking and reflection(Arbaugh, 2007).

Interaction, thatis core of social constructivist learning, is defined as reciprocal events occurring between at least two objects which mutually influence one another (Wagner, 1994).

Self-directed Learning is defined by Knowles (1975) as an instructional process in which learners take initiative, diagnose their own learning needs, define learning objectives, decide materials and information sources and, at the end evaluate learning outcomes.

*Self-regulated Learning*is a micro level of Self-directed Learning and refers to a constructive learning process in which learners are metacognitively, motivationally, and behaviorally active by monitoring, regulating and controlling their learning and actions (Pintrich, 2000).

Sense of Community refers to people's feeling of belonging to a group whose members share common goals and needs (McMillan & Chavis, 1986).

Social presence refers to the ability of participants to project themselves as 'real' in an online community through use of indicators like emotional expression, open communication, and various means (Garrison et al., 2000).

Teaching presence is also one of the constructs of Community of Inquiry model. It refers toselection, organization, designing, facilitation and direction of learning process to reach meaningful and educationally worthwhile learning outcomes (Anderson, Rourke, Garrison, & Archer, 2001).

CHAPTER 2

LITERATURE REVIEW

The central purpose of this study was to explore the strength and direction of the relationship between online self-regulated learning and community of inquiry in adult learners enrolled in an online certificate program. The second purpose is to investigate participant characteristics in relation to age, gender, previous attendance, the number of logins per week contributing to their teaching presence, social presence, and cognitive presence on one hand self-regulated learning elements including goal setting, environment structuring, task strategies, time management, help seeking and self-evaluation on the other.

This chapter will lay a theoretical and research foundation providing analysis and synthesis of past studies for the proposed study. The literature review begins by discussing the exact definition of adult learning and its distinctions from lifelong learning and continuing education. This is followed by the traditional theories of learning which are behaviorism, humanism, cognitivism, social cognitivism and constructivism. Next, the eminent adult learning theory "Andragogy" defined by Malcom Knowles (1980) as -the art and science of helping adults learn- were introduced. Additionally, andragogy's fundamental assumptions were formulated. Following that, a broad overview of the self-regulated theory (SRL) was provided. In the next section SRL and 21st century competencies were compared as a result distinctions and similarities were presented. Furthermore, the empirical studies exploring the relationship among SRL, academic achievement and engagement. Then, a connection is made between SRL and online learning and relevant literature was reviewed. Finally, the community of inquiry model (Garrison, Anderson

&Archer, 2000) and its three components- cognitive presence, teaching, and social presence, were discussed and research on these areas were explored.

2.1 Adult learning in 21st Century

The United Nations Educational, Scientific and Cultural Organization (UNESCO) (1975) describes adults as people who are not in regular schools or university systems and generally older than 15. On the other hand, Rogers (2002) avers that most people tend to consider "adult" in terms of age but age is not a sufficient criterion to define adult. He adds that legal and social responsibilities vary in different countries and cultures in different ages. Although there are common characteristics of adulthood among countries such as self-control, autonomy, far-sightedness, experience and multi-level liabilities, it is hard to claim that to be an adult, people need to possess all mentioned traits Rogers (2002). Consequently, in 1976, UNESCO brings a new definition for the term "adult". It declares that adults are people whom their own society deems to be adult, to put it differently; an adult is both recognized by others and self-recognizing.

Continuing education (CE) and lifelong learning (LLL) are frequently used in adult learning literature. These terms are synonyms that all indicate to an educational or training process which is the fundamental tool for an organization to be successful (Laal et al, 2014). However there are slight differences between them. For example, the emergence of continuing education dates back to 1960. At first, it emphasized the unity of education for both children and adults and it was associated with the slogan –from the cradle to the grave-. In time, the scope of the term was narrowed and it is currently used for institution-controlled professional and vocationally oriented learning programs (Rogers, 2002). As for lifelong education, it is defined as all learning activities undertaking throughout a lifetime, with the goal of improving knowledge, skills and competencies for personal, civic, social or employment needs (Petegem et al, 2010). Similarly, as Courtney (1989) expressed the term adult education was replaced with adult learning. Rogers (1996), on the other hand, expressed the view that the term "education" is distinct from "learning" but includes learning. He concludes that learning is an on-going, lifetime activity while education is a purposeful, planned learning. Peters (1966) supports this view and defines

education as an involvement or initiation by others in a worthwhile activity whose content is predefined. Courtney (1989) states that currently adult education, adult learning, CE, LLL, independent learning projects, community education, andragogy, adult basic education have all been used to explain the same concept.

Rogers (2002) states that there is a lack of agreement for the definition of adult learning embracing all diverse learning context, conditions and practices. For this concern, applying universal definitions is significant. The Organization for Economic Cooperation and Development (OECD) (1977), for example, defined adult education as any deliberate learning activity or program to fulfill training need or interest of a person that is over statutory school-leaving age and whose principal activity is no longer in education. Besides, UNESCO (1975) explains adult learning as organized and sustained programs of education to communicate necessary knowledge skills and understanding for people not in regular schools or university systems and generally older than 15.

Learning is firmly embedded into the daily life; hence, it cannot be isolated from social context. Parallel to changes in social context, it is required to have a better understanding of adult education in terms of advantages and barriers. The social context of adult learning is mainly characterized by globalization, the knowledge society, technology and changing demographics (Merriam, & Bierema, 2014). Globalization maintains the movements of goods, people, ideas and services across national borders. Thus Merriam and Bierema (2014) view world hyperconnected and in such a world education itself is considered as a commodity of the international market. Dumont and Istance (2010) explain that 21st century requires deep understanding and ability of creative connections to build new insights, new understandings or new products. Therefore, in this knowledge society, as Darling-Hammond et al. (2008) stated students need to be lifelong learners for professions have not yet existed, to use technologies which have not been invented yet, to figure out problems that have not yet occured. In essence, globalization and knowledge society are supported by the developments in the technology. Technology is shaping the way people learn and teach. Adult learning is changing dependent on the technology. Merriam, and Bierema (2014) express that field of adult education

nowadays particularly addresses to young adults having some certain traits like familiarity with technology, ability to multitask and also having shallow reading and lack of critical thinking. Finally, parallel to developments in technology and medicine, human lifespan is increasing and a global aging occurs. This change in demographics necessitates better understanding of adult education.

2.2 Adult Learning Theories

The nature of knowledge and the answer of how people learn were a matter of debate among numerous philosophers and scholars from ancient times to present. For instance, Aristotle defined knowing as a sensory experience which occur through five senses whereas Socrates believed knowing arises through the personal pursuit and discovery of wisdom and truth inside of the people (as cited in Jianwei, 2012). On the other side Confucius saw learning as a highly personal, moral and ethical attempt to fulfill oneself. At the present time, Merriam and Bierema (2014) consider behaviorism, humanism, cognitivism, social cognitivism and constructivism as the fundamentals of traditional learning theories.

Behaviorism operating on stimulus-response principle was founded by Watson in 1920 and became a comprehensive theory by the contribution of Skinner's, Pavlov, Thorndike, Bandura and others (Moore, 2011). In behaviorism, learning is evaluated based on observable behaviors and mental process or people' emotional feelings are not taken into account. Learning objectives, feedback and reinforcement are critical elements for behavior modification. Although the theory is criticized for being too mechanical and for ignoring the complexity of humans' learning, it is alive in much of adult vocational programs, military education, technical education, business and industry (Knowles, 1970).

By 1950s, humanistic psychologists such as Maslow and Rogers introduced humanistic learning perspective as an alternative to human learning. According to Maslow (1970) the role of learning is self-actualization, whereas for Rogers (1994) learning is a personal act necessary to achieve the learner's full potential. In essence, both of them focus on persons' need, desires and motivation to learn. Learners are

considered more independent, self-directed and internally motivated. For these reasons, humanistic learning theory has deep influence on adult learning theory.

Cognitivism focusing on inner mental activities such as thinking, memory, knowing, and problem-solving appeared as a tremendous paradigm on learning by mid-1950s (Yilmaz, 2011). Like humanistic theory, cognitivism challenged behaviorist theories of learning that disregard mental activities. It emphasized that humans are rational beings and new information is processed by mind through previous experiences to make sense. The research conducted by Edward Chase Tolman, Jean Piaget, Lev Vygotsky, Jerome Bruner, and German Gestalt contributed to the theory profoundly. For instance, Piaget shed light on the process of assimilating and accommodating information and the concepts of schemes. Vygotsky emphasized logical memory, conceptual thinking, attention and social learning and Gestalt focused on visual perception, recognition, organization and problem solving approaches (Gredler, 1997).

Social cognitivism, which can be considered as a subset of cognitivism, stresses the social aspect of learning and support, the view of human learning occurs in social environments. Within the framework, observation and imitation are the essential factors to acquire new skills, knowledge, techniques and beliefs. Bandura, one of the influential researchers of this theory, depicts learning as a reciprocal interaction between environment and person (Bandura, 1986); thus, it can be concluded that social cognitive theory draws from not only cognitive theory but also behaviorism.

Constructivism basically maintains constructing meaning from experience. The basic principle is that the learner is active and has control over the learning process. Constructivism is also considered as foundational to understand various adult learning theories because adult learning requires negotiation, constructing meaning parallel to previous experiences, reflection and self-regulated learning (Merriam, & Bierema, 2014).

2.2.1 Andragogy

Most of the investigations regarding learning are done with children or animals. Hence, the traditional learning approaches like behaviorism and cognitivism can be spurious for adult learning because of these theories' teacher-centered nature (Birzer, 2004). Therefore, adult learning requires its own specific principles, strategies and technologies.

The eminent adult learning theory "Andragogy" was introduced by Malcom Knowles in 1968 as "a new label, a new technology" of adult learning. This theory quickly became famous not only within the adult education, but also within human resource development, technical training, business, nursing, religion, agriculture and law (Davenport & Davenport, 1985).

Literally the term andragogy comes from Greek *aner* meaning man, thus andragogy specifies helping adults learn. Knowles (1980) defined it "the art and science of helping adults learn" and highlighted its difference from pedagogy which is "the art and science of helping children". Another scholar Mezirow (1981) defined andragogy as a structured and sustained effort supporting adults to learn and improve their capacity to perform as self-directed learners.

According to Knowles (1970), adults' learning process is intensely distinct from pedagogical approach; as a result, adults must be taught differently from children. Parallel to this view andragogy's fundamental assumptions were formulated as follows:

1- Self-directing learning: Although children have dependent personalities, as they mature they start to be self-directing human beings and they are assumed be responsible for their own learning. Knowles signifies that the learning climate of adults also should be supportive for self-directing. For instance, furnishing should be adult-sized and comfortable, the seating plan of meeting rooms should be arranged informally and the decoration should be suitable for adults. In addition to psychical environment, the psychological environment is highly crucial. Adult learners should feel accepted, respected, and supported, and the freedom to express oneself in learning atmosphere. Although self-directing is a

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salient feature of adult learning, Merriam and Bierema (2014) states that all adults are not always self-directing or all children are always dependent to someone for learning. In some context and for some contents, adults may need directions of a teacher or children may behave independently in their learning.

2- Experiential learning: Adults bring a rich volume of experience to the learning environment. Thus, they are themselves a rich resource for learning. Knowles (1970) suggests special techniques that tap their experiences such as group discussions, role playing, field projects, work conferences, counseling, the case method, group therapy and skill-practice experiences. Although prior knowledge of adults contributes to their learning positively, it has its downside. For example, their fixed pattern of thoughts or habits can be an obstacle for learning and they can be more dogmatic and less open-minded.

3- Readiness to learn: Knowles (1970) utters that adults have social roles and phases of growth which create readiness to learn and teachable moments for them. Therefore adult education programs should be planned around their needs and teachable moments. He suggests adult educators to create readiness through providing real life tasks or problems.

4- Problem-centered orientation: Adults consider education as a process to improve their skills or to cope with a real problem. Therefore they are more problem-centered than subject centered in learning.

5- Internal motivation: As it is explained previously; humanistic theory, emphasizing people have a natural tendency to learn, is a foundation for andragogy. The theory says that intrinsic motivation such as job satisfaction, desire for increased self-esteem or the like is a key factor to take part in an education program for adults.

6- The need to know: This assumption claims that if adults see why they need to learn and why an education program is valuable to them before starting to learn, their inner motivation enhances.

Although andragogy is seen as an influential view on adult education by many scholars, it has its opponents because of the numerous criticisms. The first criticism is related with the validity of andragogy as a theory. It is debated whether andragogy is a theory of adult education, technology of adult education, method of adult education, technique of adult education or just a set of assumptions of adult education (Davenprort & Davenport, 1985). Hartree (1984) questioned whether andragogy were shaped based on empirical research, whether the principles of adult learning were created based on research, whether it explained why and how adults learn or whether it was just a description of what the adult learning should be like. The second criticism is regarding the etymological structure of the term "andragogy". Mohring (1989) says that andragogy derived from *aner* and it means adult male. Therefore it excludes women. Because of this sexist language, she suggests using *teliagogy,* meaning adult and including both sexes. Third criticism is related with the characteristics of the population that Knowles drew andragogical assumptions. Lee (2003) commented that assumptions of Knowles are primarily based on educated, white, man and from middle-class background. In other words, he claimed that Knowles used privileged population and the characteristics of this population were overgeneralized.

2.2.2 Self-Regulated Learning (SRL)

Self-regulated learning (SRL) is a paramount concept increasingly receiving attention in the literature (Boekaerts et al., 2000; Schunk & Zimmerman, 1998; Zimmerman & Schunk, 2001; Schober et al, 2015) because of its potential to enhance both formal and informal learning. Scholars point that self-regulated learning has a crucial role in lifelong learning because the knowledge era requires people who take the responsibility of their own learning, have high self-awareness and self- regulated learning skills.

In the literature many terms like self-directed learning, autonomous learning, self-planned learning and independent study are used in the same meaning with self-regulated learning (Saks & Leijen, 2014). Especially, self-regulated learning (SRL) and self-directed learning (SDL) are most frequently used interchangeably or in a

similar way (Boekaerts and Corno 2005; Bolhuis 2003). However, their theoretical background and empirical methods are different thus the concepts should not simply be used synonymously (Jossberger et al, 2010).

SDL was defined by Knowles (1975) as an instructional process in which learners take initiative, diagnose their own learning needs, define learning objectives, decide materials and information sources and at the end evaluate learning outcomes. In other words, learners determine their priorities and choose the appropriate steps parallel to them. SRL; on the other hand, is a more specific, micro level of SDL which is a broader concept in terms of learner's freedom. Thus, a self-directed learner is expected to be self-regulated (Jossberger et al, 2010).

Pintrich (2000) describes SRL as a constructive learning process in which learners are metacognitively, motivationally, and behaviorally active by monitoring, regulating and controlling their learning and actions. Therefore, it can be concluded that SRL deals more with subsequent steps in the learning process. Zimmerman (1988) also names SRL as a self-oriented feedback loop. Learners monitor effectiveness of their learning process by giving self-feedbacks. As it is seen from these definitions, self-regulated learning has three elements. Firstly, learners focus on the goals which are developed by them. Secondly, learners develop thoughts, emotions and actions to reach mentioned goals. Finally, learners maintain a systematic process to reach the desired outcome (Boekaerts, 2002).

The socio-cognitive learning approach of Bandura, cognitive constructivist learning methods of Piaget and Vygotsky's social constructivist learning techniques are considered as the theoretical bases of self-regulated learning (Jarvela & Niemivirta, 1999). For example, the mutual interaction among personal, behavioral and environmental factors defines the individuals' actions. Therefore, sociocognitive theory emphasizes that people should not be treated as they are passive beings but as self-organizational, active, self-reflective and self-regulative individuals (Bandura, 1997). Also the SRL definition of Pintrich (2000) supports the cognitive constructivist learning perspective because SRL is considered as an active, constructive process in which learners cognitively engage in setting goals, choose the best learning environment, monitor process and control their cognition, motivation,

and behavior. Finally, according to Lev Vygotsky (1997), self-regulation begins to develop in early childhood and it proceeds in three stages. In the first step, outside regulators like parents or teachers regulate children by establishing rules and monitoring their learning and behaviors. It is the second step when children initiate to start the rules and tell others doing things wrong. In other words they notice not only rules but also violations. In the final step, children begin to apply rules voluntarily even when they are not watched by anyone and stop themselves from doing something against the rules.

According to Zimmerman (1998), self-regulation is not an academic skill like reading, calculating or not an inherent mental ability that students either have or do not have. Rather, it is a self-management process that can be taught in the classroom, across grade levels helping students develop the skills they need. Self-regulation can be learned using various self-regulated learning strategies. Zimmerman (1990) defines these strategies as the tasks that learners undertake to obtain the necessary, beneficial information or skills. Mentioned strategies include cognitive strategies like rehearsal, elaboration, organization; metacognitive strategies like planning, monitoring, altering cognition, and resource management strategies like help setting, time and environment management and affective elements like self-efficacy, volition and task value having a critical role in this self-regulation process (Pintrich & De Groot, 1990). Cho (2004) presents all these strategies under four headings in Table 2.1.

Table 2.1 Design Strategies promoting self-regulated learning (Cho, 2004)

Self-regulated learning (SRL)strategies	Design strategies
Metacognitive activities	Goal setting
	Self-monitoring
	Self-evaluation
Cognitive activities	Rehearsal
	Elaboration
	Organization
Resource management activities	Time management
	Help seeking
	Structuring learning environment
Affective activities	Self-efficacy
	Volition
	Encouraging feedbacks

In relevant literature, there are various models regarding how students self-regulate their learning. However, four assumptions are common for all models: First, although the concepts: motivation, cognition, behavior and processes are affected by a number of factors like individual differences or developmental constraints, students are assumed that they potentially regulate and monitor these concepts. Second assumption expresses that, learners engage in a constructive process by the effect of both learning context and prior experiences. Thirdly, the aim of self-regulation learning process is modifying behavior and achieving the predefined goals. Finally, it is assumed that the relationship between a student's performance, contextual factors, and individual characteristics are mediated through self-regulatory behavior (Moos & Ringdal, 2012).

In the self-regulated learning model of Valle et al. (2003), it is stated that development of learning goals is related with students' feelings for internal and external attribution and academic self-concept. Additionally, it is emphasized that deep learning strategies lead to high level of persistence in academic tasks and finally academic achievement. Steffens (2006) adapts this model as in the Figure 1.
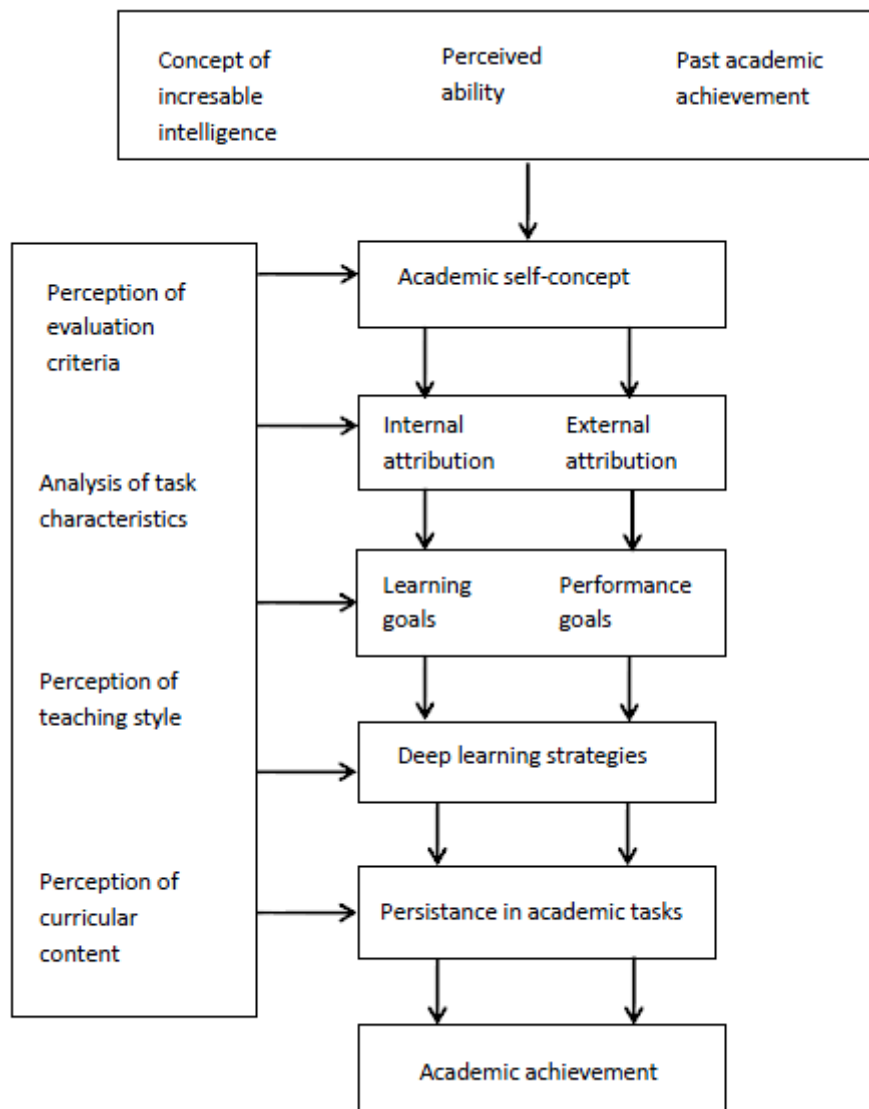
Figure 2.1 Model of self-regulated learning, adapted by Steffens (2006) from Valle et al. (2003)

Most self-regulation theorists view learning as a multidimensional and open-ended process that requires cyclical activity (Figure 2). The term cyclical refers that learners must be engaged in a cycle of personal, behavioral, and environmental events before self-regulated learning skills and strategies may develop (Barnard-Brak et al., 2010). Cyclical process contains three fundamental phases: forethought,

performance or volitional control, and self-reflection (Schunk & Zimmerman, 1998). Forethought phase represents significant beliefs and process to initiate learning. Goal setting, strategic planning, self-efficacy beliefs, goal orientation and intrinsic interest are shown as subprocesses of the forethought phase. *Goal setting* maintains choosing specific learning outcomes (Loche & Latham, 1990), and *strategic planning* refers to deciding on proper learning strategies or goals (Zimmerman & Martinez-Pons, 1992). Bandura (1986) defines *self-efficacy* as personal beliefs about one's capability to learn or perform something. Furthermore, it is explained that learners displaying *goal orientation and intrinsic motivation* learn better than who do not display (Ames, 1992; Deci, 1975). Performance and volitional control phase aims to help learners to focus on the task and enhance their performance. It has three subprocesses: attention focusing, self-instruction and self-monitoring. Finally self-reflection process has four types: self-evaluation, attributions, self-reactions and adaptivity (Schunk & Zimmerman, 1998).
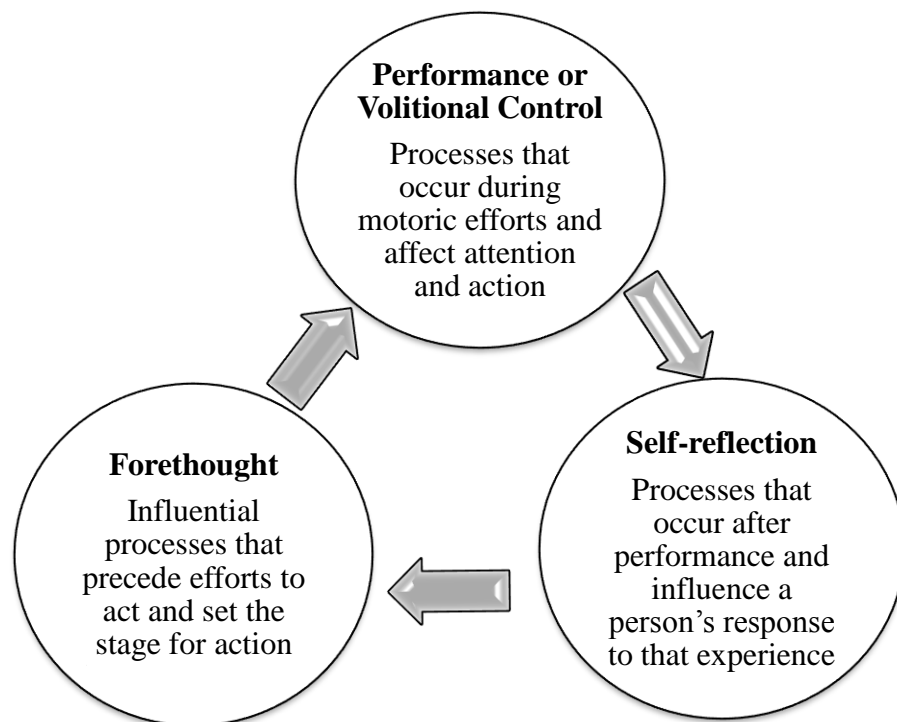
Figure 2.2 Self-regulated learning cycle phases(Schunk & Zimmerman, 1998)

SRL and 21st century competencies:

In 21st century educational paradigm, learners are considered as the central element of teaching and learning processes (Steffens, 2006), and Wolters (2010) points that self-regulated learning aligns very closely with 21st century competencies. According to The Partnership for 21st Century Learning Report (P21, 2009), it is stated that competent individuals in 21st century need to set and balance their own goals, to initiate and self-direct their own activities, and to work independently. Above mentioned features, in essence, refer to self-regulated learners described as self-starters who can work independently to achieve their goals (Wolters et al, 2005; Zimmerman, 2000). In the report, individuals' adaptability to work effectively within contexts that are ambiguous or with shifting demands and their ability to adjust efficiently to varied roles and responsibilities are stated as another competency within the 21st century framework. Wolters (2010) states that both SRL and 21st century competencies stress that individuals should communicate effectively with others cooperating to achieve common goals.

Academic Achievement:

Prior empirical researches indicate students who engage in self-regulation processes or are trained to perform self-regulated learning tend to have a greater academic achievement (Azevedo, Cromley, Winters, Moos and Greene, 2005; Boekaerts ve Corno, 2005; Baker, Chard, Ketterlin-Geller, Apichatabutra, & Doabler, 2009). For instance, Pintrich and DeGroot (1990) studied on a group of seventh graders, and the results revealed that students' performance on homework, seatwork, quizzes and overall grades were predicted by SRL's motivational, cognitive, and metacognitive dimensions. Similarly, according to Barnard-Brak, Lan and Paton (2010), learners exhibiting high self-regulation in their learning process achieve more positive academic outcomes than who exhibit poor self-regulation. In a similar vein, Cleary, Platten and Nelson (2008) concluded that a group of high school students who were trained to use SRL received higher scores on a standardized biology test compared to those who were not trained.

Engagement:

Not only academic achievement but also students' engagement and persistence in academic tasks were studied in terms of its relation with SRL. Wolters (2010) asserts that more self-regulated learners tend to evidence greater effort, engagement or persistence. He considers students' interest, value and self-efficacy as reasons of engagement and persistence with regard to academic tasks. In addition, Wolters (2003) found that SRL framework could be used to explain college students' reported level of procrastination.

2.2.3 Online Self-Regulated Learning

Although the use of technology in education field is not a new phenomenon, the rapid expansion of the Internet has remarkably enhanced the use of technology for instructional purposes (Mahar et al., 2014). Ubiquitously used web-based education for instance, is a beneficial approach regarding student satisfaction and learning outcomes (Montrieux et al, 2015). Despite these overall positive results, its effectiveness and quality is a concern for many educators (Azevedo, 2005). Shank (2005) elucidates that an online course's quality depends on the design of the course, and quality of teaching does not depend on the method used to deliver the course. There may be various factors for web-based education to be able to become successful. Self-regulated learning skills are one of these factors (Usta, 2011).

In the European Review of SRL in Technology Enhanced Learning Environments (TELE), Bartolomé et. al. (2007) stress that learners have to be capable of acquiring new competencies and of self-regulating their own learning process. In this respect, learning environment should also be designed to promote and enrich self-regulation. In the review general features of technology enhanced learning environments which supported SRL are listed as presented in Table 1.

Table 2.2   General features of TELEs which potentially support the practice of SRL adapted from Bartolomé et. al (2007)

Features that support planning

- Integrating calendars, activity plans, etc. to the learning platform
- Employing user friendly interface
- Explaining explicitly prerequisites for the assigned tasks
- Keeping track of one's activity within the environment

Features that support monitoring

- Providing multimedia educational material in different formats
- Giving opportunity to choose between different learning paths within the environment.
- Presenting tasks at various difficulty levels
- Giving formative feedback
- Providing tools enabling to exchange materials and collaborate with other students.
- Putting –help- sections explaining how to carry out the task.

Features that support self-assessment

- Providing models showing correct task execution.
- Giving opportunity to learners to compare one's own work with that of peers.
- Integrating self-evaluation tools.

In literature, a vast amount of research investigating online learning (Crippen & Earl, 2007; Cook, Dupras, Thompson, & Pankratz, 2005; Shen, Lee, & Tsai, 2007; Chang, 2007; Nelson, 2007; Tsai, 2013) concluded that enhanced self-regulation contribute positively to student success, abilities, strategies and their relationship with learning outcomes.

In a similar vein, Barnard-Brak, Lan and Paton (2010) investigates whether profiles for self-regulated learning skills and strategies exist among learners. For this purpose, they use Online Self-Regulated Learning Questionnaire (OSLQ; Barnard, Lan, & Paton, 2008) on students enrolled in online degree programs. The quantitative

analysis of results reveals that there are five different self-regulated learning profiles among students: super self-regulators, competent self-regulators, forethought-endorsing self-regulators, performance/reflection self-regulators, and non- or minimal self-regulators. Additionally, the authors state that participants' academic achievements are significantly correlated with the self-regulated leaning profile. For instance, students having minimal self-regulated learning profile have similar poorer GPAs. The researchers emphasize that self-regulated learning behaviors are very context dependent. Thus, they suggest replicating the study across different domains to analyze whether mentioned five self-regulated learning profiles exist or not.

Through a quasi-experimental research design, Tsai (2013) explores student involvement in a blended course. To achieve this purpose, the researcher created four groups of student. These groups received different interventions of online collaborative learning with and without teacher initiation and self-regulated learning with or without feedback. In the scope of the SRL interventions, students were required to take notes and review them after school. Additionally, they were expected to read the course textbook regularly and modify their websites parallel to what they read. The results of the study revealed that involvement in the implementation of online SRL was not significantly affected from the feedback of teacher and course website. Secondly, it was found that student involvement in the group of collaborative learning and self-regulated learning interventions employed was positive and higher than the group only collaborative learning interventions were employed.

In another design-based study, Lee and Ke (2013) explore graduate level online students' self-regulated learning processes within an authentic learning module. Online discussion posts and satisfaction survey on students' perceptions of the implemented authentic design elements are used as data sources. The data suggested that students' online interactions facilitated reflection and self-evaluation processes which are crucial for self-regulation. Researchers emphasized the dynamics of social interaction in online discussions which strengthen self-elaborative knowledge construction. In addition, authentic environment and meaningful tasks employed in

this environment contributed to students' engagement of learning and active self-regulated learning processes.

Self-regulation skills are considered more essential for online students due to the often-solitary learning environment. As previous research suggests self-regulation skills can be taught through experience and self-reflection; they are not innate personality traits (Zimmerman, 2001). In the study conducted by Anderton (2006), pre-service teachers' self-regulated learning strategies were investigated through an online course. Hence, the researcher examined the function of goal planning, weekly monitoring and evaluation forms that let pre-service teachers reflect on their use of specific activities. The aim was to assist participants in focusing on the behavioral, motivational, and metacognitive aspects of their learning processes. Results of the study informed that use of self-reflection forms is useful to develop self-regulatory skills.

Research indicates that non-linear nature of hypermedia requires students have a high degree of control to effectively navigate and choose needed information; at this point, prior knowledge play a significant role (Shapiro, 2004). From this point of view, Moos and Azevedo (2008) examined the relationship between undergraduate students' prior domain knowledge and their use of SRL strategies like monitoring, and planning processes with hypermedia. The hypermedia environment was a commercial, electronic encyclopedia including article hyperlinks, illustrations and video. In the data collection step, pretest that was designed to measure participants' prior domain knowledge and think-aloud protocol methodology was employed. The statistical analyses revealed that prior domain knowledge and use of specific SRL processes are significantly correlated.

In their study, Whipp and Chiarelli (2004) investigated how students use self-regulated learning strategies to perform a task and how they handle the problems occurring in web-based learning environment. Besides, the effects of motivational and environmental factors are another aspect of the research. Interviews conducted with students and the course instructor and reflective journals of the students were primary data resources. The results illustrated that students use not only traditional

SRL strategies but also online SRL strategies like planning, organization, environmental structuring, help seeking, monitoring, record keeping, and self-reflection. Moreover, it was concluded that instructor and peer support and the design of the course were pointed as crucial environmental factors.

Obviously, learners' self-regulated learning behaviors in web-based environment are studied by many researchers. For instance, in the phenomenological study conducted by Hsu (2009), undergraduate students' experiences were explored and it was found that students exerted various SRL behaviors like keeping themselves planned using online calendar, monitoring their learning performance with the online gradebook, and communicating with instructor to seek help and stay motivated. Similarly, Dresel and Haugwitz (2008) designed a computer based environment. Participants who are 6th-grade students were provided attributional feedback and training on self-regulation learning. The results showed that when self-regulation training was provided to learners, use of metacognitive control strategies was enhanced.

In a similar vein, gender issue was considerably investigated in the use of self-regulated learning strategies. In traditional learning environments, numerous researchers mentioned that male and female learners presented differences in using self- regulated learning strategies in their learning process (e.g. Zimermann & Martinez-Pons, 1990; Saad, Tek, & Baharom, 2009; Bidjerano 2005; Niemivirta,1997). Zimermann and Martinez-Pons (1990), for instance, explored the same issue through interviews with 5, 8, and 11th graders. The results unveiled that girls employed more self-regulation activities like planning, goal setting, monitoring, environment structuring that did boys. Similarly, Saad, Tek, and Baharom (2009) investigated self- regulated learning strategies among science students. The researchers reported that females' self-regulatory learning was higher that the males in science learning achievement. In another study conducted by Bidjerano (2005), it was concluded that female students use rehearsal, organization, metacognition, time management skills, elaboration and effort more than males. However, it is not valid for other self-regulated learning strategies in relation to critical thinking skills, studying with peers and help seeking.

As for online learning environments, gender differences are generally studied regarding the interaction issue including the style, purpose, and degree of interaction, and their impact on social factors (cited in Lee, 2002). Lee (2002) also notes that there are three prominent issues in which the gender factor is investigated: social interactions including styles, purposes and dynamics; motivational elements and finally examination of expressions, discussions and feedbacks.

Finally, previous research indicates distinct evidence for the contribution of age to students' self-regulated learning. For instance, Leong (2012) aims to explore, compare and contrast adult learners' online self-regulated learning literacy through survey and interviews. Adults' self-regulation skills are investigated in relation to many aspects. The age is one of these aspects as well. That study's findings present that there was a significant difference between age groups in term of "Improving learning process" of self-regulated learning literacy.

Price and Murray (2012) examined the traditional self-regulation behaviors of students enrolled in introductory psychology courses from different age groups including younger (18–25), middle-aged (26–59) and older adults (60–85). Restudying and time allocation to retrieve information are considered as elements of self-regulation. Parallel to this, the core finding of the study is that older adults allocated more time to simpler vocabulary items and restudy them. The researchers evaluated this result as a consequence of declined processing speed by age.

In another study, Castel et al. (2013) investigate the selection pattern of younger and older adults regarding valuable information to study. The central aim is to determine how aging affects self-regulated learning in relation to remembering important points. The study presents there are age-based differences in the use of additional study time to improve learning of high value items.

2.3 Community in Online Education

In online environments, creating a sense of community is essential for students to develop relationship with each other to produce better interaction, satisfaction and successful learning outcomes as a result of diminished isolation feeling (Wiesenfeld, 1996; Rovai, 2001; Palloff & Pratt, 2007; Brindley, Walti, & Blaschke, 2009). By some scholars, community is defined as collections of individuals who are socially interconnected, have a set of habits and conventions, interact with each other to share certain practices, and depend upon each other for the accomplishment of certain aims (Swan, 2002; Tu, & Corry, 2002). Brooks (1997) also defines "community" as a place where people conduct community activities, share common beliefs, and share a means of communicating. When it comes to online community, it refers to people coming together synchronously and/or asynchronously in a social network to learn from each other and engage. However, numerous factors such as gender, language, culture, interaction, communication styles, teaching methods, technology, and physical distance can pose a threat to building and maintaining an online community (Drouin &Vartanian, 2010; Swan, 2002). However, the common point that should exist in almost all online learning environments is a community with a rich social interaction in which learners are expected to connect internally in the classroom and externally with other learners and instructors, and they feel welcome, motivated and secure to express their comments and opinions (Tu & Corry, 2002).

Tu (2004) voices criticism on this interaction issue by saying that the learner-centered approach was misunderstood and, thus, misapplied in online learning platforms. He adds that online learners demonstrate higher levels of independence in learning but it does not mean that leaving online learners alone, and passing all responsibilities to them. He suggests considering learners' competence and technological expertise parallel to this, providing necessary support. In this respect, Community of Inquiry Model (CoI) combining the community, the social dimension, with inquiry to create online or blended learning environment and stressing the processes of instructional dialogue provides significant insights and methodological solutions (Garrison, Anderson, & Archer, 2000).

2.4 Community of Inquiry (CoI) Framework

The community of inquiry framework developed by Garrison, Anderson, and Archer (2000) has been widely applied to research on asynchronous learning environments. This framework examines the effective online learning in which deep and meaningful learning experiences are created and highlights the importance of teaching, cognitive, and social presence (Figure 2.3). This model consists of three overlapping and interacting elements: cognitive presence, teaching presence, and social presence. It assumes that learning occurs within the community through the interaction of three core elements (Garrison 2007; Akyol & Garrison, 2011).
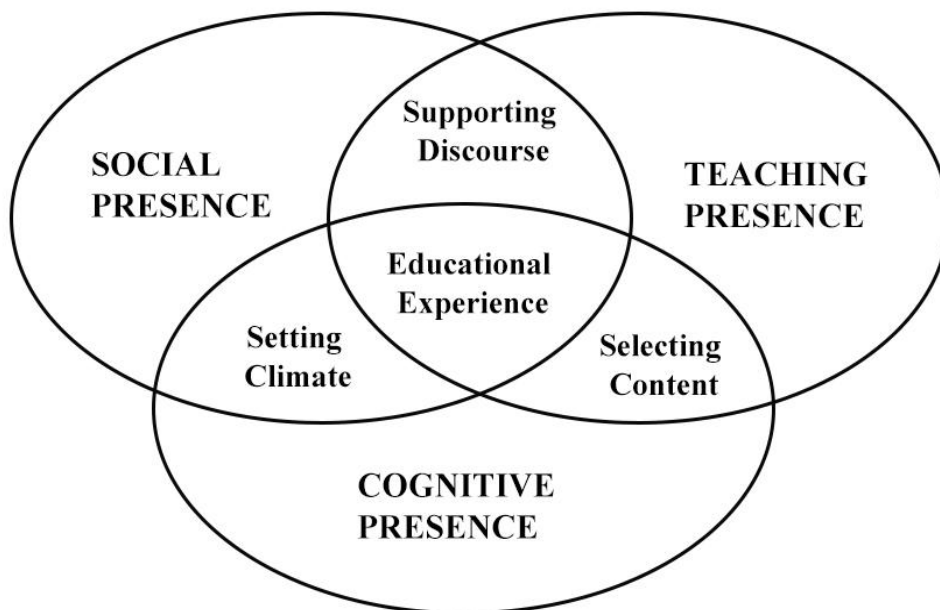
Figure 2.3 The community of inquiry model(Garrison, Anderson, & Archer, 2000)

2.4.1 Teaching Presence

It is clear that teachers play a big role in the success of any formal learning environment. In this sense, learners' perception of teaching presence is crucial. Teaching presence is defined as the selection, organization, designing, facilitation and direction of learning process to reach meaningful and educationally worthwhile learning outcomes (Anderson, Rourke, Garrison, & Archer, 2001). The main focus of teaching presence is to enhance social presence and student learning. Teaching presence occurs through the instructional design process and it continues during the course, by the contribution of instructor to facilitate the discourse which is critical to maintain the interest, motivation and engagement of students in active learning (Anderson, Rourke, Garrison, & Archer, 2001).

According to Swan and et al. (2008), this presence consists of three fundamental stages. (1) Instructional Design and Organization: This stage includes the structure, process, interaction and evaluation aspects of the online course. The instructor develops programs and lesson plans and coordinates activities. Swan (2002, 2003) considers this stage as a consistent predictor of a successful online course. (2) Facilitating Discourse: The aim of facilitation is to maximize learners' interaction with each other and the instructor (Palloff & Prat, 2011). Using relevant ice breakers, establishing netiquette policy and explaining expectations for online course at the beginning of the course are presented as examples of facilitation. (3) Providing Direct Instruction: At this stage, the instructor presents content directly and provides academic and pedagogic leadership in discussions Garrison and Vaughan (2008). The examples of teachers' activities are displayed in the Table 2.3.

Table 2.3 The examples of teaching presence

(Adapted from Tery, & et al, (2001), Anderson et al., (2001), Brower, (2003))

Instructional Design and Organization	Facilitating Discourse	Providing Direct Instruction
• Setting curriculum • Designing methods • Creating presentations and lecture notes • Developing audio/video mini-lectures, • Establishing time parameters • Providing guidelines on how to use the medium effectively	• Identifying areas of agreement/disagreement • Reviewing and comment upon student comments, • Seeking to reach consensus/understanding • Raising questions and moving discussions in a desired direction, • Drawing out inactive students, and limiting the activity of dominating ones • Assessing the efficacy of the process	• Presenting content and questions • Focusing the discussion on specific issues • Summarizing the discussion • Confirming understanding through assessment and explanatory feedback • Diagnosing misconceptions • Injecting knowledge from diverse sources • Responding to technical problems

2.4.2 Social Presence

Social presence is described as the degree to which a person is perceived as 'real' in mediated communication through use of indicators like emotional expression, open communication, and various means (Garrison et al., 2000). Motivation, feelings, emotions and attitudes are central elements of intellectual and social development according to the Vygotsky's (1986) social-cultural approach. Thus it is of utmost importance that the members of a community understand each other's feelings and have a sense of connectedness. Lee (2014) stressed that learners who feel connected are more eager to cooperate with others and they are more successful at managing their own cognitive processes.

Similarly careful examination of previous studies reveals that degree of social presence impacts students' learning outcome, interpersonal relationship and satisfaction (Tu, 2001). Various reviews on social presence in online environments exist among these studies. Oztok and Brett (2011) for instance investigated the definitions, theoretical foundations, measurements, and applications of social presence. The results revealed that that the definition of social presence lacks clarity because of that social presence is studied in diverse fields from psychology, engineering, communications, cognitive science, education, computer science to philosophy. Another gap identified by researchers is the lack of a qualitative methodology studying on social presence.

Another literature review was conducted by Cui, Lockee and Meng (2013). The salient point worthy of mentioning in their review is social presence and its relation with instructional design. Researchers argued that more social presence is not always desired or necessary. On the contrary sometimes a low level of social presence can enhance learning much more. Thus instructional designers are suggested to focus on social presence and identify appropriate design guidelines for an efficient learning environment. Another significant recommendation noted in the review is that Web 2.0 tools such as wikis, Facebook, and blogs could facilitate successful, interactive and collaborative online learning.

Although, social presence is considered a powerful construct in online learning, it is criticized by some researchers as well. Annand (2011) expressed that social presence does not adequately inform the development of online education theory and practice. He also added that the influence of social presence on the learning experience was overstated. To support this claim he shows numerous empirical studies measuring social presence through self-reported surveys and revealing no significant correlation between social presence scores, learning scores and cognitive abilities as a reference.

2.4.3 Cognitive Presence

Cognitive presence refers to the extent to which participants are able to construct meaning through critical thinking and reflection. Transferring knowledge to other subject by thinking and inquiry method is the central aim of this presence (Garrison et al., 1999). It is emphasized that effective learning must take into consideration both the internal cognitive process as it takes into account the external contextual elements that shape thinking. Reflection and collaboration are considered as two main ways of shaping cognitive presence in an asynchronous online learning context (Garrison, 2003). It is worth stressing that cognitive presence is the core of the CoI framework and it requires strong social and teaching presence as prerequisite. Thus, among the three elements of the CoI framework, it is regarded to be the most arduous presence to build (Arbaugh, 2007).

Practical Inquiry Model of learning (Figure 2.4) developed by Garrison et al. (2000) is used to assess online transcripts. The model has four phases: 1) triggering event: the problem is recognized by a task or question given by instructor, 2) exploration: different sources are used by learners and they brainstorm on needed information, 3) integration: learners reflect on the task and connect the explored ideas, and 4) resolution: learners apply the knowledge to new situation and a consensus is built or defence takes place.
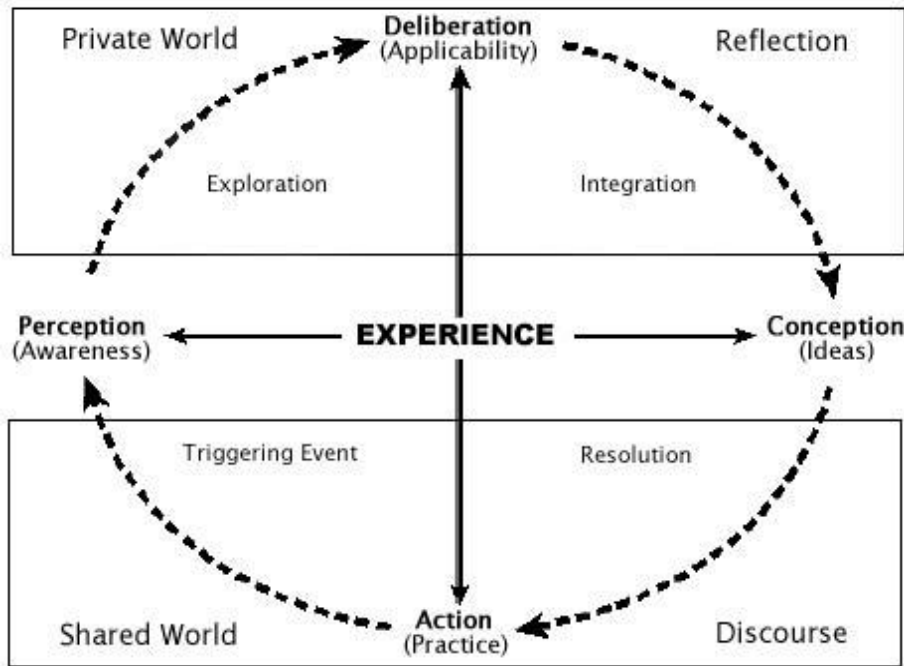
Figure 2.4 Practical Inquiry Model of Learning(Garrison et al., 2000)

2.4.4 Research on COI

The study on the CoI model (Shea, & Bidjerano, 2010) suggested a new construct "learning presence" to complement and expand upon teaching, social, and cognitive presences in CoI model. In 2011, Shea and et al. conducted another additional research on learning presence. Quantitative content analysis of student discourse was employed to collect data. After analyzing the data, some of learner discourse such as time management, reflection and goal setting did not fit within the model and represent any indicators of social, cognitive or teaching presence. Thus aforementioned indicators were considered as online learner self- and co-regulation. Although Akyol and Garrison (2011) expressed concern that adding this new construct, separating the roles of teacher and learners, to the model may be destructive for the collaborative nature of model, the authors defended that opposite might be a danger.

In 2013, Shea, Hayes, Smith and et al. suggested inclusion of learning presence in the CoI model. In order to support their suggestion they used quantitative content analysis (QCA) and social network analysis (SNA). Their central purpose was to

enhance CoI framework through gaining inside how learners regulate their learning in online environments. The significance of this study was that it contributed previous findings regarding learner presence in online learning platforms. In the study, some of the learners were facilitated online discussions as a result they contributed the design of discourse. By this way, their self- and co-regulatory performances were observed. The results of SNA and QCA revealed that discussion facilitator displayed higher levels of learning presence (agency, control, self-direction) and located advantages points in SNA. The authors comment that the online environment requires new forms of self-regulation and learner presence is both logical and important to explain the interaction and collaboration patterns. Finally, authors proposed a revised CoI model as presented in Figure 2.5.
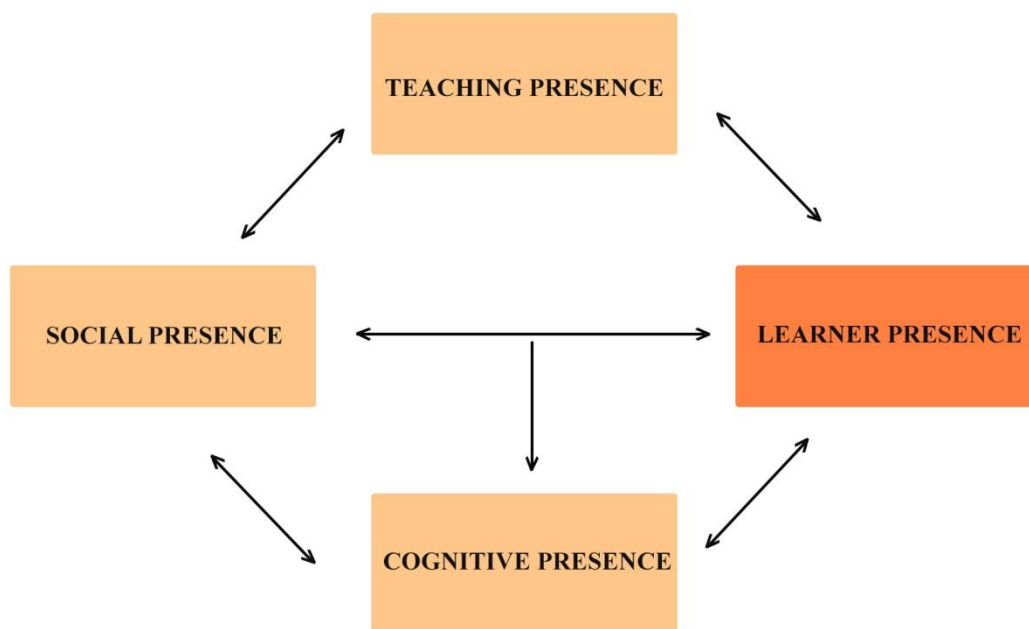
Figure 2.5 Revised Model of CoI(Shea &Bidjerano 2010).

As previously mentioned, Akyol and Garrison (2011) do not support the idea of adding the new element *learning presence* to refine CoI model. Instead they draw attention to metacognition referring to knowing about knowing. Authors believe that the creation of a fourth presence would undermine the integrity of the CoI framework; however metacognition is more compatible with the assumptions and

elements of a community of inquiry model. Thus, it was aimed to develop and test the metacognition construct in an online learning context through analyzing text-based discussion boards. Transcript analysis was conducted using the indicators of the metacognitive constructs: knowledge of cognition, monitoring of cognition, and regulation of cognition. The analysis results pointed that the essence of the metacognitive construct was found at the intersection of the cognitive and teaching presence elements (Figure 2.6). Therefore, metacognition was considered as a mediator between internal knowledge construction and collaborative learning activities.
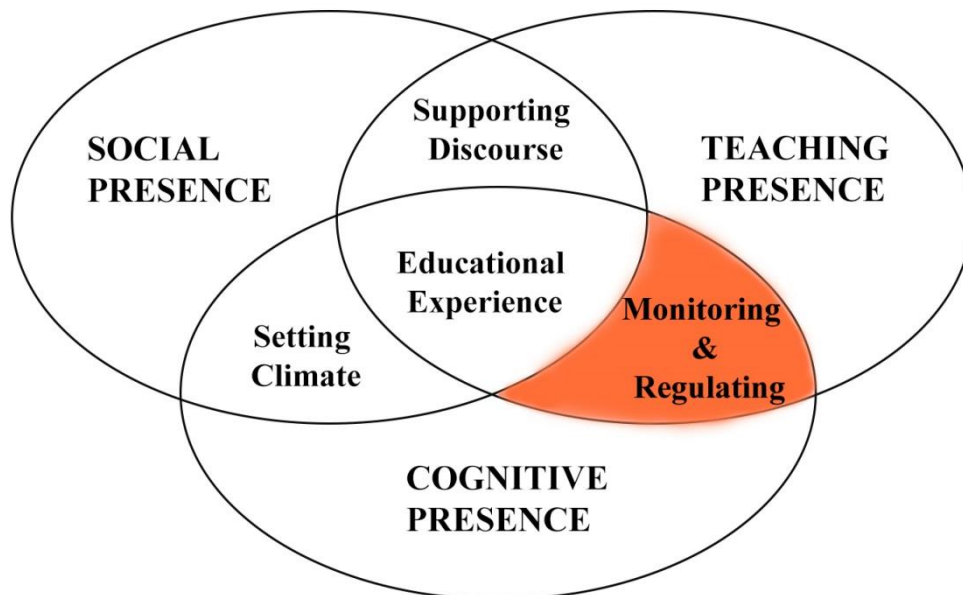
Figure 2.6 CoI model presenting location of the metacognition constructs(Akyol & Garrison, 2011)

Cleveland-Innes and Campbell (2012) also suggested adding emotional presence to the model. Previous research indicated that emotions were an integral part of the learning environment (Cleveland-Innes & Campbell, 2006); thus, influence students' learning experiences. Starting from this fact the authors of current study

hypothesized that that emotions played a role in learning and, therefore, were present in online learning environments. The participants of the study were students enrolled in two graduate programs at a single- mode distance education university. Study consisted of two phases. In the first phase, it was investigated that whether any emotions exist in the online environments. For this purpose online discussions were analyzed and the types of emotions were identified. In the second step CoI model proposed by Garrison, Anderson, and Archer (2000) was modified by addition six items designed to measure emotional presence. As next step this new instrument used to collect data from students in the same graduate programs. Results unveiled that the emotive experience existed in combination with social presence, but it also clusters together as a unique presence. At the end, emotional presence was defined as the following:

> "...outward expression of emotion, affect, and feeling by individuals and among individuals in a community of inquiry, as they relate to and interact with the learning technology, course content, students, and the instructor."

Social presence is one of the core factors in improving interactivity and as a result instructional effectiveness. It maintains the ability of learners to project themselves as a "real person" in the computer- mediated communication. Mykota (2014) conducted a research on social presence to investigate whether some learner characteristics such as sex, age, teaching experience, number of online courses taken, years using the internet, years using email were influential on social presence or not. The participants were teachers enrolled in an education course. The quantitative analysis of the results revealed that the number of years of teaching experience and age of the teacher enrolled in the online courses were not significantly correlated with social presence. However, the number of online courses taken and computer mediated communication proficiency significantly predicted social presence.

In another study on social presence, Savvidou (2013) investigated the relationship between students' and teachers' social presence in an online course. Online discussion transcriptions belonging to students and teachers were used as data

sources.The research took two consecutive semesters and the results showed that higher rates of teacher social presence density are linked to lower rates of student social presence density. In other words, high visibility of the teacher may inhibit overall student social presence. At the end of the study asking questions, supporting and encouraging student participation by complimenting and expressing appreciation were recommended to teachers to establish an effective discussion environment.

As it is stated previously, social presence is considered as a salient element to sustain a successful and meaningful online learning (Leh, 2001; Aragon, 2003). Thus, it was examined in terms of numerous aspects. Kim, Kwon and Cho (2011) investigated this presence regarding the relationship among demographic variables including gender, the number of semester(s) taken and work status, the level of media integration , the level of interactivity, and learning satisfaction a cyber-university. The quantitative analysis results conveyed that gender displayed no significant correlation with either social presence or learner satisfaction. This result confirmed the previous findings of other researches (Bourne, McMaster, Rieger, & Campbell, 1997; Arbaugh, 2000). In addition, work status and the number of semester(s) showed any significant relation with social presence and learning satisfaction. Especially, the authors explained possible reason of insignificant correlation between social presence and previous attendance as the increased comfort level making experienced learners feel no need to introducing themselves to new friends.

Finally, according to regression analysis, media integration, quality instruction and interactivity were indicated as good predictors of social presence, however only media integration and quality instruction predicted learning satisfaction.

Besides, Pollard, Minor and Swanson (2014) researched to explore whether teaching presence, social presence, and instructor social presence predict community. Employing exploratory factor analysis, Instructor Social Presence Instrument was developed. Results unveiled that instructor social presence exhibited a significant impact on community and the learning environment. Thus authors suggested adding a new dimension to COI framework that is "instructor social presence".

It is clear that the interrelation between three presences was highly investigated by many researchers (e.g., Garrison, Cleveland-Innes, & Fung, 2010;Kozan & Richardson, 2014;Lee, 2014; Pollard, Minor and Swanson, 2014). Recently, Szeto (2015) applied the CoI framework as an instructional approach in an engineering course with blended learning design. Twenty-eight students and two instructors participated to the study and data was collected through class observation, video recording and semi-structured interviews. The findings of the study support previous researches (Akyol & Garrison, 2008;Shea et al., 2006) unveiling that teaching presence played a salient role among the three presences of the CoI model. Szeto (2015) asserted that instructors' presence as an instructional expert facilitated the cognitive and social presences. In other words the prominent effect of teaching presence overshadowed the social and cognitive presences. However, the author notes that this result is valid just for the studied context. Furthermore, the study points to the features of an online teacher by saying an effective online teacher is an effective teacher having the pedagogical understanding of learning proces, motivating, assessing and orchestrating.

In a similar vein, Lee (2014) investigated the interrelation between social presence and cognitive density of online learners. From the point of constructivist view, learning in a community occurs through social interaction. This view indicates that social presence is a prerequisite for the cognitive development (Gunawardena, Lowe, & Anderson, 1997). Lee's study confirmed this perspective and results indicated that the higher the social presence, the better the density of cognitive presence. To put it differently, social presence were found as positively correlated with cognitive presence. Similarly, it is seen that the study of Kozan and Richardson (2014) which was conducted by 211 graduate students enrolled in an online MS program, pointed the same result. Correlation analyses resulted in a strong positive correlation between social presence and cognitive presence ($r = .663$, $n = 211$, $p < .01$). In addition, high levels of teaching presence related to high levels of social presence ($r = .553$, $n = 211$, $p < .01$). Finally a strong positive correlation was also noted between teaching presence and cognitive presence ($r = .826$, $n = 211$, $p < .01$).

Archibald (2010) introduces a study to explore whether online resources and online discussions enhance student learning and critical thinking. To achieve this purpose, a mix method design was applied including 189 participants enrolled in an online research methods course. CoI instrument, interviews and discussion transcriptions were used as data sources. Based on the quantitative analysis results, the author concluded that the three presences of the CoI are "very highly correlated". Further, social and teaching presences significantly contributed to the prediction of cognitive presence. Two presences exhibited almost 65% of the variance of cognitive presence after controlling other for self-directed learning readiness, prior online learning experience, and prior collaborative learning experience. However, the detailed regression results and qualitative analysis were not presented in the study.

The prediction power of teaching and social presence on cognitive presence was investigated by Shea and Bidjerano (2009) with a broad population (over 5,000) prior to Archibald (2010). The author firstly aimed to get a better understanding of student experiences in both fully online and hybrid courses. The results displayed a high rate of cognitive presence in the online courses. From this aspect, it contradicted earlier studies that suggesting online learners did not perform higher-order learning. The author brought an explanation to this contradiction by saying the previous studies had smaller sample sizes that might not be as representative as the larger sample used current study. Further, it was also concluded that teaching and social presence significantly contribute to the prediction of variance in cognitive presence. As compared with hybrid delivery, students in high teaching presence online courses were more likely to report high levels of cognitive presence than students in blended courses. Ultimately, older students reported higher levels of cognitive presence than younger students thus the age variable represented a significant predictor of cognitive presence.

Parallel to current trend investigating online, text-based discussions using the three presences of the CoI, Liu and Yang (2014) conducted a study to explore students' level of knowledge construction in four types of discussion topics—theory exploration, life experience, case-based, and debate discussion. Besides, their relationships with cognitive, social, and teaching presence were explored. The

sample consisted of 36 fourth-year undergraduate students. The online discussions were asynchronous. Participants' message posts, the teacher's reflection notes, and a survey measuring participants' perceptions and attitudes toward online discourse were the data sources. Content analysis was performed based on the CoI model. The results displayed that conceptual open discussion were students' favorite type of discussion however students performed poor CP and SP. Also, case discussion had high CP but relatively low SP. Authors recommended that discussions in this type should be embedded in social events or individual experiences. Finally, students performed good SP and an extremely poor CP in the debate type of discussion.

Although online education offers a great flexibility especially for nontraditional students, Capra (2014) approached with suspicion to the online courses in community colleges. The author conducted an in-depth, phenomenological study to examine community college students' shared experiences in online courses. A phenomenological design was employed and data were collected from 15 community college students. Interview questions were designed in accordance with the CoI model to evaluate students' cognitive and social processes. The findings conveyed that students did not experience a meaningful learning as a result of lack of CoI presences. In terms of social presence, students reported that the learning environment was isolated and lonely. Previous research indicated social presence has a strong relation with critical-thinking and collaborative work. In other words it is correlated with cognitive presence. Current study confirmed this fact and Capra (2014) reported that all participants had challenges to manage the workload to meet deadlines. Finally, teaching presence was insufficient because the instructor was found completely invisible and disconnected. Besides, there was a difference between experienced and first-time online learners in terms of self-regulation. Experienced learners indicated their cognitive engagement to their own ability to regulate themselves. On the other hand, first-time online learners required more instructional presence. At the end, the author suggested that evaluation of course design should be understood just as navigable ease and technological efficiency it should hold closer examination of social, cognitive, and instructional spheres to enhance student success, learning, and retention.

It is stressed that facilitation and instruction are essential components for deep learning and high cognitive presence (Garrison & Cleveland-Innes, 2005). However many learners are not skilled at self-regulated learning (Bjork et al., 2013). From this point of view Gašević et al (2015) investigated the effects of externally-facilitated regulation scaffolds on cognitive presence. In the study, a quasi-experimental mixed design was used. The sample of research consisted of 82 students enrolled in a master's-level software engineering course. Quantitative content analysis of online discussion transcripts and a multilevel linear modeling analysis revealed that externally-facilitated regulation scaffolding had a significant positive effect on cognitive presence than extrinsically induced motivation through grades.

Ice et al. (2007) attempted to understand the effect of audio feedback on the sense of community, satisfaction, perceived learning and teaching presence instead of text-based feedback in asynchronous courses. End of course survey, interviews, and final projects were the data sources. Students reported that they felt there was less physical and emotional distance. Besides, student's indicated audio feedback provided enhanced insight, feelings of involvement, content retention, and instructor caring. To sum up, the findings conveyed that audio feedback escalated teaching, social and cognitive presence as well as developed overall sense of community of students. Finally, instructor found this type of feedback more time and effort saving compare to text-based feedback.

Gender issue is considerably studied in the CoI literature as well. It is due to the fact that if gender differences in students' perception of CoI presences are understood well, instructors enhance or change existing learning and teaching strategies in terms of gender (Ong & Lai, 2006). Previous research highlights that there is a relation between gender and CoI elements (Garrison, et al. 2010). Some studies move beyond the relationship and found gender as a significant predictor of learning community (e.g. Shea et al., 2006; Shea & Bidjerano, 2009). For instance Gibson, et al. (2012) investigate whether gender is a factor affecting the level of the three Community of Inquiry (CoI) presences (teaching, cognitive, and social). The sample is students enrolled at a national, fully online university. The results of this study reveal that there is a significant relationship between being female and having the degree of

Teaching Presence, Cognitive Presence and Social Presence. In another study, Rovai and Baker (2005) provide empirical results to demonstrate that men and women have different communication levels thus, perceive online community differently. Briefly, their study presents that women have more social presence in online collaborative environments. In a same fashion, Thayalan,Shanthi and Paridi (2012) found significant difference between the male and the female students regarding experienced social presence in e-learning activities.

Garrison et al. (2010) have investigated potential influence of gender on CoI elements. Although they have found that gender plays a role in the relationship among CoI components, this role is not statistically significant. Therefore, the gender issue gives rise inconsistency. Similarly, Khodabandelou (2014) presents that the gender differences in the social, teaching, and cognitive presences mean scores are not significant in studied blended learning environment.

Finally, previous research indicates distinct evidence for the contribution of age to the COI presences. For instance, based on the CoI Framework, Shea and Bidjerano (2009) investigate knowledge construction in a text-based, asynchronous learning environment through self-reported measures. Study indicates that older student report higher cognitive presence in learning process. However when age is held constant, the variance in cognitive presence is still predicted by student ratings of teaching presence and social presence. In other words, age is not the core element in cognitive presence.

In line with this purpose, Gibson (2012) explores the age factor in relation to the level of the three CoI presences including teaching, cognitive, and social presences for students in a large national fully online university. The findings of study report that although the age of students in the group of non-traditional student status have no significant relationship with CoI presences, the age of students in the group of traditional student status displays significant relationship.

2.5Summary

This chapter presented a theoretical foundation providing analysis and synthesis of past studies on andragogy (Knowles, 1980), self-regulated learning (Schunk & Zimmerman, 1998) and community of inquiry (Garrison, Anderson & Archer, 2000). The investigated empirical researches indicated that the relationship among SRL, academic achievement and engagement is a highly studied field. Similarly, current literature review unveiled that an abundant amount of research on development and verification of CoI framework exist.

CHAPTER 3

METHOD

This chapter elucidates the methodology employed in the current research and it consists of nine parts: (1) Research questions; (2) The Context: Information Technologies Certificate Program (ITCP); (3) Participants; (4) Research method and instruments; (5) Data collection procedures; (6) Data analysis; (7) Validity and reliability; (8) Assumptions (9) Limitations and (10) Summary.

3.1 Research Questions

It is essential to identify the factors that contribute to success of learners participating in online learning programs because of the growing popularity of online education. This study aims to identify the relationship between adult learners' characteristics in relation to age, gender, previous attendance to an online course, the number of logins per week, community of inquiry presences consisting of teaching presence, social presence, cognitive presence andonline self-regulated learning including goal setting, task strategies, environment structuring, time management, help seeking and self-evaluation in an online instructional setting called Information Technologies Certificate Program (ITCP). Parallel to this purpose, following research questions are addressed.

(1) What is the nature of relationship between learners' characteristics, COI presences and online self-regulated learning?
(2) To what extent do learners' COI presences predict their self-regulated learning?
(3) To what extent does learners' self-regulated learning predict their COI presences?

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3.2 The Context: Information Technologies Certificate Program (ITCP)

Online Information Technologies Certificate Program (ITCP) embodying synchronous and asynchronous communication methods over the Internet was developed in 1998 as a pioneer in the field of online learning in Turkey. The program is carried out with the collaboration of Continuing Education Center and Computer Engineering Department in Middle East Technical University (METU), Ankara, Turkey (Yukselturk &Yildirim, 2008). The idea of online ITCP put forward to train the participants in the information technologies field and to bridge the gap in computer technologies discipline in Turkey. However in 2015, it serves as a program providing extensive opportunities for people from a wide range of disciplines who are eager to improve themselves in IT field and passionate about contributing to their existing career (Yukselturk, 2012). Computer literacy, internet literacy, graduating from two or four year university programs or currently being a university student, attending face to face courses and examinations are the basic requirements to be accepted to the online ITCP.

ITCP consists of four consecutive semesters and each semester proceeds two months. In the scope of ITCP there are eight courses: (1) Computer Systems and Structures, (2) Introduction to Computer Programming with Java, (3) Data Structure and Algorithms with Java, (4) Operating Systems with Unix, (5) Software Engineering, (6) Database Management Systems, (7) Software Development Project, and (8) Web Programming (Figure 3.1).

First Semester

Computer Systems and Structures	Introduction to Computer Programming with Java

Second Semester

Data Structure and Algorithms with Java	Operating Systems with Unix

Third Semester

Software Engineering	Database Management Systems

Fourth Semester

Software Development Project	Web Programming

Figure 3.1 Eight courses in ITCP

All the courses have weekly lesson programs, textbooks, an instructor and a teaching assistant. Online lecture notes, discussion forums, video-based tutorials and visual aids provided by the program serve for asynchronous communication, while predetermined chat sessions are used for synchronous communication.

To measure the learning outcome and to evaluate performance of participants, three or four assignments -depending on the instructors' lesson plan- are given to the participants for each course. Furthermore, face to face final examinations are conducted within the campus of the university at the end of each semester. Learners' final grades are determined considering exam grades, assignment scores, attendance to chat sessions and discussion forums. People who complete the aforementioned necessary requirements for the graduation receive official certificate that is approved by the president of METU, president of Continuing Education Center and chairperson of the Computer Engineering Department (Yukselturk, 2012).

3.3 Participants

A convenience sampling consisting of adult learners enrolled in an online program was used. As the term implies, convenience sampling is a group of individuals who are

available based on time, money, and location for study (Fraenkel et al., 2011). Participants of this research study included 92 trainees enrolled in a nine-month online Information Technologies Certificate Program offered by Computer Engineering Department and Continuing Education Center in Middle East Technical University.

The participants in the program varied in terms of age, education level, the number of log in per week, previous attendance to an online program and disciplines. The age of the participants ranged from 17 to 59 and included 23 females and 69 males. Education level was classified under four categories: Associate's Degree (N=10), Bachelor's Degree (N=59), Master's Degree (N=19) and Doctoral Degree (N=4). Participant's number of log in per week was presented as less than 5 times (N=22), between 5 and 10 times (N=40) and more than 5 times (N=30). 66 of the participants never attended an online course before, 26 of them had participated at least one online course (Table 3.1).

Table 3.1   Demographic characteristics of the participants

Age	Frequency	Percentage
17-19	2	2,2
20-29	45	48,9
30-39	35	38
40-49	8	8,7
50-59	2	2,2
Gender		
Female	23	25
Male	69	75
Education Level		
Associate's Degree	10	10,9
Bachelor's Degree	59	64,1
Master's Degree	19	20,7
Doctoral Degree	4	4,3
Number of log in per week		
Less than 5 times	21	22,8
Between 5 and 10	41	44,6
More than 5 times	30	32,6
Previous Attendance		
Yes	26	28,3
No	66	71,7
Total :	**92**	**100**

Finally in terms of disciplines of participants, it is seen that engineering has the most frequency with 36, and it is followed by Computer Science with 10 as presented in Figure 3.2.
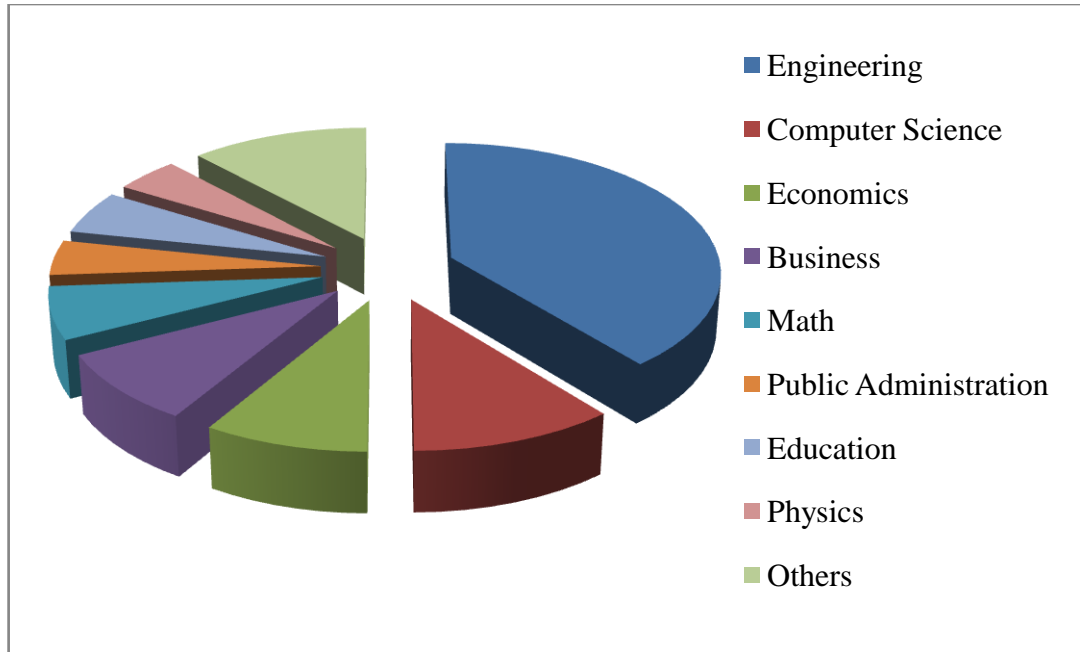
Figure 3.2 Disciplines of the participants

3.4 Research Method and Instruments

This quantitative study is conducted by employing survey technique which is a non-experimental, widely used research approach. Survey is a means of collecting information directly from people to describe, compare or explain knowledge, characteristics, attitudes, opinions, actions and behaviors in a systematic and comprehensive way (Taylor, & Hermann, 2000). Pinsonneault and Kraemer (1993) states that survey is not simply an instrument like a questionnaire or checklist to collect data. On the contrary it is an organized and comprehensive strategy including 10 major steps: (1) Setting measurable objectives, (2) Organizing and scheduling, (3) Ensuring that appropriate resources are available (4) Designing the survey (5) Preparing the data collection instrument (6) Validating the instrument (7) Selecting participants (8) Administering and scoring the instrument (9) Analyzing the data and (10) Reporting the results.

As Cook (2001) utters the research questions should dictate the research method. Considering the research questions investigated in this study, it is seen that employing survey technique and using questionnaires that ask the same question in the same way to all respondents is appropriate because main purpose of researcher in this study is producing quantitative descriptions of studied population, testing the Community of Inquiry Framework and Online Self-Regulated Learning Theory and analyzing the relationships among variables (Pinsonneault, & Kraemer, 1993). The tools used to gather data included Community of Inquiry *Questionnaire* (Ozturk, 2012) and Online Self-Regulated Learning Survey (Samsa, 2011).

Community of Inquiry Questionnaire: Participants' cognitive, social and teaching presence were evaluated by using Community of Inquiry Survey. The survey was developed by Arbaugh et al. (2008) and translated into Turkish by Ozturk (2012). The original survey consists of three sub scales which are cognitive presence, social presence and teaching presence and 34 items. 13 items are for teaching presence, 9 items are for social presence and 12 items are for cognitive presence. The items were in the form of a 4-point Likert-type scale, ordered from 1=Strongly Disagree to 4=Strongly Agree. The validity and reliability of the framework was analyzed on 140 Turkish university students. Cronbach Alpha internal consistency values were calculated .92 for teaching presence, .88 for social presence and .75 for cognitive presence. The overall value was found as .97 (Table 3.2).

Online Self-regulated Learning Questionnaire: Participants' online self-regulated learning abilities were measured by Online Self-regulated Learning Questionnaire. The questionnaire was developed by Barnard et al. (2009) and adapted into Turkish by Samsa (2011). The survey consists of 24 items which were in the form of a 5-point Likert-type scale, ordered from 1=Strongly Disagree to 5=Strongly Agree. The validity and reliability of the survey was tested on 165 Turkish university students who participated to an online course before. Self-evaluation, task strategies, help seeking, time management, goal setting and environment structuring represents the factors of survey. The overall Cronbach Alpha internal consistency value was found to be .89 (Table 3.2).

Table 3.2 Research Instruments

Instrument	Subscales	Number of Items	Value
	Cognitive presence		
Community of Inquiry	Social presence	34	Likert Type
Questionnaire	Teaching presence		Scale
(CoI)			1-4[*]
	Self-evaluation		
Online Self-regulated	Task strategies		Likert Type
Learning Questionnaire	Help seeking	24	Scale
(OSrL)	Time management,		1-5[**]
	Goal setting		
	Environment		
	structuring		

[*]1=Strongly Disagree, 2= Disagree, 3= Agree, 4=Strongly Agree

[**]1=Strongly Disagree, 2= Disagree, 3=Neutral, 4= Agree, 5=Strongly Agree

3.5 Data Collection Procedures

Creswell and Clark (2011) suggest five data collection steps that are appropriate for quantitative studies: (1) sampling procedures; (2) acquiring permissions; (3) collecting data; (4) recording the data; and (5) managing the process.

Prior to the study, firstly research permission was obtained from the Ethics Committee of university. Secondly, the permissions were received by email from the researchers who adapted the questionnaires used in the study. Finally, participant consent was obtained at the beginning of the online survey by asking the participants to check the "I agree to participate voluntarily" box.

The survey, prepared in Google Forms, was in the form of online survey. 198 participants were invited by an email containing a brief description of the study, contact information of researchers and a link of the online survey. As maintained by

Bryman(2008), ethical issues such as anonymity are essential in conducting research Thus before informing respondents about purpose of the study, it was explained that confidentiality of information provided by respondents would be guaranteed and the information would be only employed in the research to protect them from any potential harm or risk. Then, participants were asked to complete the survey by taking into account two courses taught in the first semester by two experienced instructors recognized by their endeavors in creating social presence, teaching presence and cognitive presence in online instruction. Of the 198 participants, 94 responded to the survey.

3.6 Data Analysis

The most common computerized software, Statistical Package for the Social Sciences (SPSS) version 20, was used in describing demographic information of respondents and in analyzing quantitative data retrieved from questionnaires. After checking the errors, valid and missing cases in Excel sheet and cleaning data through a manual process, data were transferred to SPSS for analysis. Two respondents' data were excluded because of being outlier. In total, valid 92 responses were included in the analysis.

Next, to determine if data was appropriate for analysis, Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) was employed (Kaiser, 1974) for both Community of Inquiry (CoI) Questionnaire and Online Self-regulated Learning Questionnaire (OSrL).

A descriptive analysis was conducted, including the means and standard deviation values for each of the items of survey instruments. Additionally skewness and kurtosis values were calculated for Community of Inquiry Composite and its subscales; teaching presence, social presence, cognitive presence and for Online Self-regulated Learning Composite and its subscales; goal setting, environment structuring, task strategies, time management, help seeking, self-evaluation.Research questions were investigated through the statistical procedures presented in Table 3.3.

Table 3.3 Data Analysis

Research Questions	Instruments	Variables	Statistical Method
(1) What is the nature of relationship between learners' characteristics, COI presences and online self-regulated learning? (2) To what extent do learners' COI presences predict their self-regulated learning? (3) To what extent does learners' self-regulated learning predict their COI presences?	• Community of Inquiry (CoI) Questionnaire • Online Self-regulated Learning (OSrL) Questionnaire	Learner Characteristics • Gender • Age • Previous attendance • Number of log in per week SRL • Goal setting • Self-evaluation • Help seeking • Time Management • Environment structuring CoI • Teaching presence • Social presence • Cognitive presence	Stepwise Linear Regression

3.7 Validity and Reliability

Ensuring validity and reliability is a crucial issue for the quality of any assessment. A valid survey measures what is intended to measure based on pre-defined objectives. In other words, it represents whether the assessment tool achieves its purpose. On the other hand, a reliable survey produces consistent scores on repeated trials; thus, a correlation is found between different versions of the test (Gardner, 2012).

In research, two types of validity are vital: (1) internal validity, and (2) external validity. Internal validity briefly points to whether the results obtained in current study are due to the conceptual variable or not. If alternative explanations exist for the result, then internal validity of the study is in danger (Phillips et al., 2013). External validity refers to generalizability of the findings to studies conducted under a variety of circumstances or conditions such as other times, people and places.

A number of threats affect the internal validity of research results, including characteristics of the assessment itself, the administration and scoring procedures, and the participants (Miller et al., 2009). In the current study, mentioned threads were minimized by (a) reviewing the previous studies researched on the same subject in detail, (b) planning research design thoroughly, (c) standardizing data collection and data analysis procedures, (d) avoiding unclear directions and ambiguous statements, and (e) examining validity and reliability of pre-published instruments used in this study. In addition, the findings acquired in the current study cannot be generalized to all online learning settings due to external validity. The findings may be valid and meaningful for only identical online learning programs.

Reliability is another salient characteristic of a research design. Reliability can be defined as the degree to which an instrument accurately and consistently measures whatever it measures, therefore, if the design of a research study is reliable, then its findings should be relatively free from measurement error; the findings should be repeatable or replicable and generalizable beyond one study (Connaway & Powell, 2010). In the literature, there are several techniques to ensure the reliability of an instrument: (a) test-retest correlation, (b) alternate form method, (c) internal consistency, and (d) inter-rater reliability (Fraenkel et al., 2011).

All instruments employed in this study were selected by supervision of experts in the field of Computer Education and Instructional Technologies. Selected surveys were developed previously by other researchers. One of them was published (CoI) in a peer-reviewed journal and the other one developed in the scope of a published doctoral dissertation (OSrL). Alpha internal consistency values were calculated as α=.97 for *Community of Inquiry Questionnaire*, and .89 for *Online Self-regulated Learning Questionnaire*(Table 3.4).

Table 3.4 Cronbach's α Value for Adapted Study and Current Study

Cronbach's α	Adapted Study	Current Study
COI	.97	.96
Teaching Presence	.92	.94
Social Presence	.88	.88
Cognitive Presence	.75	.93
SRL	.89	.91
Goal setting	.77	.82
Environment structuring	.77	.85
Task strategies	.64	.61
Time management	.74	.74
Help seeking	.66	.75
Self-evaluation	.75	.76

3.8 Assumptions

The present study was conducted under the following assumptions:

- Participants easily and clearly understood the format and structure of the survey instruments.
- Participants responded accurately to all questions in the instruments.
- Data analysis was performed meticulously.

3.9 Limitations

The methodological limitations of the current study are as follows:

- This study was limited to 92adult learners enrolled in a selected certificate program at Middle East Technical University, Ankara, Turkey. The results constructed by these participants may not sufficiently represent all online adult learners.

- Aforementioned certificate program is commercial, for this reason participants' perceptions may be different in a noncommercial course.

- The content of the online certificate program is related with Information Technologies; thus, results may vary in other courses from different fields.

- Surveys were given at the end of the semester once. Due to the lack of a pre-test measure, it is hard to determine whether the relation among variables occurred as a result of certificate program or not.

- Participants who had withdrawn from the course were excluded from the study. Therefore, the results do not represent the perceptions of all program participants.

3.10 Summary

This chapter presented the methodological design of study under ten sections: (1) Research questions: three research questions are presented, (2) Information Technologies Certificate Program (ITCP): the context of the study is introduced, (3) Participants: 92 adult students enrolled to ITCP, (4) Research method and instruments: survey method is employed and two instruments are used which are Community of Inquiry Questionnaire and Online Self-regulated learning Questionnaire, (5) Data collection procedures: Google surveys are used, (6) Data analysis: stepwise linear regression is performed (7) Validity and reliability, (8) Assumptions, (9)Limitations and (10) Summary to investigate the relationship between online self-regulated learning ability and community of inquiry of learners in a commercial online learning program. The next chapter will explain the results of the research.

CHAPTER 4

RESULTS

The purpose of current study is to identify the relationship between adult learners' characteristics in relation to age, gender, previous attendance to an online course, the number of log ins per week, community of inquiry presences consisting teaching presence, social presence, cognitive presence, online self-regulated learning and its subscales including goal setting, task strategies, environment structuring, time management, help seeking and self-evaluation in an online instructional setting. The results of the study are presented in two sections. While the first section reports descriptive analysis regarding the Community of Inquiry Questionnaire and Online Self-Regulated Learning Questionnaire, the second section presents quantitative analysis results of the research questions.

4.1 Descriptive Statistics

Community of Inquiry Questionnaire Instrument:

A descriptive analysis of the study's variables was conducted, including the means for each of the 34 questions of the Community of Inquiry (CoI) Questionnaire Instrument. The mean values of CoI Questionnaire Instrument were grouped by presences (teaching presence, cognitive presence, social presence) and sorted by mean value (Table 4.1). It indicated that teaching presence has the biggest mean with the value of M=3.36.

Table 4.1 Responses for 34 items of the community of inquiry questionnaire instrument grouped by presence and sorted by mean value

ITEMS	Mean	SD
Teaching Presence		
3. The instructor provided clear instructions on how to participate in course learning activities	3,36	,76
4. The instructor clearly communicated important due dates/time frames for learning activities.	3,29	,85
1. The instructor clearly communicated important course topics.	3,28	,77
2. The instructor clearly communicated important course goals.	3,25	,83
5. The instructor was helpful in identifying areas of agreement and disagreement on course topics that helped me to learn.	3,05	,80
6. The instructor was helpful in guiding the class towards understanding course topics in a way that helped me clarify my thinking.	3,00	,81
7. The instructor helped to keep course participants engaged and participating in productive dialogue.	2,99	,90
8. The instructor helped keep the course participants on task in a way that helped me to learn.	2,99	,84
11. The instructor helped to focus discussion on relevant issues in a way that helped me to learn.	2,96	,83
9. The instructor encouraged course participants to explore new concepts in this course.	2,93	,92
10. Instructor actions reinforced the development of a sense of community among course participants.	2,76	,89
13. The instructor provided feedback in a timely fashion.	2,66	,91
12. The instructor provided feedback that helped me understand my strengths and weaknesses relative to the course's goals and objectives.	2,55	,93

Table 4.1 *continued*

Social Presence	Mean	SD
18. I felt comfortable participating in the course discussions.	2,91	,76
14. Getting to know other course participants gave me a sense of belonging in the course.	2,90	,85
17. I felt comfortable conversing through the online medium.	2,83	,77
20. I felt comfortable disagreeing with other course participants while still maintaining a sense of trust.	2,82	,83
16. Online or web-based communication is an excellent medium for social interaction.	2,79	,80
15. I was able to form distinct impressions of some course participants.	2,78	,81
19. I felt comfortable interacting with other course participants.	2,75	,90
21. I felt that my point of view was acknowledged by other course participants.	2,73	,84
22. Online discussions help me to develop a sense of collaboration.	2,71	,83

Table 4.1 *continued*

Cognitive Presence	Mean	SD
26. I utilized a variety of information sources to explore problems posed in this course.	3,39	,69
34. I can apply the knowledge created in this course to my work or other non-class related activities.	3,30	,75
31. Reflection on course content and discussions helped me understand fundamental concepts in this class.	3,13	,68
27. Brainstorming and finding relevant information helped me resolve content related questions.	3,08	,77
30. Learning activities helped me construct explanations/solutions.	3,04	,69
29. Combining new information helped me answer questions raised in course activities.	3,03	,74
25. I felt motivated to explore content related questions.	3,00	,87
28. Online discussions were valuable in helping me appreciate different perspectives.	3,00	,82
32. I can describe ways to test and apply the knowledge created in this course.	2,99	,73
23. Problems posed increased my interest in course issues.	2,97	,84
24. Course activities piqued my curiosity.	2,90	,86
33. I have developed solutions to course problems that can be applied in practice.	2,73	,91

Additionally skewness that is a measure of the symmetry and kurtosis that is a measure of whether the data, if graphed, would appear peaked or flat relative to a normal distribution, were presented for the mean teaching presence, social presence, cognitive presence and COI composite score. The values were calculated within a range of -1.0 to +1.5 (Table 4.2). While negative values of skewness signify a pile-up on the right of the distribution, positive values indicate a pile-up of scores on the left. As for curtosis, although negative values indicate a flat and light-tailed distribution, positive values of kurtosis indicate a pointy and heavy-tailed distribution (Field, 2009).

As Field (2009) suggests the three sub-categories of community of inquiry (social, teaching, and cognitive presence) are tested for reliability. Chronbach's α is found as .94 for teaching presence, .88 for social presence .93 for cognitive presence and .96 for overall CoI model. Thus, all three sub-categories and CoI are considered to have excellent reliability.

Table 4.2   Mean, Skewness and Kurtosis values of COI composite and subscale measures

	Mean	**Std. Deviation**	**Skewness**	**Kurtosis**
TP	39,10	8,627	-,499	,016
SP	25,27	5,362	-,621	1,454
CP	36,60	7,176	-,852	1,349
COI	100,97	18,741	-,667	1,380

Furthermore, Bivariate Pearson Correlation test is run to determine the strength and direction of linear relationships between the mean values of cognitive presence, teaching presence, and social presence subscales within the survey. Table 4.3 indicates that there is a strong, positive correlation between cognitive presence and

social presence, which is statistically significant (r = .732, n = 92, p < .01). Similarly a significant, strong, positive correlation is calculated between cognitive presence and teaching presence (r = .744, n = 92, p < .01). Finally a moderate, positive correlation is found between social presence and teaching presence (r = .585, n = 92, p < .01).

Table 4.3 Pearson product-moment correlation for COI Presence

Measure	1	2	3
1. Teaching presence	-	.585*	,744*
2. Social presence		-	,732*
3. Cognitive presence			-

* *p*< .01 level, two-tailed.

Online Self-regulated Learning Questionnaire Instrument:

Another descriptive analysis of the study's variables was conducted for the means of each of the 24 questions of the Online Self-regulated Learning Survey Instrument. The mean values of Online Self-regulated Learning Survey Instrument were grouped by six subcategories (self-evaluation, task strategies, help seeking, time management, goal setting and environment structuring) and sorted by mean value as displayed in Table 4.4.

Table 4.4 Responses for 24 Items of the online Self-Regulated Questionnaire
Instrument, Grouped by Factors and Sorted by Mean Value

ITEMS	M	SD
Goal setting		
3. I keep a high standard for my learning in my online courses.	3,7	,88
2. I set short-term (daily or weekly) goals as well as long-term goals (monthly or for the semester).	3,7	,98
4. I set goals to help me manage studying time for my online courses.	3,7	,99
5. I don't compromise the quality of my work because it is online.	3,5	,97
1. I set standards for my assignments in online courses.	3,5	,92
Environment structuring		
8. I know where I can study most efficiently for online courses.	4,1	,93
9. I choose a time with few distractions for studying for my online courses.	4,0	,87
7. I find a comfortable place to study.	4,0	,95
6. I choose the location where I study to avoid too much distraction.	4,0	,92
Task strategies		
10. I try to take more thorough notes for my online courses because notes are even more important for learning online than in a regular classroom.	3,2	1,2
13. I work extra problems in my online courses in addition to the assigned ones to master the course content.	3,2	1,0
12. I prepare my questions before joining in the chat room and discussion.	2,7	1,0
11. I read aloud instructional materials posted online to fight against distractions	2,6	1,2

Table 4.4(continued)   **M   SD**

Time management

14. I allocate extra studying time for my online courses because I know   3,4   1,0
it is time-demanding.

16. Although we don't have to attend daily classes, I still try to   3,1   1,1
distributemy studying time evenly across days.

15. I try to schedule the same time every day or every week to study for   2,9   1,1
my online courses, and I observe the schedule.

Help seeking

17. I find someone who is knowledgeable in course content so that I   3,1   1,1
can consult with him or her when I need help.

20. I am persistent in getting help from the instructor through e-mail.   3,0   1,2

18. I share my problems with my classmates online so we know what   3,0   1,1
we are struggling with and how to solve our problems.

19. If needed, I try to meet my classmates face-to-face.   2,8   1,3

Self-evaluation

22. I ask myself a lot of questions about the course material when   3,6   1,0
studyingfor an online course

21. I summarize my learning in online courses to examine my   3,5   1,1
understanding of what I have learned.

24. I communicate with my classmates to find out what I am learning   2,6   1,2
that is different from what they are learning.

23. I communicate with my classmates to find out how I am doing in   2,5   1,1
my online classes.

Finally, mean, standard deviation, skewness and kurtosis values of online self-regulated learning total score and its subscales are calculated and presented in Table 4.5. Chronbach's α that is found as .91 for online self-regulated learning score is considered to have excellent reliability.

Table 4.5 Mean, Standard Deviation, Skewness and Kurtosis values of Online SRL and its subscales

	Mean	Std. Deviation	Skewness	Kurtosis
Goal setting	18,49	3,38	-,08	-,57
Environment structuring	16,55	3,01	-,48	-,70
Task strategies	12,11	3,04	,08	-,22
Time management	9,61	2,63	-,05	-,27
Help seeking	12,15	3,66	-,12	-,18
Self-evaluation	12,46	3,41	,03	-,29
Online SRL	81,37	14,12	,09	,01

4.2 Statistical Assumptions

Multiple Linear Regression test (MLR) is the major statistical technique of this research study which investigates the linear relationship among predictor variables and outcome variable. Using linear regression is advantageous because it provides the percentage of variance value explained by the predictor variables. This value is also called as coefficient of determination or Adjusted R^2. Thereby, administrators or program directors can use this value as a guide to make decisions on the program. However several assumptions should be met to draw conclusions about a population based on a regression analysis done on a sample. These underlying assumptions are addressed as follow (Field, 2009):

Variable type: The outcome variable should be measured on a quantitative, continuous and unbounded scale and all predictor variables must be quantitative or categorical (interval or ratio variable). In the current study; the variables; COI

composite score,social presence, cognitive presence, teaching presence, SRL composite score, goal setting, task strategies, environment structuring, time management, help seeking and self-evaluation are quantitative, continuous variables.

Independence: Independence means that each value of the outcome variable comes from a separate entity in other words it should be independent. In the current study, all data were received from 92 different participants who do not affect each other.

Non-zero variance: The predictor variables should have some variation in value. As it is displayed in Table 4.6, the data also met the assumption of non-zero variances.

Table 4.6   Variance values of predictor variables

Variables	N	Variance
Age	92	.59
Gender	92	.19
Previous attendance	92	.23
Number of log in per week	92	.55
Social presence	92	28.8
Teaching presence	92	74.4
Cognitive presence	92	51.5
COI composite	92	351.2
SRL composite	92	199.8
Goal setting	92	13.207
Task strategies	92	9.747
Environment setting	92	9.441
Time management	92	7.242
Help seeking	92	13.634
Self-evaluation	92	12.075

Furthermore, Bartlett's Test of Sphericity (Bartlett, 1950) is applied for testing the equality of variance components (Table 4.7). According to the results (χ^2 = 232,534; df = 45; p < 0,001), it is concluded that the sample intercorrelation matrix has come from a population in which the inter correlation matrix is not an identity matrix.

Table 4.7   Bartlett's Test Values

Bartlett's Test of Sphericity Approx. Chi-Square =	232,534	df = 45	p = 0,000*

*p<0,001

No perfect multicollinearity: This assumption maintains that the predictor variables should not correlate too highly; in other words, there should be no perfect linear relationship between two or more of them. When perfect collinearity exists between predictors, obtaining unique estimates of the regression coefficients seems impossible. Although there is no absolute rule about what value of the VIF should cause concern, the values greater than 1 are considered as a problem for the regression model (Bowerman & O'Connell, 1990). On the other hand, Neter (1996) accepts critical the values greater than 3. In the current study VIF values are between 1 and 2.6 in the regression analyses.

Independent errors: It points that the residual terms should be uncorrelated or independent for any two observations. To test this assumption Durbin–Watson test can be used. The test results take a value between 0 and 4. When the value is 2, it means that the residuals are uncorrelated. While a value greater than 2 signifies negative correlation, a less value means positive correlation. In the current study (Table4.8), Durbin-Watson Values are between 1,868 and 2,309 which can be considered as acceptable.

Table 4.8 Durbin-Watson value of outcome variables

Outcome Variables	Durbin-Watson Value
COIcomposite	2.133
Teaching presence	1.902
Social presence	2.103
Cognitive presence	1.868
SRL Composite	2.148
Goal setting	2.055
Task strategies	2.014
Environment setting	2.309
Time management	2.176
Help seeking	1.822
Self-evaluation	1.747

Homoscedasticity: As a term, homoscedasticity refers that the outcome variable exhibits same amounts of variance across the range of all predictors. Variance distribution of the outcome variables including online self-regulated learning composite, goal setting, task strategies, environment structuring, time management, help seeking and self-evaluation, community of inquiry composite, teaching presence, social presence, cognitive presence are illustrated in Figure 4.1.

Normally distributed errors: This assumption briefly addresses that the differences between the model and the observed data should be zero or close to zero. Distribution histograms (Figure 4.2) can identify whether this assumption is met.

Linearity: Linearity refers to the rate of change or the amount of change should be constant for all range of scores. The linearity graph presented in Figure 4.4 shows the linear relationship between outcome variable and predictor variables of this research study.
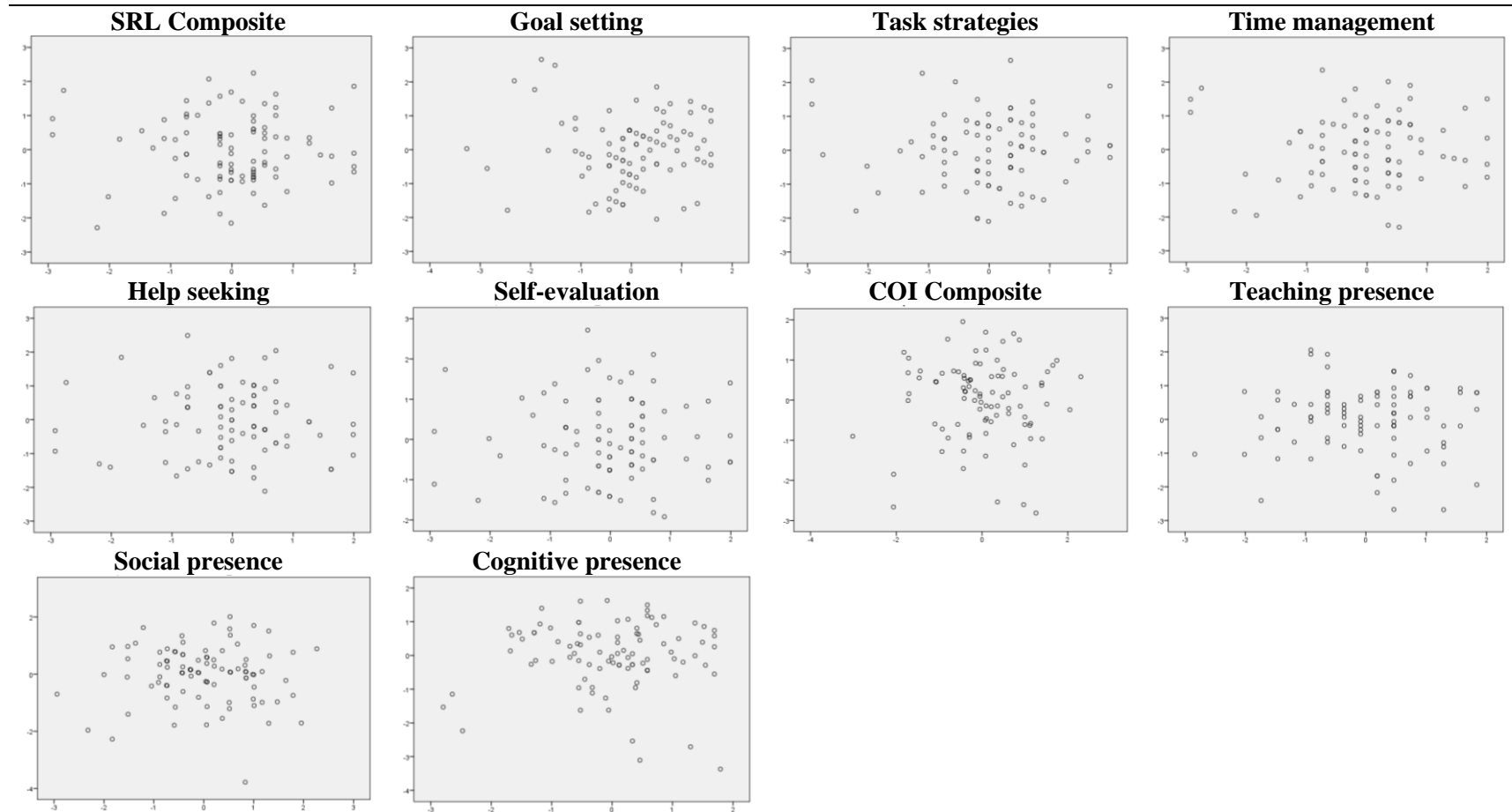
Figure 4.1 Homoscedasticity graphics for outcome variables
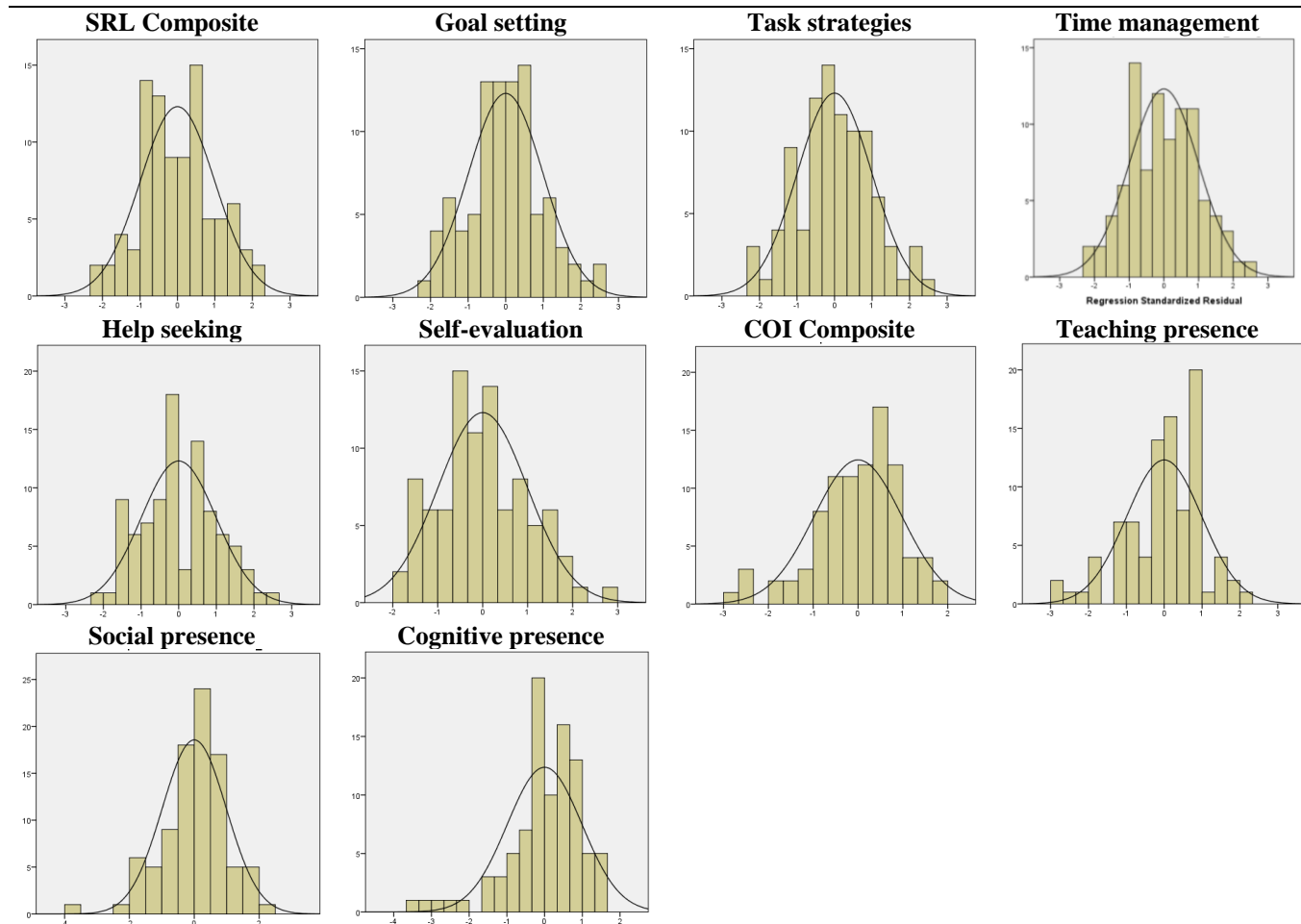
Figure 4.2 Normal distribution histogram for outcome variables
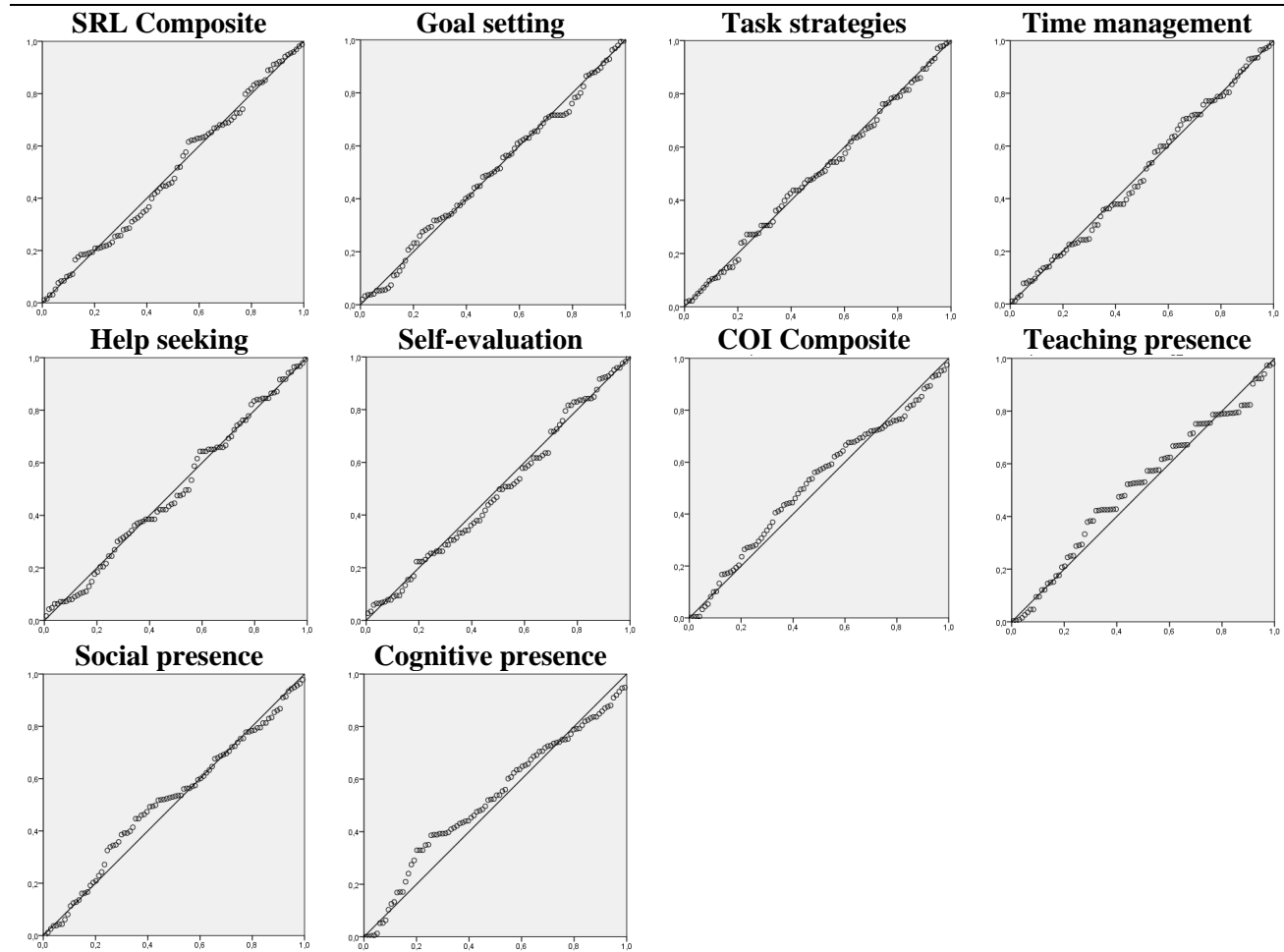
Figure 4.3 Linearity graph of variables

4.3 Research Questions

The analyses of aforementioned three research questions, (1) what is the nature of relationship between learners' characteristics, COI presences and online self-regulated learning? (2) to what extent do learners' COI presences predict their self-regulated learning? (3) to what extent does learners' self-regulated learning predict their COI presences?, are presented in this section.Firstly, Spearman's correlation and Pearson's bivariate correlation analysis are employed to examine the strength and direction of the relationship relationships among learner characteristics, subscales of both CoI and SRL Later on, stepwise multiple linear regression analysesareperformed to define to what extent the outcome variablesare predicted by independent variables stated in theresearch questions.

4.3.1 Research Question One: What is the nature of relationship among learners' characteristics, COI presences and online SRL?

In the first research question, firstly Spearman's correlation is calculated to examine the strength and direction of the relationship relationships among learner characteristics and subscales of both CoI and SRL (Table 4.9) Secondly, Pearson's bivariate correlation analysis is employed to examine the strength and direction of the relationship between CoI and SRL (Table 4.10).

Table 4.9 Spearman's correlation analysis table showing the relationships between learner characteristics, and subscales of both CoI and SRL

	Age	**Gender**	**Previous attendance**	**Number of log ins**
Community of inquiry total	-,009	-,096	-,187	,175
Social presence	-,057	-,103	-,102	,165
Teaching presence	,041	-,091	-,251[*]	,202
Cognitive presence	-,024	-,105	-,103	,139
Self-regulated learning total	-,018	-,177	,017	,313[**]
Goal setting	-,140	-,200	,004	,183
Environment structuring	,023	-,136	,026	,172
Task strategies	,073	-,119	-,082	,121
Time management	,163	,034	-,087	,373[**]
Help seeking	-,112	-,199	,040	,269[**]
Self-evaluation	-,106	-,149	,095	,207[*]

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

*. Correlation is significant at the 0.05 level (2-tailed).

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Table 4.10 Pearson's bivariate correlation analysis table showing the relationships between subscales of COI and SRL

	1	2	3	4	5	6	7	8	9	10	11
1- COI total		,829**	,904**	,928**	,497**	,535**	,179	,407**	,285**	,399**	,408**
2- Social presence			,585**	,732**	,529**	,488**	,200	,421**	,300**	,462**	,487**
3- Teaching presence				,744**	,389**	,419**	,136	,344**	,266*	,297**	,285**
4- Cognitive presence					,445**	,540**	,159	,343**	,207*	,350**	,367**
5- SRL total						,802**	,624**	,759**	,726**	,799**	,816**
6- Goal setting							,565**	,455**	,468**	,512**	,590**
7- Environment structuring								,384**	,399**	,296**	,239*
8- Task strategies									,558**	,505**	,580**
9- Time management										,493**	,483**
10- Help seeking											,741**
11- Self-evaluation											

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

*. Correlation is significant at the 0.05 level (2-tailed).

Correlation with learner characteristics

Spearman's correlation analysis shows that age and gender do not havestatistically significant correlation with both COI presences and online self-regulated learning (p>.05). On the other hand, there is a statistically significant, negative correlation[*] between previous attendance to an online course and teaching presence (r=-.251, n=92, p=.000). Finally, there are statistically significant correlations between the number of log in per week and SRL composite score (r=.313, n=92, p=.001)[**] and time management (r=.373, n=92, p=.002)[**]. Furthermore, help seeking (r=.269, n=92, p=.001)[*] and self-evaluation (r=.207, n=92, p=.001)[*]have statistically significant correlations with the number of log in per week.

As for previous attendance (0=No, 1=Yes), it is solely correlated with teaching presence (r_s=-.256, n=92, p=.01) [*] among all variables. The direction of the relation is negative. Furthermore, the number of log in per week is significantly correlated with the online self-regulated learning score (r_s=.313, n=92, p=.001) [**], time management (r_s=.373, n=92, p=.02) [**], help seeking (r_s=.269, n=92, p=.02)[*] and self-evaluation (r_s=.207, n=92, p=.00)[*]. However, it does not show a relation with cognitive presence, teaching presence and social presence.

Correlation with COI subscales and SRL subscales

Pearson's bivariate correlation analysis displayed in Table 4.10 reveals that teaching presence (r=.389, n=92, p=.001)[**], social presence(r=.529, n=92, p=.000)[***], cognitive presence (r=.445, n=92, p=.000)[***]and CoI total score (r=.497, n=92, p=.000)[**] are significantly and positively correlated with online self-regulated learning score. Furthermore, goal setting is statistically and significantly correlated withteaching presence (r=.419, n=92, p=.001)[**], social presence(r=.488, n=92, p=.000)[**] and cognitive presence (r=.540, n=92, p=.000)[***]. Task strategies is statistically and significantly correlated with teaching presence (r=.344, n=92, =.001)[**], social presence(r=.421, n=92, p=.000)[**]and cognitive presence (r=.343, n=92, p=.000)[**]. Time management is statistically and significantly correlated with teaching presence (r=.266, n=92, p=.001)[*], social presence(r=.300, n=92, p=.000)[*] and cognitive presence(r=.207, n=92, p=.000)[*]. Help seeking is statistically and significantly correlated with teaching presence (r=.297, n=92, p=.001)[*], social

presence(r=.462, n=92, p=.000)** and cognitive presence(r=.350, n=92, p=.000)**. Finally, self-evaluation is statistically and significantly correlated with teaching presence (r=.285, n=92, p=.001)*, social presence(r=.487, n=92, p=.000)** and cognitive presence(r=.367, n=92, p=.000)**. However, only environment structuring does not show any statistically significant correlation with presences. Moreover, all subscales of online SRL are statistically and significantly intercorrelated with each other.

* 0.1-0.3 small correlation, **0.3-0.5moderate correlation, ***0.5-0.7large correlation Cohen, J. (1997).

4.3.2 Research Question Two: To what extent do learners' COI presences predict their SRL?

The answer of second research question is investigated through stepwise multiple regression analysis in SPSS. Six analyses are conducted in which outcome variables are SRL composite, Goal Setting, Environment Structuring, Task Strategies, Time Management, Help Seeking and Self-evaluation.

4.3.2.1 Predictors of SRL Composite

Community of inquiry framework subscales including teaching presence, social presence and cognitive presence are used in a stepwise multiple regression analysis to predict participants' SRL composite score. The results unveil that only social presence significantly predicts the SRL composite score.

Table 4.11 Stepwise Linear Regression Results for SRL Composite

Predictor	b	β	t	R^2 adj	R^2 change
Step 1					
Constant	44.450		7.115*	.272	.280
Social Presence	1.441	.529	5.918*		

* $p < .01$

Overall, the regression analysis indicates that approximately 27% of the variance in SRL composite score is explained by social presence F (1, 90) = 35.019, p < .01, R^2adj = .272. *b, β, t* and adjusted R^2 values are also presented in Table 4.11. The R^2 change value of social presence is 28% for SRL.

4.3.2.2 Predictors of Goal Setting

Community of inquiry framework subscales including teaching presence, social presence and cognitive presence are used in a stepwise multiple regression analysis to predict participants' goal setting behavior. The results reveal that only cognitive presence significantly predicts the goal setting.

Table 4.12 Stepwise Linear Regression Results for Goal Setting

Predictor	*b*	β	t	R^2 adj	R^2 change
Step 1					
Constant	8.741		5.443*	.284	.291
Cognitive Presence	.264	.540	6.084*		

* p< .01

Overall, the regression analysis indicated that approximately 28% of the variance in SRL composite score is explained by cognitive presence F (1, 90) = 37.011, p < .01, R^2adj = .284. The R^2 change value of cognitive presence is 29% for SRL. *b, β, t* and adjusted R^2 values are also presented in Table 4.12.

4.3.2.3 Predictors of Environment Structuring

Community of inquiry framework subscales which are teaching presence, social presence and cognitive presence are used in a stepwise multiple regression analysis to predict participants' environment setting behavior. The correlations among

variables are displayed in Table 4.10 and it is indicated that environment structuring does not any statistically significant correlation with COI presences. The multiple regression analysis also reveals that the prediction model is not statistically significant (p > .01).

4.3.2.4 Predictors of Task Strategies

Subscales community of inquiry framework which are teaching presence, social presence and cognitive presence are used in a stepwise multiple regression analysis to predict participants' task strategies behavior. The correlations among variables are displayed in Table 4.10. The results reveal that only social presence significantly predicts the task strategies.

Table 4.13 Stepwise Linear Regression Results for Task Strategies

Predictor	b	β	t	R^2 adj	R^2 change
Step 1					
Constant	5.981	.421	4.287*	.168	.177
Social presence	.240		4.407*		

* $p < .01$

Overall, the regression analysis indicates that approximately 16% of the variance in task strategies score is explained by the social presence F (2, 89) = 13.609, p < .01, R^2adj = .168. The R^2 change value of social presence is 17%. In addition *b, β, t* and adjusted R^2 values are presented in Table 4.13.

4.3.2.5 Predictors of Time Management

Subscales community of inquiry framework including teaching presence, social presence and cognitive presence are used in a stepwise multiple regression analysis to predict participants' time management behavior. The results reveal that only social presence significantly predicts the time management.

Table 4.14 Stepwise Linear Regression Results for Time Management

Predictor	b	β	t	R^2 adj	R^2 change
Step 1					
Constant	5.822		4.603*	.080	.090
Social Presence	.147	.300	2.984*		

* $p< .01$

Overall, the regression analysis indicates that approximately 8% of the variance in time management score is explained by social presence F (1, 90) = 8.907, p < .01, R^2adj = .080. *b, β, t* and adjusted R^2 values are also presented in Table 4.14.The R^2 change value of social presence is 9%.

4.3.2.6Predictors of Help Seeking

Subscales community of inquiry framework including teaching presence, social presence and cognitive presence are used in a stepwise multiple regression analysis to predict participants' help seeking behavior. The correlations among variables are displayed in Table 4.10. The multiple regression analysis results reveal that only social presence significantly predicts the help seeking.

Table 4.15 Stepwise Linear Regression Results for Help Seeking

Predictor	b	β	t	R^2 adj	R^2 change
Step 1					
Constant	4.267		2.644*	.204	.213
Social Presence	.311	.462	4.938*		

* $p< .01$

Overall, the regression analysis indicates that approximately 20% of the variance in help seeking is explained by social presence F (1, 90) = 24.379, p < .01, R^2adj = .204. *b, β, t* and adjusted R^2 values are also presented in Table 4.15. The R^2 change value of social presence is 21%.

4.3.2.7 Predictors of Self-evaluation

Subscales community of inquiry framework including teaching presence, social presence and cognitive presence are used in a stepwise multiple regression analysis to predict participants' self-evaluation behavior. The correlations among variables are displayed in Table 4.10. Similar to the help seeking and time management, the results reveal that only social presence significantly predicts the self-evaluation.

Table 4.16   Stepwise Linear Regression Results for Self-evaluation

Predictor	b	β	t	R^2 adj	R^2 change
Step 1					
Constant	4.616		3.087*	.229	.237
Social Presence	.308	.487	5.291*		

* $p < .01$

Overall, the regression analysis indicates that approximately 22% of the variance in help seeking is explained by social presence F (1, 90) = 27.994, p < .01, R^2adj = .229. The R^2 change value of social presence is 23%. *b, β, t* and adjusted R^2 values are also presented in Table 4.16.

4.3.3 Research Question Three: To what extent does learners' SRL predict their COI presences?

The answer of third research question is investigated through stepwise multiple regression analysis in SPSS. Four analyses are conducted in which outcome variables are COI composite, Teaching Presence, Social Presence and Cognitive Presence.

4.3.3.1 Predictors of COI Composite

Subscales of self-regulated learning including goal setting, environment structuring task strategies, time management, help seeking and self-evaluation are used in a stepwise multiple regression analysis to predict participants' COI composite score.

The results reveal that goal setting, task strategies and environment structuring significantly predict the COI composite score. Overall, the regression analysis

indicated that approximately 33% of the variance in COI composite score isexplained bythe combination of goal setting andtask strategies. $F(2,89) = 16.067$, p < .01, R^2adj $= . 30$.*b, β, t* and adjusted R^2 values are presented in Table 4.17.The R^2 change values are 28% for goal setting and3% for task strategies.

Table 4.17 Stepwise Linear Regression Results for COI Composite

Predictor	*b*	β	t	R^2 adj	R^2 change
Step 1					
Constant	47.78	.53	5.379*	.278	.286
Goal setting	2.85		6.008*		
Step 2					
Constant	41.578	.44	4.516*		.034
Goal setting	2.358	.20	4.497*		
Task Strategies	1.282		2.101*	.305	

* p< .01

4.3.3.2 Predictors of Teaching Presence

Subscales of self-regulated learning including goal setting, environment structuring task strategies, time management, help seeking and self-evaluation are used in a stepwise multiple regression analysis to predict participants' teaching presence. The results reveal that solely goal setting significantly predict the teaching presence.

Table 4.18 Stepwise Linear Regression Results for Teaching Presence

Predictor	*b*	β	t	R^2 adj	R^2 change
Step 1					
Constant	20.172	.41	4.651*	.166	.176
Goal setting	1.017		4.379*		

* p< .01

Overall, the regression analysis indicates that nearly16% of the variance in teaching presenceisexplainedby goal setting, $F(1,90) = 19.173$, p < .01, R^2adj = . 16. The R^2 change valueis17% for goal setting. Furthermore *b, β, t* and adjusted R^2 values are presented in Table 4.18.

4.3.3.3 Predictors of Social Presence

Subscales of self-regulated learning including goal setting, environment structuring task strategies, time management, help seeking and self-evaluation are used in a stepwise multiple regression analysis to predict participants' social presence.

Table 4.19 Stepwise Linear Regression Results for Social Presence

Predictor	b	β	t	R^2 adj	R^2 change
Step 1					
Constant	11.562	.48	4.458*	.230	.239
Goal setting	.738		5.311*		
Step 2					
Constant	10.590	.30	4.191*	.284	.061
Goal setting	.466	.30	2.807*		
Self-evaluation	.482		2.777*		

* $p < .01$

Overall, the regression analysis indicates that nearly 28% of the variance in social presence is explainedby the combination of goal setting, and self-evaluation $F(2,89)$ = 19.007, p < .01, R^2adj = . 284. The R^2 change values are 23% for goal setting and 7% self-evaluation. Furthermore $b, β, t$ and adjusted R^2 values are presented in Table 4.19.

4.3.3.4 Predictors of Cognitive Presence

Subscales of self-regulated learning including goal setting, environment structuring task strategies, time management, help seeking and self-evaluation are used in a stepwise multiple regression analysis to predict participants' cognitive presence. The correlations among variables are displayed in Table 4.10.The results of this analysis reveals that solely goal setting and environment structuring significantly predict cognitive presence.

Table 4.20 Stepwise Linear Regression Results for Cognitive Presence

Predictor	b	β	t	R^2 adj	R^2 change
Step 1					
Constant	16.047		4.738*	.284	.291
Goal setting	1.104	.540	6.084*		
Step 2					
Constant	20.012		5.191*	.308	.032
Goal setting	1.353	.662	6.258*		
Environment structuring	-.521	-.216	-2.039*		

* p< .01

The regression analysis indicates that approximately30% of the variance in cognitive presence is explained by the combination of goal setting and environment structuring $F(2,89) = 21.235$, $p < .01$, R^2adj =. 308. The R^2 change valueis29% for goal setting and 3% for environment setting. Furthermore b, β, t and adjusted R^2 values are presented in Table 4.20.

4.4 Summary

This chapter presents quantitative analysis results of the study under four sections: (1) descriptive results regarding the Community of Inquiry Questionnaire and Online Self-Regulated Learning Questionnaire are reported in the "Descriptive Statistics" section; (2) assumptions which are necessary for Multiple Linear Regression test are investigated in "Statistical Assumptions" section; (3) the analysis results of research questions are exhibited in "Research Questions" section and finally; (4) the result chapter is briefly summarized in "Summary" section. The next chapter will present the discussion part of the research.

CHAPTER 5

DISCUSSION

In this chapter of the study, the major findings acquired from Pearson Correlation Analyses and Multiple Regression Analyses are discussed in the light of previous studies. Following the major findings and discussion, overall significance of the study is highlighted. Next, recommendations for future research and practice are presented. Finally, the study is concluded with summary of findings.

5.1 Major Findings and Discussion

Computer based learning environments are adaptable to individual differences and preferences. Therefore in the current study, first and foremost, students' demographic features regarding gender and age as well as their number of log in per week, the previous attendance to an online course and achievementare investigated. Mentioned variables' relationship with Self-regulated Learning ability and Community of Inquiry presences are discussed parallel to literature. Following that, the regression analyses and prediction power of variables are explained.

5.1.1 Research Question One: What is the nature of relationship among learners' characteristics, COI presences and SRL?

Gender

The drastic increase in e-learning trend within schools and universities brings concern about gender related differences. In the earlier literature on computer based instruction, women are associated with lower levels of computer literacy and lower confidence to use it (Yates 2001). However, this view is debated whether it is related with ability of females or other societal factors.

Moving from the point of view that males and females have distinct responsibilities in their life, scholars suggest investigating similarities and differences between two genders in relation to learning strategies and performance (e.g. Chyung, 2007; Lee, 2002; Rovai & Baker, 2005). In educational and psychological research, gender differences have been of great interest (Maccoby & Jack lin, 1974) and thus, there is an ample amount of research focusing on gender based differences (Yukselturk & Bulut, 2009). The core aim of these studies is to maximize learning by eliminating the differences regarding gender.

In the current research, self-regulation is explored whether it is related with gender or not. The results revealed that, there were no significant correlations between gender and self-regulation subscales including goal setting, task strategies, environment structuring, time management, help seeking and self-evaluation. In essence, this finding is not surprising due to the existing studies reporting the same result. Yukselturk and Bulut (2009), for instance, examined the gender differences in an online certificate program (Information Technologies Certificate Program) in relation to self-regulation and other variables. As a result, they found no significant relationship between self-regulation and gender.

Gender issue is considerably studied in the CoI literature as well. It is due to the fact that if gender differences in students' perception of CoI presences are understood well, instructors enhance or change existing learning and teaching strategies in terms of gender (Ong & Lai, 2006). In the current study it is found that, gender has not any significant relationship with social presence, teaching presence and cognitive presence. This results may be due to the gender imbalance in the selected sample (Female=23; Male=69).

Age

In the literature, age is one of the salient demographic variables that are investigated in relation to various aspects such as learning process, learning strategies, interaction, performance and so on. In this study, age is also investigated with regard to

participants' self-regulated learning and CoI presences. Previous research indicates distinct evidence for the contribution of age to the self-regulated learning and CoI presences.

In the current study, the age distribution of the participants is predominantly between 20 and 39 ages (17-19=2 people; 20-29=45 people; 30-39=35 people; 40-49=8 people; 50-59=2 people). Results unveil that the age variable does not show any statistically significant correlation with both online self-regulated learning and community of inquiry presences. Although some previous researches indicate there is significant difference between age and both CoI presences and self-regulated learning, it is meaningful in their own contexts. To put it differently, the unique features of ITCP such as delivery mode, timeline, course design, instructional strategies can be more influential than age factor.

Previous Attendance to an Online Course

Tyler-Smith (2006) states that research about first-time online learners is scant; therefore, to understand their unique experience is difficult. Moving from this point of view, in the current study the relationship between being first-time online learner/attending previously to an online course and CoI presences and SRL behaviors was investigated. The analyses brought out that previous attendance (0=No, 1=Yes) is solely correlated with teaching presence (r_s=-.256, n=92, p=.01) among all variables. The direction of the relation is negative and it means that, lack of previous attendance produces higher teaching presence. This finding may be interpreted as a result of learner experience. To put it differently, the more students participate to different online learning environment, the more they have chance to compare and contrast the instructional design features of existing platform with others.

The Number of Log in Per Week

The self-reported data regarding the number of log in per week
(1 ="less than 5", 2 ="between 5 and 10", 3 ="more than 10") is collected as well. Results unveil that the number of log in per week are significantly correlated with the

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online self-regulated learning score (r_s=.313, n=92, p=.001), time management (r_s=.373, n=92, p=.02), help seeking (r_s=.269, n=92, p=.02) and self-evaluation (r_s=.207, n=92, p=.00). However, it does not show a relation with cognitive presence, teaching presence and social presence. Instead of asking participants the number of log in per week, retrieving these data from ITCP's database would bring out more clear and reliable results to evaluate.

CoI Framework

Previous research findings suggest that the three presences which are cognitive presence, teaching presence and social presence are intercorrelated and influence each other. The quantitative data that is acquired from online students enrolled in ITCP are encouraging and confirm the intercorrelation among COI elements.

The results suggest that there is a strong, positive correlation between cognitive presence and social presence, which is statistically significant ($rs = .732$, $n = 92$, $p < .01$). In the same fashion a significant, strong, positive correlation is found between cognitive presence and teaching presence ($rs = .744$, $n = 92$, $p < .01$). Also a moderate, positive correlation is found between social presence and teaching presence ($rs = .585$, $n = 92$, $p < .01$). It demonstrates that students' perception of cognitive presence directly influences the perception of social and teaching presence. Therefore, CoI framework is a valuable tool to discern the relationships between social, teaching, and cognitive presences.

In the information society, learning how to learn is a vital ability and self-regulated learning is one of the reliable approaches of self-learning. It is worth stressing that self-regulated learning concept is as critical as CoI framework for a successful online learning experience. In this study, the relation between self-regulated learning and CoI presences are investigated as well. The results reveal that self-regulated learning has a moderate, positive correlation with teaching presence ($r = .389$, $n = 92$, $p < .01$), social presence ($r = .529$, $n = 92$, $p < .01$) and cognitive presence ($r = .445$, $n = 92$, $p < .01$). As for the subscales of SRL, five subscales including goal setting, task strategies, time management, help seeking and self-evaluation have statistically positive and significant correlation with all three presences. Solely environment

structuring does not show any significant relationship. This results echo the finding of past studies. For instance, Beishuizen (2008) investigates the role of the community to develop independent self-regulation skills. It is noted that teacher has a core role as an expert, model and coach to nurture students' self-regulation skills. In other words, the results indicate to the relation between self-regulation of student and teaching presence. Providing adequate, encouraging feedback to students and incorporating with students in the knowledge building process are advised for teachers. Besides, Bolhuis (2003) points out that social experiences acquired from interaction are an essential source of SRL. Social elements and collaboration with other learners are seen as a valuable resource due to the fact that self-regulated learners seek help and clarification when necessary (Anderton, 2006).

5.1.2 Research Question Two: To what extent do learners' COI presences predict their SRL?

On the purpose of investigating the linear relationship among predictor variables and outcome variables, Stepwise Multiple Linear Regression (MLR) analyses are performed. Test results that provide percentage of variance value explained by the predictor are valuable because of the fact that they can be used as a guide by administrators or program directors of online learning environments.

In the first analysis, it is attempted to predict participants' SRL composite score by teaching presence, social presence and cognitive presence. The regression analysis indicates that approximately 27% of the variance in SRL composite score is explained by solely social presence. As Mason (1991) states establishing a community atmosphere for learning by fostering interactions and creating social relationships between learners and instructors arevital. Therefore this regression result may be evaluated that when students feel less isolated in online learning environment, they tend to be more active in terms of taking initiative, diagnosing their own learning needs, selecting materials and other sources and at the end evaluating learning outcomes. In other words, they display monitoring, regulating and controlling behaviors during learning process.

In the second analysis, it is attempted to predict the *goal setting* by teaching presence, social presence and cognitive presence. The regression analysis indicates that approximately 28% of the variance in goal setting is explained by only cognitive presence. Goal setting is described as determining the aim of an action to acquire a specific standard of competency, generally within a specified time limit (Locke & Latham, 2002, p. 705). Researchers highlight that goals motivate students to engage in activities (e.g., Dweck & Elliot, 1983; Maehr & Nicholls, 1980) and also lead students to the arousal, discovery, and use of task-relevant knowledge and strategies (Locke & Latham, 2002, p. 707). Parallel to these findings, cognitive presence contains elements pertaining to curiosity, exploration and finding relevant information. Hence, the variance in goal setting that is explained by cognitive presence is understandable.

Afterward, similar to the previous analyses, it is attempted to predict the *environment structuring* by teaching presence, social presence and cognitive presence. Environment structuring indicates student-initiated efforts to arrange or control the physical setting to completea task more likely to occur without interruption. However, any of the predictors do not explain the environment structuring. The rationale behind of this finding may be laying the research of Wolters (1998). In that research, it is reported that students use various methods for controlling distractions and structuring environment such as drinking coffee, eating food, or taking naps. To be more precise, environment structuring focuses on individual environment arrangement strategies; therefore, the lack of relationship with social presence, cognitive presence and teaching presence is not surprising.

Subsequently, it is attempted to predict the *task strategies* by teaching presence, social presence and cognitive presence. The regression analysis demonstrated that approximately 16% of the variance in task strategies is explained by social presence. Developing task strategies is in the performance phase of self-regulation cycle and task strategies refer to choosing appropriate strategies to master material.Social presence makes a 16% to the model contribution in terms of variance. It may be a result of the item in the task strategies subscale saying that "I prepare my questions before joining in the chat room and discussion". In essence, this itemrefers to the

social interaction strategiesin discussion or communicationprocess. Hence, it can be deduced that students'preferences regarding communication strategies in the online platform may be influenced by their social presence.

In the next regression analysis, *time management* variable is tested by teaching presence, social presence and cognitive presence. The regression analysis presents that approximately 8% of the variance in time management is explained by solely social presence. Time management examines student use of study schedules and other time management principles related to achieving academic tasks. The variance presented by model suggests that the more students feel socially real in online environment, the more they are inclined to manage time.

Another analysis focusing on *help seeking,* presents a similar result as it is found in time management analysis. The regression analysis shows that nearly 20% of the variance in help seeking is explained by only social presence.Lee (2014) emphasizes that students who feel connected are more eager to cooperate with others and they are more successful at managing their own learning processes. Current regression model confirms Lee'sstudy and suggests that having social presence in online learning platform fosters cooperation between participants and as a result predicts help seeking.

Finally self-evaluation is included in regression analysis. Results show that it is predicted by only social presence with a 22% variance. When the four items of self-evaluation subscale are examined, it is seen that two items refers to social cues such as "I communicate with my classmates to find out what I am learning that is different from what they are learning" and "I communicate with my classmates to find out how I am doing in my online classes". Hence, this prediction of self-evaluation by social presence is quite coherent. The only puzzling point in this analysis is the lack of contribution of cognitive presence to the model. The rationale behind of this finding may be stemming from the scant number of items in the subscale.

5.1.3 Research Question Three: To what extent does learners' SRL predict their COI presences?

To explore the answer of third research question, four multiple regression analyses are performed.

In the first analysis, subscales of self-regulated learning including goal setting, environment structuring task strategies, time management, help seeking and self-evaluation are used to predict participants' *COI composite score*. The regression analysis indicates that approximately 33% of the variance in COI composite score is explained by the combination of goal setting and task strategies. In line with this result, it can be suggested that it is of utmost importance that effective goal setting by distance learners contributes their perceived COI score (Schrum and Hong, 2002). Besides, it can be suggested that the more students develop and implement task strategies the more their COI scores increase.

In the second regression analysis, subscales of self-regulated learning including goal setting, environment structuring task strategies, time management, help seeking and self-evaluation are used to predict participants' *teaching presence*. Results show that only goal setting significantly predicts the teaching presence. It is indicated that nearly 16% of the variance in teaching presence is explained by the goal setting. As it is stated by Thomson (1998) setting clear goals is a salient element of academic performance. Based on the findings of this study, it can be suggested when students set their own academic goals; the instruction, the guidance, the feedback or the encouragement provided by the teacher may be more meaningful to students.

In the next analysis,subscales of self-regulated learning which are goal setting, environment structuring task strategies, time management, help seeking and self-evaluation are used to predict participants' *social presence*. The regression model is found statistically significant (p<.01). Overall, the regression analysis indicates that 28% of the variance in social presence is explained by the combination of goal setting and self-evaluation. As it is explained previously, setting clear goals provide participants a road map. Therefore, this situation may affect their social relations with other students and instructor according to model. The prediction model also says that social presence is predicted by self-evaluation as well. Self-evaluation

subscale contains items referring students' social relationships in evaluating their learning. Hence, this prediction is expected as well.

Finally, in the last analysis, it is attempted to predict adult learners' *cognitive presence* by six SRL subscales. The model is also found statistically significant (p<.01). The regression analysis indicates that approximately 30% of the variance in cognitive presence is explained by the combination of goal setting and environment structuring. Cognitive presence which refers to construction of meaning through sustained negotiation (Garrison et al., 2000) is predominantly predicted by goal setting and this finding is not surprising. As it is defined by Zimmerman (1998), self-regulation is a cyclical process including forethought, volitional or performance control, and self-reflection. Therefore, the process firstly starts with a given task and goals are determined based on the nature of the task. Other steps of this cylical process which require cognitive efforts including monitoring, controlling, evaluation etc. are shaped by the defined goals. As a result, it may be suggested that, the goal setting is a fundamental element of cognitive presence in an online learning platform. The model also says that environment structuring negatively predicts the cognitive presence. This negative relation can be assessed such that when students attempt to arrange the environment against to distractions, they can be losing their cognitive focus. As a result, this negative prediction may occur between cognitive presence and environment structuring behavior.

5.2 Overall Significance of the Study

In this digital era, many educators, leaders and politicians highlight that online education can save both money and time. However, if students become bored and drop out the program, there will be scant savings (Bonk & Khoo, 2014). Therefore, it is fundamental to understand how theories of learning and instructions can be applied in online learning environments. The findings of this research are, first and foremost, expected to enlighten online educators and students across the world about the contribution of the Self-regulated Learning theory and Community of Inquiry framework to students' online learning experiences. Based on the regression analyses

and correlations between SRL and CoI presences, it can be suggested that when the self-regulated learning increases students' overall social presences increase as well. In a similar fashion, if students' social presence rises, self-regulation also rises. Taking into consideration that, course designers, instructors and administrators can gain important insights and revise their online learning systems.

Secondly, findings of the current study suggest that for CoI survey is a valid measure of the students' perception of teaching, social and cognitive presence due to the fact there is strong correlation among presences as supported by previous studies (e.g. Arbaugh et al., 2008; Maddrell (2011). In this regards, it is worthy of stressing that CoI presences are not independent each other and essential in creating an effective online learning environments (Akyol & Garrison, 2011; Garrison et al., 2010; Ozturk, 2012).

Thirdly, this study contributes to the existing debate in the literature regarding adding a new construct "learner presence" to the CoI model. As it is explained earlier, Shea and et al. (2011) utters that some activities such as setting goal, time management and task division performed by online students, are not explained by any of the presence in CoI model. Therefore, these activities are considered as a result of learner self- and co-regulation hence adding learner presence to the model is advised. However, Akyol and Garrison (2011) oppose this suggestion and assert that creation of a fourth presence would undermine the integrity of the CoI framework. Instead of adding a new presence, they focus on metacognition construct that has already existed at the intersection of the cognitive and teaching presence (Akyol & Garrison, 2011). In essence, the results of present study do not support any of the arguments. Self-regulation is not a predictor of teaching and cognitive presence. It does only predict social presence. Similarly, social presence predicts self-regulated learning composite score. Therefore the location of SRL in the framework may be displayed as in Figure 5.1.
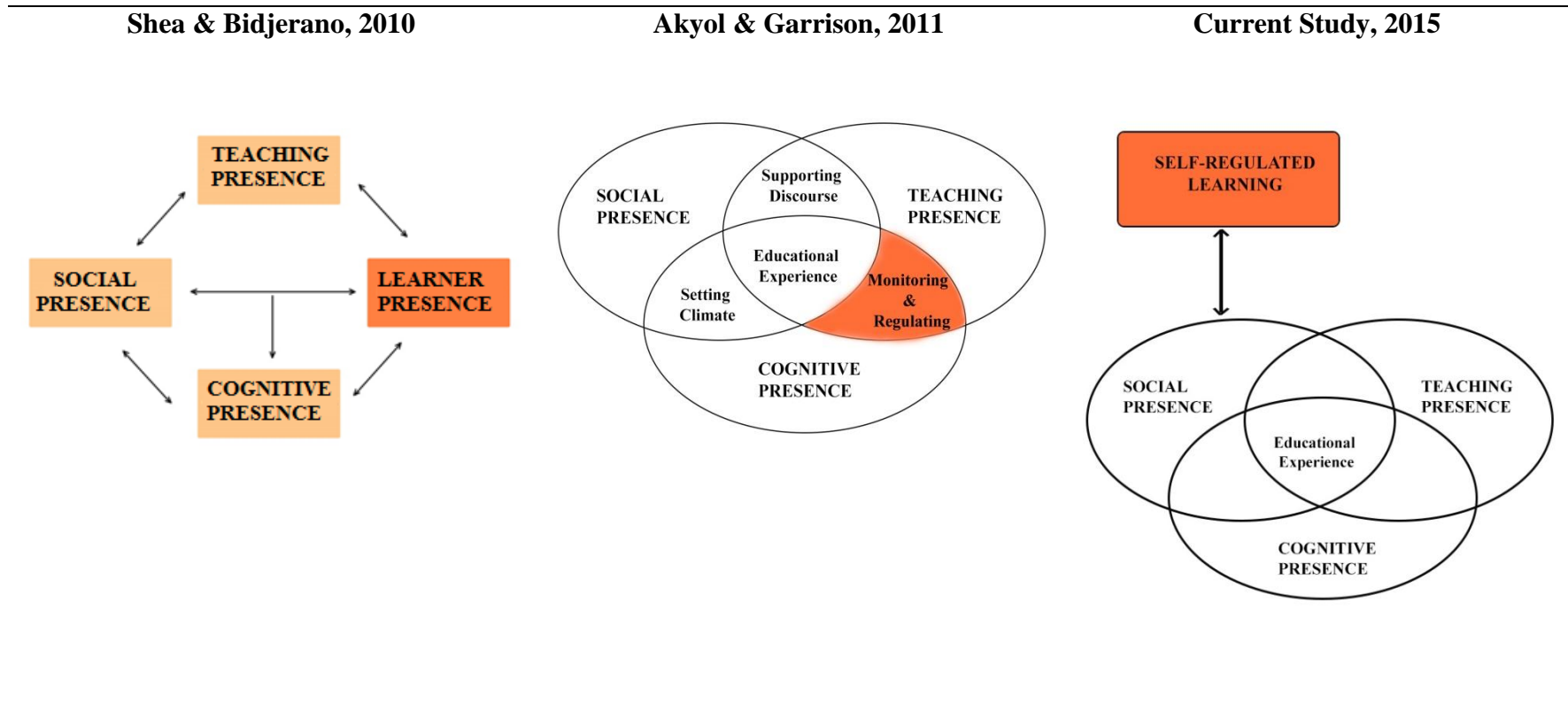
Shea & Bidjerano, 2010	Akyol & Garrison, 2011	Current Study, 2015

Figure 5.1 Suggested Modifications for Community of Inquiry Model

5.3 Recommendations for Future Research

As Bonk and Khoo (2014) state that we are in the 'Learning Century" and online learning provides vast amount of opportunities for learners of all ages. In this study, adult learners' online learning experiences are investigated through the lenses of COI framework and SRL theory. Only one online certificate program is represented in the study hence, the ability to generalize findings is limited with Information Technologies Certificate Program. The same results may not be acquired in other settings with different learners, instructors, instructional design and content. Taking into account this limitation and the findings of previous studies and current study, the following recommendations are made to be investigated by further research:

- The current research should be replicated within other online certificate programs, or online undergraduate and graduate degree programs to enhance the generalizability of the findings to the vast population.

- Due to the fact that there is no meaningful relationships between learner demographic characteristics including age and gender with the three CoI presences and SRL, other factors such as education level, socio-economics status or profession may need to be examined.

- The CoI framework does not explain how to create presences; it only measures whether presences exist or not. Therefore, it seems weak in terms of offering sufficient strategies to course designers and instructors in relation to design, direction, interaction and facilitation guidelines. For this reason "how to create presence" issue may be investigated through design based approaches and case studies.

- Although there is a plethora of research indicating how to be self-regulated in traditional learning setting, the guidelines defining how to be self-regulated in online setting seems scant; hence, further research can be conducted to establish more clear guidelines for online learners.

- As Yildirim (2004) suggests an effective online learning management system should contain self-assessment tools for the learners. In the current study, the learning platform does not have the mentioned feature. Therefore, the study may be replicated through integrating self-assessment tools and exploring its effect on self-regulation skills of online learners.

- Researchers state that self-regulation is a competence that can be developed later by training. Therefore, its interaction and relation with readiness to attend an online course may be explored.

- Examining the effect of technical infrastructure and online support services on students' perception of CoI presences may be investigated to acquire more effective online learning experiences.

5.4 Recommendations for Practice

The findings clearly indicate that social presence is a salient element to explain self-regulation in adult learners who participate in this study. Hence,in online learning platforms to strengthen self-regulation:collaborative learning activities may be increased, the format of online discussions may be revised to maximize participation of studentsorsocial media tools which let students instant communication can be included into the learning environment after carefully investigated.Moreover, social presence isalso predicted byseveral subscales of SRL including time management, task strategies, help seeking and self-assessment. Therefore, to increase social presence, an advance online calendar (creating events, e-mailing reminders etc.) can be embedded into the system to help students' time management behavior. Live video chat sessions may be employed to meet the help-seekers' demand. Online self-assessment tools can be integrated into the learning platform to foster self-evaluation.

5.5Summary

In this chapter the major findings acquired from Spearman's Correlation Analysis, Pearson Correlation Analyses and Multiple Regression Analyses were discussed.

The results regarding the correlation analyses revealed that demographic variables including age and gender did not show any statistically significant correlation with both online self-regulated learning and community of inquiry presences. Furthermore, the analyses brought out that previous attendance was solely correlated with teaching presence among all variables. As for the number of log in per week, it was significantly correlated with online self-regulated learning score, time management, help seeking and self-evaluation. However; it did not show a relation with cognitive presence, teaching presence and social presence. Finally, three presences: teaching presence, cognitive presence and social presence were found positively correlated with each presence as supported by literature.Self-regulated learning subscales, except environment structuring, also were found statistically and significantly correlated with COI presences.

The results of theStepwise Multiple Regression Analyses unveiled followings:

(1) 27% of the variance in SRL composite score was explained by social presence,

(2) 28% of the variance in goal setting was explained by cognitive presence,

(3) 16% of the variance in task strategies was explained by social presence,

(4) 8% of the variance in time management was explained by social presence, (5) 20% of the variance in help seeking was explained by social presence,

(6) 22% of variance in self-evaluation asexplained by only social presence,

(7) 33% of the variance in COI composite score was explained by the combination of goal setting and task strategies,

(8) 16% of the variance in teaching presence wasexplained by the goal setting,

(9) 28% of the variance in social presence was explained by the combination of goal setting and self-evaluation,

(10) 30% of the variance in cognitive presence was explained by the combination of goal setting and environment structuring.

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COMMUNITY OF INQUIRY QUESTIONNAIRE (TURKISH)

Öğretimsel buradalık

1. Öğretmen, dersin önemli konularını açıkça belirtmiştir.

2. Öğretmen, dersin önemli hedeflerini açıkça belirtmiştir.

3. Öğretmen, ders etkinliklerine nasıl katılacağımıza ilişkin açık bir yönerge sunmuştur.

4. Öğretmen, öğrenme etkinlikleri için önemli olan tarihleri/takvimi açık olarak belirtmiştir.

5. Öğretmen, öğrenmeme yardım eden ders konularına ilişkin fikir birliği ve fikir ayrılığı olan noktaları belirterek öğrenmeme yardım etmiştir

6. Öğretmenin ders konularının anlaşılmasındaki rehberliği, görüşlerimin netleşmesinde yardımcı oldu.

7. Öğretmen derse katılan öğrencilerin derse katılımına ve üretken bir iletişim sürecini devam ettirmelerine yardımcı oldu.

8. Öğretmenin sınıfın dersle ilgili çalışmalara odaklanmasını sağlaması öğrenmeme yardımcı oldu.

9. Öğretmen, derse katılan öğrencileri dersle ilgili yeni kavramları/fikirleri keşfetmeleri için cesaretlendirmiştir.

10. Öğretmen, derse katılan öğrenciler arasındaki "biz" hissinin gelişmesini güçlendirmiştir.

11. Öğretmen, dersle ilgili konuları tartışmaya odaklanmamızda yardımcı olmuştur.

12. Öğretmen, dersin hedeflerine ilişkin güçlü ve zayıf yanlarımı anlamamda yardımcı olarak bana geri bildirimler vermiştir.

13. Ders öğretmeni zamanlaması iyi geribildirimler vermiştir.

Toplumsal Buradalık

14. Dersin diğer katılımcılarının olduğunu bilmek, kendimi bu derse ait hissetmemi sağlamıştır.

15. Derse katılan bazı öğrencilerle ilgili belirgin izlenimler edindim.

16. Çevrimiçi ya da web-temelli iletişim, sosyal etkileşim için mükemmel bir ortamdır.

17. Çevrimiçi ortamlar yoluyla konuşurken kendimi çok rahat hissettim.

18. Ders tartışmalarına katılırken kendimi çok rahat hissettim.

19. Dersin diğer öğrencileri ile etkileşim kurarken kendimi rahat hissettim.

20. Dersin diğer katılımcılarının görüşlerine katılmadığımda bile kendimi rahat hissettim, üstelik bu durumda bile gruba karşı güvenim sürmekteydi.

21. Kendi bakış açımın dersin diğer katılımcıları tarafından kabul edildiğini hissettim.

22. Çevrimiçi tartışmalar, başkalarıyla işbirliği yaptığım hissinin gelişmesine yardımcı oldu.

Bilişsel Buradalık

23. Ortaya atılan soru/sorunlar ders konularına olan ilgilimi arttırdı.

24. Ders etkinlikleri beni meraklandırdı.

25. Dersle ilgili soruların yanıtlarını bulmak için kendimi güdülenmiş hissettim.

26. Bu dersle ilgili soru/sorunları çözmek için çeşitli bilgi kaynaklarını kullandım.

27. Beyin fırtınası yapmak ve ilgili bilgileri bulmaya çalışmak içerikle ilgili soruları yanıtlamamda yardımcı oldu.

28. Çevrimiçi tartışmalar, farklı görüşleri anlamama yardım ederek değerli bir katkı sağladı.

29. Karşılaştığım yeni bilgi/fikirler ders etkinliklerindeki soruları yanıtlamamda bana yardım etti.

30. Öğrenme etkinlikleri, açıklamalar ve çözümler oluşturmamda bana yardım etti.

31. Ders kapsamındaki tartışmalar ve ders içeriğine ilişkin düşüncelerim bu dersteki temel fikirleri anlamama yardım etti.

32. Bu derste oluşturulan bilgileri uygulamak ve sınamak (test etmek) için çeşitli yollar tanımlayabilirim.

33. Derste ele alınan sorunlara, gerçek yaşamda uygulayabileceğim çözümler geliştirdim.

34. Bu derste oluşturulan bilgileri, ilerde işimde ya da dersle ilgili olmayan diğer etkinllerde kullanabilirim.

ONLINE SELF REGULATED LEARNING QUESTIONNAIRE (TURKISH)

1. Çevrimiçi ortamda ödevlerim için belli standartlar belirlerim.

2. Öğrenme sürecinde uzun dönemli hedefler (aylık/dönemlik) kadar

kısa dönemli hedefler de (günlük/haftalık) belirlerim.

3. Çevrimiçi öğrenme sürecimde yüksek bir standart gözetirim.

4. Çevrimiçi ortamda, çalışma zamanımı yönetmede bana yardımcı olacak

hedefler belirlerim.

5. Çevrimiçi ortamlarda çalışmamın kalitesinden ödün vermem.

6. Çalışırken dikkatimin çok fazla dağılmasına neden olmayacak ortamları seçerim.

7. Çalışmak için rahat bir ortam bulurum.

8. Çevrimiçi derslerime en verimli şekilde nerede çalışabileceğimi bilirim.

9. Çevrimiçi derslerime çalışmak için dikkatimin az dağılacağı zamanları seçerim.

10. Çevrimiçi derslerde daha fazla not tutmaya çalışırım, çünkü

not tutmak çevrimiçi ortamda, geleneksel ortamdan çok daha önemlidir.

11. Dikkatimin dağılmaması için çevrimiçi olarak sunulan

öğretim materyallerini yüksek sesle okurum.

12. Sohbet odalarına ve tartışmalara katılmadan önce sorularımı hazırlarım.

13. Ders içeriğini öğrenebilmek için ders içeriğinde tüm kullanıcılara

sunulan problemlere ek olarak başka problemler üzerinde de çalışırım.

14. Çevrimiçi derslere fazladan zaman ayırırım, çünkü daha fazla zaman

harcamayı gerektirdiğini bilirim.

15. Çevrimiçi derslerime çalışmak için her gün veya her hafta aynı

zamanı planlarım ve bu planı düzenli olarak takip etmeye çalışırım.

16. Her gün derslere katılma zorunluluğum olmasa dahi günlük

olarak çevrimiçi dersler için çalışma zamanı ayırırım.

17. Ders içeriği ile ilgili yardıma ihtiyaç duyduğumda danışabileceğim

birilerini bulurum.

18. Problemlerimi sınıf arkadaşlarımla çevrimiçi olarak paylaşabilirim,

böylece neyle karşı karşıya olduğumuzu ve problemimizi nasıl çözeceğimizi biliriz.

19. İhtiyaç olduğunda sınıf arkadaşlarımla yüz yüze görüşmeye çalışırım.

20. Eğitimciden e-posta yoluyla yardım istemede ısrarcıyımdır.

21. Çevrimiçi ortamda ne öğrendiğimi gözden geçirmek için öğrendiklerimi özetlerim.

22. Çevrimiçi ortamda çalışırken ders materyalleri hakkında kendi

kendime sorular sorarım.

23. Çevrimiçi ortamlarda nasıl bir performans sergilediğimi

anlamak için sınıf arkadaşlarım ile iletişime geçerim.

24. Arkadaşlarımın öğrendiklerinden farklı olarak ne öğrendiğimi

bulmak için arkadaşlarımla iletişim kurarım.