CEIT UNDERGRADUATE STUDENTS' PERCEPTIONS AND PREFERENCES OF FORMATIVE FEEDBACK, AND THE RELATIONSHIP OF THESE PERCEPTIONS AND PREFERENCES WITH THEIR LEARNING APPROACHES

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I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

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ABSTRACT

CEIT UNDERGRADUATE STUDENTS' PERCEPTIONS AND PREFERENCES OF FORMATIVE FEEDBACK, AND THE RELATIONSHIP OF THESE PERCEPTIONS AND PREFERENCES WITH THEIR LEARNING APPROACHES

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Formative feedback in project-based courses helps students either group or individual to deal with complex tasks and problems and facilitates their project and report development. This study investigates CEIT undergraduate students' perceptions and preferences for formative feedback given for their projects and reports. The study also examines the relationship of these perceptions and preferences with the type of their learning approaches (Deep vs. Surface).

Sequential exploratory mixed methods research design was employed. Semi-structured interviews with participants (n=10) resulted in themes describing perceptions and preferences for a variety of formative feedback types and feedback sources. These themes and literature were used to create a questionnaire with two scales: perceptions and preferences. Data for pilot study were collected from 97 CEIT undergraduate students in Middle East Technical University. Exploratory Factor Analyses resulted in three factors for perceptions scale (development, understandability and encouragement) and one factor for preference scale. Data for main study were collected from 250 CEIT undergraduate students in 2012-2013 Spring Semester from three public universities: Amasya, Ankara and Hacettepe. Confirmatory Factor Analysis was conducted on perceptions and preferences scales. Further analyses were conducted on the quantitative data, including descriptive analysis, Canonical correlation analysis and factor score correlation analysis.

Results indicated that students gave significant attention to the importance of formative feedback on their project and report development as well as on their development of learning in project based courses. Formative feedback was viewed as a key component in project based courses. Their perceptions were varied with respect to different formative feedback providers. Yet, they appreciated formative feedback provided by instructors.

In relevance to formative feedback preferences, students commonly preferred to receive formative feedback that helps them develop their projects and reports by showing the weak and strong sides of their project and report performances, giving clear explanations about how to make necessary revisions, including suggestions to improve weak aspects of their projects and reports. Moreover, students preferred formative feedback to be clear, understandable, practical, consistent, and timely. Students also wanted encouraging formative feedback that recognizes their efforts on their projects and reports, motivates them for revisions, and provides messages in a positive tone and manner.

The results of the study also indicated that students' formative feedback perceptions and preferences were only correlated with deep learning approach. Students adopting deep approach tend to have high preferences and high appreciation toward formative feedback provided for their projects and reports.

Key Words: Formative Feedback, Perceptions, Preferences, Projects, Learning Approaches.

ÖZ

BÖTE LİSANS ÖĞRENCİLERİNİN BİÇİMLENDİRİCİ GERİ BİLDİRİME YÖNELİK ALGILARI VE TERCİHLERİ İLE BU ALGI VE TERCİHLERİN ÖĞRENME YAKLAŞIMLARIYLA OLAN İLİŞKİSİ

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Proje derslerinde verilen biçimlendirici geri bildirim, öğrencilerin grup veya bireysel olarak karmaşık görev ve problemlerle baş etmesine yardım etmekte, proje ve rapor gelişimini kolaylaştırmaktadır. Bu çalışma Bilgisayar ve Öğretime Teknolojileri lisans öğrencilerinin projelerine ve raporlarına verilen yapılnadırıcı geri bildirime yönelik algılarını ve tercihlerini araştırmaktadır. Ayrıca bu çalışmada, öğrencilerin biçimlendirici geri bildirime yönelik olan algılarının ve tercihlerinin öğrenme yaklaşımları (Derinlemesine öğrenme ve Yüzeysel öğrenme) ile olan ilişkisi de incelenmektedir.

Araştırmada karma yöntem desenlerinden aşamalı keşif araştırma deseni kullanılmıştır. Öğrencilerle (n=10) yapılan yarı yapılandırılmış görüşmeler sonucunda, öğrencilerin çeşitli biçimlendirici geri bildirim özeliklerine ve kaynaklarına yönelik olan algılarını ve tercihlerini betimleyen temalar oluşturulmuştur. Oluşturulan temalar ve literatür kullanılarak algılar ölçeği ve tercihler ölçeğinden oluşan bir anket oluşturulmuştur. Pilot çalışma için veriler Ortadoğu Teknik Üniversitesi'nde Bilgisayar ve Öğretim Teknolojileri Bölüm'ünde bulunan 97 lisans öğrencisinden toplanmıştır. Açımlayıcı faktör analizi sonucunda, üç faktörlü (gelişim, anlaşılırlık ve teşvik) algılar ölçeği ve bir faktörlü tercihler ölçeği elde edilmiştir. Ana çalışma için veriler Amasya, Ankara ve Hacettepe üniversitelerinde bulunan 250 BÖTE lisans öğrencisinden 2012-2013 Bahar Döneminde toplanmıştır. Algılar ölçeği ve tercihler ölçeğine doğrulayıcı faktör analizi uygulanmıştır. Ayrıca betimsel analizi, kanonik korelasyon analizi ve faktör skoru korelasyonu analizini içeren diğer analizler nicel verilere uygulanmıştır.

Çalışma sonucunda, proje derslerinde verilen biçimlendirici geri bildirimlerin, öğrencilerin proje ve rapor gelişimlerinin yanı sıra, onların öğrenme gelişimleri üzerindeki önemi öğrenciler tarafından önemli şekilde dikkat çekilmiştir. Proje derslerinde verilen biçimlendirici geri bildirim öğrenciler tarafından dersin ana bileşeni olarak görülmüştür. Öğrencilerin biçimlendirici geri bildirime karşı olan algılarının biçimlendirici geri bildirimi veren kişiye göre değişiklik gösterdiği saptanmıştır. Yine de, öğrenciler öğretim üyesi

tarafından verilen biçimlendirici geri bildirime önem vermişlerdir. Biçimlendirici geri bildirim tercihleri ile ilişkili olarak, öğrenciler genellikle proje ve rapor performansının zayıf ve güçlü yönlerini açık bir şekilde gösterip geliştirmesine yardım eden, gerekli düzeltmelerin nasıl yapılacağını açık bir şekilde söyleyen, proje ve raporun zayıf yönlerini geliştirmek için öneriler sunan biçimlendirici geri bildirimler tercih etmişlerdir. Buna ek olarak, öğrenciler verilen yapılanadırıcı geri bildirimlerin açık, anlaşılır, pratik, tutarlı ve zamanında verilmesini tercih etmiştir. Ayrıca öğrenciler, projelerde ve raporlarda gösterdiği çabayı dikkate alan, onları düzeltmeler için motive eden, ve olumlu verilen biçimlendirici geri bildirimleri istemişlerdir.

Çalışma sonuçları ayrıca öğrencilerin biçimlendirici geri bildirime yönelik algıları ve tercihlerinin sadece derin öğrenme yaklaşımı ile ilişkili olduğunu göstermiştir. Derin öğrenme yaklaşımına sahip olan öğrencilerin, projelere ve raporlara verilen biçimlendirici geri bildirime yönelik tercihlerinin ve algılarının yüksek olma eğilimi olduğu görülmüştür.

Anahtar Kelimeler: Biçimlendirici Geri Bildirim, Algılar, Tercihler, Projeler, Öğrenme Yaklaşımları.

To my deceased mother and father

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CHAPTER 1

INTRODUCTION

1.1 Statement of the Problem

The purpose of this study was to explore the perceptions and preferences of CEIT undergraduate students pertaining to the formative feedback they received for their term projects and reports. It also explored the relationships of these perceptions and preferences to the students' learning approaches. Therefore, different from previous research studies that explored formative feedback, this study is built upon the relationships of four main concepts: a) formative feedback, b) students' perceptions and preferences, c) term projects, and d) learning approaches.

Formative feedback is described as an undeniable crucial part of teaching and learning process and the positive effects of formative feedback on the development of students' learning and skills are accepted by a lot of research studies in literature (Chen, 2001; Higgins et al., 2002; Stracke & Kumar, 2010; Brown, 2004; Bruning & Horn, 2000; Crooks, 1988; Kellogg & Whiteford, 2009; Kluger & DeNisi, 1996). Besides the developmental effects, formative feedback also enhances students motivation (Brown, 2004; Bruning & Horn, 2000), performance (Hattie and Timperley 2007; Shute 2008; Tanes& Anold& King & Remnet, 2011), personal and overall development (Brown, 2007), and self-regulated learning (Stracke & Kumar, 2010).

The perceptions and preferences of students are very important for the effective provision of feedback; however, there are few research studies that investigated these students' perception and preferences (Row & Wood, 2008). Moreover, it is very important to understand what students want during the learning and teaching processes (Brown, 2007). As instructors have information regarding their students' needs and preferences, they may provide more personalized feedback. When personalized feedback is given not only students' knowledge and skills acquisition increase but also their motivation, performance (Fredenburg, Lee, & Solmon, 2001; Higgins, Hartley, & Skelton, 2002; Noels, Clement, & Pelletier, 1999) and problem solving capability (Brown, 2004; Bruning & Horn, 2000).

In project-based learning, there is a process in which students work as a team or a group. Teachers are facilitators and tutors who give feedback to students on their projects (Frank & Barzilai, 2004). McGrath, Arrow, & Berdahl (2000) defined teamwork environment as complex, adaptive, and dynamic at all hierarchical levels. Moreover, in such environment students are required to interact with each other and share the efforts as team in order to solve complex and high effort demanding problems (Barron, 2000; Dillenbourg, 1999; Druskat & Kayes, 2000). Given the high complexity and difficulty of project-based environment, formative feedback is essential for students in order to trigger learning, relieve the complexity of problems and increase probability of acquisition of knowledge and skills.

Feedback is a powerful tool for the performance of team and team learning (Kozlowski & Ilgen, 2006; Locke & Latham, 1990; London & Sessa, 2006). Project based-courses give instructor a big opportunity to give feedback to the students (Razmov & Vlasseva, 2004). Razmov & Vlasseva (2004) believe that specific feedback given on different aspects of a project gives students a helpful opportunity to see the areas they succeed and the areas they need to give additional attention. However, inconsistencies are likely between the instructors' expectations and students' reactions toward the feedback (Ross & Wels, 2008). The main reason may be due to the unknown perceptions and preferences of students toward feedback provided by the instructor. Hall, Hanna and Quinn (2012) stated that the reason of students' unsatisfaction with the provision of feedback was because of the gaps and inconsistencies between instructor feedback and student's expectations toward instructor feedback. They also stated that "academic staff members must be made aware of students' expectations and opinions related to feedback provision and reminded of the documented importance and benefits of feedback to teaching and learning" (p. 6). Therefore, it is crucial to explore the perceptions and preferences undergraduate students pertaining to the formative feedback they received for their term projects and reports.

Majority of the courses in the department of Computer Education and Instructional Technology (CEIT) are considered as term project-based courses based on their heavy emphasis on the project (YÖK, 2013). Project-based courses involve small scale or large scale projects. Aside from performing and developing a project with acquired knowledge and skills during the course, instructors also expect students as a group or individual to write a comprehensive report related to their projects (CEIT, 2013). Usually both the project and the report are important requirements for the completion of the course. During project construction, students as group or individual meet with instructor and teaching assistants regularly every week. During these meetings they have discussions on the flow of their projects, written reports and problems they have faced during the process. This face-to-face interaction and dialogue frequently continues in electronic written form in online environments through e-mail, open courseware, social media, especially Facebook. Given the relatively a large number of project-based courses in CEIT department, it is important to explore CEIT undergraduate students' perceptions and preferences for formative feedback on their projects.

Learning approaches have been investigated extensively in literature and a considerable importance has been given to this issue by researchers because of the valuable information that it can provide to faculty about students' learning. Deep and surface learning approaches constitute the formation of learning approaches. Gijbels et al (2005) were among many others who defined these two approaches. Students who adopt surface approaches are referred to a group of students whose intentions are to learn by memorizing the contents of study materials, whereas students who adopt deep approaches are referred to a group of students whose intentions are to learn by understanding and constructing the meaning of the content of study materials.

Learning approaches can be one of the factors that affect the students' formative assessment preferences and perceptions. Yet, few previous research studies have examined the relationship between students' assessment preferences and students' approaches to learning. The results of such studies have indicated that students' assessment preferences were

correlated with students' learning approaches or strategies (Birenbaum, 1994, 1997; Birenbaum & Feldman, 1998; Gijbels & Dochy, 2006). Since every student tend to have different learning approaches, acceptance, perceptions and preferences toward formative assessment, it may be very hard for faculty to tailor formative feedback for each student However, examining this relationship between assessment preferences and learning approaches may help faculty make some categorizations among students who have different assessment preferences. As the study pointed out students who were in the favor of one of the learning approaches possessed a certain kind of formative assessment preferences that was specific to favored learning approach (Gijbels & Dochy, 2006). Categorizing students as deep and surface may help faculty in different disciplines address students' individual feedback needs. For example, if instructors know which learning approaches student has, they can give him individual feedback according to the approaches he/she has. However, there is not adequate information in the literature regarding students' learning approaches in project-based courses and its relationship to the formative feedback perceptions and preferences.

1.2 Background of the Study

In constructivist theory students are given an opportunity to construct new ideas or concepts based upon their knowledge and experiences (Bruner, 1986). Thomas (2000) stated that as suggested by constructivist approach, students form their own knowledge by collaborating in teams and teacher act as guide and coach in that process, and finally students make a product. Moreover, in project based environments students as a group share their knowledge, thoughts and ideas, and construct their own knowledge.

In this process, formative feedback is important part of learning because it can help and guide students during their learning activity (Hattie and Timperley 2007; Shute 2008). Birenbaum (2007) stated that investigating preferences of students for instruction and assessment are important for understanding the factors that drive the learning process and outcomes. London (2003) defines several functions of feedback which are guiding and motivating effective behavior and reducing ineffective behavior in project-based courses.

The power of feedback as a tool in team learning and on performance has been well-recognized in the literature (Kozlowski & Ilgen, 2006; Locke & Latham, 1990; London & Sessa, 2006). Feedback given to teams have an effect on students' performance and coordinated process through which students bring their cognitive, affective and behavioral resources together in order to complete their tasks (Bartram & Roe, 2008; Kozlowski & Ilgen, 2006). Given the effectiveness of formative feedback in teams or group, it is important to know what kind of feedback students frequently prefer to receive and what do they think about a variety of feedback types. Characteristics of feedback (clarity, purpose, source, and valence) affect perceptions of students shaped as a result of group characteristics such as demands, goals and prior learning experiences (Gabelica at al., 2011). Therefore, explorations of these group characteristics in integration with these perceptions and preferences would be fruitful.

The second focus of the study, learning approaches is what students adopt while approaching to the task in order to learn it. They have been categorized as deep and surface learning approaches.

Depending on the perceived learning task, students make changes in their strategies in order to achieve learning outcome (Marton & Saljö, 1976). While deep learning approach is adopted in situations where students are active learners who engage in learning process and strive to comprehend meaningful learning, surface learning approach is adopted in situations where students are interested in learning basic knowledge of concepts and tend to memorize information (Biggs, 1987a,1987b, 1987c). Assessment of students' achievement was described as one of the factors affecting on-going approach to learning a particular task (Biggs et al., 2001). Students' formative assessment in which feedback was given was found be associated with students' approaches to learning (Gijbels & Dochy, 2006). Moreover, Rowe and Wood stated that there is a link between students' feedback preferences and learning approaches because different from surface learners, deep learners tend to prefer feedback that allows them meaningfully understand materials. However, they have not explored this relationship in project-based courses and for formative feedback.

In project-based learning environments students are exposed to complex and challenging tasks during project construction process. While encountering such tasks, they are expected to adopt one of the learning approaches in order to tackle with them. Their perceptions and preferences of formative feedback provided during project construction process would be also different depending on the approaches they adopt. Therefore, exploring students' learning approaches they adopt in project-based courses would be very important to understand the association between students' formative feedback preference/perceptions and their learning approaches.

This study focused on CEIT program undergraduate students, therefore background information on this program is also necessary. In CEIT program there are 43 must courses (YÖK, 2013). Particularly in the Middle East Technical University CEIT program in 15 must or elective courses students as individual or group are expected to perform an educational project together with a comprehensive project report. These projects could be small scale projects lasting four week to one week, or long term projects lasting two months to one year (CEIT, 2013). In addition to lab hours dedicated to design and development of project and report, in project-based courses students interact with instructor and teaching assistant every week meetings in order to present their current project and report performance and to take formative feedback about weak and strong sides of their performance, their questions and misunderstandings related to flow of the project and also to understand instructor and teaching assistants expectations. Contestations like in every week meetings also take place in online through e-mail or Gmail group. Students ask their questions and problems in the form of writing. Such online and face to face conversations usually continue throughout the project construction process.

1.3 Purpose of the Study

The primary purpose of this study is to examine the perceptions and preferences of CEIT undergraduate students pertaining to formative feedback they received for their term project and report. The second purpose of this study is to explore the relationship of students' formative feedback perceptions and preferences with their learning approaches

1.4 Significance of the Study

Perceptions and preferences for feedback is an important variable for understanding what students really want from instructors and teaching assistants. Without it, mismatches emerge between students' final products and teacher expectations (Ross & Wels, 2008). As suggested in the literature, analyzing beliefs that students have on the purpose of feedback, messages they convey and language they use, instructors would get an opportunity to connect with students and address their primary misconceptions and problems (Hounsell, 1987; Lea & Street, 2000; Ivanic, 2000).

This study also provides the following benefits not only for instructors but also for teaching assistants and faculty administrators. Instructors and teaching assistants would get an important opportunity to evaluate themselves with respect to the students' perceptions of the quality of their formative feedback types, tone, manner, characteristics, clarity, adequateness, and specificity they provide to students for their projects and reports. Specifically, information regarding the students' formative feedback perceptions would help instructors and teaching assistants notice their strengths and weaknesses in provision of formative feedback. Apart from perceptions, information regarding the students' formative feedback preferences would help instructors and teaching assistants aware of students' formative written and oral feedback preferences and give them an important opportunity to tailor their formative feedback by considering students' preferences of formative feedback types, tone, manner, characteristics, clarity, adequateness, and specificity. Instructors would explore what types of formative feedback students in project groups often prefer to take during the construction of the project and adapt or change her/his previous method of giving feedback to a new method that students prefer to take.

Moreover, instructors would discover what are the most powerful and efficient types of formative feedback in a project based courses and under which conditions these types of formative feedback help students develop their skills and improve their understanding and learning. Useful formative feedback mechanisms would be explored by instructors and they would be used for the easy transformation of undeveloped skills and competencies. Such information may help faculty administrator to recognize formative feedback related issues and address these issues by arranging seminars about how to provide quality formative feedback in the alignment with students' preferences.

This study contributes to the literature by filling the gap for undergraduate students' perceptions and preferences for formative feedback in their project courses and the relationships of these to their learning approaches. It also provides an instrument to explore these perceptions and preferences that can be used in further research as well as by instructors and teaching assistants.

1.5 Definition of Terms

Feedback: Feedback is defined as "the information about the gap between the actual level and the reference level of a system parameter which is used to alter the gap in some way" (Ramaprasad, 1983, p.4).

Formative feedback: Formative feedback is defined as "information communicated to the learner that is intended for modify his or her thinking or behavior for the purpose of learning" (Shute, 2008). In addition to Shute' formative feedback definition, in this particular study formative feedback was referred as verbal and oral information provided to learners by instructors, course assistant, peer on their demands with the intention of revising their skills, correcting their misunderstanding, improving their learning, developing their artifacts, and confirming their accurate behavior.

Learning Approaches (Deep and Surface): While deep approach is defined as "the intention to establishing mastery of the material and integration of it into the learner's existing knowledge base", surface approach is defined as "the intention to achieve short-term memorization of the material so that it may be reproduced, for example, in an assessment."(Cuthbert, 2005, p.238)

Project-based learning: There is not a consensus on specific definition of project based learning. However, Buck Institute for Education (BIE) in PBL handbooks for teachers defines PBL "as a systematic teaching method that engages students in learning knowledge and skills through an extended inquiry process structured around complex, authentic questions and carefully designed products and tasks"(p. 4).

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This study explored students' formative feedback perceptions and preference in project-based course settings and the relationship with learning approaches. In literature instead of formative feedback term, the terms "feedback", "assessment", "assessment feedback" and "formative assessment" and "formative feedback" were interchangeably used. Therefore, while reporting relevant studies and their results, the same terms that individual studies used were used in the same way. In this review, feedback is conceptualized as written and oral information provided by the faculty, peers, teaching assistants, and others regarding the aspects of students' performance, development and understanding.

Almost in all of the definitions of feedback having made in literature the main emphasis was given to the gap between the current level learners have and desired level learners are expected to achieve. For example, McDonald (1991) defines feedback as "the process of providing some commentary on student work in which a teacher reacts to the ideas in print, assesses a student's strengths and weaknesses, and suggests directions for improvement" (p. 3). Moreover, feedback definition is viewed in a broad manner and defined in different disciplines. From the perspective of educational literature, Hattie and Timperlay (2007) defined feedback as "information provided by an agent such as teacher, peer, book, parent, self, and experience regarding aspects of one's performance or understanding" (p.81). Different from the perspective of Hattie and Timperlay, Ramaprasad (1983) viewed feedback from the perceptive of management theory and identify feedback as "information about the gap between actual level and the reference level of a system parameter which is used to alter the gap in some way" (p.4). Apart from the researchers' definition of feedback, students' definition related of feedback was also stated by Brown (2007). According to Brown students see feedback as a form of assessment rather than a form of examination test given at the end of the course.

In this review, after the presentation of the conceptual framework, the research studies about students' perceptions and preferences on a variety of dimensions of feedback and formative feedback is presented. Then, research studies specifically explored the students' perceptions and preferences on formative feedback on term projects and the relationships of learning approaches were presented.

2.2 Conceptual Framework

The conceptual framework of this study is built upon three different theoretical approaches. In the first approach formative assessment and feedback is described and the feedback is identified as key component in formative assessment. In the second approach, the description of project-led education together with the important role of feedback in it is presented. In the

third approach, the theory of learning approach and its association with feedback is presented.

2.2.1 Formative Assessment and Feedback

Assessment is a crucial as well as natural part of teaching and learning process. Assessment is gathered information from the students used to interpret and make judgments about students' works and performance status (Berry, 2009). The focus of assessment to support learning is clearly defined as follows:

> "Assessment focuses on describing students' learning, identifying where each student is in his or her personal learning progression, diagnosing any difficulties students may be having in their learning, and providing direction to the instructor and the student in the steps to be taken to enhance learning " (Berry, 2009, p.5)

Assessment techniques are described to take two forms: formative assessment and summative assessment (Bloom, et al., 1971). Sadler (1989) defines the focus of formative assessment as a process of appraising the quality of student work by giving judgments on students' performances and works. In contrast to formative assessment, summative assessment is concerned with summarizing up students' achievement and reporting it at the end of course, usually in the form of grades (Bloom, et al., 1971; Sadler, 1989). Feedback is described as a key element in formative assessment (Sadler, 1989) not only for the instructor but also for the students about the learning progress (Wiliam & Black 1996). Students use feedback given during formative assessment to monitor the week sides and strong sides of their performance, and take actions by modifying and improving unsatisfactory aspects (Sadler, 1989). Ramaprasad (1983) stated that information is considered as feedback when it is used to alter the gap between actual and reference level. According to Sadler (1989) students have to know three key premises in order to use information to alter the gap: 1) reference level, 2) performance level in relation to reference level, 3) using strategies to close the gap occurred between performance level and reference level by modifying their performance.

2.2.2 Project-led Education and Feedback

Project-led education is a way of increasing students' motivation and progression rate during the time interval specified by a given academic program (Powell, 2004). Some of the properties project-led course environment has in nature highlighted in a study (Powell, 2004). 1) One of them was that project-led course was supported by several theory-based lectures. 2) The second feature is that project occupies a large amount of time throughout the entire term. 3) Project meeting is the third characteristic of project-based learning environment. Project teams gathered with tutor in meeting sections of predefined time per week. In those meetings the role of tutor was to facilitate the content and the process of running project by suggesting some kinds of strategies and advice students could be able to make use of and resort to when dealing with the problems they encountered during the development of project. 4) Finally the fourth feature is that when examining team as whole, teacher holds team responsible for the performance.

There are ideas and approaches overlapped concerning the differences between problem-based learning (PBL) and project-led education (PLE) or project-organized learning (POL).

Scale of learning activities mainly differentiate "problem-based" from "project-based" education in such manner that while PBL covers team-based discussion of smaller-scale problems that students engage with within a week or few weeks, PLE projects cover a complete semester with team-based discussion of larger-scale (Powel, 2004).

In project-based learning there is a process in which students work as team or group and teachers are facilitators and tutors who give feedback to students (Frank & Barzilai, 2004). McGrath, Arrow, & Berdahl (2000) defines team working environment as complex, adaptive, and dynamic at all hierarchical levels. Moreover, in such environment students are required to interact with each other and share the efforts as team in order to solve complex and high effort demanding problems (Barron, 2000; Dillenbourg, 1999; Druskat & Kayes, 2000). Feedback is a powerful tool for the performance of team and team learning (Kozlowski & Ilgen, 2006; Locke & Latham, 1990; London & Sessa, 2006). In project based-courses teachers get a big opportunity to capture the time and give feedback to the students (Razmov & Vlasseva, 2004).

Learning is constructed within social context with the collaboration of social environment (Vygotsky, 1978). Students in project-based courses work collaboratively who engages in project construction process and deals with the problems they have encountered, resulting construction of knowledge.

2.2.3 Learning Approaches and Feedback

The construct of approach to the learning emerged as a result of a series of studies by Marton and Säljö (1976a, 1976b). In their first study they investigated how university students process information by focusing on what was learnt (Marton & Säljö, 1976a). Students were given an academic article to read and told that they would be asked some questions related to how they approached the task of reading an academic article. Analysis of these responses indicated that two approaches to learning were employed by students. While the students who experienced text as information that needed to be memorized for answering questions were considered to employ surface approach, the students who experienced text as something that needed to be understood its underlying meaning together with underlying concerns were considered to employ deep approach. Students who approached to learning task using deep approach answered a lot of questions and better understood the meaning of article. Depending on the students perceptions of the tasks they may employ either deep or surface approach.

By adding 'achieving' approach to Students' Approaches to Learning (Marton & Saljö, 1976), Biggs (1987a) and (1987b) developed a questionnaire called Student Process Questionnaire (SPQ) in order assess students' use of those three approaches. Strategy (how students approach the task) and motive (why students want to approach task) were two components for each approach in Student Process Questionnaire. Conceptual structure of three approaches and their components was depicted in following table 2.1.

Table 2.1 Conceptual Structure of Three Approaches and Their Components (Biggs, 1987c)

	Surface	Deep	Achieving
Motive	Fear of failure	Intrinsic interest	Achievement
Strategy	Narrow target, rote learning	Maximize meaning	Effective use of space and time

Overtime, the original Student Process Questionnaire (SPQ) undergone through changes, items were added, and revisions made. After refinement of new items being added and 43 items taken from SPQ (Biggs, 1987c), new version of Student Process Questionnaire called the revised two-factor Study Process Questionnaire abbreviated as R-SPQ-2F was developed by Biggs et al. in 2001. Different from SPQ, R-SPQ-2F contained 20 questionnaire items being adapted, two approaches (Deep and Surface), and two components (Motive and Strategy) (Biggs et al., 2001).

Struyven et al. (2006) argued that learning approaches are not synonymous with learning styles. Rather, students can shift between surface learning and deep learning depending on the students' interpretation of and characteristics of the context. Relation between context and learning determine whether student will adopt deep or surface approach. However, learning styles are stable and do not change depending on the context (Struyven et al., 2006; Biggs, 1993, 2001; Birenbaum, 1994).

2.2.4 Summary

Given the important function of formative feedback provided during formative assessment in project-based courses, formative feedback serves two important roles: 1) presenting performance level of students as group or individual on project and report, 2) facilitating their performance revision by giving specific guidance during project and report construction process. Considering the effect of assessment on students' perceptions of task on the way they approach it, learning approaches extend the understanding of relationship between formative feedback perceptions / preferences and learning approaches.

2.3 Research Studies on Perceptions and Preferences for Feedback and Formative Feedback in Undergraduate Education

This section presents the research studies about undergraduate students' perceptions and preferences for feedback or formative feedback under 14 categories: a)the amount of feedback, b) usefulness of feedback, c) effectiveness of feedback, d) feedback for future improvement, e) comprehensibility-complexity and specificity, f) lack of feedback, g) feedback and marking, h) feedback source, i) tone (positive and negative), j) good feedback, k) importance of feedback, l) feedback timing, m) media (written and oral), n) motivation-self-esteem-engagement and self-efficacy.

a. The Amount of Feedback

Zacharias (2007) administered a study in order to find out teacher and student attitudes toward teacher feedback comments students received on their writing assignments in English language learning course. One of the themes emerged in the study showed that the state of students' feelings is mostly depending on the amount of feedback teacher gave on drafts. That is, too much feedback caused students to be annoyed and discouraged to keep writing.

In contrast, little feedback was seen as the sign of fewer mistakes and therefore they felt happy and motivated when taking less feedback. The similar result was supported by Ferguson (2011) who administered a study with graduate and undergraduate students in order to investigate what students' assessment feedback preferences are in the form of light, detail and timing. A large number of students perceived that feedback comprising just one word or short explained response had no value for them. They supported the notion that the more detail feedback is the better feedback as long as it was clear and constructive. Some reasons of not giving feedback in detail were also explained and identified. For instance, Rowe and Wood (2008) in their qualitative study with 29 students from different disciplines concluded that students' responses related to whether enough feedback was being provided by the instructor were mixed, and they attributed the result of those mixed responses to large class size and lectures' limited time. However, Ferguson (2011) viewed the amount of feedback from a different perspective. Different from previous researchers Ferguson argued that the amount of feedback for students who have low-motivation and low self-perception was needed more attention. Because, giving detailed feedback for those students was time consuming. The main concern had to be how to encourage all those students.

b. Usefulness of Feedback

Meaningful and useful feedback help fill the void between what is desired by teachers and what is achieved by students. In order given feedback to be useful and meaningful, perceptions of students on feedback and contingent feedback benefits from students' point of view need to be considered and examined in an extensive manner. According to Brown, relatively few research studies conducted in the area of feedback from the students' perspective. Students are given passive roles in defining learning outcomes because nobody tells them what kind of feedback they would like receive under different conditions. Instead of students, teachers have taken a role of feedback decision makers in formative process and they know the best way of offering the types of feedback to the students. However, students own feelings, views, and beliefs on feedback they receive are neglected (Brown, 2007). Moreover, Brown stated that such feedback features which are being individual-based, being relevant and being detailed in specific points are useful for students because of being liked by them. One research study in 2007 on student attitude toward teacher feedback students received on writing assignments in English language learning course as comments showed that general feedback such as "many mistakes on grammar", "add more information", "revise your ideas", and "develop the idea" were seen relatively unhelpful by students. They were in favor of taking directive, explicit, specific suggestions on how to correct writing errors, and telling students what they need to do to have better writing. Because such kind of feedback made students had a better understanding on how to revise the draft, improve it, and did not repeat the similar mistakes again. Similar results were supported in a qualitative study administered by Poulos and Mahony in 2008. They conducted focus group interview for understanding students' perceptions of effectiveness of feedback provided by university teachers during university studies and its contribution on students' learning and teaching. Three feedback dimensions from transcribed data were discovered: perceptions of feedback, impact of feedback, and credibility of feedback. They stated that although delivery of feedback was depended on person and feedback, students saw one-to-one feedback and written feedback more useful due to the reason that written feedback could be used for similar assignment in future. One of the earlier study related to useful feedback reported that

"the most useful feedback as being constructively critical and providing specific information on ways to improve, and viewed feedback as a process that would ideally lead to action on their part (Murdoch-Eaton and Sageant, 2012)". In spite of the supportive considerable evidence related to usefulness of feedback and a number of teachers' views pertaining to usefulness of feedback for student learning, Perera et al. (2008) claimed that the actual practice was inadequate in using feedback effectively.

c. Effectiveness of Feedback

Differing perceptions of students (n=1740) and staffs (n=460) concerning the written comments on drafts and assignments has been explored by Carless (2006) with a large-scale questionnaire survey and by semi-structured interviews. Study results showed that there was a significant difference between perceptions of students and tutors toward the effectiveness of feedback given on assignments as comments. The number of tutors who thought giving detailed , useful, and helpful feedback that helps them improve their next assignment was significantly small than the number of students who thought the same way. The students perceived that given feedback was not useful and rarely helped making improvements on their learning. In addition to Carless, Ramaprased (1983) argued that feedback can only be effective when it is used to alter the gap between what is desired and what has been undertaken. Related to how effective provision of feedback is important, Poulos and Mahony (2008) suggested that perceptions of feedback, impact of feedback and credibility of feedback are three important key dimensions for effective provision of feedback to students but they are not sufficient. They stated that a program whose aim is to extend and improve students' ability with respect to how to use and recognize feedback needs to be associated with these identified dimensions. Preliminary conclusion derived from a study administered by Wingate (2010) confirmed the effectiveness of formative feedback that many students in their academic writing made quicker progress as a result of exposed repeated feedback during the first term.

Kulhavy and Stock (1989) reported that verification and elaboration were two features of effective formative feedback by which learners get information. Shute (2008) described two types of information in following manner. Verification is a statement in which a judgment is provided to learners about whether their answers are correct or incorrect. This is the most common used type of information learners receive in their feedback messages. Different from verification, elaboration is quite broad and guide learners with the feedback message in which relevant cues are provided. Since more variations in elaborated feedback have than verification feedback, it has more specific and directive (i.e., address a topic and the response), and also general and facilitative (i.e., provide worked examples and respectful guidance) types of feedback.

d. Feedback for Future Improvement

The results of the interview in a study conducted by Carless (2006) on students differing perceptions related to feedback showed that students were interested in taking feedback comments that can be used in future improvements in different assignments because those feedbacks help them improve not only current assignment but also subsequent ones that need similar actions to previous one. The same result is also supported by Poulos and Mahony (2008). According to them the significance of feedback was approved by a majority of

students because students stated that feedback could be used by students not only to make a change on ongoing products and assignments but also help to utilize in professional practice.

e. Comprehensibility, Complexity and Specificity of Feedback

Comprehensibility of feedback was another issue for students because students were getting harder to understand teacher's written feedback because of incomprehensibility of tutor's writing. Therefore, they were sometimes frustrated due to the incomprehensibility in tutor's writing (Carless, 2006; Weaver, 2006). In one of the exploratory qualitative study administered by Brown (2007) with 20 undergraduate students from different levels the same complaint was highlighted and concluded that it got harder for students to understand teachers' comments because they were insufficient, lacking, and too vague. Moreover, being not clear relationship between ticks, marks, and comments in the teachers' feedback make comments hard to understand. Similar to Brown and other researchers, one of the current studies also focuses on the reading difficulties students are exposed, and found that interestingly almost all of the students had difficulty in understanding written responses from faculty and highlighted that as a problem in their higher education studies (Ferguson, 2011). One of the themes in a research study declared the same difficulties students encountered in understanding teacher feedback. Almost all the students in the study expressed to have difficulty when trying to understand the message teacher feedback contained. Students pointed out oral feedback accompanying with writing one as a way of dealing with this problem. Furthermore, the level of language was investigated and found that most of the students had complaints related to the level of language teacher used when delivering feedback. The similar result was emerged in a study administered by Robb, Ross and Shortreed (1986). They found that students' effective making use of feedback was mostly related to the level of language teacher used in delivering feedback. Different from other researchers, Shute (2008) stated that learner characteristics and different learning outcome are the variables on which specific and clear feedback may be depended. Student ability level, motivation and retention may affect the student level of understanding feedback as implicit or explicit.

f. Lack of Feedback

One of the influential studies on students and faculty perfection towards feedback given on the draft and assignment revealed that students did not receive feedback and follow-up in the assessment process (Carless, 2006). Tutors in interviews expressed that large class size, insufficient time, and institutional constraints were major contributing factors to the students' lack of feedback and follow-up (Carless, 2006).

g. Feedback and Marking

Students were only interested in high grade, rather than improving their next assignment or learning when interacting with feedback (Carless, 2006). Different from Carless, Hall et al. (2012) stated that the only reason students receive a particular feedback come from grade. The relationship has been found between students' demand for feedback and the score they take. For example, Brown (2007) in his exploratory qualitative study with undergraduate students showed that students' desire for getting feedback changed with the degree of mark they were awarded. That is, students' demand for feedback grew when they had scored less than they expected. On the other hand, students who showed better performance than they

expected didn't indicate a strong desire for feedback as students with lower mark. The importance of grade for students makes them to predominantly accept feedback from the instructor who has a full control and manipulation on grade is the claim asserted by Zacharias (2007). Zacharias stated that one of the reason students preferred to take feedback from teacher stemmed from the full authority of teachers in grades. Students saw teacher feedback as a valuable means that would help them get better grades. Consistencies between assessment criteria and comments has been also investigated and found that tutor's giving mark and feedback are not matched. That is, there are inconsistencies between marks and feedback instructor gives (Weaver, 2006). Related to whether students prefer to take either mark or grade, or both of them at the same time, Poulos and Mahony in their study showed that both marks and comments were accepted by students to be given simultaneously. However, the result of one of the studies conducted by Perera et al. in 2008 revealed that most of the students (%75) were in favor of not confining effective feedback to giving a grade. Moreover, the majority of students (%90) wanted to receive a sufficient explanation to grade so as to realize what is the criterion instructor defines for expected standards.

h. Source of Feedback

Students saw teacher as the source of knowledge therefore they prefer to take feedback from teachers. They saw the comments coming from a teacher as the most reliable and valuable feedback source (Zacharias, 2007). Since the source of quality external feedback is teacher rather than peer, the information coming from the teacher should have facilities that guide students evaluating their own progress and internal constructions of criteria (Nicol & Dick, 2006). Rucker and Thomson (2003) pointed out a number of constructs having identified commonly by prior researchers related to the role of feedback in their research. A source of feedback was one of those contracts. They regarded faculty members, peers and assistants as a source of knowledge and accepted them as the members who give evaluative judgments on student performances. To support previous studies Perera et al. (2008) stated that students were in favor of taking feedback from content specialist namely faculty rather than course coordinator.

i. Positive and negative feedback

There are considerable evidence that support the balance between positive and negative feedback. For example, in one of the influential studies administered by Weaver (2006) on students' perceptions pertaining to tutor written feedback indicated that although constructive criticism motivated students to improve, occasionally such constructive criticism was seen in the instructor's written feedback. The majority of students identified positive feedback as impetus on their confidence and a balance between positive and negative feedback. However, tutor's written feedback usually focused on negative sides and thus including negative feedback. Even though positive and written feedback has proven to be preferred by students (Weaver, 2006), Paulos and Mahony (2008) reported that not only the combination of positive and negative but also combination of written and oral feedback was identified to be helpful by students. Students' views about positive and negative feedback with respect to their maturity differences have been also investigated and found that junior and senior students have different views about the positive and negative feedback. While negative feedback was viewed by senior student as a constructive form in which specific ways are given for improvement, positive feedback was seen by junior student as the

affirmation to whether standards are met or reassurance is provided. Murdoch-Eaton & Sargeant (2012) administered a study with graduate and undergraduate students in order to investigate students' assessment feedback preferences. The main theme derived from the comments of many students are aligned with the notion that when all the given feedback is negative, it may cause students to give up. Therefore, given feedback should comprise of not only negative comments but also a certain amount of positive comments in order to sustain and build confidence and encouragement role of feedback. Moreover, these negative comments should help students guide for future action and improvement rather than just indicating places where work is inadequate. Wingate (2011) highlighted the negative effect of criticism containing in the feedback message on the encouragement of weaker students, and stated that giving weaker students a large amount of negative feedback on various topics in a while can lead students to being discouraged.

j. Good Feedback

By reviewing a large body of research studies in the literature on formative assessment, Poulos and Mahony (2008) identified seven principles of good feedback practice. The first principle is that 1) good feedback helps clarify what good performance is. Due to the fact that students and tutors have different conceptions of assessment criteria and standards, students are having difficulty in addressing the gap between the required and actual performance. Exemplars of "performance" were mainly suggested to be provided to students in order to clarify the characteristics of good performance.

2) The other principle pointed out in the study is that good feedback facilitates the development of self-assessment in learning. Good feedback is the feedback that provides students with more structured opportunities to practice and regulate their own learning. For example, long term projects provide students an environment in which such kind of opportunities could be received.

3) Delivering high quality information to students about their learning is the quality of good feedback as stated in third principle. Since the source of quality external feedback is teacher rather than peer, the information coming from teacher should have facilities that guide students evaluating their own progress and internal constructions of criteria. External quality feedback with respect to self-regulation was identified to have following characteristics: involving not only weaknesses but also strengths, offering corrective advice and being in a timely manner.

4) The fourth principle is that good feedback encourages teacher and peer dialogue around learning. Good feedback provides an environment in which not only students receive initial feedback information, but also teacher and students get an opportunity to engage in discussion about feedback. As a way of encouraging communication, a small group discussion after students had received feedback was suggested to be structured in classroom. Feedback provided by peer was described to develop students' sense of self-control over learning by different ways of exposing different perspective and giving informal judgments about work.

5) Good feedback was found to encourage students' positive motivational beliefs and self-esteem as stated in fifth principle. The role of motivation and self-esteem are accepted to be

important in learning and assessment in literature (Hattie & Timperley, 2007). Majority of studies in literature approve that students' belief about learning affects students' responses to external feedback. These studies stated that mark or grades given to the students as feedback have negative impact on both motivation and self-esteem, and also cause students to give less attention to comments (Shute, 2008).

6) The sixth principle is that robust opportunities are provided by good feedback in order to close the gap between current and desired performance (Sadler, 1989). While students are engaging in assessment tasks, they are supported with feedback by instructor and this feedback can help students close the performance gap.

7) Provision of information to teachers which can be used to change the shape of teaching is the last principle most of the studies pointed out. It is now essential for teachers to have good data about students' ongoing progress in order to provide relevant and informative feedback and thus meeting students' needs. Related to difference between good and poor feedback Rowe and Wood (2008) stated that the things that differentiated good feedback from poor feedback were that detailed information rather than superficial one was provided not only by comments but also by verbal explanation to the group.

k. Importance of Feedback

Importance of feedback on the students' views is highlighted in most of the influential studies investigating students' perceptions and preferences toward feedback being given in educational settings. The study of Meerah and Halim (2011) is one of them that showed that students were aware of the importance of feedback on their developments as Rowe and Wood (2008), and Zacharias (2007) explicitly stated in their study. Moreover, they wanted to receive feedback on their both work and performance. Because students were interested in knowing instructor expectations related to quality of work and level of performance. Murdoch-Eaton and Sageant (2012) in their qualitative study have reached the similar result and showed that students affirmed the notion that receiving feedback is the most important part for learning. Furthermore, Hall et al. (2012) concluded that surprisingly a large number of participants (98.0%) strongly agreed the notion pointed out by Murdoch-Eaton and Sageant that one of the significance of the degree program was to receive feedback.

l. Feedback Timing

The promptness of receiving feedback was important for students because of the fact that they could not refresh their previous mistakes and might had forgotten what they had done (Meerah & Halim, 2011; Rucker & Thomson, 2003). Different results were emerged in many studies related to whether receiving timely feedback is important or not. In the same studies delayed and immediate feedback contrasted with respect to level of preference and acceptance (Hattie & Timperley, 2007). For example, Poulos and Mahony (2008) in their study explored students' perceptions of effectiveness of feedback provided by university teachers during university studies. They concluded that while provision of early or timely feedback was accepted to be useful, different responses students shared emerged whether late feedback was useful or not. Some students preferred to take late feedback because of the reason that late feedback could be used in later on. However, the other students contended that late feedback did not serve as positive because of been given too late. Like the previous

study, Murdoch-Eaton and Sageant (2012) differentiated immediate and delayed feedback with respect to fields each of them separately affects. While immediate feedback enhance learning outcomes related to the acquisition of verbal, procedural or motor skills, delayed feedback is more likely to be effective for the transfer of learning or conceptual formation tasks. For the problem based learning environments (PBL) Perera et al. (2008) found that almost all students (95 %) wanted to receive immediate feedback on problem based learning sessions. However, Rowe and Wood (2008) in their influential study showed that students complained about the feedback not being provided in a timely manner. They preferred timely feedback that was provided in a short time after submission (Carless, 2006). Moreover, they have investigated whether timely feedback has any impact on learning approaches (deep and surface) that learners have, and noted that "the preliminary findings in this study imply that the provision of appropriate and timely feedback promotes deep learning in students"(p.83).

m. Written and Oral Feedback

According to Meerah and Halim (2011) feedback can be in written comments and oral form. Generally, while verbal feedback is given in conversations during office hours or out of office hours as verbal comments, written feedback is given on students' drafts and assignments by hand or through e-mail as written comments (Meerah and Halim, 2011). Rowe and Wood (2008) in their study noted that students' feedback preferences were contradictory. Yet, students agreed that they prefer verbal feedback to the group if generic information would be provided, and they preferred written feedback on individual assignment if specific comment would be given. The study of Ferguson (2011) conducted on students' assessment feedback preferences indicated that students viewed timely, personalized, clear, positive and constructive feedback types as the best feedback options provided. Furthermore, students' and instructors' preferences in terms of written and verbal feedback were different from each other. That is, results of the study showed that students (85 %) preferred to receive written feedback for all writing assignments, and oral feedback after problem based learning sessions, whereas teachers (95%) preferred to give oral feedback all the time (Perera et al., 2008).

n. Motivation – Self-Esteem – Engagement –Self-Efficacy

Students' motivation and self-perception may have an effect on how to utilize feedback (Wingate, 2010). Because, students' intrinsic motivation have been found to be influenced by the perception of feedback. Teacher's interpersonal behavior also affects the perception of feedback within the classroom. It seems that the provision of feedback and teacher's interpersonal behavior are two important factors that highly influence the level of willingness of student when attempting to engage in further learning (El et al., 2012). Schartel (2012) in his analyses of evaluating the effectiveness of feedback on learning and performance identified following reasons that may cause increase or decrease in self-efficacy. External verbal encouragement and successful performance had positive effects on self-efficacy. In contrast, external verbal discouragement and repeated failures are the causes of decline in self-efficacy (Bandura, 1977; Vygotsky, 1978). Therefore in order to keep increases in self-efficacy, encouragement accompanying with guidance or assistance needs to be given. Furthermore, feedback focused on person rather than task or goal acquisition is more probable to have decreases on self-efficacy.

2.4 Research Studies on Project-led Education and Feedback/formative Assessment

Ferguson (2011) investigated how 465 graduate and 101 undergraduate students perceived assessment feedback and what were their assessment feedback preferences based upon their experiences within higher education context. Result of the study in regard to undergraduate students' perceptions about different forms of assessment feedback indicated that while group verbal feedback was the least useful, brief written comment and written summary were rated the most useful. However, most of the students complained of having difficulty while reading written feedback. Regarding which different aspects of feedback were viewed important, assessment feedback given both on overall structure/content and on the specific ideas were more importance to students than assessment feedback given on the small details (spelling, grammar). Students preferred to take both supportive assessment feedback that would help them improve, and encouraging critical feedback that would highlight their positive performance. Students stated that more than one negative feedback would destroy their confidence and in turn cause students to give up.

Razmov & Vlasseva (2004) believed that specific feedback given on different aspects of project gives students a helpful opportunity to see the areas they succeed and the areas they need to give additional work and attention. However, most of the times mismatches are occurred between what students as group do and what teacher wants students to do (Ross & Wels, 2008). Heron (2011) suggest that;

"There were inconsistencies and a lack of alignment in the formative and summative feedback provided by tutors. Such inconsistencies raise issues of equity in terms of the way feedback is provided to students". (p.293)

Meerah & Halim (2011) stated that students use feedback given by teacher to help them understand what is the teacher' expectations and methodology and evaluate their progress in light of these expectations (Meerah & Halim, 2011). A study conducted by Meerah & Halim (2011) showed that apart from teacher' feedback peer feedback also has positive impact on learning and ensures the formation of a stronger partnership in team and learning.

Lizzio and Wilson (2008) investigated the students' perceptions about the quality and effectiveness of written assessment feedback given on assessment tasks such as essays, laboratory reports, case studies and literature reviews. They conducted study in two phases. In the first phase, within the area of quality and effectiveness of assessment feedback, they identified and searched the characteristics and components of effective feedback that students perceived, underlying structures in students' perceptions of assessment feedback, and relatedness of students' evaluations concerning with the effectiveness of assessment feedback to feedback components. The analysis results of 238 written comments of 57 psychology students showed that students used three criteria while evaluating quality of provided assessment feedback: developmental focus, engagement, encouragement and fairness. Based on the domain of themes reached in the first phase, second phase with larger sample (277 students from various level of university study) was conducted to identify underlying structure of students' perceptions of assessment feedback. Students' perception of assessment feedback was analyzed with respect to three dimensions. Developmental feedback, Encouraging feedback and Fair feedback are the three dimensions in which students' feedback perceptions were associated as depicted in the following table:

Table 2.2 Domain of Feedback Criteria

Developmental feedback (*associated type of feedback*)	Encouraging Feedback (*positive aspects of feedback*)	Fair feedback (*clarity and consistency of feedback*)
Guide direction	Acknowledging excellence	Student friendly form
Guide strategy	Identifying correct responses	Clear
Engagement with academic learning and performance	Recognizing effort invested in assignment	Legible
Facilitating self-regulation		Consistency of information
Applicable more widely		
Discussion with markers		

The overall results of the study indicated that students' assessment feedback perceptions can be investigated in the light of the domain of criteria: developmental feedback, encouraging feedback, fair feedback. Moreover, while developmental focus and engagement criteria were associated with the effectiveness of assessment feedback, encouragement and fairness criterion was strongly correlated with students' evaluations of effective assessment feedback.

Lizzio and Wilson (2008) also analyzed the relationship between students' perceptions of assessment feedback and personal and contextual variables such as age, gender, year of enrollment, self-reported academic achievement, satisfaction with degree, and employment. Result showed that exception of year of enrollment, students' perceptions of assessment feedback was not significantly influenced by above personal and contextual variables.

Lynch et al. (2012) conducted a study in which they investigated how the incorporation of self- and peer-assessment and feedback affect deep approach to learning and in turn promote their critical thinking and metacognitive skills in designed project based coursework. Undergraduate students (n=47) was assigned to two Modules. While in one Module only peer feedback was given, in the second module only instructor feedback was given. They were expected to design and manufacture a model motorcycle. In the Module students were evaluated based on their term exam and project based elements including level of engagement and reflection with e-portfolio, formative peer feedback in online blog, and finished model motorcycle. All students had access to each other's e-portfolio. Analysis of observations, students' reflections and postings on e-portfolio indicated that students' interaction and engagement with the material covered in the Module promoted their deep learning.

2.5 Research Studies on Learning Approaches and Feedback/Formative assessment

A possible relationship was found between student learning approaches and feedback preferences was the important conclusion derived from one of the influential studies conducted in field of the students' perceptions and preferences of feedback (Rowe & Wood, 2008). Moreover, a primary preliminary finding in the same study was that timely and appropriately provided feedback highly enhances deep learning which is one of the learning approaches (Rowe & Wood, 2008). The other prior studies also pointed out the correlation between students' assessment preferences and approaches to learning, and have indicated

that differences in students' learning orientations and strategies were related with the differences in students' assessment preferences (Birenbaum, 1994, 1997).

The study of Gijbels and Dochy (2006) is one of the influential and effective studies that investigated the relationship between students' approaches to learning and their formative assessment preferences. Participants of the study were first-year bachelor students (N= 108). Pre-test at the beginning of semester and post-test at the end of semester were given to the students in order to collect data concerning with approaches being used by students and their formative assessment preferences. Students took formative feedback on their group assignments that faculty expected from them to accomplish after instructor introduced and covered theoretical concepts of the lecture. Electronic discussion form was also used by students for discussion on the assignments. Two main approaches, deep and surface, were identified at the outset of study and they were defined respectively as follow. Deep learning approaches were linked to the intention of getting actual and total meaning of content to be learned, and understanding and constructing context in detailed manner. Different from deep learning, Surface learning approaches were linked to the intention of learning contents of the study materials by memorizing and reproducing so as to just provide minimal requirements. After correlational analyses were performed among variables, study result showed that there was a correlation between students' assessment preferences and approaches to learning. That is, the students who adopt deep approach to learning preferred assessment procedures that allow them to demonstrate their understanding, and that supported high-order thinking tasks and integrated assessment both before and after experienced with the formative assessment. However, the students who adopt surface approaches to learning did not prefer such assessment procedures both before and after experienced with the formative assessment. As a result, overall conclusion drawn from the study was that formative assessment has a strong influence on learning processes.

2.6 Summary

Review of literature indicated that a large body of research has been conducted on perceptions of students toward feedback. Compared to studies of perceptions, a small number of studies have investigated students' feedback preferences. Investigation of written feedback given as comments or statements on undergraduate students' assignments, piece of writing, and artifacts is the most selected research field, whereas oral feedback is the least focused research field. Instructors and tutors were described common feedback sources who provide feedback to the students in classroom.

As for formative feedback, relatively few studies have investigated students' formative feedback perceptions and preferences. There is inadequate information and research study findings about students' perceptions and preferences toward oral and written formative feedback Furthermore, aside from course instructor, teaching assistant oral and written formative feedback with respect to students' opinion has not been investigated adequately.

Literature review showed that there was a well-established agreement among researchers in regards to the importance of formative feedback given on students' works in project-based learning. Furthermore, formative feedback when provided effectively was accepted to encourage students' engagement with project materials and facilitate their misunderstandings during project construction process. There were some research studies having been

conducted on students' thoughts and opinions about written formative feedback given on their assignments and piece of work in project courses. However, students' formative oral and written feedback perceptions and preferences in project based courses have not been investigated adequately.

Some studies reported the effect of assessment on students' learning approaches and the relationship of instructors' assessment strategies with students' learning approaches. Even though the relationship of learning approaches with students' assessment preference was highlighted in some qualitative studies, the relationship of students' formative feedback perceptions and preferences with their learning approaches has not been adequately researched in both qualitative and quantitative aspect.

CHAPTER 3

METHODOLOGY

This chapter presents research questions, design of the study, general description of the courses involving term project, data collection instruments, qualitative phase, quantitative phase, assumption of the study, and limitation of the study.

3.1 Research Questions

The purpose of this study is to examine the perceptions and preferences of CEIT undergraduate students pertaining to formative feedback they receive for their term projects and the relationship of these perceptions and preferences with learning approaches (Deep and Surface).

This study was designed to investigate the following main questions:

1. What are the perceptions and preferences of CEIT 3rd and 4th year undergraduate students pertaining to formative feedback they receive for their term projects?

2. Is there a significant relationship between these perceptions /preferences and students' deep and surface learning approaches?

3.2 Design of the Study

This study was designed to investigate the perceptions and preferences of CEIT undergraduate students pertaining to formative feedback they receive for their term projects. It also explored the relationships between these perceptions / preferences and students' learning approaches. Sequential exploratory design (Creswell, 2013) was used in this study in order to gather reliable data, provide meaningful interpretation about the perceptions and preferences of students toward formative feedback. Qualitative phase was the first phase of the sequential exploratory design. In this design the primary importance was placed on the second phase namely quantitative data collection and analysis (See Figure 3.1).

Rowe and Wood (2008) developed an instrument measuring students' general perceptions and preferences of feedback, however only for traditional courses or lectures. To specifically understand these perceptions and preferences in project based courses, more in-depth understanding of the phenomenon and development of a more specific instrument for project based courses was necessary.

For this reason mixed methods research methodology was used in this study. For probing, exploring and understanding students' perceptions and preferences of formative feedback and their relationship with learning approaches in depth, a qualitative approach was used. For investigating the research questions with a larger group of students with more specific questions, a questionnaire was formed based on the information extracted from the qualitative data as well as themes identified in the literature.

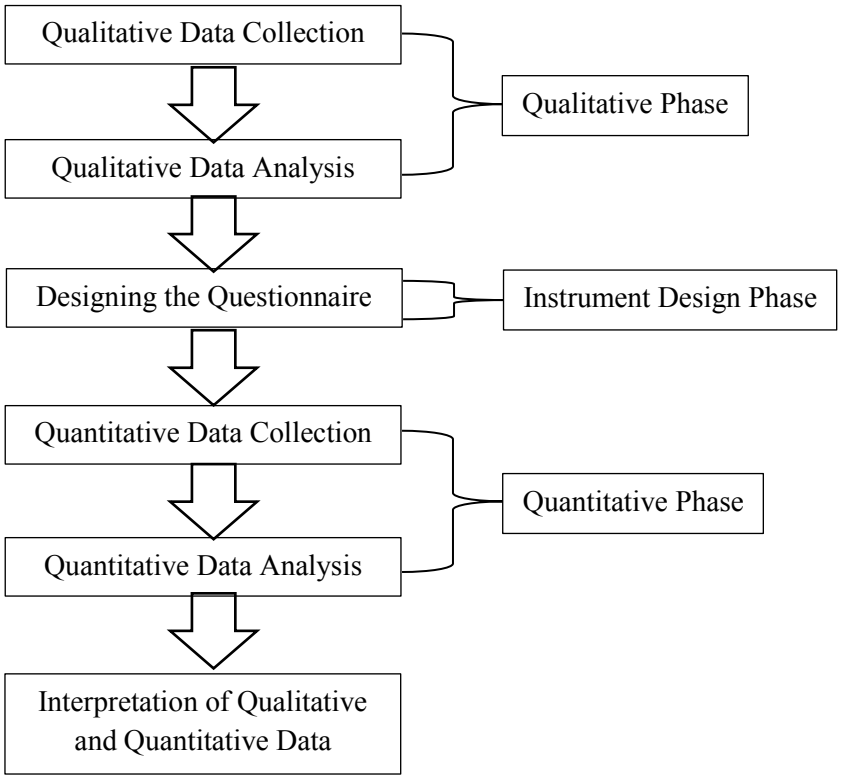


Figure 3.1 Design of the Study

3.3 Description of the Term Project-Based Courses

CEIT program offers several project-based courses in which the main emphasis is given on project design and development. The contents of these courses address different fields. For example, some courses are related to computer software, others are about the computer hardware, and the other ones are pedagogical courses (YÖK, 2013).

Generally two phases are highlighted in project-based courses in CEIT programs. The first phase is the phase in which theoretical portion of the course is given to the students. In the second phase students as a team are required to reflect their acquired knowledge and skills while dealing with some kind of complex and difficult tasks (CEIT, 2013). These complex and difficult tasks might involve creating educational or useful product, preparing a video, designing a poster and writing reports. Although some courses entail students performing all above tasks, some entail students performing some of them. Apart from differences in the number of tasks, the time allocated for tasks is also different for each course. The main reason can be attributed to the task difficulty level. More complex and difficult tasks usually entail more time allocation during all the processes described above, students as individual or as a group frequently interacts with the instructors, teaching assistants, and peers.

The flow of project-based courses indicate that aside from performing and developing an education project with acquired knowledge and skills during the course; a comprehensive report is also an important requirement for the completion of the course. During project construction, students as group or individual meet with instructor and teaching assistants

regularly every week. During these meetings they have discussions on the flow of their projects, written reports and problems they have faced during the process. This face-to-face interaction and dialogue also continues in electronic written form in online environments through e-mail, open courseware, social media, especially Facebook.

3.4 Data Collection Measures

In this study three main instruments were used: an interview guide in the qualitative phase, perceptions and preferences for formative feedback in project based courses questionnaire, and "Revised Two-Factor Study Process Questionnaire". This study and the data collection procedure have been approved by Middle East Technical University Human Subjects Ethics Committee (HSEC).

a. Interview Guide

Qualitative data were gathered through interview guide being developed by the researcher as a result of iterative and comprehensive literature review, in consultation with subject matter experts, and a pilot study with 3 students The first version of the interview questions were developed based on the information contained in previous studies in the literature about feedback, formative feedback, assessment and formative assessment. Then a pilot study was conducted with purposefully selected three 4th year CEIT students at Middle East Technical University who had taken Instructional Feedback Design and Development elective course. Interview with those three students were conducted in semi-structured manner.

One of the purposes of the pilot study was to understand whether each question in interview guide was clear and understandable to the students. The second purpose was to probe information and revealed the questions that were required to be within interview questions but in some cases researcher had missed or overlooked to include. All three interviews were conducted in a quiet meeting room in the Faculty of Education Building.

The time taken for each three interview was 67, 57, and 50 minutes. Aside from asking the questions in the interview guide, the researcher also asked participants about the clarity of each question. Participant's comments and suggestions during each interview were written on the paper separately. After administration of first interview existing interview questions undergone some modifications and adaptation, some extra questions were added based on the information given as comments and suggestions.

As a result of interviews or pilot study five questions were modified because of being not clear enough, two questions were removed due to redundancy, an explanation was added at the beginning of a series of questions, and finally nine questions were added.

After revision of interview questions, revised interview guide was reviewed by two faculty members who have extensive experiences concerning with the preparation of interview questions. The validity and suitability of each interview questions were approved after detailed examination and then researcher started conducting interviews with the participants.

In the final interview guide there were 40 questions. Interview guide is composed of two parts. The first part consists of 33 main questions related with formative feedback given in

project-based courses for their projects and reports. The second part consists of 7 main questions regarding the learning approaches students have in projects-based courses.

b. Perception and Preference Questionnaire and Revised Two-Factor Study Process Questionnaire

The collection of the quantitative data was performed by means of two measurement instruments: "perception and preference for formative feedback for project-based courses" questionnaire and "Revised two-factor Study Process Questionnaire" (R-SPQ-2F).

Perception and preference questionnaire was developed adapting some questions from Rowe and Wood (2008), data drawn from transcribed interview dataset and data taken from in relevant studies in literature. There were total of 48 questions. The Cronbach Alpha values were .97 for perception and .96 for preference. The development of the survey instrument for quantitative data collection was explained in detailed manner in the quantitative phase section.

As for the learning approach instrument, this instrument was adopted from Önder and Beşoluk (2010) who adapted and translated the original Revised Two Factors Study Process Questionnaire (R-SPQ-2F) having developed by Biggs, Kember and Leung (2001) into Turkish language. They administered the revised version of the questionnaire to 528 undergraduate and graduate students from the faculty of education in Sakarya University. The original instrument contains both a) deep approaches (DA) with identified deep strategy (DS) and deep motivations (DM) sub-scales, and b) surface approaches (SA) with identified surface strategy (SS) and surface motive (SM) subscales. Out of 20 items, 10 items are associated with deep learning approaches, 10 items are associated with surface learning approaches. The learning approach instrument was suggested by Biggs et al. (2001) as two and four factor model. However, Önder and Beşoluk (2010) reported that the adapted version is best represented by two factor model: deep learning and surface learning. Therefore, learning approach instrument was considered as two factor model in this study.

Construct validity of the adapted instrument was ensured by exploratory factor analysis and confirmatory factor analysis (Önder and Beşoluk, 2010). Confirmatory factor analysis for two factor model with CFI value of .93, RMSEA value of .06, NFI value of .90, IFI value of .93, RFI value of .88, GFI value of .92, and AGFI value of .89 indicated acceptable model fit. The Cronbach Alpha value of deep learning and surface learning was 0.78, 0.74 respectively, indicating high reliability

3.5 Qualitative Phase

Participant Selection

Data were collected in Middle East Technical University, CEIT program students. Convenience sampling method has been used for selecting the university and the program, and purposeful sampling method has been used for selecting the participants in the program.

Middle East Technical University is an international university holds a top place among other public universities in Turkey with respect to high quality education, innovative technological facilities, successful and experienced academic staff. The excellences of

ODTU in research and education have been highlighted many times in recently announced rankings (THE, 2013b; METU, 2013a). Recently METU is placed among the top 60 universities in the "World Reputation Rankings 2013" announced by Times Higher Education (THE) (THE, 2013a). The language of instruction in the university is English. In METU CEIT program there are about 15 project-based must courses and 7 project-based elective courses (METU, 2013b). There are 10 faculty members and instructors in the department actively giving courses.

Since the intent of this phase is to debrief as much information as possible for comprehensive understanding of feedback phenomenon in a broad perspective, participants were selected purposefully. Students who would be participants in the study were selected depending on two criteria. First criterion was that participants should be 4th year undergraduate students because 4th year students have taken lots of project-based courses and hence engaged in more long-term or short-term projects compared to lower grade levels. The second criterion was that participants should be among the most successful 20% of the students who had recently taken "Instructional Feedback Design and Development" elective course, because in-depth understanding of the concept "formative feedback" was necessary for the interviews. Students who have taken this course were expected to have awareness of feedback characteristics such as types, tones, styles, manners, forms.

The instructor of the elective course had identified top 20% of the students who had recently taken the course. A total of 15 students were identified. E-mails were sent to all 15 students who had taken the course. Interviews were arranged with 10 students who had accepted the invitation. A place and a time for each interview were set in collaboration with participants through e-mail. All the interviews were conducted in a quiet meeting room close to their department.

The participants of the qualitative part of the study were 10 fourth year undergraduate students who enrolled 2012 – 2013 Fall semesters at the department of Computer Education and Instructional Technology (CEIT) in Middle East Technical University (METU). Out of 10 participants six were male, four were female. The demographic characteristics of participants are presented in Table 3.1.

Table 3.1 The Demographic Characteristics of Interview Participants

Characteristics	*f*	*Percentage*
Gender		
Male	6	60
Female	4	40
Education		
4th year undergraduate students	10	100

Conducting Interviews

The researcher ensured that the interview was conducted in a conversational atmosphere in which participants can express their opinions, feelings, and experiences freely and genuinely

to the researcher. Before starting the interview, the researcher spent 5-10 minutes with each participant, having daily conversation to establish rapport.

Then, the purpose of the study was clearly explained by the researcher. Moreover, participants were informed about the importance of their participation, their potential benefits to the study, and the amount of time interview might take. Furthermore, researcher ensured each participant that their identity would totally remain confidential.

Consent forms were provided to each participant. Participants were informed with regard to the rights they possessed during the interview section through voluntary participant form. Voluntary-based participating, right of not answering bothering questions, right of quitting interview anytime, and acceptance of the use of data for the study were especially highlighted in the consent form. After the participants signed the form upon reading thoroughly, their questions regarding to the procedure was asked.

All interviews were face-to-face. Interviews took between 39 to 67 minutes, with an average of 50 minutes. It was recorded by digital-recorder with the consent permission of the participants.

3.5.1 Qualitative Data Analysis

After all interview sessions had been completed, audio-recorded data were transcribed. Transcribing data was followed by qualitative data analysis. Coding procedures suggested by Corbin and Strauss (2008) was employed during qualitative data analysis. Those were open coding and axial coding.

Open coding started with the analysis of first participant's data at paragraph level. Accordingly, the first paragraph of the first participant's dataset was examined in detail. Since the purpose of open coding was to identify and name concepts which are the main blocks of theory, to define categories, and to develop categories with respect to their properties and dimensions, during examination data was broken down into discrete parts and then each parts was closely examined phrase by phrase and word by word in terms of similarities and differences. After identification of concepts and development of categories along with their dimensions and properties for the first paragraph, the same analysis in the same way was exposed to the second paragraph. The analysis of second paragraph allowed the researcher either to discover new concepts or develop new categories in terms of their dimensions and properties or to further develop the concepts and categories that were discovered and defined during analysis of first paragraph. This procedure proceeded iteratively for each participant's dataset. During this procedure each participant's dataset was subjected to iterative analysis more than once. Whenever the new concepts were not discovered and existing ones were not further developed and also new categories were not defined and existing ones were not further developed, the categorization process was completed. Upon completion of 10 interview transcripts, the saturation for the categories was adequate.

The second coding procedure used during qualitative data analysis was axial coding. Axial coding was employed to relate categories to their subcategories and link categories along the lines of their dimensions and properties. Since open and axial coding was used concurrently,

axial coding was applied together with open coding. During axial coding, whenever the concepts and categories were discovered to share similar properties and dimensions, they were assembled under the generated new category or main-category that defined them as whole.

During both open and axial coding whenever concepts were discovered and categories were developed they were labeled by the researcher. To each concept and categories a label that represented it meaningfully was given. Labeling allowed the researcher to classify concepts and categories in terms of their properties and dimensions.

3.5.2 Validity and Reliability of Qualitative data

In qualitative research while validity is referred the extent to which researcher' inferences are appropriate, meaningful and useful, reliability is referred the extent to which researcher' inferences are consistent without any limitation of time, location and circumstances (Frankel and Wallen, 2011). Handling validity and reliability issue in qualitative data is different from in quantitative data in such that in the qualitative research data collection and analyses are more inquire-based and therefore it is more subject to researcher' biases. Since researcher is the only one who directly and actively involved in all qualitative data collection and analysis processes, the likelihood of doing biases is probable for researcher (Strauss & Corbin, 1998). Yet, in order to deal with and eliminate the possibility of occurrence of such biases, some techniques were suggested.

As a collection aggregated under the concept of trustworthiness credibility, transferability, dependability, and conformability are the suggested procedures by Lincoln and Guba (1985), and the procedures that researcher followed throughout qualitative phase so as to increase the credibility of qualitative findings.

Under the title of credibility, three criteria were emphasized to increases the credibility of the research by Lincoln and Guba (1985) when considered. The first one was that how much researcher was familiar with the culture of participants and the research questions. Since researcher was also an undergraduate student in the same department and having took all the project-based courses before he was familiar with the culture of undergraduate students and project-based courses in CEIT department. The second one which is referred as triangulation was the variety of data collection instruments. By answering the second criteria, researcher collected data through multiple instruments including interview guide and questionnaire from multiple participants and received the responses of multiple participants on multiple open-ended questions. While analyzing qualitative data researcher also checked consistencies among the answers given by multiple participants. The third one was the archiving of dataset in order to be used for future analysis. In this study participants' answers were recorded and then recorded data was transcribed and archived so that future studies and replication studies can make use of and reference it.

Transferability was the other procedure of trustworthiness researcher considered in this study. Transferability as defined by Lincoln and Guba (1985) is concerned with the generalizability and transferability of results drawn from the study to other settings and context. Thick description and purposeful sampling were two criteria considered for transferability. Firstly, description of detailed reporting of data together with extensive

quotations from participants (Frankel & Wallen, 2011) as clearly seen in the interpretation and conclusion sections provides readers an opportunity to reach their own judgments (thick description) (Lincoln & Guba, 1985). Secondly, utilizing purposeful sampling strategy allows researchers going deeper into perceptions and preferences of participants and reaching more detailed information about them.

Conformability is about the degree to which other studies could corroborate and confirm the results that you have drawn from the study. For dependability and conformability of qualitative data findings audit trail was utilized and considered in this study. Researcher developed audit trail by documenting whole results of data such as keeping record of investigation through describing each steps taking at the beginning of research, during the development of research and at the end of research. Interview sound records, interview transcripts, data synthesis products (categories, relationships, concepts, dimensions, properties), and interview notes are all the information reported when developing audit trail. (Lincoln & Guba, 1985)

3.6 Instrument Design Phase

Survey questions to be used for gathering quantitative data were developed based on two data sources: qualitative data and information drawn from the literature. Following procedures were used to generate questionnaire items from the qualitative data.

First of all, all the transcribed data were again analyzed by the researcher from beginning to end word by word in detail in order to explore the relation across distinct concepts. An analysis of exploration was carried out based on the main-categories, sub-categories, and related dimensions and properties which were formed during open end axial coding. During analyses of transcribed data once the relation was explored it was written in a table under the defined main-theme. For example, a few participants said that “assistants’ feedback is not useful because they have not enough disciplinary knowledge”. Linking between the concept of “assistants’ feedback” and of “disciplinary knowledge” was defined as a relation and written in the table under the location of the main-category of “perceptions and preferences of characteristics of feedback providers”. The same technique was used when exploring relation and locating it under related main-theme. As a result of relation-exploration analysis, a table showing all relations was prepared. Furthermore, the transcribed qualitative dataset was analyzed respectively for each participant. After the analyses of transcribed data of the first participant were completed, researcher labeled all the relation by writing a unique number at the end of each phrase. A unique number was also defined for other each participant like above. Once the participant said the relation, the number unique to that participant was written at the end of the phrase. Phrases showing relation between concepts were labeled like above throughout analyses process. Qualitative data analyses of exploring relations showed that while some of the relations were said by more than one participant, some of them were only said by one participant. Researcher primarily took into account the number of labels having written at the end of each phrase when writing a survey item. That is, during the process of generating survey questions priority was given the relation phrases that were said by most of the participants. Positive and negative direction of the relation was also considered during each survey item generation.

Review of literature was another source of generating questionnaire items in the study. The researcher reviewed the literature in higher education and explored common themes and concepts concerning with the feedback, formative feedback, formative assessment, and assessment. Information in the literature regarding the types and characteristics of feedback, the effect of feedback on different constructs, effects of constructs on quality provisional of feedback and characteristics of feedback providers was also examined and then compared with the concepts and relations among concepts explored during qualitative data analysis. Highlighted and underlined concepts and themes explored during qualitative data analysis were given priority by the researcher when generating questionnaire items. Furthermore, similarities and differences among concepts and themes found in literature and explored during qualitative analyses were also considered and made use of in order to generate more rational, logical and reliable questionnaire items. When referring to the literature, the aim was not to add new questionnaire items for the study from the literature, rather the aim was to compare explored concepts in the literature to the concepts having investigated and found and to revise questionnaire items in the light of literature when necessary.

At the beginning a pool including approximately 100 questionnaire items related to both perceptions and preferences toward formative feedback was developed. After that, each developed item was checked more than once to find out whether the item would yield the results that were parallel to the purpose of the study. As a result of iterative content analyses on questionnaire items, some items were excluded, some items were reworded and some additional items were added to the pool. Items in both perception and preference scales in the questionnaire took their final form after being revised based on suggestions from two subject matter experts who reviewed the questionnaire for content validity.

The revised version of the questionnaire comprised of two scales (perceptions and preferences) each included 40 items. It also had demographic questions at the beginning, including gender, university, class and general academic average. However, the questionnaire did not ask students' names or any identifying information. The questionnaire was pilot tested and modified, which is further explained in the following section.

The original questionnaire was developed in Turkish language. Considering that there are international CEIT students, the questionnaire was translated into English with the guidance of METU Academic Writing Center. Both Turkish and English versions were also checked with an ESL English language instructor. The items discovered to be not consistent in meaning were refined or reworded in collaboration. . Finally, both versions were compared again with the help of a content matter expert. Since Revised two-factor Study Process questionnaire (R-SPQ-2F) was already available in both Turkish and English form (Biggs, Kember & Leung, 2001; Önder & Beşoluk, 2010), both versions were used without making any changes. The questionnaire was pilot tested, which is explained in detail in the following section.

3.7 Quantitative Phase

Quantitative phase of the study was performed in two sections. While in the first section pilot study with exploratory factor analysis was conducted, in the second section main study with confirmatory factor analysis was conducted. The main purposes of the quantitative phase were to ensure the generalizability of qualitative findings with a large sample size, to

confirm the relationship among constructs and themes explored during axial and open coding, and to further develop the results of qualitative findings.

3.7.1 Pilot Study

Participants

Convenience sampling was used for the pilot study participant selection process. The participants of the pilot study were 4th and 3th year undergraduate students who enrolled 2012 – 2013 Spring semester at the department of Computer Education and Instructional Technology (CEIT) in Middle East Technical University (METU). There were total of 120 3rd and 4th year students registered to the program, a total of 97 completed questionnaire which was paper-based (participation rate= 81%). Considering gender of the participants 63 of them (64.9%) were male, 34 of them (35.1%) were female. (See Table 3.2)

Table 3.2 The Demographic Characteristics of Pilot Study Participants

Characteristics	Class		*Total*	*Percentage*
	3th	4th		
Gender	*f*	*f*		
Male	30	33	63	64.9
Female	14	20	34	35.1
Education				
3th year undergraduate students	44	--		
4th year undergraduate students	--	53		
Total			97	100

3.7.2 Refinement of Questionnaire Items

Data were analyzed using IBM SPSS Statistics 20 software. Exploratory Factor Analysis (EFA), parallel analysis and Velicer's MAP test were conducted. Required tests were conducted prior to EFA to check the satisfaction of its assumptions. Within the scope of factor analysis assumptions, correlation matrix, KMO and Bartlett's test of sphericity, and multivariate normality for each main part of the questionnaire was respectively examined to make sure that all assumptions were met. Furthermore, for each variable in two measurement instruments univariate normality test such as histogram, normal Q-Q plot, detrended normal Q-Q plot, normality plots with test, box plot, and the values of skewness and kurtosis was examined.

All the assumptions were met as follows. First, the value of skewness and kurtosis for each variable needed to be within the range of -3 and +3(Hair et al., 1998). Analyses result of the value of skewness and kurtosis for each variable in these two instruments indicated that the values were within the range of -3 and +3. Secondly, researcher analyzed test of normality by checking the value of sigma for each variables. Non-significant value of sigma was achieved. Thirdly, the graph of histogram, normal Q-Q plot, and detrended normal Q-Q plot was checked in detail respectively and found that each variables in two measurement

instrument was normally distributed. Fourthly, correlation matrix table of two measurement instruments illustrated that exception of the correlation between a few variables the value of correlation between remaining all two variables was higher than the value of.300 (Hair, et al., 1998). Fifthly, researcher examined the graph of matrix scatter for the control of linearity assumption. The graph of matrix scatter clearly showed that the assumption was met. Finally, the value of KMO and Bartlett's test of sphericity which is supposed to be at least higher than the value of .60 (>.60) was checked out and found to be a relatively higher than the value of .60 (Hair et al., 1998). A set of analysis conducted within the factor analysis assumptions confirmed that dataset was suitable for exploratory factor analysis.

The procedures followed by researcher as described above in order to show that dataset was appropriate to be exposed to factor analysis showed that all the required assumptions were met. The same procedures were used for both parts of the questionnaire in the same manner.

In EFA analysis, as an extraction method Maximum Likelihood was selected based on Fabriger, MacCallum and Strahan (1999) argument that maximum likelihood is the best extraction method when the data is normally distributed in social sciences studies. Since analyses of univariate normality confirmed that variables were normally distributed, maximum likelihood seems to be good choice as an extraction method. Secondly, as an oblique rotation method direct oblimin was selected in regarding to the opinion that oblique method is used when variables are correlated (Costello & Osborne, 2005). Detailed analyses of correlation matrix tables denoted that the value of correlation between variables was high. While making the final decision on the number of factors to retain two validated procedures namely parallel analysis and Velicer's MAP test was adopted. Due to providing more reliable and precise results, the use of parallel analyses for factor number retention have been most widely recommended in literature (Costello & Osborne, 2005; O'Conor, 2000; Fabriger, MacCallum and Strahan, 1999). Furthermore, the result of scree plot which is the rule of thumb was also taken into account during the process of factor retention however because of being problematic (O'Conor, 2000) and causing both underestimating and overestimating (Zwick & Velicer, 1986) the main importance was given to parallel analysis. The opinion regarding the number of factors researcher postulated at the outset was also given priority when forming the final decision on the number of factors to be retained.

a. Perceptions Scale

Both parallel analysis and scree plot test were conducted by researcher and different number of factors was attained. While the result of scree plot indicated that 5 factors needs to retain, the result of parallel analysis showed that scale comprised of 3 factors. Because of emerged different factor retention numbers, the scale was exposed to four fixed number of factors: 3, 4, 5, and 6 respectively. The premise here was to reveal how the variables best showed under which fixed number of factors. Researcher rigorously analyzed communalities, pattern matrix correlation tables of each fixed number of factor so as to find out the flawed variables that had a relatively low extraction and correlation, and were either loaded more than one factors or none of the factors. The procedures followed by researcher for each three fixed number of factors as described above were exemplified as following.

At the beginning factor analyses was performed based on three fixed factors. Communalities, correlation matrix and pattern matrix correlation table for 3 fixed factors was separately

examined in detail. When examining communalities table item by item, the variables that had a relatively low communalities were jotted down on the paper by researcher. After detailed analyses of communalities table finished and the flawed variables were noted, researcher started to examine correlation matrix tables. The correlation matrix tables was rigorously examined and the variable that was found to have lower correlation than the value of .3 was jotted down on another paper dedicated for flawed items that were found in correlation matrix tables. Once the depth examination of correlation matrix tables finished and relatively low correlation items were written, researcher attempted to go into the phase of examining pattern matrix table. If the value of variable was equal or more then the value of .300, that variable was accepted to be loaded. Conversely, if is not, variable was posited to have lack of loadings. Furthermore, if any variable was found to have cross-loadings, researcher looked at each loading of variable whether the difference between factor loadings was higher than the value of .20. If the variable with the highest value of factor loadings was higher than other factor loadings, it was accepted to load on that factor.

The procedure as described above was followed when examining pattern matrix table. As done in the phase of analyzing correlation matrix and communalities table, researcher jotted down the flawed variables which either had no loading or load more than one factor on the different paper. Three distinct papers, the first one for communalities table, the second one for correlation matrix table, and the final one for pattern matrix table, were collected as a result and each paper hold information regarding problematic variables for corresponding table. The same procedures were followed in the same way for the other fixed number of factor: 4, 5, and 6 respectively. When the analyses finished researcher compared all the papers in order to find out common flawed variables for different fixed factors. Such analyses result demonstrated that some of the flawed variables written on one paper were also seen to be on another paper or papers. By doing so, researcher identified the variables that were more likely to be extracted from factor analyses.

Eight variables that were firstly extracted from factor analyses were the ones that had low correlation (<.300). Some of those variables had also low communalities. Seven variables that were secondly extracted from factor analyses were the ones that had cross-loadings. Furthermore, some of those variables did not load on any factor. After the process of extracting problematic variables, the remaining variables were again exposed to three fixed number of factors respectively 3, 4, 5, and 6. The variables were clearly seen to be shown in the best way when fixed number of factor was 3. This result was confirmed to be correct by two ways. The first way was that researcher prepared questionnaire based on three factors. That is, researcher postulated that prepared items would be shown under three factors. The second way was that parallel analysis, Scree test, and Velicer's MAP test were again performed for remaining variables and the results confirmed 3 factors.

The final version of perceptions questionnaire formed as a result of factor analyses was composed of 3 factors. It explained 58% of the total variance derived from exploratory factor analysis. (See Table 3.3)

Table 3.3 Principal Component Analysis (PCA) with Oblique Rotation

	Factor		
Item	1	2	3
gives direction during revision process	.918		
explain how to revise in detail	.860		
includes basic tips about how to revise	.762		
shows me clearly the place where revision is needed	.694		
provides what needs to be done to improve weak sides of performance	.687		
gives clues about which direction to look	.614		
is effective	.611		
is constructive	.596		
is well-explained	.580		
negative points are given with their justifications	.532		
helps me in future projects	.471		
is easy to understand		.843	
is easy to read (for written feedback)		.817	
is easy to revise / practical		.638	
is consistent / not contradictory		.607	
is relevant to the topic and the problem		.592	
draw attention to weak sides of performance		.587	
is given based on the previously defined assessment criteria		.527	
shows that instructor cares about the work I have done			.838
recognizes the effort I have made			.688
motivates me to revise			.560
is mostly positive			.560
presents negative things in a positive way			.481
has positive tone and manner			.472
has a balance between critical and positive			.465

b. Preferences Scale

In this section the same procedures and steps in the same manner as described in the section of perceptions above were followed and applied by researcher.

Six observed variables that were firstly extracted from factor analyses were the ones that had low correlation (<.300). Moreover, some of those variables had either low communalities or had no loading. Thirteen observed variables that were secondly extracted from factor analyses were the ones that had cross-loadings. Some of those variables also did not load on any factor. After the process of extracting problematic variables, the results of Scree test, Parallel analysis, and Velicer's MAP indicated that the items describing preferences were best reflected under one factor. One factor explained 52% of the total variance derived from exploratory factor analysis. (See Table 3.4)

Table 3.4 Principal Component Analysis (PCA) with Oblique Rotation

item	Factor
is consistent / not contradictory	0.86
is easy to read (for written feedback)	0.86
has positive tone and manner	0.86
is not unnecessary	0.84
is easy to understand	0.83
is useful	0.83
is relevant to the topic and the problem	0.81
negative points are given with their justifications	0.77
is easy to revise / practical	0.74
shows that instructor cares about the work I have done	0.74
motivates me to revise	0.7
draw attention to strong sides of performance	0.67
recognizes the effort I have made	0.67
gives clues about which direction to look	0.65
provides what needs to be done to improve weak sides of performance	0.63
indicates the reason why I receive a particular grade	0.63
includes suggestions about how to further improve strong sides of performance	0.62
gives me good and bad examples when needed	0.61
is timely	0.61
is effective	0.59
helps me in future projects	0.58
shows me clearly the place where revision is needed	0.54
explain how to revise in detail	0.44

3.7.3 Main Study

Participant Selection

A convenience sampling method was used and data were collected from 3 public universities that allowed data collection: Hacettepe University, Ankara University and Amasya University. Participants were 250 3rd and 4th year undergraduate students at the department of Computer Education and Instructional Technology (CEIT). Participation rate for the questionnaire was 26% from Amasya, 34% from Ankara, and 40% from Hacettepe.

After formal permissions received from each university for quantitative data collection, the chair of each CEIT department identified the number of 3rd and 4th year students who had taken project based must courses. Particularly, courses that all of the 3rd or 4th year undergraduate students took were given priority. Researcher applied instructors who give those must courses and requested them permission to collect data in their courses. Before collecting data, researcher informed that participation is voluntary therefore there would not

be any pressure if they do not want to fill out questionnaire. Moreover, students were free to ask question about any items.

Participants

The sample consisted of 250 participants, 65 from Amasya University (26%), 85 from Ankara University (34%) and 100 from Hacettepe University (40%). (See Table 3.5).With respect to gender 146 participants were female (56.4%) and 109 participants were male (43.6%), and 138 participants were 3rd year (55.2%) 112 participants were 4th year (44.8%). (See Table 3.5)

Table 3.5 The Demographic Characteristics of Participants

Characteristics	Class		Total	Percentage
	3th	4th		
Universities				
Amasya University	36	29	65	26
Female	23	19	42	
Male	13	10	23	
Ankara University	47	38	85	34
Female	28	17	45	
Male	19	21	40	
Haccetepe University	55	45	100	40
Female	34	20	54	
Male	21	25	46	
Total	138	112	250	

Questionnaire Administration

Questionnaire was completely administered paper-based in all three universities. Data were collected during 2012 - 2013 spring semester and the collection of data spread over three months. With respect to Universities, the first portion of data was collected at CEIT department in Hacettepe University where questionnaire was filled out firstly by 4th year undergraduate students at the beginning of course in classroom, subsequently by 3rd year undergraduate students at the beginning of course lab in lab environment. The second portion of data was collected at CEIT department in Ankara University where questionnaire was filled out firstly by 3rd year undergraduate students at the beginning of two courses in classroom environment, subsequently by 4th year undergraduate students at the beginning of course in classroom environment. The last portion of data was collected at CEIT department in Amasya University where questionnaire was filled out firstly by 3rd year undergraduate students at the end of course in classroom environment, subsequently by 4th year undergraduate students at the end of course in classroom environment. Table 3.6 summarized the description of where, how and from whom the data was collected.

Table 3.6 Descriptions of Interviews Time and Place

University	Class		When?	Where?
	3	4		
Amasya	X		end of course	Classroom
		X	end of course	Classroom
Ankara	X		beginning of the course	Classroom
		X	beginning of the course	Classroom
Hacettepe	X		beginning of the course	Lab
		X	beginning of the course	Classroom

3.7.4 Quantitative Data Analysis

Preliminary analysis including screening of data, missing data, recoding, normality of data and sample size were considered and performed before quantitative data analysis. After dealing with preliminary analyses descriptive and multivariate data analysis was conducted. Within the scope of multivariate data analysis Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), Canonical Correlation Analysis and Factor Score Correlation Analysis were conducted. IBM SPSS Statistics 20 and IBM SPSS Amos 20 were used for preliminary and multivariate data analysis.

Validity and Reliability of Quantitative Data

A number of procedures for validity such as content-related validity and construct-related validity and for reliability such as construct-related reliability can be used to ensure the validity and reliability of the findings. In this study researcher utilized and applied several of them in order to ensure validity and reliability of quantitative findings (Fraenkel &Wallen, 2011)

Regarding the validity issue, first of all, content validity of instrument was independently checked with respect to suitability of content and format of questionnaire by two researchers who had experience and knowledge in the content area and the questionnaire design. Secondly, construct-validity of instrument was considered by researcher with a pilot study through conducting exploratory factor analysis and further ensured by means of applying confirmatory factor analysis. Moreover, researcher actively involved in gathering quantitative data collection process so that issues and threats associated with data collector could be largely eliminated and internal validity of qualitative phase could be ensured. Considering reliability of quantitative data, Cronbach's Alpha was used to assess the internal consistency of the questionnaire during the analysis of the findings of both pilot and the main study. The Cronbach Alpha value of each questionnaire was measured with respect to both factor level and scale level.

3.7.5 Assumption of the Study

For this study, following assumptions are pointed out:

- Participants responded accurately to all measures
- The measures employed were reliable and valid indicators of the constructs to be studied
- The qualitative and quantitative data were accurately recorded, collected and analyzed.
- Participants reflected their general formative feedback perceptions without specifically considering any particular instructor, teaching assistant, and peer feedback (As specifically indicated at the beginning of the questionnaire)

3.7.6 Limitation of the Study

The following limitations were recognized throughout the study:

- The scope of this study is limited to third and fourth year CEIT undergraduate students.
- Students' attitudes toward specific instructors might influence reliability of students' responses.
- Socioeconomic status of student was not considered in this study and the data were collected only from public universities.
- Students were asked to reflect their perceptions to formative oral and written feedback given by a combination of instructor, teaching assistant, and peer.

CHAPTER 4

RESULTS

This chapter presents the results of qualitative and quantitative phases. For the qualitative analysis phase, procedures used to analyze the collected dataset with respect to categories, subcategories, concepts, dimensions, and properties were employed from Corbin and Strauss (2008). The results of quantitative data were reached by use of Confirmatory Factor Analysis, Canonical Correlation Analysis, Factor Score Correlation Analysis and descriptive statistics.

4.1 Qualitative Data Analysis

In this phase transcribed dataset collected with semi-structured interviews were conceptualized according to guidelines provided by Corbin and Strauss (2008). Open coding and axial coding were two main parts of analyses that were used throughout the close examination of a dataset and exploration of categories, subcategories, concepts along with their dimensions and properties.

The conceptualization of data during open coding and axial coding involved labeling phenomena or concept, discovering categories, naming categories, and developing categories in terms of their properties and dimensions. Since "concepts are the basic units of analyses" (Strauss and Corbin, 1990, p. 63) raw data at the outset was broken into discrete parts and very closely examined. Sentences, clauses, paragraphs, events, ideas, names, objects, action/interactions that were representing phenomena were separated from each other and closely examined in order to generate concepts. During the generation of concept, the concept was labeled based on the same word or phrase included in transcript, or a common conceptual label representing it the best. Once the concepts were closely examined and then generated for a specific part of raw data, they were grouped under categories identifying them. Corbin and Strauss (2008) defined the categories as "higher-level concepts under which analyst group lower-level concepts according to shared properties" (p. 159). Therefore, concepts pertaining to the similar phenomena were categorized. Labeling categories involved generating conceptual and more abstract labels. Those labels at first were temporarily given and produced by researcher with respect to the meaning they had for embracing a set of concepts.

Concepts and categories were also examined and developed in terms of their properties and dimensions. Strauss and Corbin (1990) defined properties as "attributes or characteristics pertaining to a category", and dimensions as "location of the properties along a continuum" (p. 61).

Regarding the procedures outlined by Corbin and Strauss (2008) the first analyses of data started with the systematical analysis of data of the first participant. At that point, first participant's data analysis was conducted with questions level and then paragraph level. That is, the answers to the given structured questions and probes for each question were analyzed

more than three times in depth and the concepts, categories and subcategories in terms of their properties and dimensions were developed and explored. The same procedure was applied the same way for the subsequent questions. After the analysis of data on first participant, a set of temporary concepts was developed, categories and subcategories in terms of their properties and dimensions were discovered. With respective analyses of other remaining participants' data, developed concepts were further developed and the discovered categories in terms of their properties and dimensions were further discovered. The process of developing concepts and discovering categories in terms of their properties and dimensions continued iteratively and the saturation level for concepts, categories, subcategories, dimensions and properties was achieved. As a result of qualitative data analysis eleven themes or main categories together with their sub-categories, concepts, dimensions and properties were explored.

Representation of main categories was carried out with the aid of diagrams that are the modes utilized to present findings revealed as a result of analytic coding-based qualitative data analysis. The importance of making use of diagrams for the purpose of qualitative data analysis results is highly emphasized and suggested by Corbin and Strauss (2008). They theoretically defined diagrams as "visual devices that depict relationship between analytic concepts" (Corbin and Strauss, 2008, p. 117). Procedures and suggestions explained and described by Strauss and Corbin regarding the effective way of using diagrams were followed by researcher while the final results of qualitative data was being presented.

4.1.1 The Results of the Qualitative Phase of the Study

Qualitative data analysis resulted in eleven main categories as follows: 1) perceptions of and preferences for characteristics of feedback providers, 2) attitudes toward feedback delivery media (written vs. oral), 3) effect of feedback on attitude and perceptions, 4) media and technology used in the course, 5) purposes of using media/technology in the course,6) things that affect the use of feedback in revisions, 7) strategies being used when learning new things, 8) factors influencing learning new things, 9) attitude towards factors affecting learning something in project, 10) attitudes towards ways of learning something, 11) perceptions and preferences toward different formative feedback characteristics.

Importance of Feedback

Result of qualitative data analysis indicated that all students (n=10) were aware of importance of written and oral formative feedback given for their projects and reports. Apart from instructor, teaching assistant and peer formative feedback was also endorsed as being importance by participants; however, the main importance was given to instructor feedback. They also highlighted the importance of written and oral formative feedback on their learning development during project and report progression. Two of the participants regarding the importance of formative feedback said:

> "Feedback is definitely quite important for a project. Actually, the feedback that we will receive is necessity of the development of our project. Feedback from the instructor and the feedback from peers together guide us in project. The feedback that instructor will give is as important as feedback that we will receive from our peers. However, at the last phase, no matter how much feedback we have taken from

peers to make revisions, we give final form to our developed project based on feedback given by instructor." (Interviewee 2)

"Tabi ki geri bildirimler proje için oldukça önemli. Daha doğrusu bizim projemizin gelişiminin olmazsa olmazı bu alacağımız geri bildirimler. Alacağımız dönütler arkadaşlarımızdan alacağımız geri dönütler ile birlikte projede bizi yönlendiriyor. Hocamızın vereceği dönütler de arkadaşlarımızdan alacağımız kadar önemli. Ama son aşamada arkadaşlarımızdan ne kadar dönüt alıp düzeltsekte biz ondan sonra hocamızın verdiği dönütlere göre geliştirdiğimiz projeyi tekrar şekillendiriyoruz."(Interviewee 2)

"Now, it is up to student to continue a project or terminate it. In fact, motivation is necessary for that. I think that feedback is the primary source of motivation. No matter how willing student is, he/she will stick somewhere when any feedback is not provided. Therefore, positive or negative feedback is required to be given." (Interviewee 10)

"şimdi bir projeyi devam ettirmek de ögrencinin elinde, bitirmek de ögrencinin elinde. Aslında bunun için motivasyon gererkli. Motivasyonun birinici kaynağının da geri bildirim olduğunu düşünüyorum. Şimdi öğrenci ne kadar istekli olursa olsun herhangi bir geri bildirim almadıktan sonra bir yerde takılacaktır. Bu yüzden onlara olumlu geri dönüt yada olumsuz geri dönüt gerekir." (Interviewee 10)

Perceptions of and Preferences for Characteristics of Feedback Providers

Interviews revealed that participants have different perceptions and preferences toward different formative feedback providers who were described by informants as teacher, assistant, peer, someone expert, and anyone who is eligible to give feedback. For example, some of the participants (n = 5) stressed that feedback provider's experience, authority on grade, and level of disciplinary and specific knowledge about subject affect our preferences toward whether to take feedback or not. Course teacher therefore was regarded as the most preferable formative feedback provider among most of the interviewed participants. Half of the participants (n = 5) shared similar preferences like the one who said:

"…certainly I need to take [feedback] from my instructor at regular intervals at project development; because, ultimately he/she has more experiences. There is also grading which has a point. Therefore, her/his appreciation is being important for us." (Interviewee 2)

"…kesinlikle belli aralıklarla proje gelişiminde hocamdan [geri bildirim] almam gerekiyor çünkü sonuçta onun tercübesi daha çok. Bir yerde notlandırma var. Bu yüzden onun beğenisi bizim için önemli oluyor." (Interviewee 2)

One of the other participants similarly stated:

"As I said, due to the matter of experience I want to take [feedback] from instructors. They can say me the things that I have never seen and have never come to my mind. They can say that it would be better if you do that or do not do that." (Interviewee 4)

"Dediğim gibi, genelde hocalardan [geri bildirim] almak istiyorum çünkü tecrübe konusu sonuçta. Benim hiç görmediğim, aklıma gelmeyen bir şeyi onlar bana

söyleyebilirler. Şunu yapma veya şunu yapsan daha iyi olur diyebilirler. (Interviewee 4)

Regarding the teaching assistants who are among feedback providers in project courses, participants have varying perceptions and preferences in terms of their quality of relationship, level of knowledge and types of formative feedback they provide. The notion that assistants do not have enough information therefore their feedback is not useful especially while revising project and project related documents like report were supported by some of the participants (n = 2). One of them said:

> "I do not want to take too much [feedback] from course assistants. Because, now in Turkey, majority of course assistants are lack of enough knowledge." (Interviewee 3)

> "Asistanlardan pek fazla [geri bildirim] almak istemiyorum. Çünkü şu anda Türkiye'de öğrenci asistanlarının çoğu yeteri kadar bilgiye sahip değiller." (Interviewee 3)

The similar perception related to the quality of feedback teaching assistant provides was shared by another participant and explained as follows:

> "Some feedback was not adequate. That time feedback was not helpful for me. For example, provided feedback was not understood clearly when my mistakes were not explained in detail. Those types of feedback were not beneficial." (Interviewee 2)

> "Bazı dönütler eksik oluyordu. O durumda pek yarar sağlamıyordu bana. Örneğin hatamı ayrıntılı bir şekilde söylemediği zaman anlaşılamayabiliyordu dönütler. Onların pek yararı olmuyordu." (Interviewee 2)

Qualitative data clearly showed that there are some differences taking place between perceptions and preferences of students concerning with the extent to which timely feedback is provided. Although, feedback delivery time was viewed as salient attribute of quality feedback by all participants (n = 10), few complaints underlined showed that some of the feedback providers, instructor and teaching assistant, do not provide timely feedback especially when feedback is provided through a media such as e-mail. The issue of feedback time was covered by some of the interviewees (n =4). One of them followed by the other one stated:

> "…when feedback is given immediately at the phases of project, revising project is easier, better, and person's motivation are not put off. However, instructor does not deal with the project and telling us go there after finishing it. After finishing project, you show project to instructor and instructor says I do not like your project, you need to change these and those. So at that time some problems appear. Therefore, immediate feedback is very valuable at every stage." (Interviewee 1)

> "…projenin aşamalarında [geri bildirim] immediate şekilde verilirse, projenin revise edilmesi daha kolay, daha güzel, ve kişinin motivasyonu kırılmıyor. Ama hoca ilgilenmiyor…bir yapın da gelin diyor. Sen projeyi bitirip hocaya götürdüğünde hoca ben bunu beğenmedim, şunu değiştir, bunu değiştir diyor. Yani o zaman sıkıntı oluyor. O yüzden her bir aşamada immediate geri bildirim çok kıymetli." (Interviewee 1)

"… for me a project means that you race against time. And time is very important for me in that competition. Since my e-mails were generally given a response after six and seven hours, I do not want those e-mails. I can develop many things during that six and seven hours." (Interviewee 3)

"…bir proje demek zamanla yarışıyormuşsun demektir benim için. Ve o yarışmada zaman benim için önemli. Attığım maillere genelde altı yedi saatte cevap verildiğinden dolayı ben o mailleri istemem. O altı yedi saatte daha çok şey geliştirebilirim." (Interviewee 3)

The analysis results indicated that there is a possible relationship between students' perceptions toward feedback provider and the extent to which feedback provider is approachable. That is, students' preferences dealing with from whom to take feedback are highly determined by the level of approachability of feedback provider. Therefore, peer was viewed by most of the interviewed participants (n = 6) as the one from whom feedback is requested at first. Furthermore, some of the participants' responses (n =2) indicated that the probability of accessing teaching assistant and peer is higher than of accessing instructor. They attributed this to the high burden on instructor. Two of the participants pointed out how approachability of formative feedback providers affects students' preferences toward them as follow:

"The people that I take feedback primarily are my friends. Because, firstly I can easily approach to them and take feedback from them faster…we generally prefer to take feedback from our peers because we may not reach our instructurs as faster as we reach our peers." (Interviewee 7)

"Geri bildirim aldığım kişiler öncelikle arkadaşlarım. Çünkü onlara daha kolay ulaşabiliyor ve daha hızlı dönüt alabiliyorum ilk etapta…arkadaşlarımızdan geri bildirim almayı daha çok tercih ediyoruz. Çünkü hocalarımıza onlar kadar sık ulaşamayabiliyoruz." (Interviewee 7)

"…because, maybe there is a possibility that you can not find instructor after setting an appointment with him. As I said we preferred [to take feedback] from our peer more due to their easy approachability." (Interviewee 6)

"… çünkü belki hoca ile randevulaştıktan sonra gidip hocayı bulamama gibi bir durumda olabiliyor. Ama dediğim gibi biz daha çok belki kendi arkadaşlarımızdan [geri bildirim almayı] tercih ettik. Ulaşımdan dolayı." (Interviewee 6)

In addition to approachability, several interviewed participants (n = 4) strongly emphasized the effect of rapport between formative feedback provider and student on student perceptions and preferences toward them. Interview data indicated that some of the participants commonly take and appreciate to receive feedback from the person from whom they have a quality relationship. Related to the state of rapport one of the interviewee said:

"I prefer to take feedback from people with whom I have a better rapport. For example, sometimes I may not perefer to take feedback from course assistant because of having bad relationship with him/her." (Interviewee 4)

"iletişimimin daha kuvvetli olduğu kişilerden [geri bildirim] almayı tercih ederim. Mesela bazen feedback almayı tercih edemeyebiliyorum asistan ile aram iyi olmadığı için." (Interviewee 4)

Following diagram conceptually illustrates main categories, subcategories, dimensions, properties, and concepts regarding students' perceptions of and preferences for characteristics of feedback providers (see Figure 4.1)

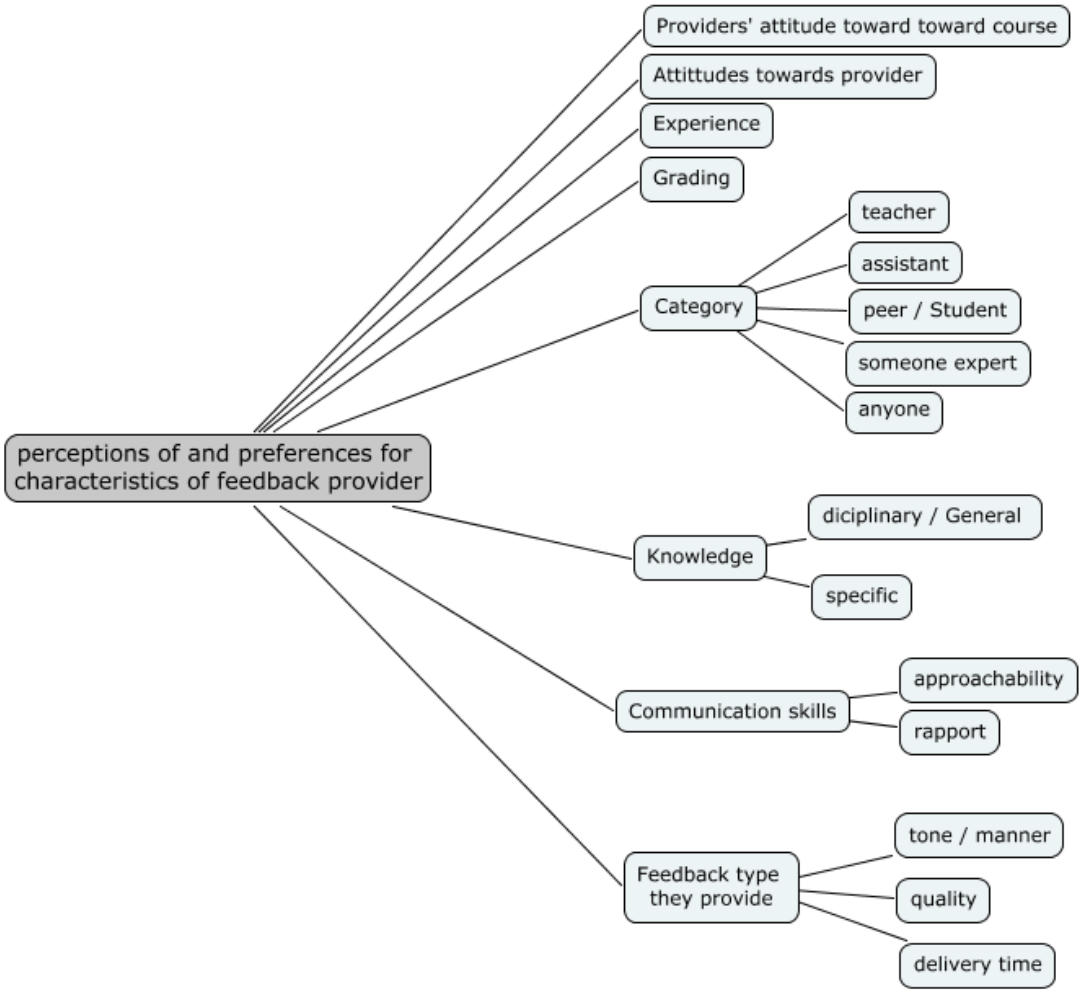


Figure 4.1 Perceptions of and Preferences for Characteristics of Feedback Providers

Attitudes toward Feedback Delivery Media (Written vs. Oral)

Attitudes of students toward feedback delivery media (written vs. oral) were categorized under four subcategories as a result of analysis of responses of participants, including performance, quality of effect on communication, turnaround duration, and language.

Participants' responses clearly indicated that the things that outweigh written feedback from oral feedback are written formative feedback properties such as being storable, looked again after a long time when needed, and high duration of remembering. Some of the participants (n = 4) emphasized the noticeable properties of written formative feedback and claimed that such properties make great contributions to preferences of written feedback. That claim was supported by the responses of following participants. One of them stated:

> "Because written feedback can be either stored or looked after making revision. How much I could do?...written feedback somehow is an evidence. Maybe, written feedback can be called more useful in this aspect because some things can be lost and not remembered when oral feedback is given such as did she/he say doing these like that or something like that. However, it would be very useful when written feedback is given." (Interviewee 1)

> "Çünkü yazılı geri bildirim hem saklanabilir, hem de revise edildikten sonra tekrar bakılabilir. Ne kadarını yapabildim?... Bir şekilde bir kanıt yani yazılı feedback. Belki daha yararlı denilebilir bu açıdan çünkü sözlü feedback aldığında bazı şeyler kaybolabilir veya unutulabilir. Şurayı şöyle mi yap demişti, şöyleymiydi falan diye. Ama yazılı feedback verilirse bu daha yararlı olur." (Interviewee 1)

In addition to advantages of written feedback, participants also pointed out some disadvantages of written feedback. They asserted that probability of being misunderstood, being delayed and being lack of emotion are some of the issues arisen from formative writing feedback and during delivery of formative written feedback. Almost the entire participants in their response emphasize on the issues associated with formative written feedback. One of them said:

> "As I said the disadvantage of written feedback is its' lack of emotions…emotions are also important for example you came back to understand what is tried to convey here. This leads to a loss of time." (Interviewee 10)

> "Yazılı feedback'in dediğim gibi dezavantajı duygu ifade etmiyor…Duygular da önemli mesela burda ne anlatmak istedi diye tekrar geliyorsunuz. Bu bir zaman kaybına yol açıyor." (Interviewee 10)

The other participant related to formative writing feedback delivery time stated:

> "There were conditions where written feedback would not be helpful; because, since there was not simultaneous communication, it took long time to take answers about the things that stick in our mind and that we could not understand in feedback. Maybe, that feedback could coincide with the time that feedback could not be helful anymore." (Interviewee 2)

> "Yazılı dönütlerin yararlı olamayacağı durumlar oluyordu çünkü eşzamanlı bir iletişim olmağı için kafamıza takılan yada dönütte anlamadığımız bir durum olduğunda bunun cevabını almamız üzün bir süre alabiliyordurdu belkide artık işimize yaramayabilecek bir tarihe denk gelebiliyordu." (Interviewee 2)

Responses of participant clearly indicated that students apply formative oral feedback as way of compensating drawbacks of formative written feedback such as misunderstanding, lack of emotion, inability to ask prompt question, and delayed feedback delivery. Moreover, some of the participants (n = 6) attributed their preferences of oral feedback to such properties as more explanation opportunity, ability to ask prompt questions and immediate delivery. For instance, following phrase drawing from one of the transcribed participant responses confirmed that attribution.

> "The advantage of oral feedback is that there is certainly no place for misunderstandings…I can immediately ask the problems if I have in my mind." (Interviewee 2)

"Sözlünün avantajı yanlış anlaşılmalara kesinlikle yer yoktur…Ben eğer kafamda bir problem olursa anında sorabiliyorum." (Interviewee 2)

For the property of formative oral feedback delivery timing one of the participant stated:

"…actually timing is also important. We send an e-mail and wait a question because we have things to do immediately. They respond to e-mail very late. However, if we had face-to-face communication we get response instantly." (Interviewee 10)

"…bide zamanlamada çok önemli aslında. Bir mail atıyoruz, bir soru bekliyoruz çünkü hemen yapmamız gereken birşey var. Çok geç dönülüyor ama yüz yüze olsak anında karşılığını alabiliyoruz." (Interviewee 10)

"oral feedback may be forgetten with respect to that day situation. You do not remember what have happened or you can forget two or three things out of five different things that heve been said." (Interviewee 8)

"sözlü olan biraz daha o günkü duruma göre uçucu olabiliyor yani. Ne olduğu hatırında kalmıyor veya beş farklı şey söylemiştir arasından ikisini üçünü unutabiliyorsun bazen." (Interviewee 8)

Following diagram conceptually illustrates main categories, subcategories, dimensions, properties, and concepts regarding students' attitudes toward feedback delivery media (written vs. oral) (See Figure 4.2)

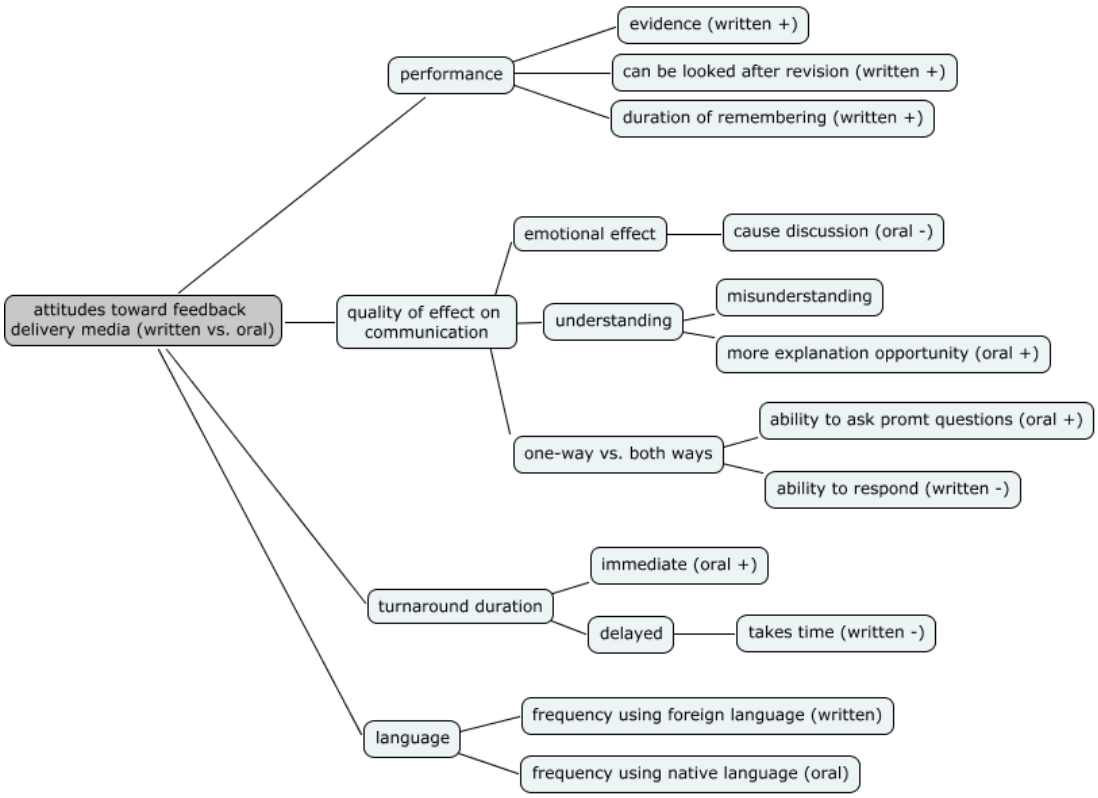


Figure 4.2 Attitudes toward Feedback Delivery Media (Written vs. Oral)

Effect of Feedback on Attitudes and Perceptions

Attitudes toward the course, attitude and perception change towards provider, overall effect, and attitudes toward revision are the subcategories drawn after responses of interviewed participants were analyzed in depth. The theme representing the effect of feedback on attitudes and perceptions was depicted in Figure 4.3.

The interviews revealed that the effects of feedback, positive or negative, most of times occurred when the feedback was not delivered in mode and manner that students expected. Because, responses indicated that mode and manner of formative feedback was one of the factor that mostly effect students' attitudes and perceptions. Almost all of the students (n = 9) accepted the potential effects of formative feedback. For example, one of the interviewee pointed out how effect of feedback lead to changes on both effort and motivation and stated:

> "If feedback is provided in good and respectful manner, you want to respond to that feedback and make revision. However, if feedback is provided in negative manner, you can lose your interest to the course or the topic, thereby causing you to give up. Morover, your respect towards instructor decreases. Opinionsregarding whether to take that instructor's feedback or not do not make any change emerge." (Interviewee 9)

> "Eğer güzel bir şekilde aktarmışsa, bize saygılı bir şekilde vermişse, insan geri dönüte cevap vermek istiyor ve düzeltmek istiyor. Eğer ama kırıcı olursa insan dersten soğuyor veyahut da o konudan soğup yapmamak istiyor. Veya o hocaya karşı olan saygı azalıyor. O hocanın geri bildirimlerini almasakta olur alsakta olur gibisinden kanaatler ortaya çıkıyor." (Interviewee 9)

The other one in similar way said:

> "I am affected emotionally when instructor gives more negative feedback. However, you are keen to do when feedback is given in lovely manner." (Interviewee 5)

> "Hoca çok olumsuz geri bildirim verdiği zaman duygularım etkileniyor. Ama güzel güzel anlattığı zamanda insanın yapması geliyor" (Interviewee 5)

The analyses of interview showed that more than one participant underlined the effects of formative feedback. For example, generally participants focused on the effects of destructive formative feedback on students' attitudes and perceptions toward formative feedback provider and course (n = 4), the effects of negative feedback on motivation towards study and revision and effort students spend in project (n = 3), and finally effects of the amount of feedback on motivation. One of the participants regarding the effects of formative feedback said:

> "For example, if provided feedback makes me happy and I like doing my job, I give more importance to feedback. However, if I had negative thoughts somehow or the feedback that I have taken makes me unhappy, I do not give more importance to that feedback. For instance feedback sometime may not enough. After going and taking feedback a few times, I still do not understand what I need to do. When this happens, we are discouraged to continue our project. We could not give up project but our motivation decreases." (Interviewee 7)

"Mesela hocanın verdiği geri bildirim beni mutlu etmişse, sevmişsem o yaptığım işi [geri bildirime] daha fazla önem veririm. Ama bir şekilde olumsuz bir düşüncem olmuşsa yada aldığım o geri bildirim beni mutlu etmemişse [geri bildirime fazla önem vermem]. Bazen mesela [geri bildirimler] yeterli olmayabiliyor. Birkaç kere gidip geri bildirim alıyorum ama ne yapacağımı hala anlamamış oluyorum. O zamanda projeye devam etme noktasında isteksiz oluyoruz. Bırakamıyoruz tabi ama motivasyonu düşürüyor" (Interviewee 7)

Following diagram conceptually illustrates main categories, subcategories, dimensions, properties, and concepts regarding students' attitudes toward feedback delivery media (written vs. oral) (See Figure 4.3)

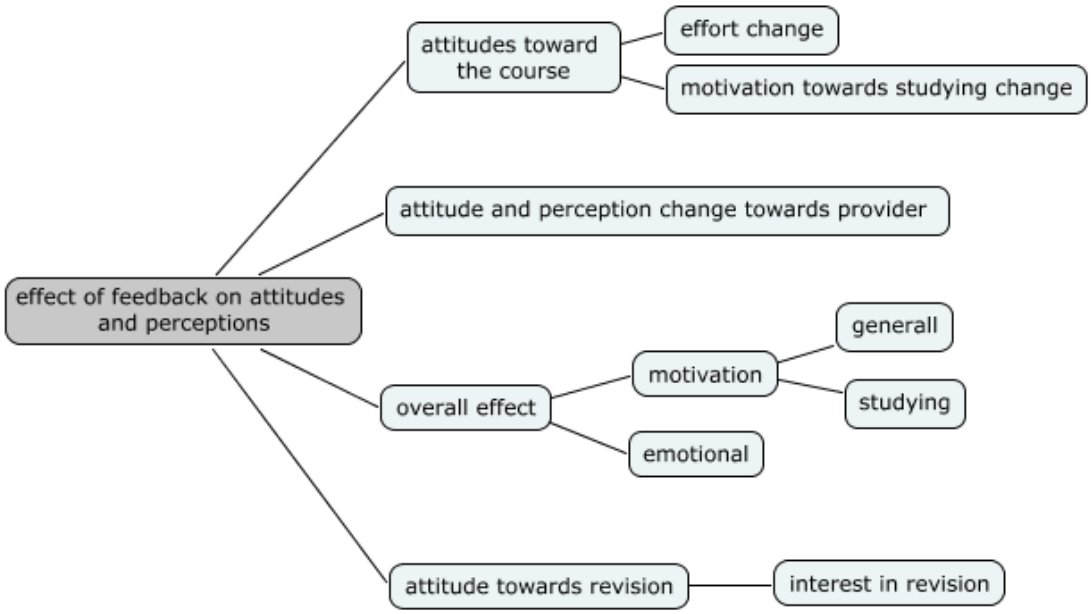


Figure 4.3 Effect of Feedback on Attitudes and Perceptions

Media and Technology Used in the Courses

Most of the participants interviewed showed that different media and technologies are used in project-based courses for delivering formative feedback. Used technologies are not only social media such as Facebook but also teaching course-related technologies like course management system and course web site. Common responses (n =9) indicated that the delivery of written feedback taking place both between instructors and students and between teaching assistants and students is accomplished through e-mail. One of the participants said:

"If we want to take feedback from course assistants, we generally make connection through e-mail…we sometimes upload file from Facebook. [For delivery of feedback] facebook, e-mails, metu-online for instructors and metu-mail are used. Moreover, Microsoft word plugin is also used." (Interviewee 2)

"Asistanlardan geri dönüt alacaksak genellikle e-mail yolu ile iletişim sağlıyorduk… bazen facebook'tan dosya yükleyebiliyoruz. [geri bildirim için]

> Facebook, E-mail'ler, hoca için Metu-online ve Metu-mail kullanılıyor. Sonra Microsoft word'ün eklentisi var." (Interviewee 2)

Interview data showed that students most of time use Facebook as a medium of giving and receiving feedback from their peer. Therefore, they give great value to the delivery of feedback by means of Facebook. One of the participants underlined the usage of Facebook for formative feedback delivery and stated:

> "Feedback takes place in social Medias among our peer…for example we can create a Google group where together with our peer we have shares with each other." (Interviewee 10)

> "Sosyal medyada arkadaşlarımızla oluyor… mesela bir Google grup kurabiliyoruz. Ordan diğer grup arkadaşları ile birlikte paylaşımlarımız oluyor." (Interviewee 10

Moreover, general responses (n = 8) focused on the dynamic transections of formative feedback in groups in Facebook or Gmail environment. In such groups formative feedback is provided to all students who are subscribers of the group. By indicating how groups serve as feedback delivery tool one of the interviewee said:

> "…we had project mail group where we cummunicate with instructor and course assistants though e-mail. We are given response to the questions about our reports and project in project mail group" (Interviewee 4)

> "…projemizin mail grubu oldu. Orda hoca ve assitanlar ile mail iletişimi kurduk. Raporlarımız ve projemiz hakkındaki sorularımıza ordan cevap verildi bize." (Interviewee 4)

Following diagram conceptually illustrates main categories, subcategories, dimensions, properties, and concepts regarding media and technology used in the course. (See Figure 4.4)

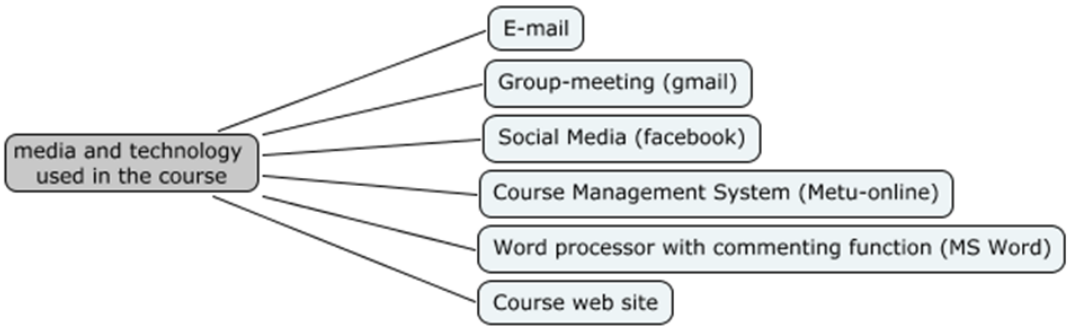


Figure 4.4 Media and Technology Used in the Course

Purposes of Using Media / Technology in the Course

The analysis results indicated that different media and technology are used for different purposes by different students. Responses from seven of participants showed that e-mail is commonly used for the purposes of asking questions, receiving feedback to asked questions,

sending the paper, receiving paper with feedback. Six of participants underlined uses of Facebook for the purpose of feedback transactions in their project-based courses.

Following diagram conceptually illustrates main categories, subcategories, dimensions, properties, and concepts regarding the purposes of using media / technology in the course. (See Figure 4.5)

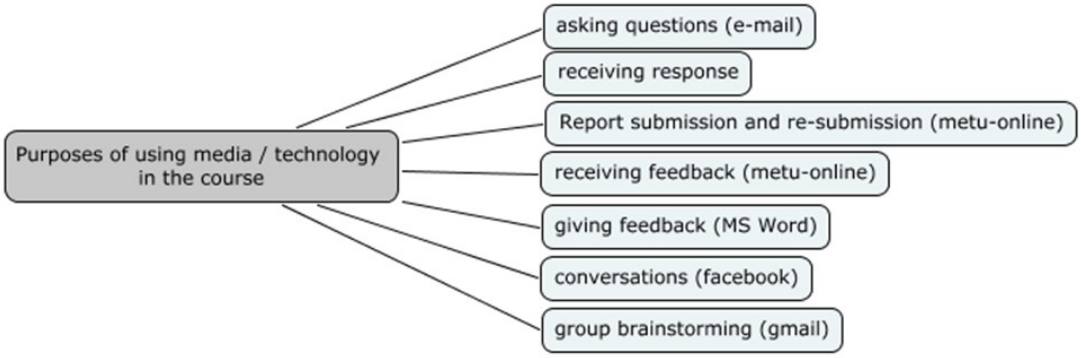


Figure 4.5 Purposes of Using Media / Technology in the Course

The Things that Affect the Use of Feedback in Revisions

Analysis of qualitative data clearly indicated that depending on the formative feedback quality, perceptions toward feedback provider, perception towards project, endeavor, stage or feedback delivery time and perceptions toward course as portrayed in figure 4.6 students takes action against whether to use feedback in revisions or not.

Some of the interviewed informants (n = 3) noted that grading concerns and probable use of the product in future affect our decisions in attempting to revise project and report of the project. Moreover, formative feedback delivery time, during the process of project or after the project finishes, was also emphasized to have great effect on the uses of feedback in revisions. By covering these effects, one of the informants stated:

> "…if project is to be graded, we make use of feedback for [revisions]. For example, if I use project in my curriculum vitea and add my portfolio, I revise that project. For instance, now our [project] will be used in METU College and watched to children…because that material will be used. That is,I use feedback when I feel that material will serve the purpose. If project will not be useful, I may not use [feedback]. if project is completed, I may not revise it." (Interviewee 1)

> "…proje puanlı ise [geri bildirimler ile düzeltme] yapıyoruz. Mesela CV'de projeyi kullanacaksam ve portfolioma ekleyeceksem o projeyi revise ederim yani. Mesela şimdi yaptığımız [proje] odtu kolejinde kullanılacak, çocuklara izletilecek.... Çünkü kullanılacak bu materyal. Yani metaryalin bir işe yarayacağını hissetiğim zaman [geri bildirimi kullanırım]…proje birşeye yaramıyorsa [geri bildirimi] kullanamayabilirim. Proje bitmişse revise etmeyebilirim." (Interviewee 1)

In addition, qualitative data analysis showed that feedback characteristics such as including suggestions (n = 8), providing basic clues (n = 6), and referring to examples and non-example about the parts needed revision were mostly underlined by participants. Formative feedback that has such characteristics is accepted and applied during the revision process. Following excerpt taking from one of the participant transcribed date stressed such feedback characteristics.

> "…certainly [feedback] should include clues and orient me even if it does not explain directly. I need to understand somehow what I need to do. That is, just saying 'not work' does not make anything." (Interviewee 7)

> "…kesinlikle [geri bildirim] direk söylemese bile bir ipucu içersin beni yönlendirsin. Bir şekilde ben anlayayım ne yapmam gerektiğini. Yani sadece 'olmamış' gibi birşey olduğu zaman çok bir şey ifade etmiyor." (Interviewee 7)

The participants' responses indicated that formative feedback provider's level of competency, expertise, knowledge, and interest in project-based cause changes on students' decisions of making use of formative feedback while revising. Especially, participants thought that formative feedback provided by feedback provider who is perceived as lacking of interest, competency, expertise, and knowledge is not considered to be useful and therefore is not cared. Furthermore, responses indicated that after students receive feedback they analyses it in order to draw conclusion about its usefulness and correctness. Depending with the conclusion they come up with the idea for using it or not. By covering perceptions toward formative feedback provider, one of the participants said:

> "That is, if I find that feedback is helpful and correct, I absolutely make revision. However, as I said I do not care feedback of person who I think is not adequate. Probably I would not care. If I believe that he/she is not knowledgable in that topic, I would not consider his/her feedback." (Interviewee 2)

> "Yani dönütü faydalı bulduysam, doğru bulduysam mutlaka düzeltme yaparım. Ama dediğim gibi dönütü aldığım kişiyi yeterli bulmuyorsam bu dönütü dikkate almayacağım. Büyük ihtimalle almam yani .o konuda pek bilgi sahibi olduğuna inanmıyorsam onu [geri bildirimlerini] dikkate almayacağım." (Interviewee 2)

Most of the participants (n = 7) pointed out the correlation between the acceptance of formative feedback in revision and importance of project. They thought that acceptance of feedback is depended on the perceived importance and effectiveness of project. That is, given feedback is regarded as an important and used in revision whenever project is important, useful, and interest students. Grade giving for revision was also emphasized by two of participants to entail them to make necessary revisions. They thought that grade given for revision by feedback provider necessitates them to make revision even if given feedback is perceived to be not useful and logical. One of the interviewed participants stated:

> "Instructor feedback is very valuable when I consider project and think that project will be helpful for me, and also have made research myself. Because, when I get feedback I will not only improve myself but also develop project. However, if I consider project as a course to take and pass it, I will use provided feedback but I do not consider feedback so much. I do not ignore feedback in my project because I need to apply feedback for receiving grade." (Interviewee 7)

> "Eğer ben o projeyi önemsiyorsam, benim için faydalı olduğunu düşünüyorsam, kendim de araştırma yapmışsam o zaman hocanın verdiği feedback benim için daha değerli olur. Çünkü ben onu aldığımda hem kendimi geliştireceğim hem de materyali geliştireceğim. Ama sadece ders alayım geçiyim diye düşündüğüm bir proje ise o zaman hocanın verdiği dönütü uygularım. Yine projemi değiştiririm ama çok da önemsemem. Onu [geri bildirimi] projemde ignore etmem çünkü not almam için o dönütü uygulamam gereklidir." (Interviewee 7)

In addition, two of interviewed informants emphasized the effect of the amount of time and effort wasted for project and report on the perceived importance of feedback. They clearly noted that they value given feedback if they have spent a great deal of time and effort for the construction of the project and report. Related to relationship between time and effort one participant said:

> "if project is important and I give importance to the project and spent a few months for it, I give weight to feedeback and attempt to revise it " (Interviewee 9)

> "..eğer proje önemli ise, projeye önem vermiş bir kaç ayımı ayırmışsam geri dönüte de önem verir projemi düzeltmeye çalışırım." (Interviewee 9)

Following diagram conceptually illustrates main categories, subcategories, dimensions, properties, and concepts regarding the purposes of using media / technology in the course. (See Figure 4.6)

Figure 4.6 the Things that Affect the Use of Feedback in Revisions

Strategies being Used When Learning New Things

Analyses of qualitative data as portrayed in Figure 4.7 showed that students make use of different strategies when attempting or trying to learn new things in project-based courses. In terms of strategies being used, media, self-study and seeking help from instructor were highlighted by students. Participants (n = 4) clearly showed that they benefits from such medias as video, audio and internet so as to get better understanding and comprehending of the topic taught either in project-based courses class or in laboratories in which students are given opportunity for practicing and applying. In addition to the use of media reading (n = 2), researching (n = 3), applying (n = 4) and learning by doing mistake and fixing it (n = 3)

were also stressed to be used while learning new things in project-based courses. Following excerpt taken from one of the participant's transcribed data partly reveal what types of strategies are used.

> "…of course labs take place. For example, last year there were flash labs. I think that those labs are helpful…I learn [new things] by applying it, maybe watcing videos.if the topic interests me so much, really I can read something about it. For example, I can read articles." (Interviewee 1)

> "…tabi labaratuarlar oluyor. Mesela geçen sene flash labaratuarları oldu. Yararlı olduğunu düşünüyorum…Bir şeyi uygulayarak [yeni bir şeyi öğreniyorum]. Video izlemekte olabilir. Çok ilgimi çeken bir konu ise gereçekten onunla ilgili birşeyler okuyabilirim. Makaleleri okuyorum mesela." (Interviewee 1)

Following diagram conceptually illustrates main categories, subcategories, dimensions, properties, and concepts regarding the strategies being used when learning new things. (See Figure 4.7)

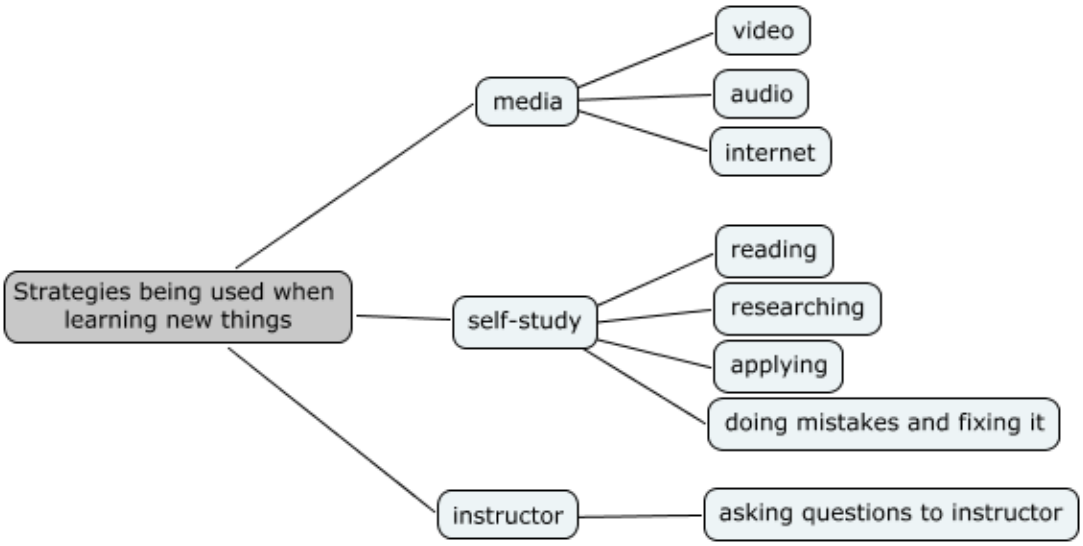


Figure 4.7 Strategies being Used When Learning New Things

Factors Influencing Learning New Things

Analysis of transcribed data showed that the process and intention of learning new things by using different strategies are interfered with some external and internal factors. External factors such as workload, time, usefulness of project and report in the future and internal factor such as interest were emphasized to have influences on learning new things. Such influences were claimed by participant (n = 2) to force them to be surface learners rather than deep learners. Some of the participants (n = 3) suggested that provision of feedback during the process of learning new things could minimize the influence of internal and external factors. For example, one of the participants said:

"…also conditions are important. Moreover, if I have no special interest to that topic, conditions do not permit, and I have limited time, probably I will learn that topic superficially. Feedback in this surface learning will make my jop easy. That is, thanks to feedback I will not spent any more time. " (Interviewee 2)

"… yine koşullar önemli. Bir de verilen o konuya özel bir ilgim yoksa, buna muhtemelen koşullarda müsaade etmiyorsa, kısıtlı bir zamanım varsa bunu yüzeysel öğreneceğim büyük ihtimalle. Bu yüzeysel öğrenmede de dönütler işimi kolaylaştıracaktır. Yani onun üzerine daha vakit ayıramayacağım bu sayede." (Interviewee 2)

Following diagram conceptually illustrates main categories and subcategories regarding the factors influencing learning new things. (See Figure 4.8)

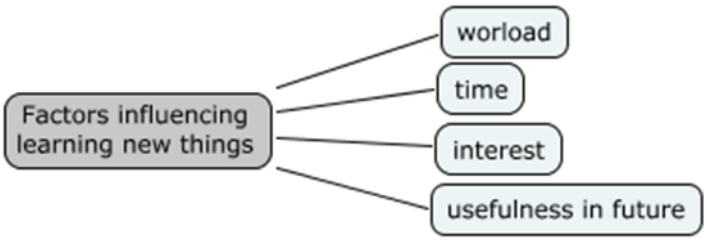


Figure 4.8 Factors Influencing Learning New Things

Attitudes towards Factors Affecting Learning Something in Project

Participants were asked to respond the question of "what kinds of factors influence you while learning something?" in order to elicit information about which learning approaches they have. Detailed analyses of participants' responses indicated that there are multitudes of factors students are affected while learning something in project courses. Those factors were categorized by researcher as course-related, students-related, feedback-related and instructor-related factors as depicted in Figure 4.9. Each category consists of several factors that are indicators employed while searching out which students have which learning approaches. Each category was presented in detail as follows.

Course-related factors

Grading in the project courses was marked to have influences on learning by two of participant. They also argued that the things that make grading a highly important factor on learning new thing in project are its dominant effect on grade point average (GPA). Moreover, participants claimed that since students are required to keep their GPA as high as possible, a high grade given in project automatically force students to give importance to the course and course documents provided them for learning. By covering the factor of grading, one of the interviewee stated:

"…the importance of the course depends mostly on its impact on grade average of university graduation. That is, if course grade has a big impact on grade average, I will try to allocate more time to the project…however, having a big impact on grade

averagedoes not necessarily make me to like the tnings that I have done." (Interviewee 2)

"…dersin önemi daha çok notunun benim üniversitede mezun olacağım sıradaki ortalamama etkisine bağlı. Yani ağırlığı çoksa derse çok daha fazla zaman ayırmaya çalışacağım…ama dersin ağırlığının çok olması orda yaptığım şeyleri bana sevdirmek için bir şart değildir" (Interviewee 2)

Interest in lecture which is the other course-related factor was confirmed by almost all of the participants (n = 8). Responses of participants clearly indicated that if the course interests them, they strive to learn in detail whatever included in the course, conversely, if the course does not interests them, they just try to meet the requirements by keeping their efforts in minimum level. One of the participants who support the effect of interest on learning also pointed out the factor of usefulness of project and said:

"Interest of the course, instructor's approaches, whether course will make the contributions to my life after learning it, and whether I will use it in future or not affect whether to learn that course in detail or not. If the course is unnecessary and I will not use it in future, I can say that it is okey not to learn that course; passing course is enough… if the course does not interest me, I only skip it after memorizing. On the other hand, if the course interests me, I can make research about it after the course hours. I just try to pass the course if it does not motivate, contribute me later, and have additional stimulation." (Interviewee 9)

"dersin ilgimi çekmesi , hocanın yaklaşımları , dersin öğrendikten sonra bana hayatta katkısı olup olmayacağı, ilerde bunu kullanıp kullanamayacağım o dersi detaylı öğrenip öğrenmeyeceğimi etkiler. Eğer çok gereksiz bir ders ise ileride ben bunu kullanamayacaksam öğrenmesem de olur diyebilirim. geçiyim yeter...ilgimi çekmiyorsa zaten sadece geçmek içi ezberleyip geçerim. Ama ilgimi çekiyorsa dersten çıktıktan sonrada onunla ilgili araştırma yapabilirim. Motive etmezse, ilerde bana katkısı olmayacaksa, ekstra ateşleyiciler yoksa, sadece geçmek için uğraşırım." (Interviewee 9)

In addition, nine of the interviewee placed emphasis on the effect of the factor on motivation in in project. They particularly showed that high motivation in the course does not only causes high learning outcomes but also lead students to attend each class on time, to have positive interest towards both course and instructor and to strive to learn most of things in the course. One of participants related to the effect of the factor on motivation in learning something in project-based course articulated:

"of course it is a factor.Coming to the class is even a positive motivation. If you come to the course willingly, your learning increase but if you come to the course by force and just pass that day, you already do not listen to the lecture or you do your jops and assignments only for getting rid of your duty. Therefore, you made surface learning." (Interviewee 7)

"tabi ki faktör. Derse gelmek bile pozitif bir motivasyon. O derse isteyerek geliyorsanız öğrenmeniz artıyor ama çok böyle bir zorla geliyorsanız bu günde geleyim bitsin falan diyorsanız dersi zaten dinlemiyorsunuz yada yaptığınız işler ödevler olsun sadece yani yapmış olmak için yapıyorsunuz. Dolayısıyla yüzeysel oluyor." (Interviewee 7)

Student-related factors

Analysis of qualitative data explored the effect of student's attitude toward courses and teacher on learning something in project and also on student's intention of requesting feedback. Highlighted articulation by participants indicated that students have inclination towards spending more effort for learning something in detail in the courses taught by instructor they like. One of the participants clearly showed the effect of liking instructor on the effort towards studying and said:

> "for example, instructor is important for me. That is, the approaches of instructor from whom I take the course are important. If instructor is the person that I like, I study more seriously. This is certain." (Interviewee 1)

> "mesela benim için hoca önemli oluyor. Yani ders aldığım hocanın yaklaşımı önemli oluyor. Sevdiğim biri ise daha ciddi çalışıyorum . Bu kesin yani." (Interviewee 1)

Feedback related factors

Interviews revealed that feedback provider's feedback characteristics such the amount of feedback, quality of feedback, tone, and manner of feedback as depicted in Table 4.9 play a key role in students' intention of learning something. Two of the interviewed participants emphasized that provision of inadequate and illogical feedback may change all your positive attitudes that you have at the beginning of the course and subsequently make you to have the course meet the minimum requirement and minimum effort. One of the participants associated with the effect of factor of feedback characteristic on learning said:

> "Sometimes you really start to study for learning at the beginning of the semester but you cannot do a lot in the process. Feedback is insufficient and provided sounds ridiculous to you. After that you just said that okay I will try to fulfill the required conditions and to take my grade. " (Interviewee 1)

> "Bazen gerçekten dönem başında cidden öğrenmek için başlıyorsun ama böyle süreç içerisinde çok şey yapamıyorsun. Geri bildirimler yetersiz oluyor, verilenler sana çok saçma geliyor. Ondan sonra sadece diyorsun ki tamam ben gereken koşuları yerine getirmeye çalışacağım ve notumu almaya çalışacağım diyorsun." (Interviewee 1)

Moreover, two of the participants particularly pointed out the effect of tone and manner of formative feedback, including destructive, constructive, positive and negative, on their ideas toward whether learning or not. Although from views of participants positive feedback is regarded as an impetus on their desire to learn something, negative feedback is the something that leads to decreases in positive attitudes and simultaneously increases in negative attitudes toward course. Following excerpt drawn from one of the participant's transcribed data clearly supported the idea described.

> "I enjoy when provided feedback is useful and I want to learn. That is, I strive to do a lot. Anyway, provided feedback changes your point of view towards the course. If feedback is provided very negatively, it can decrease your interest towards the course and makes you repulsive but if feedback is provided positively, for example, it can be motivating as well." (Interviewee 5)

> "Verilen geri bildirim yararlı oluyorsa ve öğrenmek istiyorsam hoşuma gidiyor. Daha çok yani yapmaya çalışıyorum. Verilen geri bildirim zaten derse bakış açısını değiştiriyor yani. Çok olumsuz verirse o derse seni soğutabiliyor ve itici yapabiliyor ama olumlu verilirse mesela motive edici de olabiliyor." (Interviewee 5)

Instructor-related factors

Responses of participants showed that all participants share the same notion that attitudes of instructor is definitely among the factors affecting learning something in course. They clearly indicated that we will not have any interest towards the course and course materials if course instructor does not have good attitudes toward the course. Out of the 10 participants, four expressed that our level of interest in the course is totally depended on the degree to which instructor cares the course. Similar expressions associated with other teacher-related factors such as instructor motivation, behavior, readiness to the course, and teaching style were also expressed to influence students' intention and attitudes toward learning something by other participants. Effects of instructor-related factors on the process of learning something were represented below by one of the participant's comment.

> "If the instructor does not care the cause why students should care. If instructor came to the class just for teaching the course and then going, students come to the class just for passing the course. Instructor himself/herself does not know, speak and speak in front of the class. You lost your enthusiasm and do not want to do anything… before anything else the course needs to be liked by an instructor who teaches it. The instructor needs to attract the attention of students and make students to like that topic while teaching the course. The instructor needs to employ different techniques so that students learn better and like it. " (Interviewee 8)

> "Hoca dersi önemsemiyorsa öğrenciler niçin önemsesin. Hoca dersi sadece anlatıp gitmek için gelmişse oraya öğrenciler de sadece dersi geçmek için gelir. Kendisi de bilmiyordur. Çıkar tahtaya konuşur konuşur gider insanın şevki kırılır yani hiçbirşey yapmak istemez… herşeyden önce hocanın kendi anlattığı dersi sevmesi lazım. O konuda bilgi sahibi olması lazım. Öğrencilere anlatırken öğrencilerin dikkatini iyi bir şekilde çekmesi lazım, öğrencilere o konuyu sevdirmesi lazım, Farklı teknikler kullanmalı ki öğrenciler daha iyi öğrensin and sevsin." (Interviewee 8)

In addition, interview data as illustrated in Figure 10 marked how the instructor's attitude toward students in the course is the factor and how this factor drives students in pursuing their intention of learning. The comments of the three of the participants clearly indicated that not only attitudes of instructor toward students but also quality of instructor's relationship with students in the course and out of course inform every aspect of students' decisions in learning something. Students expected instructor to explicitly indicate her/his attitudes in the class and to give students a sense of valuing. This view was shared by one of the participants like others as indicated by the following comment drawing from the transcribed interview data:

> "…the instructor's attitudes toward student are very important. If instructor cares students, and when I went to him and ask a question, the instructor teach me especially that course, the instructor is important for me even if the instructor does not teach the course. That is, instructor attitudes toward me should be clear and obvious. The instructor needs to be like a close friend… there are a lot of instructors who use old slides and come to the class without any preparation. However, for me

although some instructors come to the class without any preparation, they give me special care when I go to them. At that time it was important for me." (Interviewee 3)

"…[hocanın] öğrenciye karşı tutumu çok önemlidir. Dersi anlatamazsa bile öğrenciyi önemsiyorsa ben gittiğimde bir soru sorduğumda bana özellikle o konuyu anlatıyorsa benim için önemldir o. Yani bana karşı tutumu net ve açık olmalı. Yakın arkadaş gibi olmsı lazım…eski sılaytları kullanan, derse çalışmadan gelen çok hoca var. Ama benim için bazıları derse çalışmadan geliyor fakat yanına gittiğimde benimle özel olarak ilgileniyor falan. O zaman benim için önemlidir." (Interviewee 3)

Following diagram conceptually illustrates main categories, subcategories, dimensions, properties, and concepts regarding the strategies being used when learning new things. (See Figure 4.9)

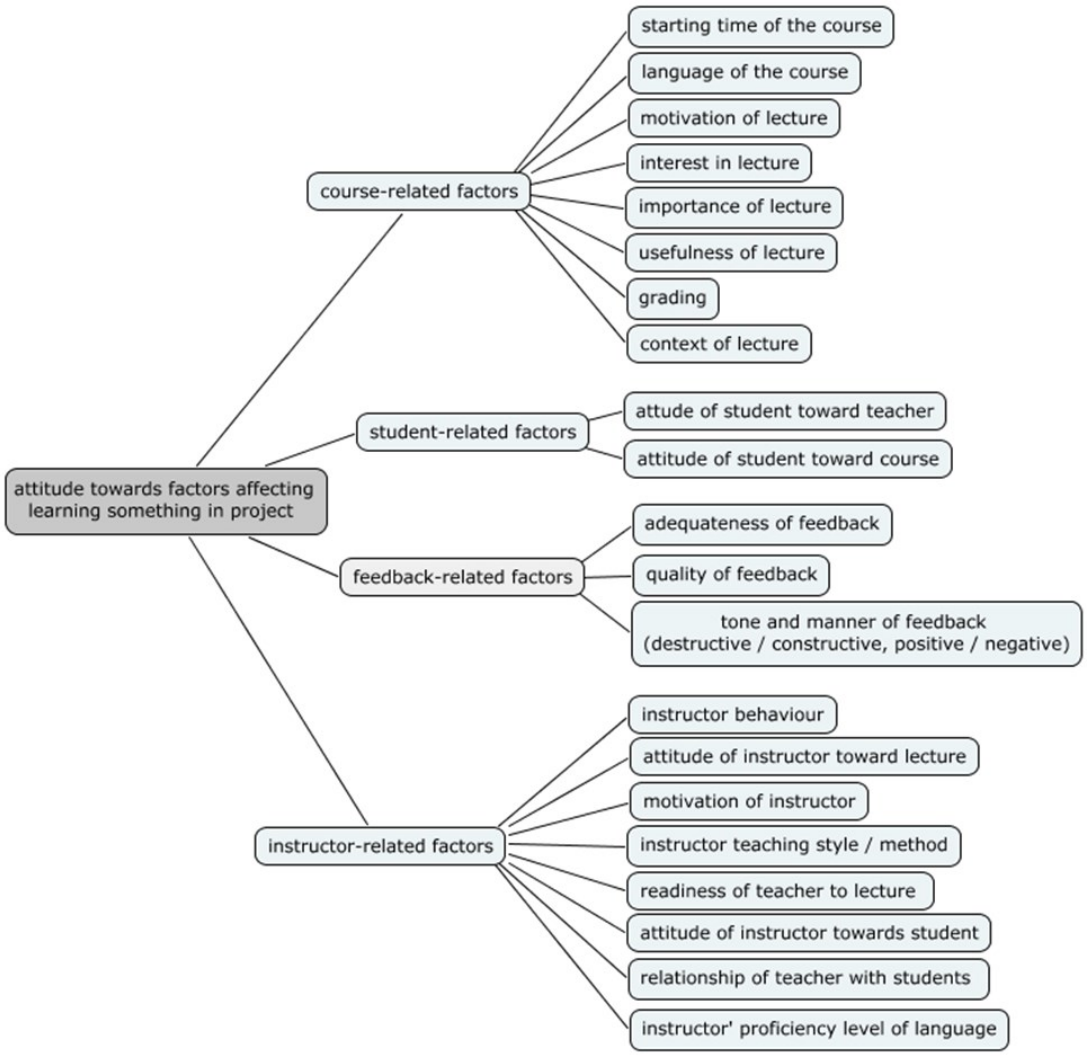


Figure 4.9 Attitudes towards Factors Affecting Learning Something in Project

Attitudes towards Ways of Learning Something

Detailed analysis of the responses of the participants to the question "what type of ways you pursue when learning something in the project?" showed that participants basically use three ways when learning something in the project. Those ways as depicted in Figure 4.10 were respectively learning only the main/core content, learning a topic in detail, learning from extra materials that are unlikely to be in the exam. The comments of the participants also indicated that following one of those ways is highly linked and affected by a set of internal and external variables. Internal and external variables in some extent may discern which learning approaches, deep and surface, students employ when trying to learn something from the project.

Participants noted that some internal and external determining factors define our approaches whether to learn only the main/core content or not. As an internal factors desire to learn (n = 2), interest (n = 3) and as an external factors usefulness of what is learned (n = 2), passing the course (n = 1) were pointed out to have influence on learning something. They emphasized that if the main knowledge that we would learn is adequate for just passing the semester and the course, we try to learn only the main/core content of the course. The similar view was shared by some other participants who underlined that if we have a relatively low interest toward the course or project, we just strive to meet minimum requirements or spend minimum effort in the course or project. How students decide to learn only the main/core content was clearly illustrated by following excerpt taking from interview data:

> "…in general, it actually depends on the things that I will learn. if the thing is something that interests me, I want to learn I detail. I investigate in detail when the course or project interests me. That is, maybe I want to learn the components and the other details of [project and course] as well. However, if I do not like so much the thing that ı will learn and does not interest me or time is very limited, I learn more basic things. For example, if I study for the exam, I learn more basic things and at least I try to pass that exam." (Interviewee 5)

> "…genelde aslında öğreneceğim şeye bağlı. Eğer ilgimi çeken birşeyse genelde ben detaylı öğrenmek isterim. İlgimi çeken birşeyse daha detaylı araştırırım. Mesela belki ama belki onu [dersin ve projenin] diğer ayrıntılarını ve komponentlerini de öğrenmek isterim. Ama böyle çok sevmediğim ve ilgimi çekmeyen birşey ise yada süre çok kısıtlı ise biraz daha temel şeyleri öğrenirim. Mesela sınava çalışıyorsam daha temel şeyleri öğrenip en azından o sınavı geçmeye yönelik çalışırım." (Interviewee 5)

In addition, participants' approaches toward learning a topic in detail was found in qualitative analysis to be extensively affected by several variables as illustrated in Figure 4.10. Answers of more than half of the participants (n = 7) showed that students tend to learn every aspect of a topic in detail when the topic interests them. Moreover, a few participants (n = 5) pointed out the aspect of time needed to study and reflect on the topic. They complained that insufficient time is a boundary standing in front of them and do not let them learn a topic in detail by looking it in different perspectives. Furthermore, three of the participants stressed that level of importance of the topic to be learned plays an important role when attempting to learn a topic with all the details. According to them, when the topic is not important or not motivated they chose way of learning a topic superficially instead of

ways of learning topic deeply. There were also other variables highlighted in the participants' comments as illustrated in Figure 4.10. By covering effect of such variables on participants' decisions towards ways of learning, two of the participants stated:

> "I strive to learn in detail when [topic] interests me, course motivates me and instructor makes effort in that topic." (Interviewee 2)

> "…[konuya] ilgi duyuyorsam, derste beni motive ediyorsa, hocamızda bu konuda çaba gösteriyorsa daha detaylı öğrenmeye çalışırım." (Interviewee 2)

> "…when subject interests me, is so prominent and is very important, I learn that topic deeply. Otherwise, I just look at basic things superficially. I look at whether it will help or not, and I will use it functionally or not." (Interviewee 9)

> "… ilgimi çeken bir konu olduğu zaman, çok gündemde olan bir konu olduğu zaman, önemli bir konu olduğu zaman [derinlemesine öğreniyorum] .Yoksa sadece yüzeysel olarak temel şeylere bakarım. Bana faydası olacakmı olmayacak mı? işlevsel olarak ben onu kullanacakmıyım, kullanamayacakmıyım. Onlara da bakarım." (Interviewee 9)

Furthermore, qualitative data analysis indicated that most of the participants share the similar opinion that whether learning from extra materials that are unlikely to be in the exam or not is mostly depend on the level of interest in subject, amount of time, the level of desire to learn and the purpose towards passing the course. Five of the participants stressed that they resort to extra materials when the topic interest them. Moreover, few participants (n = 2) underlined that if our purpose is just to pass the course, we don't make use of any other supplementary materials provided for further improvement. Following comment drawing from one of the participant's transcribed data clearly indicate participants' approaches toward resorting extra material that are unlikely to be in the exam:

> "if subject does not interest me I never look it…or there is no possibility that subject will be in the exam. For example, there is a course that I am taking now at the department. Questions are already certain. The topics that will be asked are obvious. Instructor asks the same questions every year. So this happens. Therefore, I do not remember that I look any books related to that course. Even I do not read the course slides. There is an occasion that I have an exam after memorizing the questions that have been asked last year and previous years. There have been more than just three or five exam like this…I may study hard but this not happen for every course. There are some courses that interest me as well. This change from course to course and from instructor to instructor." (Interviewee 9)

> "ilgimi çekmiyorsa hiç bakmam…veya sınavda çıkma ihtimali yoksa…mesela bölümde bir tane ders alıyoruz. Sorular zaten belli. Çıkacak konular belli. Hocanın soruları her yıl aynı geliyor. Bu oluyor yani. O yüzden o ders ile ilgili hiç kitap açıp yüzüne baktığımı bilmiyorum. Sılaytlarını okuduğumu dahi bilmiyorum. Hocanın geçen yıl çıkmış sorusu ve ondan önceki yıl çıkmış sorularını alıp ezberleyip sınava girdiğim oldu. 3 veya 5 değil çok oldu…çok çalıştığım oluyor ama her derstte olmuyor. İlgimi çeken konularda oluyor. Desten derse ve hocadan hocaya değişiyor." (Interviewee 9)

Following diagram conceptually illustrates main categories, subcategories, dimensions, properties, and concepts regarding the strategies being used when learning new things. (See Figure 4.10)

Figure 4.10 Attitudes towards Ways of Learning

Perceptions and Preferences toward Different Formative Feedback Characteristics

Interview revealed that participants have different perceptions and preferences toward different formative feedback characteristics. These characteristics as shown in Table 4.1 were categorized depending on the relatedness to each other under five main-categories. Each main-category was presented by researcher as follows.

Delivery

Qualitative data analysis indicated that two media or mode of formative feedback delivery, written and oral, are used by feedback providers in order to have students deliver formative feedback in project courses. All of the participants mentioned that not only oral feedback but also written feedback is given by feedback providers in project courses. Feedback providers who use any one of mode for feedback delivery were illustrated in Figure 2. Following comment drawing from one of the participant's transcribed data clearly showed which media is used for delivering formative feedback:

> "During project based courses, apart from written feedback, we also take oral feedback when showing our product to course assistant between certain time intervals. During the first meeting we take an oral feedback. After that we give the developing project. Instructor makes some analyses on our project after that and gives again a written feedback. We have received oral feedback from our peers in ninety percent of the rate." (Interviewee 2)

> "Proje dersleri sırasında asistanlarımızdan genellikle haftalık görüşmelerimizde yazılı haricinde ürünü belli tarihlerde ürünü onlara gösterdiğimizde hani hem sözlü hem yazılı dönüt aldığımzda oluyor. Ilk toplantı yaptığımız sırada sözlü bir ön dönüt alıyorduk. Daha sonra geliştirmekte olduğumuz ürünü veriyorduk. Hocamız daha sonra onun üzerinden incelemeler yapıp tekrar yazılı bir dönüt veriyordu. Biz arkadaşlarımızdan genelde yüzde dokzan oranında sözlü dönütler alıyorduk." (Interviewee 2)

Moreover, participants were found to have different perceptions regarding the adequateness of given written and oral feedback. The perception that given written and oral feedback is generally adequate was not shared by all participants because of differing feedback characteristics given by different feedback providers. Some feedback providers' feedback is viewed as commonly adequate, whereas the other feedback providers' feedback is viewed as sometimes or on occasion adequate. For example, four of participant indicated that given formative feedback is sometimes adequate but sometimes is not. One of them said:

> "…eventually every feedback was distinct…some feedback was enough. Some feedback was not enough. When feedback was insufficient; even so, I tried to make revision as I could but I give almost the same thing. " (Interviewee 4)

> "…sonuçta her feedback değişikti …Bazısı yeterli oldu. Bazısı yetersiz oldu. Yetersiz olanda ben gene yine aynı şeyi elimden geldiği kadar düzeltip hemem hemen aynı şeyi verdim." (Interviewee 4)

Furthermore, responses of participants indicated that whenever given written feedback is not adequate students attempt to take oral feedback by going to instructor or teaching assistant in order to get additional explanation and clarification. One of the participants said:

> "…there were some occasions that written feedback was not enough. In those conditions, we reached our instructors and strive to get explanation." (Interviewee 2)

> "… yazılı dönütlerin yetersiz olduğu durumlar oluyordu. Bu durumlarda hocalarımıza ulaşıp bir açıklama almaya çalışıyorduk." (Interviewee 2)

Qualitative data analysis indicated that participants received either written formative feedback or oral formative feedback. Yet, differing responses were given when participants were asked "which formative feedback types you generally receive?" Some said we

generally receive written feedback, whereas some said we commonly receive oral feedback. However, they commonly agreed with the statement that oral feedback could be forgotten when compared to written feedback. One of the participants said:

> "Generally feedback is given in written form. I think provided feedback in written form is better than oral feedback. That is, everything can be written in detail. I prefer written feedback on occasions where I do not remember the places in oral feedback. As I said when feedback is oral, person's gestures and talks can sometimes be perceived negatively. However, when feedback is written, you can directly see what there is and you do not have any chance to overlook…in oral feedback your mind sometimes may be confused and some things can be gone away. However, when feedback is written, either it is in front of your eyes or this is more effective for me." (Interviewee 8)

> "Genellikle [geri bildirim] yazılı geliyor. Yazılı gelmesi sözlü gelmesinden daha iyi bence. Yani herşey ayrıntısı ile yazılabiliyor. Sözlüde bazen unuttuğumuz yerlerde yazılı benim tercihim. Dediğim gibi sözlü olduğu zaman mimikler olsun insanın konuşması olsun bazen olumsuz algılanabiliyor. Ama yazılı olduğunda direk orda ne olduğunu görebiliyorsun ve kaçırma şansın olmuyor…sözlüde bazen kafan karışık oluyor veya başka birşey oluyor ve bazı şeyler uçup gidebiliyor. Ama yazılı olduğu zaman hem gözünün önünde oluyor hem daha etkili oluyor benim açımdan." (Interviewee 8)

> "…I take generally oral feedback but written feedback can be also effective. This may be due to the reason that oral feedback is no remembered all the time. "written feedback" can be shown on paper." (Interviewee 4)

> "…sözlü [geri bildirim] alıyorum genelde. Ama yazılıda etkili olabiliyor. Daha çok sözlü herzaman akılda kalmadığı için herhalde. [yazılı geri bildirim] kağıt üstünde gösterebiliyor." (Interviewee 4)

According to participants, both written formative feedback and oral formative feedback has its own advantages and disadvantages. Those advantages and disadvantages were reported to have influence on their preferences toward written formative feedback and oral formative feedback. This was clearly indicated by following comment:

> "I prefer oral feedback but in some occasions written feedback is more useful because written feedback can be either kept or looked again after making revisions such as how much I was able to do and how did it happen. Written feedback is somewhat evidence. Maybe in this aspect it can be said that written feedback is more useful because when receiving oral feedback some things can be gone away and not remembered such as did he say to do this like those or these . However, it would be more useful when written feedback is given." (Interviewee 1)

> "Sözlü [geri bildirimi] tercih ederim ama bazı durumlarda yazılı daha yararlı yani. Çünkü yazılı geri bildirim hem saklanabilir, hem revise edildikten sonra verilen geri bildirim'lere tekrar bakılabilir. Hani ne kadarını yapabildim. Nasıl oldu diye. Bir şekilde bir kanıt yani yazılı geri bildirim. Belki daha yararlı denilebilir bu açıdan çünkü sözlü geri bildirim aldığında bazı şeyler kaybolabilir ve unutabiliyor. Şurayı şöyle mi yap demişti, şöyle miydi falan diye. Ama yazılı geri bildirim verirse bu daha yararlı olur." (Interviewee 1)

Beside, even though general preferences of students toward formative feedback types were to receive a combination of written and oral formative feedback, they accepted written feedback on a written product, and oral feedback on a visual product. One of them said:

> "I prefer to take written feedback while receiving oral feedback. Of course if there is a visual product. If there is a writing product, I prefer to take writing feedback given within a certain time. That is, feedback that does not take too long. Of course it will take long but feedback given at 1.5 week is not helpful." (Interviewee 1)

> "…sözlü geri bildirim alıp not almayı tercih ederim. Tabi ki görsel bir ürün varsa ortada. Eğer yazılı bir ürün varsa bunun için de belirli bir süre içerisinde verilen yazılı geri bildirimi'i tercih ederim. Yani çok uzamayan. Tabi ki yine uzayacak ama 1.5 haftada verilen bir geri bildirim yararlı olmaz." (Interviewee 1)

As to formative feedback delivery time, participants indicated that their motivation was positively influenced when receiving immediate feedback, and negatively influenced when receiving too late feedback.

> "…if feedback is given immediately during project phases, revising project will be so easy and nice, and person's motivation does not put off. However, instructor does not care and says 'come to me after you do project'. You finish the project and show to the instructor. Instructor says that ok I like it, change these and those. So problem occurs that time. Therefore, in every process feedback is very valuable." (Interviewee 3)

> "…projenin aşamalarında [geri bildirim] immediate şekilde verilirse bunun revise edilmesi daha kolay ve daha güzel, ve kişinin motivasyonu kırılmıyor. Ama hoca ilgilenmiyor. Yapın da gelin bakalım diyor. Sen projeyi bitiriyorsun götürüyorsun diyor ki beğenmedim, şunu değiştir, bunu değiştir. Yani o zaman sıkıntı oluyor. O yüzden herbir aşamada ve immediate feedback çok kıymetli birşey." (Interviewee 3)

Content

Analysis of qualitative data clearly showed that certain types of formative feedback were mostly preferred to be given on project and report. Two types that all participants preferred to take were the clarity and understandability of formative feedback. This was clearly seen in following statement:

> "…readability and understandability of [feedback] is important…sometime something is drawn on the side of paper with pencil. You cannot understand what is said. This leads to trouble. It becomes more understandable when direct explanation is given the word document. Some of our instructors do like this. At least you understand what they write. It may not be understandable when something is drawn over word document." (Interviewee 9)

> "…[geri bildirimin] okunması ve anlaşılması önemli… bazen kurşun kalemle üzerine çizip kağıdın yan tarafa birşeyler karalıyorlar. Ne dediğini anlayamıyorsun. O sıkıntılı oluyor. O word belgesi üzerinde direk açıklama çıkıp alta yazsalar daha anlaşılır oluyor. Bazı hocalarımız öyle yapıyor .. Hiç yoktan ne yazdığını anlıyorsun. Öyle üzerini karalayıpta üzerine birşeyler yazdığı zaman ne demek istediği anlaşılamayabiliyor." (Interviewee 9)

According to responses of participants given formative feedback should be constructive, includes suggestion about how to revise project and report, and provide ways of amending weak side of project and report. One of them said:

> "…feedback should be constructive and guiding. What can I say, it shows me what I will do, and also make me develop and take me one step further." (Interviewee 7)

> "… [geri bildirim] yapıcı ve yol gösterici olmalı. Nasıl diyim ne yapacağımı gösteriyor hemde beni geliştiriyor bir adım öteye ilerletebiliyor olmalı." (Interviewee 7)

Regarding the formative feedback manner, analysis of students' comments indicated that most of the participants (n=7) preferred to receive critical formative feedback as long as given formative feedback tone was not humiliating. As for formative feedback tone, all of the participants (n=10) appreciated positive formative feedback.

> "Actually what I mean by saying positive 'I do not mean that this did not happen or happened bad'. I thought a feedback explaining 'it will be better if you do like this'. However, if there is an obvious negativeness, this must be put into words. Yet, the negativeness should be mentioned in positive manner." (Interviewee 1)

> "Aslında şey olumlu derken 'bu olmamış, kötü olmuş değil de. Şöyle yapsan daha iyi olabilir gibi bir feedback düşünmüştüm. Ama bariz bir olumsuzluk varsa bunu dile getirilmesi lazım. Ama dile getirilmiş şeklinin olumlu olması lazım." (Interviewee 1)

Preferences toward the amount of formative feedback were also pointed out by participants. More than half of the participants did not prefer to take too much formative feedback. Instead they appreciated to receive formative feedback that is neither too much nor very little. They reported that too much formative feedback decrease their motivation and prevents them from making use of their creativity in project. For example, two of the participants said:

> "…this may not be very useful because when so much detailed feedback is given, you think like that I do this job one week and now I will do this job one week more and that feedback makes boredom and lack of motivation for you. That is, I think the time that you spent for revisions is important." (Interviewee 1)

> "…bu pek yararlı olmayabilir. Çünkü çok aşırı ayrıntılı geri bildirim verdiği zaman da sende şey gibi hissediyorsun. Ben bu işi bir hafta yaptım ve şimdi bir hafta daha yapacağım diyorsun ve o feedback senin için bıkkınlık ve motivasyon eksikliği sağlıyor. Yani feedback'i düzeltmek için yani harcadığın süre önemli bence." (Interviewee 1)

> "…I think detailing [feedback] so much will prevent me to think freely and more precisely surpass my creativity. I think it is not necessary [to give very detailed feedback]. As I said short feedback and the feedback that let me look at different aspects is enough for me." (Interviewee 2)

> "…[geri bildirimi] çok detaylandırılması durumda benim özgür düşünmemi daha doğrusu yaratıcılığımın önüne geçeceğini düşünüyorum. Gereği olmadığını düşünüyorum [detaylı geri bildirim vermenin]. Dediğim gibi kısa, birde benim farklı açılardan bakmamı sağlaması benim için yeterlidir." (Interviewee 2)

Table 4.1 Formative Feedback Characteristics

Main categories	Sub-categories	Further subcategories /properties / dimensions	Relations
Delivery	media	Written feedback only	
		Commonly written feedback	
		Very little written feedback	
		Combination of written and oral feedback	
		Oral feedback only	
		Commonly oral feedback	
		Taking notes with oral feedback	
	frequency	Weekly meetings	
		frequently	
		On occasions	
		From project to project	
		rarely	
		Towards the end of semester	
		Weekly meetings	
		frequently	
		sometimes	
		On occasion	
	time	immediate	Motivation (+)
		delayed	
		Too late	Motivation (-)
	Feedback providers' gestures/language (Face to face)	Seeing opposite as if unknowledgeable	
		Having good facial expression	
		Giving importance to opposite when speaking	
		good use of language	
Content	clarity	Easy to read and understand	
		Difficult to read handwriting on the paper	
	relatedness	Related with problem and subject	
	format	Smile mark	
		Exclamation mark	
		Underline mark	
		Question mark	
		Red color	
	specifity	General feedback	
		Specific feedback	
		Giving feedback just for important points	
guidance	-----	Telling how to complete	
		Specifying inadequate parts	

Table 4.1 (Continued)

		Having constructive feature	
		Containing suggestions	
		Having guiding feature	
		Giving clues about which direction to look	
Amount	Quality	Detailed feedback	
		Not detailed feedback	
		Superficial feedback	
	Quantity	A lot of feedback	
		Very little feedback	Motivation (-)
		Having an adequate level	
		Too much feedback	Motivation (-)
Tone	Positive vs. negative	Positive feedback only	Motivation (+)
		Negative feedback only	Motivation (-)
		positive and negative feedback	
		neutral	
		Positive or negative feedback	
		Negative feedback with the reason why it is negative	
	Constructive vs. Destructive	Constructive feedback	
		Telling mistakes with strong language	
	friendly polite		
	Formal language	Always formal	
		Commonly formal	
	Informal language	Commonly informal	
	Semi-informal language		
	Formal language	Always formal	
		Commonly formal	
	Informal language	Commonly informal	
	Semi-informal language		

4.1.2 Summary of Qualitative Results

Results of the qualitative data analysis indicated that students' formative feedback perceptions change with respect to instructor, teaching assistant, and peer. While some instructors' formative feedback was perceived to be useful, constructive and timely, the other ones did not. Aside from characteristics of formative feedback, some other factors such as instructors' attitude toward course and student, and student's attitude toward course and instructor were described to influence students' formative feedback perceptions. However, in general most of the students appreciated formative feedback provided for their projects and reports. When formative feedback providers are compared, teaching assistants' formative feedback in regard to effectiveness, clarity and credibility was less appreciated by students. As for formative feedback preference, students identified a set of formative feedback types, characteristics, and modes that they prefer to receive in project based courses. Those were clear, constructive, helpful, effective, timely, positive, specific or general formative feedback. Students are more inclined to take formative feedback from instructors rather than teaching assistant and peer because of the belief that instructors are quite knowledgeable and they give constructive feedback as well as have authority on grade. Related to how students' approaches to learning is changed and what makes students to approach to learning in different manner, qualitative results showed that some internal and external factors such as interest, motivation, mark , instructor attitudes and also feedback affect their ways of approaching to learning. Students' ways of approaching to learning sometimes changed when they were given different quality and tone of formative feedback.

Qualitative results were presented by means of two types of categories: categories associated with learning approaches and categories associated with formative feedback perceptions and preferences. During the development of questionnaire researcher only made use of categories associated with formative feedback perceptions and preferences while generating items for perception and preference questionnaire. Each category was analyzed with its sub-categories, dimensions and properties, and concepts. The concepts within each category that were mostly highlighted in interviews were detected and for each concept with its dimension and property a questionnaire item was generated. The same procedure was utilized throughout the development of questionnaire.

4.2 Quantitative Data Analysis

4.2.1 The Results of the Quantitative Phase of the Study

This section of the chapter provides results of demographic characteristics of participants, descriptive statistics, confirmatory factor analysis, canonical correlation analysis, and factor score correlation analysis.

4.2.1.1 Demographics of the Participants

The participants of the quantitative phase of the study composed of 250 3rd and 4th year undergraduate students from three different state universities. The distribution of the participants in terms of university was as follows: 65 (26%) participants from Amasya University, 85 (34%) from Ankara University and 100 (40%) from Hacettepe University. Distribution of participants' gender and year levels was presented in terms of Amasya, Ankara and Hacettepe University in the following tabular form. (See Table 4.2)

Table 4.2 Demographic Characteristics of Participants from Three Different Public Universities

	Class		Gender			
University	3rd	4th	Male	Female	Total	Percentage
Amasya	36	29	23	42	65	26
Ankara	47	38	40	45	85	34
Hacettepe	55	45	46	54	100	40
Total	138	211	109	141	256	100

4.2.2 Preliminary Analyses

a. Sample Size

Since the precision of model parameter estimation and statistical power are sensitive to the number of sample size, reaching an adequate sample size was considered in this study. In this regard, data were collected from a total of 250 participants, which is the indicative of adequate sample size when considering that as a rule of thumb minimum sample size was suggested to be larger than 100 (N>=100) and at least 5 to 10 cases per parameter (Brown, 2006).

b. Missing Data

In overall 27 cells were detected to be missing in a total of 17250 cells (.16%). When considering missing data in terms of questionnaire and scale level, 18 missing data from the perception scale, 5 missing data from the preference scale and 4 missing data from the learning approach questionnaire were found. Moreover, 237 (94.8%) cases were found to have no missing value. Since the number of missing values and its percentage was a relatively low each missing cell was imputed with the mode of associated dataset.

c. Multivariate Normality

Hair (2009) defined multivariate normality as one of the benchmarks for statistical methods and CFA is known to be one of them. Therefore, Univariate and multivariate normality were considered in this study.

Univariate normality was checked before multivariate normality. For univariate normality, skewness and kurtosis values for each item were checked out and their appropriateness was evaluated according to West, Finch, and Curran (1995). They stated that univariate normality is violated whenever the value of skewness is larger than 2 (Skewness>2) and the value of kurtosis is larger than 7 (kurtosis>7).

Multivariate normality was also inspected by using the multivariate kurtosis value of Mardia's coefficients. For multivariate normality the result of p (p + 2), where p is the number of variable, is required to be larger than the kurtosis value of Mardia's coefficient.

Perception

The result of skewness and Kurtosis values for each variable showed that while the values of skewness index were in the range of .10 to .78, the values of kurtosis index were in the range of .07 to .63. (See Table 4.7)

The result of the analysis of Mardia coefficient showed that measured Mardia's normalized estimate of multivariate kurtosis of 118.25 was less than the value of 675 coming from the above formula, indicating multivariate normality.

Preference

The result of skewness and Kurtosis values for each variable showed that while the values of skewness index were in the range of .73 to 1.29, the values of kurtosis index were in the range of .09 to 1.21. (See Table 4.8)

The result of analysis of Mardia coefficient showed that measured Mardia's normalized estimate of multivariate kurtosis of 489.74 was less than the value of 575 coming from the above formula, indicating multivariate normality.

Learning Approach

The result of skewness and Kurtosis values for each variable showed that while the values of skewness index were in the range of .05 to .79, the values of kurtosis index were in the range of .01 to 1.28. (See Table 4.9)

The result of analysis of Mardia coefficient showed that measured Mardia's normalized estimate of multivariate kurtosis of 52.64 was less than the value of 440 measured from the above formula, indicating multivariate normality.

c. Multicollinearity

Researcher analyzed linear relationship not only among variables but also among factors. Correlation matrix of the variables in the model was inspected for detection of bivariate collinearity among variables. Whenever correlation between two variables was above .90 (>.90), two variables were accepted as highly correlated, resulting in multicollinearity. Analysis of correlation matrix showed that correlation among variables changed from .32 to .82, indicating not multicollinearity.

4.2.3 Multivariate Data Analysis

The purpose of using EFA in this study as noted by Field (2009) is (1) to understand how a set of observed variables is structured, (2) to develop a questionnaire that best measure structured observed variables and (3) to refine dataset to a more manageable size as much as possible either by removing unutilized observed variables or by retaining original observed variables in the dataset.

As noted by Stevens (2009) EFA is initially used for the theory-generating and then generated theory is tested with CFA whether to which extent the tested factor model is best fitted to initially generated factor model. In this study for each perception and preference

scale a factor model was generated after each questionnaire was exposed to EFA. For the scale of perception a factor model comprised of three factors namely “development”, “understandability”, “encouragement” was achieved and each factor were loaded with a set of variables 11, 7 and 7 respectively. For preference scale a factor model composed of one factor with 23 variables was generated after EFA. (See Table 4.3)

Table 4.3 A Provisional Factor Model Generated for Perception

Factors	items
Development	11
Understandability	7
Encouragement	7

CFA was conducted with the purpose of testing the theory or model for a set of variables being structured through EFA by specifying whether variables are correctly loaded on the factors that were previously posited. Moreover, CFA was conducted to identify whether the factors are correlated and the number of factors fixed a priori (Stevens, 2009). Loadings of variables for both perception and preference scale were presented in Table 4.4 and Table 4.5 respectively.

Table 4.4 The Loadings of Perception Scale Variables (CFA)

Variable	Loading
gives direction during revision process	.81
explain how to revise in detail	.77
includes basic tips about how to revise	.78
shows me clearly the place where revision is needed	.77
provides what needs to be done to improve weak sides of performance	.74
gives clues about which direction to look	.78
is effective	.82
is constructive	.79
is well-explained	.79
negative points are given with their justifications	.70
helps me in future projects	.75
is easy to understand	.74
is easy to read (for written feedback)	.78
is easy to revise / practical	.77
is consistent / not contradictory	.82
is relevant to the topic and the problem	.82
draw attention to weak sides of performance	.74
is given based on the previously defined assessment criteria	.72
shows that instructor cares about the work I have done	.78
recognizes the effort I have made	.77
motivates me to revise	.83
is mostly positive	.82
presents negative things in a positive way	.68
has positive tone and manner	.82
has a balance between critical and positive	.79

Table 4.5 The Loadings of Preference Scale Variables (CFA)

Variable	Loading
negative points are given with their justifications	0.87
shows that instructor cares about the work I have done	0.87
is effective	0.87
recognizes the effort I have made	0.86
has positive tone and manner	0.86
motivates me to revise	0.85
helps me in future projects	0.85
is timely	0.84
is useful	0.84
indicates the reason why I receive a particular grade	0.83
is consistent / not contradictory	0.82
is not unnecessary	0.82
is relevant to the topic and the problem	0.81
gives clues about which direction to look	0.77
includes suggestions about how to further improve strong sides of performance	0.77
explain how to revise in detail	0.76
is easy to understand	0.76
is easy to revise / practical	0.76
shows me clearly the place where revision is needed	0.75
is easy to read (for written feedback)	0.75
gives me good and bad examples when needed	0.73
draw attention to strong sides of performance	0.68
provides what needs to be done to improve weak sides of performance	0.26

CFA provided testing model fit of provisional factor models. Since Maximum Likelihood (ML) is one of the most widely used methods for CFA model estimation (Brown, 2006), this study used ML while estimating model in CFA. However, ML has several requirements that need to be considered. Otherwise model may be faced distorted solutions and misspecifications. Brown arranged these requirements as large sample size, measurement of variables on a continuous scale, and multivariate normality (normally distributed data). These three criteria were ensured in this study with a large sample of 250, measurement of variables on ordinal scale and normally distributed variables.

Although there are several goodness-of-fit indices that are available and could be used while evaluating model fit, there is no consensus among researchers on the number of fit indices. The most widely used and recommended fit indices were selected to be reported based on the recommendation by Brown (2006). These classic fit indices are Chi-square ($\chi 2$) (Absolute Fit), Comparative Fit Index (CFI), Tucker Lewis Index (TLI) (Comparative Fit), and Root Mean Square Error of Approximation (RMSEA).

The cutoff criteria were defined for fit indices however these criteria are changed among authors in literature. Similarly Brown (2006, p.86) stated that "which indices should be used?" and "what cutoff criteria should be applied to indicate good and poor model fit?" is still debatable. Yet, there are some authors who recommended some guidelines for comprehensive evaluation of cutoff criteria. Hu and Bentler (1999) is one of them and

according to them CFI and TLI values should be close to or greater than .95 (>=.95), RAMSE values should be close or below .06 (<=.06). However, less than 0.08 value of RMSEA was suggested as adequate model fit by Browne and Cudeck (1993). Moreover, RAMSE value in the rage of .08-0.10 was suggested as "mediocre" fit. With respect to CFI and TLI, Bentler (1990) stated that when value of CFI and TLI is in the rage of .90-.95, it can be indicated as acceptable model fit. In one of the newly published article, Schermelleh-Engel, Moosbrugger, and Muler (2003) suggested recommendations for model evaluation of fit indices. According to their suggestions,

Chi-square ($\chi 2$) value within the range of $0 \leq \chi 2 \leq 2df$ is the indicative of acceptable model fit. Moreover, the value of Chi-square ($\chi 2$) statistic to degrees of freedom (*df*) within the range of $0 \leq \chi 2/df \leq 2$ is indicative of acceptable model fit. Regarding the value of Root Mean Square Error of Approximation, they suggested that the value of RMSEA within the rage of $.05 < \text{RMSEA} \leq .08$ is indicative of acceptable model fit. The cutoff criteria considered for model fit in this study were described in Table 4.6.

The answer to the second research question asking "is there any relationship between students' perceptions/preferences of formative feedback and learning approaches (Deep and Surface)" canonical correlation analysis was conducted. Stevens (2009) stated that canonical correlation "is appropriate if the wish is to parsimoniously describe the number and nature of mutually independent relationships existing between two sets" (p. 395). Therefore, canonical correlation was chosen the most suitable correlation method. Since the assumptions of canonical correlation was not completely satisfied in this study, factor score correlation analysis was also adopted to confirm the results of canonical correlation analysis.

Table 4.6 Criteria for Model Fit

Model fit criterion	Description	Suggested Criteria
Chi-square ($\chi 2$)	"The $\chi 2$ goodness-of-fit statistic assesses the magnitude of the discrepancy between the sample and fitted covariance matrices, and it is the product of the sample size minus one and the minimum fitting function" (Hu & Bentler, 1999, p. 2).	Schermelleh-Engel, Moosbrugger, and Muler (2003) $2df < \chi 2 < 3df$: Acceptable Fit $.01 \leq p \leq .05$: Acceptable Fit $2 < \chi 2/df \leq 3$: Acceptable Fit
Comparative Fit Index (CFI)	"The CFI is defined as the ratio of improvement in noncentrality (moving from the null to the proposed model) to the noncentrality of the null model" (Raykov & Marcoulides, 2000, p. 41)	CFI > .90 and < .95 (indicative of acceptable model fit) (Bentler, 1990)
Tucker Lewis Index (TLI)	"The measure can be used to compare alternative models or a proposed model against a null model"(Schumacker & Lomax, 2004, p. 103)	95 ≥TLI ≥.90 (indicative of acceptable model fit) (Bentler, 1990)
Root Mean Square Error Of Approximation (RMSEA)	"The RMSEA is a population-based index that relies on the noncentral $\chi 2$ distribution, which is the distribution of the fitting function...when the fit of the model is not perfect....The RMSEA is an 'error of approximation' index because it assesses the extent to which a model fits reasonably well in the population (as opposed to testing whether the model holds exactly in the population; cf. $\chi 2$)" (Brown, 2006, p. 83).	**a.** $05 < RMSEA \leq .08$: Acceptable Fit (Schermelleh-Engel, Moosbrugger, and Muler ,2003) **b.** $RMSEA \leq .05$: Close fit $.05 \leq RMSEA \leq .08$: Fair Fit $RMSEA \geq .10$: Poor fit (Browne & Cudeck, 1993)

4.2.4 Descriptive Results

a. Perceptions

CEIT 3rd and 4th year undergraduate students were asked to reflect their perceptions to formative feedback given to them during project-based course on five-point Likert-scale (1= "Never", 2="Rarely", 3="Occasionally", 4="Frequently", 5= "Very Frequently"). Students evaluated quality of formative feedback in wider range based on three domains: developmental, understandability, encouragement. A number of concerns related to formative feedback were identified by students. As seen in Table 4.7, half of the participants (N=127) perceived that formative feedback provided frequently gives direction during revision process. However, According to fewer participants (N=96), received formative feedback is occasionally easy to revise and practical. Even though positive feedback is occasionally given (N=89), 46.4% of the participants frequently agreed with the statement that formative feedback provided for written artifacts is easy to read. Almost half of them (N=117) perceived that formative feedback provided frequently draw attention to weak side of performance. Furthermore, 36% of the participants occasionally agreed with the statements that received formative feedback explain how to revise in detail. Almost the same percentage of the participants (37%) reflected that in received formative feedback, negative points with their justification are occasionally given. Considering the perceptions of the students toward formative feedback, formative feedbacks with developmental focus such as suggesting strategies, transferability, and engaging content and the formative feedbacks with understandability focus such as transparency, clarity, and justification of mark were perceived to be given frequently. However, formative feedback with encouragement focus such as acknowledging achievements, giving hopes, and recognizing efforts were perceived to be received either occasionally or frequently. (See Table 4.7)

Table 4.7 Formative Feedback Perceptions: Mean, SD, Frequencies and Percentages, Skewness, Kurtosis

Variables	M	SD	Never *f* (P)	Rarely *f* (P)	Occasionally *f* (P)	Frequently *f* (P)	Very Frequently *f* (P)	Skewness	Kurtosis
draw attention to weak sides of performance	3.49	0.94	9 (3.6%)	26 (10.4%)	73 (29.2%)	117 (46.8%)	25 (10%)	-0.66	0.26
helps me in future projects	3.47	1.12	14 (5.6%)	36 (14.4%)	64 (25.6%)	90 (36%)	46 (18.4%)	-0.45	-0.51
is easy to read (for written feedback)	3.46	0.95	11 (4.4%)	26 (10.4%)	74 (29.6%)	116 (46.4%)	23 (9.2%)	-0.69	0.26
gives direction during revision process	3.45	0.97	11 (4.4%)	32 (12.8%)	60 (24%)	127 (50.8%)	20 (48%)	-0.77	0.13
is relevant to the topic and the problem	3.45	0.95	12 (4.8%)	26 (10.4%)	70 (28%)	122 (48.8%)	20 (8%)	-0.78	0.34
shows that instructor cares about the work I have done	3.45	1.13	14 (5.6%)	37 (14.8%)	70 (28%)	80 (32%)	49 (19.6%)	-0.37	-0.61
is constructive	3.41	1.04	14 (5.6%)	29 (11.6%)	82 (32.8%)	91 (36.4%)	34 (13.6%)	-0.45	-0.19
is effective	3.4	1.06	13 (5.2%)	37 (14.8%)	69 (27.6%)	98 (39.2%)	33 (13.2%)	-0.45	-0.38
is given based on the previously defined assessment criteria	3.39	0.99	13 (5.2%)	25 (10%)	91 (36.4%)	93 (37.2%)	28 (11.2%)	-0.47	0.07
recognizes the effort I have made	3.38	1.17	20 (8%)	34 (13.6%)	73 (29.2%)	77 (30.8%)	46 (18.4%)	-0.38	-0.61
includes basic tips about how to revise	3.37	0.9	8 (3.2%)	31 (12.4%)	89 (35.6%)	105 (42%)	17 (6.8%)	-0.5	0.08
motivates me to revise	3.36	1.11	21 (8.4%)	31 (12.4%)	67 (26.8%)	100 (40%)	31 (12.4%)	-0.56	-0.34
is well-explained	3.34	0.98	11 (4.4%)	35 (14%)	87 (34.8%)	93 (37.2%)	24 (9.6%)	-0.38	-0.19
gives clues about which direction to look	3.32	0.95	7 (2.8%)	47 (18.8%)	72 (28.8%)	107 (42.8%)	17 (6.8%)	-0.4	-0.48

Table 4.7 (Continued)

provides what needs to be done to improve weak sides of performance	3.31	0.93	12 (4.8%)	30 (12%)	91 (36.4%)	103 (41.2%)	14 (5.6%)	-0.59	0.15
is consistent / not contradictory	3.28	1.01	13 (5.2%)	41 (16.4%)	80 (32%)	95 (38%)	21 (8.4%)	-0.39	-0.35
is easy to understand	3.23	0.94	8 (1.2%)	46 (18.4%)	96 (38.4%)	81 (32.4%)	19 (7.6%)	-0.15	-0.36
is easy to revise / practical	3.21	0.99	13 (5.2%)	41 (16.4%)	96 (38.4%)	80 (32%)	20 (8%)	-0.26	-0.26
explain how to revise in detail	3.17	1	16 (6.4%)	43 (17.2%)	90 (36%)	85 (34%)	16 (6.4%)	-0.34	-0.34
has a balance between critical and positive	3.14	1.05	23 (9.2%)	39 (15.6%)	82 (32.8%)	92 (36.8%)	14 (5.6%)	-0.47	-0.44
negative points are given with their justifications	3.13	1	14 (5.6%)	50 (20%)	92 (36.8%)	77 (30.8%)	17 (6.8%)	-0.19	-0.43
has positive tone and manner	3.1	1.02	20 (8%)	43 (17.2%)	94 (37.6%)	78 (31.2%)	15 (6%)	-0.32	-0.37
shows me clearly the place where revision is needed	3.09	0.94	15 (6%)	44 (17.6%)	105 (42%)	76 (30.4%)	10 (4%)	-0.32	-0.18
is mostly positive	3.07	1.07	24 (9.6%)	45 (18%)	89 (35.6%)	74 (29.6%)	18 (7.2%)	-0.25	-0.53
presents negative things in a positive way	2.69	1.1	43 (17.2%)	60 (24%)	92 (36.8%)	42 (16.8%)	13 (5.2%)	0.1	-0.63

Note. After imputation of missing values; M: Mean; SD: Standard Deviation

b. Preferences

Students were asked to express their preferences to formative feedback given to them on their projects and artifacts on a 1-5 Liker scale with 1=”Never”, 2=“Rarely”, 3=”Occasionally”, 4=”Frequently”, 5=”Very Frequently”. As can be seen in Table 4.8, the means ranging 3.97 to 4.18 showed that students have a high preference toward formative feedback types described in Table 4.8. Specifically, almost half of the students (N=120) very frequently preferred to take formative feedbacks that they could use with future projects. It seems that formative feedback that has encouraging effects is preferred to be given very frequently. That is, 48% of the students preferred to receive formative feedbacks very frequently which shows that instructor cares about the work they have done. Formative feedback that recognized the effort students have made on project and reports was preferred to be given very frequently by 117 participants. Regarding the tone of formative feedback, 43% of participants very frequently prefer to receive formative feedback in positive tone and manner. Related to developmental focus of formative feedback, almost half of the participants (N=120) very frequently prefer to receive formative feedback which gives clues about which direction to look in project and report. Moreover, formative feedback which provides detailed explanation regarding how to revise project or report was preferred to be given very frequently by 113 students. Students’ responses related to clarity and understandability of formative feedback showed that 106 students very frequently preferred to receive consistent rather than contradictory formative feedback on projects and reports. Furthermore, 42% of the students very frequently preferred to receive feedback type which is not unnecessary. (See Table 4.8)

Table 4.8 Formative Feedback Preferences: Mean, SD, Frequencies and Percentages, Skewness, Kurtosis

Variables	M	SD	Never f (P)	Rarely f (P)	Occasionally f (P)	Frequently f (P)	Very Frequently f (P)	Skewness	Kurtosis
helps me in future projects	4.18	0.98	3 (1.2%)	16 (6.4%)	35 (14%)	76 (30.4%)	120 (48%)	-1.09	0.5
motivates me to revise	4.17	0.98	6 (2.4%)	8 (3.2%)	43 (17.2%)	74 (29.6%)	119 (48%)	-1.16	1
is effective	4.16	0.92	3 (1.2%)	11 (4.4%)	38 (15.2%)	89 (35.6%)	109 (44%)	-1.04	0.73
is relevant to the topic and the problem	4.15	0.87	2 (.8%)	14 (5.6%)	25 (10%)	113 (45.2%)	96 (38.4%)	-1.1	1.14
recognizes the effort I have made	4.15	1.03	7 (2.8%)	16 (6.4%)	26 (10.4%)	84 (33.6%)	117 (47%)	-1.29	1.13
is not unnecessary	4.14	0.93	4 (1.6%)	9 (3.6%)	4 (16.4%)	9 (36.4%)	10 (42%)	-1.04	0.89
is useful	4.13	0.9	2 (.8%)	12 (4.8%)	40 (16%)	94 (37.6%)	102 (40.8%)	-0.91	0.41
shows that instructor cares about the work I have done	4.13	1.02	5 (2%)	14 (5.6%)	43 (17.2%)	69 (27.6%)	119 (48%)	-1.05	0.43
is consistent / not contradictory	4.12	0.94	4 (1.6%)	9 (3.6%)	45 (18%)	86 (34.4%)	106 (42%)	-0.99	0.67
has positive tone and manner	4.11	0.96	5 (2%)	9 (3.6%)	46 (18.4%)	83 (33.2%)	107 (43%)	-1.02	0.72
is easy to read (for written feedback)	4.09	0.88	2 (.8%)	12 (4.8%)	37 (14.8%)	109 (43.6%)	90 (36%)	-0.9	0.65
gives clues about which direction to look	4.08	0.88	3 (1.2%)	13 (5.2%)	30 (12%)	120 (48%)	84 (33.6%)	-1.05	1.21
negative points are given with their justifications	4.08	1.05	5 (2%)	20 (8%)	38 (15.2%)	75 (30%)	112 (45%)	-1	0.21

Table 4.8 (Continued)

provides what needs to be done to improve weak sides of performance	4.06	0.95	5 (2%)	8 (3.2%)	51 (20.4%)	88 (35.2%)	98 (39.2%)	-0.92	0.62
gives me good and bad examples when needed	4.06	0.96	4 (1.6%)	11 (4.4%)	50 (20%)	86 (34.4%)	99 (39.6%)	-0.87	0.34
includes suggestions about how to further improve strong sides of performance	4.05	0.96	5 (2%)	14 (5.6%)	37 (14.8%)	102 (40.8%)	92 (36.8%)	-1.03	0.83
shows me clearly the place where revision is needed	4.04	0.89	3 (1.2%)	10 (4.0%)	46 (18.4%)	105 (42%)	86 (34.4%)	-0.84	0.58
draw attention to strong sides of performance	4.04	0.89	4 (1.6%)	8 (3.2%)	47 (18.8%)	107 (42.8%)	84 (33.6%)	-0.89	0.87
is easy to understand	4.04	0.89	3 (1.2%)	9 (3.6%)	50 (20%)	102 (40.8%)	86 (34.4%)	-0.79	0.46
is timely	4.03	1.06	9 (3.6%)	15 (6%)	37 (14.8%)	88 (35.2%)	101 (40.4%)	-1.1	0.71
explain how to revise in detail	4	0.87	2 (.8%)	12 (4.8%)	47 (18.8%)	113 (45%)	76 (30.4%)	-0.73	0.36
indicates the reason why I receive a particular grade	3.98	1.12	13 (5.2%)	15 (6%)	35 (14%)	88 (35.2%)	99 (40%)	-1.13	0.65
is easy to revise / practical	3.97	0.97	4 (1.6%)	15 (6%)	53 (21.2%)	91 (36.4%)	87 (34.8%)	-0.75	0.09

Note. After imputation of missing values; M: Mean; SD: Standard Deviation

c. Learning Approaches

Students were asked to rate the extent to which they agree with the each statemnts described in Table 4.12 on a 1-5 Liker scale with 1=”Never”, 2=“Sometimes”, 3=”Half of the time”, 4=”Frequently”, 5=”Always”. Related to the items indicating deep learning level of students, majority of students (N=136) rated frequently the item “I find that I have to do enough work on a topic so that I can form my own conclusions before I am satisfied.” Students frequently thought that “I find that at times studying gives me a feeling of deep personal satisfaction” (40%) and half of the time thought that “I feel that virtually any topic can be highly interesting once I get into it” (41%), “I find most new topics interesting and often spend extra time trying to obtain more information about them” (46%), and “I come to most classes with questions in mind that I want answering” (35%). Regarding the items indicating surface learning level of students, students half of the time thought that “I see no point in learning material which is not likely to be in the examination” (N=92). “I find it is not helpful to study topics in depth. It confuses and wastes time, when all you need is a passing acquaintance with topics”(N=91), and “I find I can get by in most assessments by memorizing key sections rather than trying to understand them”(N=83). (See Table 4.9)

Table 4.9 Learning Approaches: Mean, SD, Frequencies and Percentages, Skewness, Kurtosis

Variables	M	SD	Never f (P)	Rarely f (P)	Occasionall f (P)	Frequently f (P)	Very Frequently f (P)	Skewness	Kurtosis
I find that I have to do enough work on a topic so that I can form my own conclusions before I am satisfied.	3.92	0.8	3 (1%)	8 (3%)	49 (20%)	136 (54%)	54 (22%)	-0.79	1.28
I work hard at my studies because I find the material interesting.	3.53	1.04	29 (12%)	74 (30%)	88 (35%)	51 (20%)	8 (3%)	-0.32	-0.54
I find most new topics interesting and often spend extra time trying to obtain more information about them.	3.41	0.98	13 (5%)	38 (15%)	114 (46%)	67 (27%)	18 (7%)	-0.48	-0.13
I find that at times studying gives me a feeling of deep personal satisfaction.	3.33	0.94	11 (4%)	32 (13%)	88 (35%)	101 (40%)	18 (7%)	-0.51	0.01
I make a point of looking at most of the suggested readings that go with the lectures.	3.3	1.14	11 (4%)	49 (20%)	86 (34%)	81 (32%)	23 (9%)	-0.36	-0.58
I generally restrict my study to what is specifically set as I think it is unnecessary to do anything extra.	3.23	0.97	17 (7%)	72 (29%)	78 (31%)	58 (23%)	25 (10%)	-0.39	-0.43
I test myself on important topics until I understand them completely.	3.22	1.01	10 (4%)	33 (13%)	78 (31%)	103 (41%)	26 (10%)	-0.18	-0.51
I only study seriously what's given out in class or in the course outlines.	3.16	0.95	11 (4%)	47 (19%)	80 (32%)	98 (39%)	14 (6%)	-0.18	-0.02
I find that studying academic topics can at times be as exciting as a good novel or movie.	3.14	1.03	34 (14%)	50 (20%)	83 (33%)	65 (26%)	18 (7%)	-0.17	-0.54
My aim is to pass the course while doing as little work as possible.	3.13	0.99	21 (8%)	70 (28%)	65 (26%)	60 (24%)	34 (14%)	-0.16	-0.28
I find I can get by in most assessments by memorizing key sections rather than trying to understand them.	3.06	1.18	41 (16%)	83 (33%)	65 (26%)	50 (20%)	11 (4%)	0.07	-0.95

Table 4.9 (Continued)

I believe that lecturers shouldn't expect students to spend significant amounts of time studying material everyone knows won't be examined.	3.01	1.09	21 (8%)	37 (15%)	75 (30%)	81 (32%)	36 (14%)	0.13	-0.74
I see no point in learning material which is not likely to be in the examination.	2.95	1.11	26 (10%)	58 (23%)	92 (37%)	50 (20%)	24 (10%)	0.06	-0.59
I feel that virtually any topic can be highly interesting once I get into it.	2.93	1.14	15 (6%)	45 (18%)	102 (41%)	69 (28%)	19 (8%)	-0.13	-0.76
I spend a lot of my free time finding out more about interesting topics which have been discussed in different classes.	2.93	1.13	35 (14%)	60 (23%)	81 (32%)	61 (24%)	13 (5%)	-0.22	-0.84
I learn some things by rote, going over and over them until I know them by heart even if I do not understand them.	2.83	1.11	35 (14%)	50 (20%)	76 (30%)	75 (30%)	14 (6%)	-0.05	-0.79
I come to most classes with questions in mind that I want answering.	2.8	1.11	15 (6%)	52 (21%)	87 (35%)	76 (30%)	20 (8%)	0.05	-0.63
I find the best way to pass examinations is to try to remember answers to likely questions.	2.8	1.23	46 (18%)	58 (23%)	69 (28%)	55 (22%)	22 (9%)	0.08	-0.97
I do not find my course very interesting so I keep my work to the minimum.	2.74	1.01	7 (2%)	35 (14%)	74 (30%)	86 (34%)	48 (19%)	0.05	-0.6
I find it is not helpful to study topics in depth. It confuses and wastes time, when all you need is a passing acquaintance with topics.	2.63	1.11	36 (14%)	5 (24%)	91 (36%)	48 (19%)	16 (6%)	0.24	-0.79

Note. After imputation of missing values; M: Mean; SD: Standard Deviation

4.2.5 Evaluation of Factor Model

Assessment of model fit deals with testing the commonly used multiple goodness of fit indices including Chi-square ($\chi 2$) statistics, Comparative Fit Index (CFI), Tucker Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA). For each perception and preference scale, factor model was assessed by using the above goodness of fit indices. The cutoff criteria considered for each fit indices were presented in criteria of model fit table. (See Table 4.6)

Perception

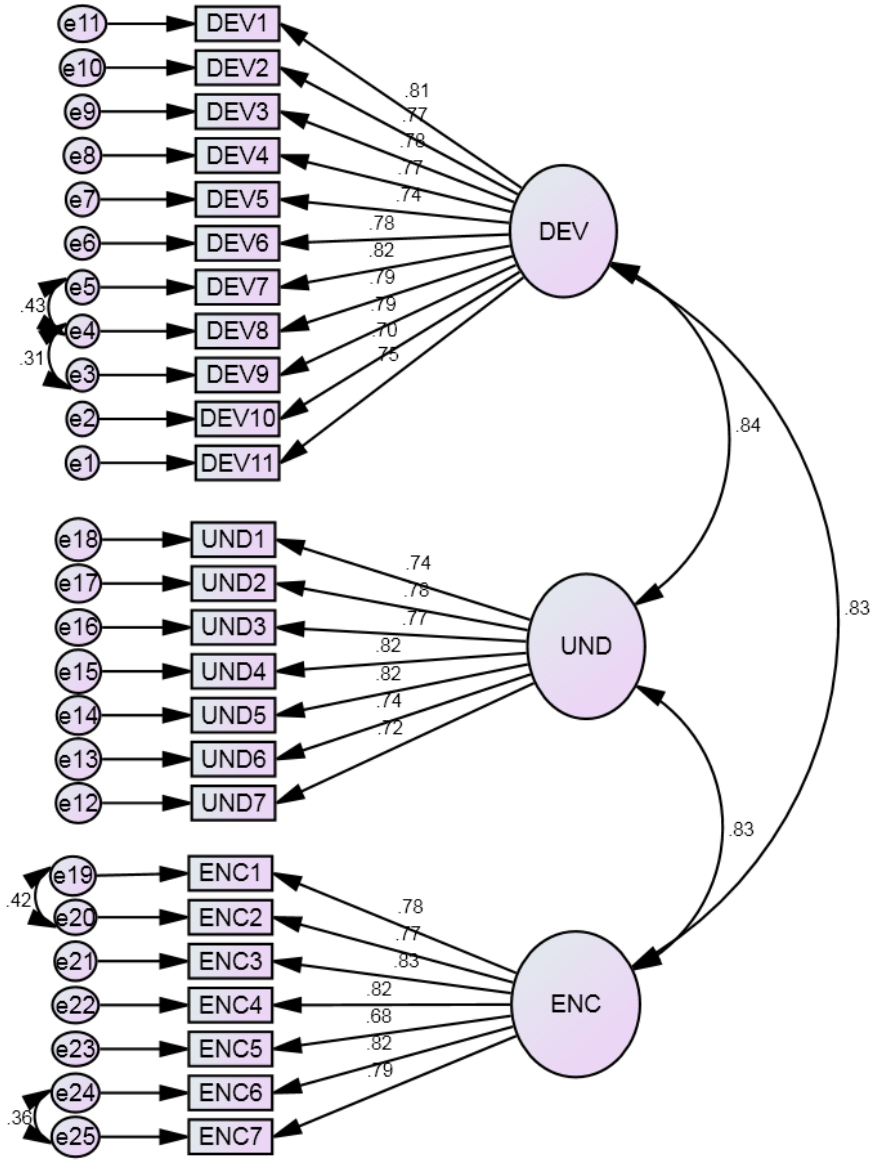
The initial estimation of factor model indicated the Chi-square ($\chi 2$) value of 819.67 with the 272 degrees of freedom, CFI value of .89, TLI value of .88, and RAMSE value of .09. None of values satisfied acceptable model fit. The causes of misspecification of model fit can be associated with the high covariance between error terms. Therefore, modification indices were inspected for large error terms that tended to cause ill fit. Because, factor analysis allows researcher remedy covariate error terms found to be higher between two observed variables in order to refine the model as much as possible. A review of modification indices indicated that four error terms deserved attention.

Descriptive information about which error terms of observed variables were subjected to covariate and the changes occurred in values of fit indices was presented in Table 4.10. The final estimation of factor model revealed the Chi-square ($\chi 2$) value of 670.91 with the 268 degrees of freedom, CFI value of .92, TLI value of .91, and RAMSE value of .078. Except non-significant value of $\chi 2$, other values indicated acceptable model fit. (See Table 4.10, Table 4.11, Figure 11)

Table 4.10 The Summary of Post Hoc Factor Model Modification

	Factor Model	M.I.	χ^2	df	CFI	TLI	RMSEA	Model Comparison
0	Hypothezed	--	819.67	272	.89	.88	.090	--
1	covariate[a]	e19 <--> e20	720.88	271	.90	.89	.086	0 vs. 1
2	covariate[b]	e4 <--> e5	722.73	270	.91	.90	.082	1 vs. 2
3	covariate[c]	e3 <--> e4	694.97	269	.91	.91	.080	2 vs. 3
4	covariate[d]	e24 <--> e25	670.91	268	.92	.91	.078	3 vs. 4

Note. M.I. Modification Indices; a. The error covariance between ENC1 and ENC2; b. The error covariance between DEV7 and DEV8; c. The error covariance between DEV8 and DEV9; d. The error covariance between ENC6 and ENC7; e. Measurement errors found to be high were covariated; $\chi 2$. Chi-square; CFI. Comparative Fit Indices; TLI. Tucker Lewis Index; RMSEA. Root Mean Square Error of Approximation



Note. DEV: Development; UND: Understandability; ENC: Encouragement

Figure 4.11 Standardized Parameter Estimates For Finalized Factor Model (Perception)

Table 4.11 Confirmatory Factor Analysis Results for perception Scale

Model fit criterion	Results	Suggested Criteria	Satisfaction
Chi-square ($\chi 2$)	$\chi 2 = 670.91$	a. $2df < \chi 2 \leq 3df$: Acceptable Fit (Schermelleh-Engel, Moosbrugger, and Muler ,2003)	a. Satisfies
	df= 268	b. Non-significant value of $\chi 2$ (Schumacker & Lomax, 2004)	b. Does not satisfy
	p .00		
	$\chi 2$ /df= 2.5	c. $2 < \chi 2/df \leq 3$: Acceptable Fit (Schermelleh-Engel, Moosbrugger, and Muler ,2003)	c. Satisfies
Comparative Fit Index (CFI)	.92	a. CFI > .90 and < .95 (indicative of acceptable model fit) (Bentler, 1990)	a. Satisfies (According to Bentler)
Tucker Lewis Index (TLI)	.91	a.95 ≥TLI ≥.90 (indicative of acceptable model fit) (Bentler, 1990)	b. Satisfies (According to Bentler)
Root Mean Square Error Of Approximation (RMSEA)	.078	a. 05 < RMSEA ≤ .08 : Acceptable Fit (Schermelleh-Engel, Moosbrugger, and Muler ,2003)	a. satisfies
		b. RMSEA ≤ .05 : Close fit .05 ≤ RMSEA ≤ .08 : Fair Fit	b. Fair fit
		RMSEA ≥.10 : Poor fit (Browne & Cudeck, 1993)	
		c. .08 ≤ RMSEA ≤ .10 : "Mediocre fit" (MacCallum et al., 1996)	c. Does not satisfy

Preference

The initial estimation of factor model indicated the Chi-square ($\chi 2$) value of 1011.11 with the 230 degrees of freedom, CFI value of .86, TLI value of .85, and RAMSE value of .117. None of the values of fit indices indicated acceptable model fit. However, a review of modification indices indicated that a covariate between error terms deserved attention.

Descriptive information about which error terms of obs erved variables were subjected to covariate and the changes occurred in values of fit indices was presented in Table 4.12. The

final estimation of factor model revealed the Chi-square ($\chi 2$) value of 726.8 with the 226 degrees of freedom, CFI value of .91, TLI value of .90, and RAMSE value of .094. As can be seen in Table 4.13 all of the measured fit indices values indicated that hypothezed model was mediocre fitted.

Table 4.12 The Summary of Post Hoc Factor Model Modification

	Factor Model	M.I.	$\chi 2$	df	CFI	TLI	RMS EA	Model Comparison
0	Hypothezed	--	1011.1	230	.86	.85	.117	--
1	covariate[a]	e22 <--> e23	885.6	229	.88	.87	.107	0 vs. 1
2	covariate[b]	e15 <--> e16	827.6	228	.90	.88	.103	1 vs. 2
3	Covariate[c]	e19 <--> e20	771.6	227	.91	.89	.098	2 vs. 3
4	Covariate[d]	e4 <--> e5	726.8	226	.91	.90	.094	3 vs. 4

Note. M.I. Modification Indices; a. The error covariance between e22 and e23; b. The error covariance between e15 and e16; c. The error covariance between e19 and e20; d. The error covariance between e4 and e5; $\chi 2$. Chi-square; CFI. Comparative Fit Indices; TLI. Tucker Lewis Index; RMSEA. Root Mean Square Error of Approximation

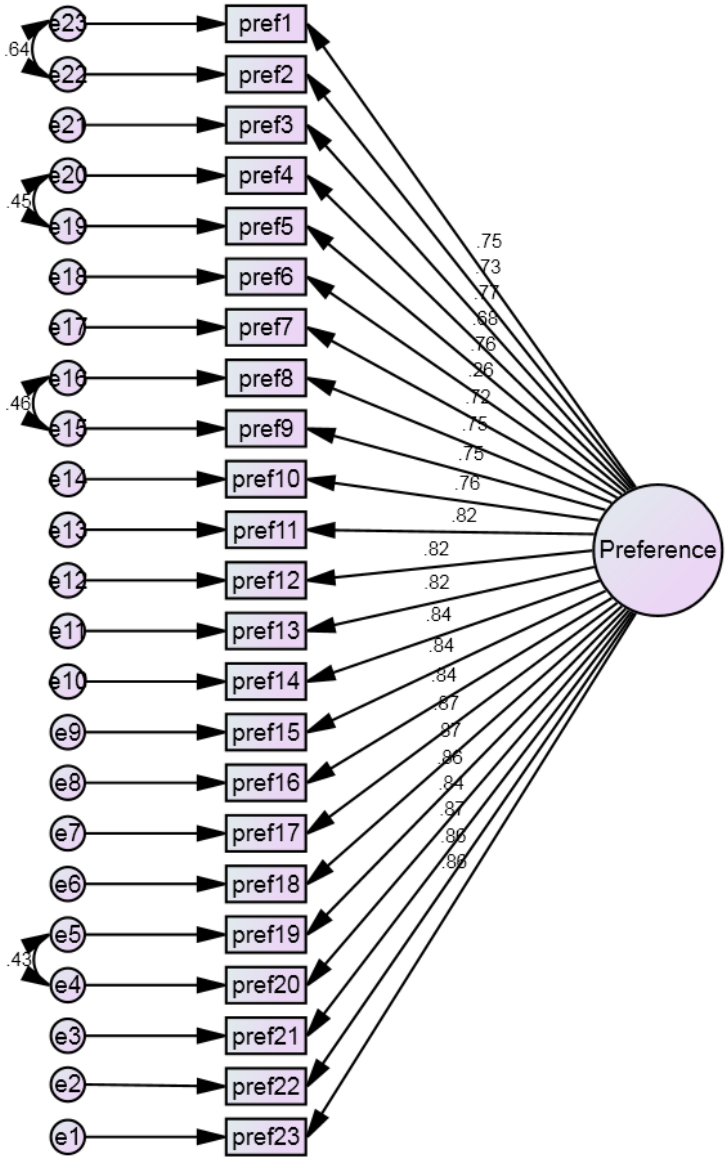


Figure 4.12 Standardized Parameter Estimates For Finalized Factor Model (Preference)

Table 4.13 Confirmatory Factor Analysis Results for Preference Scale

Model fit criterion	Results	Suggested Criteria	Satisfaction
Chi-square ($\chi 2$)	$\chi 2$ = 726.8 df= 226 p .00 $\chi 2$ /df= 3.2	a. $2df < \chi 2 \leq 3df$: Acceptable Fit (Schermelleh-Engel, Moosbrugger, and Muler ,2003) b. Non-significant value of $\chi 2$ (Schumacker & Lomax, 2004) c. $2 < \chi 2/df \leq 3$: Acceptable Fit (Schermelleh-Engel, Moosbrugger, and Muler ,2003)	a. Does not satisfies b. Does not satisfy c. Does not satisfy
Comparative Fit Index (CFI)	.91	a. CFI > .90 and < .95 (indicative of acceptable model fit) (Bentler, 1990)	a. Satisfies (According to Bentler)
Tucker Lewis Index (TLI)	.90	a.95 ≥TLI ≥.90 (indicative of acceptable model fit) (Bentler, 1990)	b. Satisfies (According to Bentler)
Root Mean Square Error Of Approximation (RMSEA)	.094	a. 05 < RMSEA ≤ .08 : Acceptable Fit (Schermelleh-Engel, Moosbrugger, and Muler ,2003) b. RMSEA ≤ .05 : Close fit .05 ≤ RMSEA ≤ .08 : Fair Fit RMSEA ≥.10 : Poor fit (Browne & Cudeck, 1993) c. .08 ≤ RMSEA ≤ .10 : "Mediocre fit" (MacCallum et al., 1996)	a. Does not satisfy b. Does not satisfy c. Satisfy

4.2.6 Canonical and Factor Score Correlation

Both statistical analyses, canonical correlation and factor score correlation, were employed to measure the extent to which students' formative feedback perceptions and preferences were correlated with their approaches to learning. Initial analysis started with canonical correlation analysis. Testing of canonical correlation assumptions indicated that except minimum sample size required for canonical correlation analysis the other assumptions such as univariate and multivariate normality, no multicollinearity were met. Regarding sample size for canonical correlation, Stevens (1986) recommended that in order to reach reliable estimates of canonical factor loadings and obtain robust results sample size should be at least 20 times as many cases as variables. Otherwise, any interpretation and conclusion drawn from the canonical correlation results could be lack of reliability. Therefore, factor score correlation analysis was also applied together with canonical correlation analysis to obtain more reliable results.

a. Canonical Correlation

Answer to the second question of this study canonical correlation analysis was adopted to analyze the linear relationship of students' learning approaches to their formative feedback perceptions and preferences. Canonical correlation was suggested as an appropriate method when the aim is to "to parsimoniously describe the number and nature of mutually independent relationships existing between two sets" (Stevens, 2009, p.395). Like other multivariate statistical methods, canonical correlation analysis requires the meeting of some assumptions like multivariate outliers. The procedures followed while screening dataset for perception scale, preference scale, and learning approach scale separately were identified at the section of methodology under the quantitative data phase.

While determining the significant level of correlation coefficient during canonical correlation analysis, the criteria that were suggested by Tabachnick and Fidell in 1996 were employed. Accordingly, only canonical correlations whose canonical correlation coefficient (R) exceeded the value of .30 and statistically significant ($p < .05$) were retained and considered significant. Regarding canonical loadings for both set1 and set2, only loadings whose values were larger than .30 were taken into consideration in comparing correlation among two sets.

Descriptive information of canonical correlation analysis concerning with set of students'' learning approaches and their formative feedback perceptions was presented in Table 4.14. First and first, canonical correlation coefficient (R) was checked and found to both larger than .30 (R=381) and statistically significant ($p=.00$, $p < .05$). Secondly, in order to identify loading of factor in each set1 and set2, values under canonical loadings for set1 and set2 were inspected with respect to whether canonical loadings were above the value of .30, if it was than what sign, positive or negative, loading had was analyzed. While large number is the indicative of strong correlation, sign is the indicative of direction of correlation.

Result of canonical correlation analysis indicated that bot deep and surface learning are significantly correlated with students' formative feedback perceptions. More specifically, the pattern of structure coefficients in the first variate relates high preference for deep learning

and low preference for surface learning with high preference for development, understandability and encouragement factors respectively.

Besides, Table 4.14 showed that while proportion of variance of set-1 explained by its own was .500, proportion of variance of set-1 explained by opposite (set-2) was .073. Furthermore, while proportion of variance of set-2 explained by its own was .753, proportion of variance of set-2 explained by opposite (set-1) was .109.

Table 4.14 Correlations and Standardized Canonical Coefficients for Perceptions and Learning Approaches scale

		First Canonical Variate	
		Correlation	Coefficient
Set-1			
	DL	-0.91	-0.90
	SL	-0.44	-0.42
	Percent of variance	0.51	
	Redundancy	0.07	
Set-2			
	DEV	-0.84	-0.18
	UND	-0.80	-0.02
	ENC	-0.99	-0.84
	Percent of variance	0.77	
	Redundancy	0.11	
	Canonical correlation	0.38 (p=.000)	

Note. Set 1: A set of variables for learning approaches; Set 2: A set of variables for perceptions; DL: Deep Learning; SA: Surface Learning; DEV: Development; Und: Understandability; ENC: Encouragement.

b. Factor Score Correlation

In addition to canonical correlation technique, factor score correlation technique was also used to analyze the association of learning approaches, with formative feedback perceptions and formative feedback preferences. The premise was that supporting the results of canonical correlation with the results of factor score correlation analysis would yield more reliable and robust results. As can be seen in Table 4.15, surface learning was not correlated with any factors, whereas deep learning was significantly associated with the development (r(250)= .26, p<.00), understandability (r(250)= .28, p<.00) and encouragement (r(250)= -.35, p<.00) factors. Although the correlation of deep learning with development and understandability factors is positive, encouragement factor was negatively correlated with deep learning. As a result, students with deep approach tend to have high appreciation to formative feedback types ranged under the development and understandability factors, low appreciation to formative feedback types ranged under the encouragement factor.

Regarding the correlation between learning approaches and formative feedback preferences, Table 4.19 showed that while deep learning was significantly correlated with formative feedback preferences(r(250)= .20, p<.00), surface learning did not(r(250)= .01, p<.862),

indicating that students with deep learning approach have predisposition towards having high preference to formative feedback. (See Table 4.16)

Since several dependent and independent variables were correlated simultaneously for a single data set, Bonferroni Correction was used during factor score correlation analysis and critical *p* value was divided by the number of comparisons being made. Therefore, for factor score correlation analysis between perceptions and learning approaches *p* vale of .05 and .01 was divided by 6 measured when comprising deep learning or surface learning to development, understandability, and encouragement factors. During factor score correlation analysis between preferences and learning approaches *p* vale of .05 and .01 was divided by 3 measured when comprising preference to deep and surface learning.

Table 4.15 Factor Score Correlation for Perceptions and Learning Approaches

	Deep Learning	Surface Learning
Development	.26** (*p*=. 00)	.15* (*p*=. 02)
Understandability	.28** (*p*=. 00)	.15* (*p*=. 02)
Encouragement	-.35** (*p*=. 00)	-.14* (*p*=. 07)

Note. Significant *$p<.008$, **$p<.002$, two-tailed.

Table 4.16 Factor Score Correlation for Preferences and Learning Approaches

	Deep Learning	Surface Learning
Preference	.20** (*p*=. 001)	.01 (*p*=. 862)

Note. Significant **$p<.003$, two-tailed.

CHAPTER 5

DISCUSSION

There were two main purposes of this study. While the first one was to investigate perceptions and preferences of CEIT 3rd and 4th year students toward formative feedback (Written and Oral) provided by instructors, teaching assistants, and peers on their projects and reports., the second one was to investigate the relationship of these perceptions and preferences with students' learning approaches (Deep and Surface).

5.1 Formative Feedback Perceptions

Students' perceptions of formative feedback were investigated with respect to three domains which are called factors in this study. Those were development, understandability, and encouragement of formative feedback. Students' perceptions of formative feedback were suggested to be meaningfully understood in terms of these three dimensions (Lizzio and Wilson, 2008). Students reflected their perceptions of formative feedback provided in projects and reports by considering these three dimensions. Lizzio and Wilson (2008) in their study explored similar domains after theming students' written descriptions of the types and quality of written feedback provided on their assignment. Beside the domain of development and encouragement, they used the domain of "justice" that describes the justification of mark, transparency, opportunity for voice, and clarity. However, this study resulted in the domain of "understandability" that describes how easy to understand, read, revise feedback, and whether feedback is consistent or relevant. Moreover, under the domain of development Lizzio and Wilson focused on transferability, goals, and strategies. Similarly, this study results focused more on effectiveness of feedback on project and report revision process and students' project and report performances.

Regarding how students perceived instructor, teaching assistant, and peer formative feedback, results showed that half of the students frequently or very frequently perceived that provided formative feedback draws attention to the weak sides of performance and helps students improve these sides Regarding perceptions of formative feedback students utilized during revisions, 50.8% of them rated that formative feedback frequently gives directions during revision process. However, the same number of students was not happy with the formative feedback that directs them where revisions is needed, and explain them in detail how to revise the parts of the project and report that needed revision. Participants also reflected their perceptions with respect to understandability of formative feedback in project based courses. According to frequencies and percentages, most of the participants perceived that formative feedback provided was easy to read (written feedback only) and relevant to the topic and problem. Yet, the same number of participant rated that formative feedback that is consistent, easy to understand, and easy to revise were not given.

Students' beliefs and thoughts about the importance of feedback in their learning have been reported in many research studies. Qualitative results of the study showed that all students

are aware of the importance of formative feedback for their project and report development. They also thought that formative feedback given in project based courses does not only help them develop their project and reports but also help them to improve their learning and understanding. According to participants, what makes formative feedback very important for them is that formative feedback given many times at different stages of their project helps them move to the next stage with an understanding of their previous mistakes.

Descriptive analysis results indicated that participants categorized people who provide formative feedback in project based courses under four sources: instructor, teaching assistant, peer, and anyone who can give feedback. There seems to be variations in students' perceptions and preferences toward different feedback providers'. Even though students are generally content with instructors' formative feedback compared with teaching assistant and peer feedback, there are varying perceptions in instructors' feedback quality. Participants highlighted that every feedback coming from instructors was not necessarily helpful. There are some instructors whose feedback was not helpful many times or half of time. The same situation was also described for teaching assistant and peer feedback. Such variations in quality of feedback provided may be derived from feedback providers' lack of knowledge and experience about subject and feedback practices ,because; qualitative results indicated that almost all of the participants preferred to take feedback from the people who are perceived to be equipped with disciplinary and specific knowledge. Instructors were viewed among those people. This was supported by previous studies (London & Sessa, 2006). London and Sessa in their analysis of relationship between feedback, group learning and performance stated that "feedback is likely to be perceived as important, accurate, and useful for learning when it comes from a knowledgeable, trustworthy, and objective source" (p.312). Since instructors were regarded as knowledgeable, trustworthy, and objective sources, all participants primarily preferred to take feedback from instructor.

In addition to the instructors' quality of feedback, instructors' authority and power on grading made participants to give preliminary importance to instructor feedback. Participants thought that project and report having revised in the light of non-instructor feedback may not satisfy instructor and result in low grade. The similar result was found in some research studies (Zacharias, 2007).

Feedback providers' relationship quality with students was also expressed to influence students' feedback perceptions and preferences. Surprisingly, most of the interviewed participants reflected preferences in getting formative feedback from people who are approachable and have positive rapport with students. This was supported by Pokorny and Pickford (2010). In their study the importance of relationship of participants was stressed. They suggested that rapport building from student to instructor and from instructor to students is necessary for effective use of feedback. Moreover, Fluckiger et al. (2010) stated that instructors' positive rapport with students make them more approachable to the students and thus students feel more comfortable while requesting help and asking questions about their misunderstandings and problems.

Qualitative results of the study were parallel to some of the results of the study by Poulos and Mahony (2008). They found that students' perceptions of instructor's feedback were influenced by their perceptions of instructor accessibility and types of feedback. In addition

to Poulos and Mahony's study results, this study results also indicated that student's perception of instructor feedback was influenced by instructor and student's attitudes toward the course, and student's attitude toward revision. That is, if students see that instructor's attitude toward the course is not good, they disregard that instructor feedback. The same issue is also true for students. Students appreciated feedback provided in the courses they interested in. As the Poulos and Mahony (2008) said, effective feedback provides emotional support. Emotion and motivation of students are likely to be influenced by effect of feedback. Participants of the study also stressed this concern with their comments. The theme highlighted in their comment was that students' motivation toward studying, effort change and revisions was influenced by the effect of feedback. This effect can be negative or positive depending on the effectiveness of feedback provided.

5.2 Formative Feedback Preferences

Quantitative data indicated that even if one factor structure reflected students' formative feedback preferences, their preferences of formative feedback can be categorized under three aspects: effects of the continuous formative feedback (how formative feedback helps student improve their projects and reports performance), fairness of formative feedback (how clearly and adequately the message included in formative feedback is comprehended by students to calibrate the accomplishment of the project and report goals), encouragement of formative feedback (how formative feedback encourages students to facilitate the process of and to keep working on the development of project and report). Specifically, 48% of the participants preferred to take formative feedback that includes clues about which direction to look. This may be because of the quality of message included in feedback clues. Sadler (1989) identified the effective use of formative feedback clues in self-regulated learning under three processes: developing standard being aimed for, comparing current performance level with developed the standard, engaging actions for the purpose of closing the gap. Three processes identified should be attributed to all feedback types. Because, all feedback types in project based courses should be given with the intention of facilitating students' self-regulated learning by clearly showing the students where revisions are required and providing some clues that students are able to utilize to make correct revisions. Formative feedback explaining how to revise project and report in detail was preferred to be given however there was no consensus about the degree or amount of explanation that should be given. In qualitative data the scope was drawn by students. Their preferences were toward taking explanation in adequate level because more explanations cause them to feel like instructor does all the things instead of them. Ackerman and Gross (2010) stated that providing many comments may effect students' perceptions as if no feedback is provided. Students' preferred characteristic of the formative feedback that provides what needs to be done to improve weak sides of project and report performance was described in previous study as descriptive formative feedback (Fluckiger et al., 2010). Students' preference to such formative feedback type is understandable because the message in descriptive formative feedback informs students' current performance strengths and weaknesses, and helps them address the parts needed development.

The results of qualitative data highlighted that students' intention of asking for formative feedback was not only derived from the students' expectation of grade but also their expectation of learning. Even though, they generally approached to formative feedback for

the purpose of both learning new things and getting high grade, a variety of factors such as interest for and the importance of project, instructors' attitudes and behaviors, teaching methods were described to have impact on students' expectations whether to be more grade-oriented or learning-oriented.

Regarding understandability, transparency and clarity of formative feedback students' preferences were in parallel with the literature. They wanted to frequently take feedback that is easy to understand, easy to read, and easy to revise. Moreover, they wanted their formative feedback to be consistent and relevant to the topic and the problem rather than unnecessary.

Zacharias (2007) reported student feelings towards teacher feedback. In addition to the feedback that "helped students to be aware of their mistakes", this study also indicated that while given formative feedback frequently motivate students to revise their project or paper, the feedback that shows that instructor cares about students' work and recognize the effort students have made in both project and report is given occasionally. Quantitative data reflected relatively high preferences toward such feedback and the others which recognize the effort students have made and help them in future projects. Too much or little feedback was found to affect students' feelings by making them annoyed or motivated (Zacharias, 2007). However, this result was only partially supported by the qualitative data analysis results of the present study. Qualitative data analysis showed that students usually do not concerned with the amount of feedback, rather they are more concerned with the quality of message formative feedback contains especially whether it is constructive, effective, and helpful. This study indicated that students are likely to be annoyed or discouraged when given feedback is far from being constructive, and they get motivated or happy when negative comments are presented positively with their justifications through feedback along with constructive criticism. This is supported by research study indicating that even though such feedback types are rare in higher education, students indicated that they were motivated to improve when constructive criticism was provided by the instructor (Weaver, 2006).

5.3 Learning Approaches and Formative Feedback

Another important focus of this study was the exploration of the relationship between formative feedback perception / preferences and learning approaches. Both canonical correlation analysis and factor score correlation analysis indicated that students' formative feedback perceptions were significantly correlated with their deep approaches to learning. Moreover, factor score correlation analysis showed that there was a significant correlation between students' formative feedback preferences and their deep approaches to learning. Both results of statistical analysis yielded that students' surface approach to learning was not correlated with students' formative feedback perceptions or preferences. The finding of relationship between students' formative feedback preferences and learning approaches were in line with the findings of previous research studies (Gijbels &Dochy, 2006; Birenbaum, 2007; Rowe & Wood, 2008). Gijbels and Dochy in their study found that students' formative assessment preferences and their learning approaches were correlated with each other. In project based courses students are experienced with complex and effort demanding projects, tasks and assignments and they are expected to deal with such difficult workload by reflecting their understanding and acquired skills knowledge. It was found that students who engaged meaningfully in learning process as they do in project based courses employed deep

approach (Rowe & Wood, 2008). Therefore, students who strive to handle the problems they have encountered at different stages of project and report construction process are more likely to adopt deep learning. Moreover, in this process they would ask for more formative feedback in order to make necessary revisions to projects and reports. This finding also supports the suggestion that assessment procedures that allow students to demonstrate their understanding are preferred by students who adopt deep approach to learning (Entwistle and Tait, 1990).

The result of canonical correlation analysis showed that students' deep approach to learning was significantly correlated with development, understandability, and encouragement factors of formative feedback perceptions. It can be understood that that students adopting deep approach to learning tend to have a high appreciation to formative feedback provided in project based courses. Students adopting deep approach to learning may be expected to have high expectations toward formative feedback provided. Because, the message contained would help students as a group or individual facilitate their active engagement with the project and report. Therefore, students adopting deep approach to learning would strive to benefit from formative feedback as much as they can in order to meet their expectations. Such an effort with the intention of making use of formative feedback in maximum level may cause students to appreciate formative feedback provided. Therefore, such relationship between students' formative feedback perceptions and their deep approach to learning may be expected.

Qualitative results of the study indicated that students' approaches to learning in project-based courses can change depending on a large number of factors students described. Changes in learning approaches can also affect students' intention to ask for formative feedback. The majority of participants indicated that depending on their level of interest, desire and motivation in project based courses, they would strive to develop a better project by utilizing formative feedback (adopting deep approach) or spend minimum effort to meet basic project requirements (adopting surface approach).

Students described a set of factors that have the capability to cause students to adopt deep approach instead of surface approach or surface approach instead of deep approach. Negative and destructive formative feedback, large amount of course workload and limited amount of time for studying were also described to make students to adopt surface learning. The correlation between workload and learning approaches was supported by Gijbels &Dochy (2006) and Struyven et al. (2006). They stated that perceived excessive workload can have an effect on students' learning approaches and make them to adopt surface approach. Moreover, importance of lecture, high course grading, positive attitudes of students toward the project course and instructor, adequate, quality, constructive and positive formative feedback, positive relationship of instructor with students were noted by participant to cause them to employ deep approach. Besides, students tend to adopt deep approach in project based courses whenever they perceive that project will be usefull in future, instructor shows effort in the course, instructor has positive attitudes toward both students and lecture, and instructor has good teaching styles in the course. Qualitative results also indicated that effects of these factors on students' learning approaches can result in changes in students' perceptions and preferences toward formative feedback. This result was clearly supported

and extended by quantitative study where significant correlation between learning approaches and students' formative feedback perceptions and preferences was found.

5.4 Written and Oral Feedback

The results of the analysis of students' comments showed that students had different preferences about written and oral feedback. While some students preferred written feedback, the other ones did not. However, they agreed that both written and oral feedback should be given, especially in situations where written feedback or oral feedback alone is not clear and constructive. As for perceptions, not all instructor and teaching assistant written and oral feedback was perceived to be useful. Oral feedback was perceived to be more useful than written feedback in general. However, Ferguson (2011) found a different result in that participants perceived written feedback useful than group verbal and personal verbal feedback. Such differences may be due to different contexts in which feedback is provided. Characteristics of formative feedback seem to effect whether students will ask for it or not. For example, students who preferred written feedback saw it as evidence that can be looked again after making revision. Furthermore, written feedback was regarded not an immediate feedback that is delivered to students after a certain time has elapsed.

However, students saw that oral feedback allows them to receive immediate feedback by prompt questions together with additional explanations about misunderstandings and problems they faced. Such attitudes toward formative written and oral feedback can influence students' intention whether to ask for written feedback or oral feedback during different stages of project and report. Asking for written feedback would be better when students cannot approach to instructor or teaching assistant. Likewise, asking for oral feedback would be better when students think that additional explanations may be required.

5.5 Implications for Research and Practice

The results of this study have several implications for research and practice. Firstly, this study provided comprehensive understanding about students' perceptions and preferences toward formative feedback provided for projects and reports. This information can be used by instructors, students, faculty member and administrator for different purposes. For example, this study may help instructors aware of how their formative feedback is perceived by students and take necessary actions based on these perceptions. Faculty administrator may arrange seminars to the instructors about how to provide quality formative feedback by taking account students' formative feedback perceptions in project based courses.

Secondly, information related to students' formative feedback preferences in project based courses can help instructors tailor their formative feedback types, characterisitcs, tone and manner considering what students generally perefer to receive. This study may also provide a dialogue through which students and instructors may collaborate and more importantly understand each other. Moreover, with this study students may get an opportunity to reflect their perceptions and preferences regarding to the formative feedback.

Thirdly, this study provided information about correlation between students' formative feedback perceptions / preferences and their learning approaches that can be used by

instructors while providing formative feedback for students' projects and reports. This information may help formative feedback providers categorize students based on the information about students' learning approaches and than calibrate their formative feedback based on the categories student belongs to.

Lastly, while contributing to the largely neglected area of research in the literature, this study also provides researchers a scale for perceptions and preferences for formative feedback which can be tested with further research. Moreover, this study may guide researchers in their studies related to formative feedback and project based course.

The generalizability of the findings of this study is limited to CEIT senior undergraduate students who are exposed to project and report in project based courses. This study specifically investigated CEIT senior undergraduate students' perceptions and preferences of formative feedback given for their projects and reports in project based courses where different technologies are predominantly used by students to make and develop their projects. Therefore, use of technology is the key component in project based courses in CEIT department. The different results may be achieved in project based courses at different departments based on the use of thechnologies. Moreover, project based courses at different departments require to have similar features with those at CEIT department in order to get similar results.

5.6 Recommendations for Future Research

This study was limited to students' perceptions and pereferences of a combination of formative written and oral feedback provided for their projects and reports. Further research needed to extensively understand separately students' formative written feedback perceptions / preference and students' oral formative feedback perceptions / preferences in project based courses. Moreover, how formative feedback is used within project group members and among project groups is another research area. A model for formative feedback can be generated to understand how different factors such as feedback-related, instructor-related, course-related and student-related influence students' use of formative feedback behaviours in their projcts and reports' revisions.

The scope of this study was limited to 3rd and 4th year undergraduate students from four public universities. In further research, data should be collected from a lot of universities in different regions of Turkey in order to obtain more generalizable results and test the reliability and validity of a questionnaire developed for measuring perceptions and preferences for formative feedback.

This study investigated the the relationship of students' formative feedback perceptions /preference with their learning approaches. The effect of formative feedback on students' learning approaches was described qualitatively. Furher research may be conducted to extensively understand how formative feedback provided for projects and reports effects students' way of approaching to learning in project based courses.

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APPENDIX A

CONSENT FORM (IN TURKISH)

Gönüllü Katılım Formu

Bu çalışma, Ar. Gör. Mustafa Şat tarafından Orta Doğu Teknik Üniversitesi Bilgisayar ve Öğretim Teknolojileri bölümünde yapılan bir çalışmadır. Çalışmanın amacı Bilgisayar ve Öğretim Teknolojileri 3. ve 4. sınıf öğrencilerinin proje derslerinde aldıkları biçimlendirici geri bildirime karşı tutumlarını ve tercihlerini incelemek ve bu tercihlerin öğrencilerin sahip olduğu öğrenme yaklaşımları ile ilişkisi olup olmadığını araştırmaktır. Çalışmaya katılım tamamiyle gönüllülük temelinde olmalıdır. Anket soruları, genel olarak kişisel rahatsızlık verecek soruları içermemektedir. Ancak, katılım sırasında sorulardan ya da herhangi başka bir nedenden ötürü kendinizi rahatsız hissederseniz cevaplama işini yarıda bırakıp çıkmakta serbestsiniz. Böyle bir durumda görüşmeyi uygulayan kişiye, görüşmeyi tamamlamadığınızı söylemek yeterli olacaktır. Görüşme sonunda, bu çalışmayla ilgili sorularınız cevaplanacaktır. Bu çalışmaya katıldığınız için şimdiden teşekkür ederiz. Çalışma hakkında daha fazla bilgi almak için Bilgisayar ve Öğretim Teknolojileri Eğitimi bölümü araştırma görevlilerden Mustafa Şat (Oda: EF-23; Tel: 210 75 40; E-posta:msat@metu.edu.tr) ile iletişim kurabilirsiniz.

Bu çalışmaya tamamen gönüllü olarak katılıyorum ve istediğim zaman yarıda kesip çıkabileceğimi biliyorum. Verdiğim bilgilerin bilimsel amaçlı yayımlarda kullanılmasını kabul ediyorum.

İsim Soyad	Tarih	İmza	Alınan Ders
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APPENDIX B

INTERVIEW QUESTIONS (IN TURKISH)

Mülakat Formu

Biçimlendirici geri dönüt (Formative feedback) genel olarak eğitim ortamında belirli bir süreç içerisinde öğrencilere sözlü veya yazılı olarak verilmektedir. Biçimlendirici geri dönüt vermedeki amaç öğrencinin sahip olduğu bilgiyi ve gösterdiği performansı geliştirmek, yükseltmek ve istenilen dereceye getirmektir. Biçimlendirici geri dönüt hem sınıf ortamında hemde sınıf ortamının dışında verilebilmektedir. Örneğin, sözlü geri dönüt genellikle karşılıklı olarak yapılan görüşmelerde ve tartışmalarda yani anlık verilirken, yazılı geri dönüt reflection ve rapor gibi yazılı dökümanlar üzerinde yazılı olarak verilmektedir. Yazılı geri dönüt'ü sadece kağıt üzerine yazılan yazılarla sınırlı tutmak yanlış olur çünkü e-mail, moodle ve tartışma formu gibi ortamlarda yazılı olarak yapılan yapıcı yorumlar ve yazılar da birer yazılı geri dönüt'tür.

Giriş:

- Projeleriniz için geri bildirim verilmesinin önemli olduğunu düşünüyor musunuz?
- Proje derslerinde sözlü veya yazılı olarak aldığınız geri bildirimin sizin için önemli olduğunu düşünüyor musunuz? Açıklayabilirmisiniz.
- Genel olarak, verilen geri bildirimin öğrenmeniz üzerinde bit etki yapıyor mu? Nasıl?

Geri Bildirim Veren:

- Projeniz için genellikle kimlerden geri bildirim alıyorsunuz?
- Geri bildirim almayı özellikle tercih ettiğiniz kişiler varmı? Neden?
- Geri bildirim almayı özellikle istemediğiniz kişiler varmı? Neden?
- Bu kişiler hakkında tutumunuz onların verdiği geri bildirime karşı tutumunuzu etkiliyor mu?
- Proje dersleri için sınıf arkadaşınıza geri bildirim veririr misiniz? Ne tür geri bildirimler verirsiniz?
- Onlardan geri bildirim alırmısınız? Ne sıklıkla? Ne tür geri bildirimler alırsınız? Bu geri bildirimleri yararlı buluyormusunuz?
- Ders assistanından geri bildirim alırmısınız? Ne sıklıkla? Ne tür geri bildirimler alırsınız? Bu geri bildirimleri yararlı buluyor musunuz?

Medya:

- Geri bildirimi genellikle hangi ortamlarda alırsınız?(e-mail, moodle, CMS, etc..)
- Geri bildirimi genellikle yazılı mı sözlü mü alırsınız?
- Hangisini daha yararlı buluyorsunuz? Veya hangisini tercih edersiniz? Size göre ikisinin avantaj ve dezavantajları nelerdir?

Yeterlilik ve Yararlılık:

- Projeleriniz için ne tür geri bildirimler alırsınız? Örnek verebilirmisiniz?
- Bu geri bildirimin yeterliliği hakkında ne düşünüyorsunuz?
- Hatayı görmek ve düzeltmek konusunda yeterli mi?
- Projede düzeltme yapabilmek için yeterli mi?
- Bu geri bildirimin yararlılığı hakkında ne düşünüyorsun?
- Hataları görmek ve düzeltmek için yararlı mı?
- Projede düzeltme yapmak için yararlı mı?
- Verilen geri bildirim o proje dışında da yararlı oldu mu? Yoksa sadece o projeye mi özgüydü?
- Siz ne tür geri bildirim almayı tercih edersiniz?
- Bahsettiğiniz bu geri bildirim özellikleri dışında birkaç farklı geri bildirim özelliği söyleyeceğim. Lütfen herbiri hakkında ne düşündüğünüzü ve bu tür geri bildirimleri tercih edip etmediğinizi belirtiniz?
  - Okunmasının ve anlaşılmasının kolaylığı
  - Yapıcı, öneri içeren ve yol gösteren özelliklere sahip olması
  - Olumlu veya olumsuz olması
  - İlişkili, konu ve problem ile ilgili olması
  - Çok fazla olması. Herşeyin detaylı bir şekilde anlatılması.

Kullanılan Dil:

- Hangi dilde daha çok geri bildirim alıyorsunuz? Birkaç örnek verebilirmisiniz?
- Hangi dilde verilen geri bildirimi yararlı ve faydalı buluyorsunuz? Neden?
- Hangi dilde daha çok geri bildirim almak istersiniz? Neden?
- Yazılı ve sözlü aldığınız geri bildirimlerde "formal" ve "informal" dil yapısı olarak daha çok hangisi kullanılıyor? Bunu faydalı buluyor musunuz?
- Hangi dil yapısı kullanılarak yazılan geri bildirimleri tercih edersiniz? Neden?

Duygular:

- Duyguların geri bildirim üzerindeki etkisi hakkında ne düşünüyorsunuz?
- Sizi duygusal olarak etkileyen geri bildirimlere karşı nasıl yaklaşırsınız? (Ör. Önemsememek, kabul etmemek, hiç okumamak)
- Yazılı ve sözlü aldığınız geri bildirimler sizi duygusal olarak etkiledi mi? Ne sıklıkla? Birkaç örnek verebilir misiniz?

Düzeltme:

- Geri bildirim aldıktan sonra genellikle düzeltme yaparmısınız?
- Düzeltmeler sırasında birazdan sıralayacağım geri bildirim özelliklerinden hangilerini en çok tercih edersiniz veya yararlı buluyorsunuz?
  - Yol gösterici olması
  - Nasıl düzeltileceği ile ilgili temel ipuçlar içermesi
  - Ayrıntılı bir şekilde nasıl düzeltileceğini açıklaması
  - Düzeltilecek bölüm ile ilgili İyi ve kötü örnekler içermesi / referans vermesi.

Öğrenme Yaklaşımları:

Öğrenme sırasında derinlemesine yaklaşım (Deep approach) ve yüzeysel yaklaşım (surface approach) olmak üzere iki tür öğrenme yaklaşımı kullanılmaktadır. Derinlemesine öğrenme yaklaşımı öğrenme sırasında daha çok bir konuyu derinlemesine öğrenmeye çalışmak, var olan kaynaklardan başka farklı kaynaklara başvurmak, konular arasında neden sonuç ilşkisi kurmak ve o konuyu özümsemek ile ilgili iken yüzeysel öğrenme yaklaşımı daha çok bir konuyu ezberlemek ve sadece temel bilgileri öğrenmek ile ilgilidir.

- Proje derslerinde yeni bir şeyi en iyi nasıl öğrenirsiniz?
- Bu yöntemde geri bildirim almak önemli midir? (İlk soruya verilen cevaba bağlı olarak)
- Sizce projeye verdiğiniz önem ile geri bildirime verdiğiniz önem arasında bir ilişki varmı?
- Proje derslerinde sizin için hangisi daha önemlidir? Açıklayabilir misiniz?
  - Dersi geçmek
  - Yeni birşeyler öğrenmek
- Verilen geribildirim öğrenme yaklaşımınızda bir değişikliğe neden olur mu? Nasıl ?
  - Sadece dersi geçmek yerine onu öğrenmeye çalışmak
  - Dersi öğrenmeye çalışmak yerine sadece geçmek
- Birşeyi öğrenmede sizi ne tür faktörler etkiler?
  - Dersin ilgimi çekmesi
  - Dersin benim için çok önemli olması
  - Dersin beni motive etmesi
  - Hocanın tutumu (derse karşı ve öğrenciye karşı)
- Birşey öğrenirken nasıl bir yol izlersiniz? Açıklayabilir misiniz?
  - Sadece temel şeyleri öğrenmeye çalışmak
  - Herşeyi detaylı bir şekilde incelemek ve öğrenmeye çalışmak
  - Verilen dökümanlarının yanında başka bir dökümana çalışmak / çalışmamak.
  - Sınavda çıkma olasılığı düşük olan materyalleri çalışmak / çalışmamak.
  - Bir şeyi tamamen öğrenene kadar kendimi test etmek / etmemek (örneğin açık ve kapalı uclu sorular çözmek)
  - Bir şeyi öğrenene kadar onun üzerinde sürekli geçmek ve tekrarlamak

APPENDIX C

PERCEPTIONS AND PREFERENCES, AND LEARNING APPROACHES QUESTIONNAIRE (IN TURKISH)

PROJE DERSLERİNDE VERİLEN BİÇİMLENDİRİCİ GERİ BİLDİRİME KARŞI ALGI VE TERCİH ANKETİ VE ÇALIŞMA SÜRECİ ANKETİ (R-SPQ-2F)

Sevgili BÖTE Öğrencileri,

Bu çalışma **proje derslerinizde** proje, rapor ve ödevleriniz için sizlere verilen biçimlendirici geri bildirimlere (formative feedback) karşı **algı ve tercihlerinizi**, bu algı ve tercihlerinizin çalışma sürecinizle ilişkisini araştırmaktadır.

Anket 4 ana bölümden oluşmaktadır.

1. Genel Bilgiler
2. Proje derslerinde verilen biçimlendirici geri bildirime yönelik algılar
3. Proje derslerinde verilen biçimlendirici geri bildirime yönelik tercihler
4. Çalışma süreciniz

Araştırmaya katılım tamamen gönüllülük temeline dayanmaktadır. Vereceğiniz cevaplar bu çalışma dışında kullanılmayacak ve gizli tutulacaktır. Araştırma ODTÜ İnsan Araştırmaları Etik Kurulu (IAEK) tarafından onaylanmıştır.

Araştırmanın amacına ulaşabilmesi için lütfen <u>boş madde bırakmayınız.</u>

Katkılarınızdan dolayı çok teşekkür ederim.

Çalışmanın sonuçları hakkında bilgi almak istiyorsanız lütfen e-posta adresinizi yazınız (E-posta:.....)

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Tez Danışmanı:	Yrd. Doç. Dr. Gülfidan Can

Proje Dersleri: Akademik dönem içinde, öğrencilerin proje, rapor ve ödevler yaparak öğrenmelerini ve performanslarını geliştirmelerini amaçlayan, projenin özellikle önemsendiği derslerdir. Örneğin: BÖTE435-Proje Yönetimi ve Geliştirilmesi ve BÖTE323-Çoklu Ortam Tasarımı ve Geliştirilmesi.

Biçimlendirici Geri Bildirim: Proje derslerinde öğrenmenizi ve performansınızı geliştirmek amacıyla, yapmış olduğunuz proje, rapor ve ödevlerin **yapılış süreçleri içerisinde** verilen geri bildirimlerdir. Öğretim üyesi, ders asistanı veya sınıf arkadaşlarınızdan yazılı veya sözlü olarak gelebilir.

1. GENEL BİLGİLER

a) Cinsiyet: ○ Erkek ○ Bayan

b) Üniversite:
   - ○ Amasya Üniversitesi
   - ○ Ankara Üniversitesi
   - ○ Hacettepe Üniversitesi
   - ○ Orta Doğu Teknik Üniversitesi

c) Sınıf: ○ 3. Sınıf ○ 4. Sınıf

d) Genel ortalama:

2. BİÇİMLENDİRİCİ GERİ BİLDİRİME YÖNELİK ALGILAR

Aşağıdaki soruları cevaplarken lütfen proje derslerinizde PROJE, RAPOR ve ÖDEV performansınıza verilen SÖZLÜ ve/ veya YAZILI (elektronik / el yazısı) biçimlendirici geri bildirimleri göz önüne alınız.

Genel olarak, projeme verilen biçimlendirici geri bildirimler...	**Asla**	**Nadiren**	**Ara sıra**	**Sık sık**	**Çok sık**
düzeltme sürecinde yol gösterir.	○	○	○	○	○
ayrıntılı olarak nasıl düzeltme yapacağımı açıklar.	○	○	○	○	○
nasıl düzeltme yapacağım ile ilgili temel ipuçları içerir.	○	○	○	○	○
düzeltme gereken yerleri açık şekilde gösterir.	○	○	○	○	○
performansın zayıf yönlerini geliştirmek için yapılması gerekenleri belirtir.	○	○	○	○	○
bakmam gereken yön hakkında beni yönlendirir.	○	○	○	○	○
etkilidir.	○	○	○	○	○
yapıcıdır.	○	○	○	○	○
açıklayıcıdır.	○	○	○	○	○
olumsuz noktaları sebepleriyle beraber verir.	○	○	○	○	○
gelecekteki projelerim için faydalıdır.	○	○	○	○	○
anlaması kolaydır / anlaşılırdır.	○	○	○	○	○
okunması kolaydır (yazılı geri dönüt için).	○	○	○	○	○
düzeltmesi kolaydır / pratiktir.	○	○	○	○	○
tutarlıdır / çelişkili değildir.	○	○	○	○	○
konuya ve soruna uygundur.	○	○	○	○	○
performansın zayıf yönlerine dikkat çeker.	○	○	○	○	○
önceden belirlenmiş değerlendirme ölçütlerini temel alır.	○	○	○	○	○
yaptığım işe değer verildiğini hissettirir.	○	○	○	○	○
sarfettiğim emeği dikkate alır.	○	○	○	○	○
düzeltmeler için beni teşvik eder.	○	○	○	○	○
çoğunlukla olumludur.	○	○	○	○	○
olumsuz şeyleri olumlu şekilde sunar.	○	○	○	○	○
tonu ve yaklaşımı olumludur.	○	○	○	○	○
olumlu ile eleştirel arası dengelidir.	○	○	○	○	○

3. BİÇİMLENDİRİCİ GERİ BİLDİRİME YÖNELİK TERCİHLER

Aşağıdaki soruları cevaplarken lütfen proje derslerinizde PROJE, RAPOR ve ÖDEV performansınıza verilmesini istediğiniz SÖZLÜ ve/ veya YAZILI (elektronik / el yazısı) biçimlendirici geri bildirimleri göz önüne alınız.

...biçimlendirici geri bildirimi tercih ederim.	**Asla**	**Nadiren**	**Ara sıra**	**Sık sık**	**Çok sık**
Ayrıntılı olarak nasıl düzeltme yapacağımı açıklayan	○	○	○	○	○
Düzeltme gereken yerleri açık şekilde gösteren	○	○	○	○	○
Bakmam gereken yön hakkında beni yönlendiren	○	○	○	○	○
Performansın güçlü yönlerine dikkat çeken	○	○	○	○	○
Performansın güçlü yönlerini daha da geliştirmek için öneriler sunan	○	○	○	○	○
Performansın zayıf yönlerini geliştirmek için yapılması gerekenleri belirten	○	○	○	○	○
Gerektiğinde bana iyi ve kötü örnek veren	○	○	○	○	○
Anlaması kolay / anlaşılır	○	○	○	○	○
Okunması kolay olan (yazılı geri dönüt için)	○	○	○	○	○
Düzeltmesi kolay / pratik	○	○	○	○	○
Tutarlı / çelişkili olmayan	○	○	○	○	○
Konuya ve soruna uygun	○	○	○	○	○
Gereksiz olmayan	○	○	○	○	○
Zamanında verilen	○	○	○	○	○
Yararlı	○	○	○	○	○
Aldığım notu neden aldığımı belirten	○	○	○	○	○
Olumsuz noktaları sebepleriyle beraber veren	○	○	○	○	○
Yaptığım işe değer verildiğini hissettiren	○	○	○	○	○
Sarfettiğim emeği dikkate alan	○	○	○	○	○
Düzeltmeler için beni teşvik eden	○	○	○	○	○
Etkili	○	○	○	○	○
Tonu ve yaklaşımı olumlu	○	○	○	○	○
Gelecekteki projelerim için faydalı	○	○	○	○	○

4. ÇALIŞMA SÜRECİ ANKETİ (R-SPQ-2F)

İlk tepkinizi en iyi yansıtan seçeneği işaretleyiniz.

	Hiç	Nadiren	Ara sıra	Genellikle	Her zaman
Zaman zaman ders çalışmak bana derin bir kişisel tatmin hissi verir.	○	○	○	○	○
Bir konu üzerinde yeterince çalışarak kendi çıkarımlarımı yapabiliyorsam kendimi yeterli hissederim.	○	○	○	○	○
Amacım dersi en az çalışmayla geçmektir.	○	○	○	○	○
Yalnızca sınıfta verilen materyalleri veya dersin konu başlıklarını ciddi bir şekilde çalışırım.	○	○	○	○	○
Bir kere başladıktan sonra, nerdeyse her konunun benim için son derece ilginç olabileceğini düşünüyorum.	○	○	○	○	○
Yeni konuların çoğunu ilginç bulurum ve sıkça bu konularda daha fazla bilgi edinmek için ekstra zaman harcarım.	○	○	○	○	○
Aldığım bir dersi çok ilginç bulmaz isem çalışmamı en az düzeyde (minimumda) tutarım.	○	○	○	○	○
Bazı konuları anlamasam dahi ezberleyene kadar üzerinden tekrar tekrar geçerim.	○	○	○	○	○
Benim için zaman zaman akademik konuları çalışmak, bir roman ya da bir film kadar heyecan verici olabiliyor.	○	○	○	○	○
Önemli konuları tamamen anlayana kadar kendimi o konularda sınarım.	○	○	○	○	○
Önemli konuları anlamaya çalışmaktansa ezberleyerek birçok sınavda başarılı olabilirim.	○	○	○	○	○
Genellikle belirtilen yerler dışındaki konulara çalışmam; çünkü fazladan çalışma yapmanın gereksiz olduğunu düşünüyorum.	○	○	○	○	○
Derslerime çok çalışıyorum; çünkü materyalleri ilginç buluyorum.	○	○	○	○	○

Boş zamanlarımın çoğunu farklı derslerde tartışılan ilginç konular hakkında daha fazla bilgi edinmek için harcarım.	○	○	○	○	○
Konuları derinlemesine çalışmanın yararlı olmadığını düşünüyorum; çünkü konular hakkında genel bilgiye sahip olmak dersten geçmek için yeterliyken daha fazlasını yapmak yalnızca kafa karışıklığı ve zaman kaybına sebep olur.	○	○	○	○	○
Öğretim elemanlarının, sınavda sorulmayacağını herkesin bildiği konular üzerinde uzun zaman harcamamızı beklememesi gerektiğine inanıyorum.	○	○	○	○	○
Derslerin çoğuna, zihnimde konu ile ilgili cevaplamak istediğim sorularla girerim.	○	○	○	○	○
Çoğunlukla dersler işlenirken önerilen kaynakları okumayı yararlı bulurum.	○	○	○	○	○
Sınavda çıkma ihtimali olmayan materyalleri öğrenmenin gereksiz olduğunu düşünüyorum.	○	○	○	○	○
Sınavlarda başarılı olmanın en iyi yolunun, çıkması muhtemel soruların cevaplarını ezberlemek olduğunu düşünüyorum.	○	○	○	○	○

APPENDIX D

PERCEPTIONS AND PREFERENCES, AND LEARNING APPROACHES QUESTIONNAIRE (IN ENGLISH)

PERCEPTIONS OF AND PREFERENCES FOR FORMATIVE FEEDBACK GIVEN IN PROJECT COURSES QUESTIONNAIRE & STUDY PROCESS QUESTIONNAIRE (R-SPQ-2F)

Dear CEIT students,

This study investigates **your perceptions of and preferences for** formative feedback given for your projects, reports and assignments in **project courses**, and the relationship between these perceptions and preferences with your study process.

The questionnaire consists of 4 main sections.

1. General information
2. Perceptions of formative feedback given in project courses
3. Preferences of formative feedback given in project courses
4. Study Process

Participation in this study is entirely voluntary. Your answers will be kept confidential and will not be used for any other purposes. This study has been approved by METU Human Subjects Ethics Committee (HSEC).

Please do not leave any items empty.

Thank you very much for your participation.

If you want to get information about the results of the study, please enter your e-mail address (E-mail :……..……)

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Thesis Supervisor:	Asst. Prof. Dr. Gulfidan Can

Project courses: Project courses are semester-long courses aim to improve the students' learning and performances via projects, reports, and assignments and they give particular importance to the projects. For example: CEIT435 - Project Development and Management and CEIT323 - Multimedia Design and Development.

Formative feedback: It is the feedback that is given to you **during the process of doing** your projects, reports, and assignments to improve your learning and performance. It can be given by your professors, teaching assistants, or by your peers in oral or written form.

1. GENERAL INFORMATION

a. Gender: ○ Man ○ Woman

b. University:

- ○ Amasya University
- ○ Ankara University
- ○ Hacettepe University
- ○ Middle East Technical University

c. Class: ○ 3th ○ 4th

d. Cumulative (GPA):

2. PERCEPTIONS TOWARD FORMATIVE FEEDBACK

While answering the following questions, please think about ORAL and/or WRITTEN FEEDBACK (electronic or handwritten) given to you for your performance of your PROJECTS, REPORTS and ASSIGNMENTS.

In general, formative feedback given to my project...	**Never**	**Rarely**	**Occasionally**	**Frequently**	**Very Frequently**
gives direction during revision process	○	○	○	○	○
explain how to revise in detail	○	○	○	○	○
includes basic tips about how to revise	○	○	○	○	○
shows me clearly the place where revision is needed	○	○	○	○	○
provides what needs to be done to improve weak sides of performance	○	○	○	○	○
gives clues about which direction to look	○	○	○	○	○
is effective	○	○	○	○	○
is constructive	○	○	○	○	○
is well-explained	○	○	○	○	○
negative points are given with their justifications	○	○	○	○	○
helps me in future projects	○	○	○	○	○
is easy to understand	○	○	○	○	○
is easy to read (for written feedback)	○	○	○	○	○
is easy to revise / practical	○	○	○	○	○
is consistent / not contradictory	○	○	○	○	○
is relevant to the topic and the problem	○	○	○	○	○
draw attention to weak sides of performance	○	○	○	○	○
is given based on the previously defined assessment criteria	○	○	○	○	○
shows that instructor cares about the work I have done	○	○	○	○	○
recognizes the effort I have made	○	○	○	○	○
motivates me to revise	○	○	○	○	○
is mostly positive	○	○	○	○	○
presents negative things in a positive way	○	○	○	○	○
has positive tone and manner	○	○	○	○	○
has a balance between critical and positive	○	○	○	○	○

3. PREFERENCES TOWARD FORMATIVE FEEDBACK

While answering the following questions, please think about ORAL and/or WRITTEN FEEDBACK (electronic or handwritten) you want to be given for your performance of your PROJECTS, REPORTS and ASSIGNMENTS.

I prefer formative feedback which...	**Never**	**Rarely**	**Occasionally**	**Frequently**	**Very Frequently**
explain how to revise in detail	○	○	○	○	○
shows me clearly the place where revision is needed	○	○	○	○	○
gives direction during revision process	○	○	○	○	○
draw attention to strong sides of performance	○	○	○	○	○
includes suggestions about how to further improve strong sides of performance	○	○	○	○	○
provides what needs to be done to improve weak sides of performance	○	○	○	○	○
gives me good and bad examples when needed	○	○	○	○	○
is easy to understand	○	○	○	○	○
is easy to read (for written feedback)	○	○	○	○	○
is easy to revise / practical	○	○	○	○	○
is consistent / not contradictory	○	○	○	○	○
is relevant to the topic and the problem	○	○	○	○	○
is timely	○	○	○	○	○
is not unnecessary	○	○	○	○	○
is useful	○	○	○	○	○
indicates the reason why I receive a particular grade	○	○	○	○	○
negative points are given with their justifications	○	○	○	○	○
recognizes the effort I have made	○	○	○	○	○
shows that instructor cares about the work I have done	○	○	○	○	○
motivates me to revise	○	○	○	○	○
is effective	○	○	○	○	○
has positive tone and manner	○	○	○	○	○
helps me in future projects	○	○	○	○	○

4. STUDY PROCESS QUESTIONNAIRE (R-SPQ-2F)

Please respond to the following items based on your immediate reaction.

	Never	Sometimes	Half the time	Frequently	Always
I find that at times studying gives me a feeling of deep personal satisfaction.	○	○	○	○	○
I find that I have to do enough work on a topic so that I can form my own conclusions before I am satisfied.	○	○	○	○	○
My aim is to pass the course while doing as little work as possible.	○	○	○	○	○
I only study seriously what's given out in class or in the course outlines.	○	○	○	○	○
I feel that virtually any topic can be highly interesting once I get into it.	○	○	○	○	○
I find most new topics interesting and often spend extra time trying to obtain more information about them.	○	○	○	○	○
I do not find my course very interesting so I keep my work to the minimum.	○	○	○	○	○
I learn some things by rote, going over and over them until I know them by heart even if I do not understand them.	○	○	○	○	○
I find that studying academic topics can at times be as exciting as a good novel or movie.	○	○	○	○	○
I test myself on important topics until I understand them completely.	○	○	○	○	○
I find I can get by in most assessments by memorizing key sections rather than trying to understand them.	○	○	○	○	○
I generally restrict my study to what is specifically set as I think it is unnecessary to do anything extra.	○	○	○	○	○
I work hard at my studies	○	○	○	○	○

because I find the material interesting.					
I spend a lot of my free time finding out more about interesting topics which have been discussed in different classes.	○	○	○	○	○
I find it is not helpful to study topics in depth. It confuses and wastes time, when all you need is a passing acquaintance with topics.	○	○	○	○	○
I believe that lecturers shouldn't expect students to spend significant amounts of time studying material everyone knows won't be examined.	○	○	○	○	○
I come to most classes with questions in mind that I want answering.	○	○	○	○	○
I make a point of looking at most of the suggested readings that go with the lectures.	○	○	○	○	○
I see no point in learning material which is not likely to be in the examination.	○	○	○	○	○
I find the best way to pass examinations is to try to remember answers to likely questions.	○	○	○	○	○