# EXPLORATION OF INSTRUCTIONAL DESIGN PROCESS AND EXPERIENCE OF NOVICE INSTRUCTIONAL DESIGNERS THROUGH THE FRAMEWORK OF ACTIVITY THEORY: A CASE STUDY IN AN INSTRUCTIONAL DESIGN COURSE

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## ABSTRACT

EXPLORATION OF INSTRUCTIONAL DESIGN PROCESS AND EXPERIENCE OF NOVICE INSTRUCTIONAL DESIGNERS THROUGH THE FRAMEWORK OF ACTIVITY THEORY: A CASE STUDY IN AN INSTRUCTIONAL DESIGN COURSE

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Contextual issues have considerable role on learning outcomes of instructional design process. In this dissertation study, an instructional multimedia design and development course was explored to understand how contextual issues influence the experience and processes of Novice Instructional Designers' (NIDs) activities in an instructional design project. The main participants of the study were 47 junior Computer Education and Instructional Technology students who were enrolled in the course. Besides, 26 students who took the course in previous years also participated in the study to verify the results. In the course, the students followed an instructional design process, including analysis, design, development, implementation and evaluation (ADDIE framework) phases while developing instructional multimedia products. The researcher, as one of the facilitators of the course, aimed to guide the project teams iteratively to make them effectively collaborate with the community consisting of target group students, teachers, group members, graduate students and subject matter experts. Moreover, the researcher and other facilitators provided methodological and technical tools that novice instructional designers needed for their projects. Thus, the researcher was a part of the natural context. A qualitative approach was used to collect the data and Activity Theory (Engeström, 1999) was utilized to analyze contextual issues, find out interrelationship between contextual issues and present the results. Results showed that especially expectation and motivations of NIDs, team working skills, role of facilitator and role of target group was important to understand the instructional design experience and quality of processes which was conducted in instructional design.

The results will be useful in improvement of instructional design course settings to strength practical skills of novice instructional designers.

Key words: Activity theory, course evaluation, instructional design course, novice instructional designers, student assessment.

# ÖZ

BAŞLANGIÇ SEVİYESİNDEKİ ÖĞRETİM TASARIMCILARININ ÖĞRETİM TASARIMI SÜRECİ VE DENEYİMLERİNİN ETKİNLİK KURAMI ÇERÇEVESİNDE İNCELENMESİ: BİR ÖĞRETİM TASARIMI DERSİNİN DURUM ÇALIŞMASI

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Bağlamsal faktörler öğretim tasarımı sürecindeki öğrenim kazanımları üzerinde önemli bir role sahiptir. Bu tez çalışmasında, başlangıç düzeyindeki öğretim tasarımcılarının bir öğretim tasarımı uygulamasındaki süreçleri ve deneyimlerini etkileyen bağlamsal unsurları ortaya koymak amacıyla bir öğretimsel çoklu-ortam tasarım geliştirme dersi incelenmiştir. Çalışmanın katılımcılarını Bilgisayar ve Öğretim Teknolojileri Eğitimi bölümünde derse kayıtlı olan 47 üçüncü sınıf öğrencisi oluşturmaktadır. Ayrıca, dersi önceki yıllarda almış 26 öğrenci, elde edilen sonuçların desteklenmesi amacıyla çalışmaya veri sağlamıştır. Derste, öğretimsel çoklu-ortam ürünleri geliştirilirken analiz, tasarım, geliştirme, uygulama ve değerlendirmeyi (ADDIE yapısı) kapsayan bir öğretim tasarımı çerçevesi izlenmiştir. Dersin proje danışmanlarından biri olan araştırmacının rolü hedef kitle öğrenci ve öğretmenleri, takım arkadaşları, mezun öğrenciler ve konu uzmanları ile etkili bir işbirliği içinde olmalarını sağlamak amacıyla düzenli bir şekilde proje ekiplerini yönlendirmek olmuştur. Araştırmacı ve diğer proje danışmanları ek olarak proje gruplarına projeleri için gereken yöntemsel ve teknik araçları sağlamışlardır. Araştırmacı bu şekilde ortamın doğal bir parçası olmuştur. Veri toplamada nitel bir yaklaşım kullanılmış ve bağlamsal unsurları ortaya koymada, bu unsurlar arasındaki karşılıklı bağları bulmada ve sonuçların sunumunda Etkinlik Kuramı'ndan (Engeström, 1999) yararlanılmıştır. Sonuçlar başlangıç düzeyindeki öğretim tasarımcılarının beklenti ve motivasyonlarının, takım çalışması becerilerinin, proje danışmanının ve hedef kitlenin rolünün öğretim tasarım sürecini anlamada ve öğretim

tasarımında yürütülen süreçlerin kalitesi üzerinde etkileri olduğunu göstermektedir. Sonuçların başlangıç düzeyindeki öğretim tasarımcılarının uygulama becerilerini güçlendirmek için öğretim tasarımı derslerinin iyileştirilmesinde yararlı olacağı düşünülmektedir.

Anahtar kelimeler: Etkinlik kuramı, ders değerlendirme, öğretim tasarım dersi, başlangıç düzeyi öğretim tasarımcıları, öğrenci değerlendirme

To the ones who care about me more than I do

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| | |
|---|---|
| ADDIE | Analysis, Design, Development, Implementation, Evaluation |
| AECT | Association for Educational Communications and Technology |
| AT | Activity Theory |
| AS | Activity System |
| CEIT | Computer Education and Instructional Technology |
| IBSTPI | The International Board of Standards for Training, Performance and Instruction |
| ID | Instructional Design |
| IDT | Instructional Design and Technology |
| MoNE | Ministry of National Education |
| NID | Novice Instructional Designer |
| TTKB | Talim Terbiye Kurulu Başkanlığı |

# CHAPTER I

# INTRODUCTION

In this part, background, purpose, research questions and significance of the study exploring the contextual issues influencing novice instructional designers (NIDs)' material development and learning outcomes in an instructional design environment will be presented.

## 1.1 Background of the Study

Instructional design and technology (IDT) is a field which "encompasses the analysis of learning and performance problems, and the design, development, implementation, evaluation and management of instructional and non-instructional processes and resources intended to improve learning and performance in a variety of settings, particularly educational institutions and the workplace" (Reiser, 2001, p. 53). Although IDT's available definitions are very broad, this definition continuously changes in definition and scope, as IDT field renovates and changes (Reiser, 2007). Expected competencies of instructional designers have also been changed (Davidson-Shivers & Rasmussen, 2002). This change brings new approaches and strategies to train NIDs in accordance with the needs of the field.

Today, instructional systems based on constructivist philosophy are taking the place of traditional methods (Ertmer & Newby, 1993). Instructional designers learn in a flexible and self-directed environment, which is also the assumption of constructivist philosophy. To train instructional designers, especially project based and design based authentic activities where the designers get insights from different contexts are used (Davidson-Shivers & Rasmussen, 2002). Since they learn by designing, also a constructionist perspective (Papert & Harel, 1991) is applied in instructional design projects. Both constructivism and constructionism pose that the truth is not dictated by the world; acquisition of knowledge is influenced by their social life and other different activities that they engage (Gergen, 1985).

These two views assume that the artifact of the "communal interchange" is the source of the understanding the world as stated by Gergen. The context is very important to understand the world since all the actions and activities are embedded in a social context (Young & Collin, 2004). Therefore, it can be argued that instructional design environments should accommodate the methods which take the context into consideration.

Nowadays the modern instructional theories are based on *rich, multidisciplinary, collaborative, authentic, and real life tasks* (Van Merriënboer & Martens, 2002),. They are also guided to societal direction from individual (Engeström, 1987). This makes learning environments become more complex in terms of design and evaluation. The context becomes the unit of analysis, since there are many factors playing a role in complex learning environments. While designing learning environments, the designers analyze the context and design their instruction in accordance with the feasibility of the context. This contextual approach provides better experiences for learners. In contextual perspective the unit of analysis is the actions of the individuals in the context; the meaning of the behavior is shaped by the context (Shull & Lawrence, 1993). In this contextual perspective, the historical act is also important (Hayes, 2004). It means that if an individual behaves in a certain way, it is not just because of the current context, but also because it is a purposive part of the life of the individual. In this sense, contextualism has a similar view with constructivism in that both of them assume that the truth is not obtained in the same way for everyone. According to Shull and Lawrence (1993), contextualism seeks historical description of the events occur in the context by avoiding to formulate abstract generalizations. Contextualism closely examines the events which constitutes whole picture and it is associated with philosophies like social constructivism and social constructionism (Hayes, 2004).

For many years, the field of instructional design and technology has been using constructivist and constructionist learning practices like problem based, case based and project based learning strategies, and goal based scenario in design (Jonassen & Rohrer-Murphy, 1999). While educating instructional designers, use of contextual and constructivist approaches such as apprenticeship, practicing, professional real life experience, experience of contextualized knowledge is also suggested (Winn, 1997). Bannan-Ritland (2001) believes that instructional design and technology competencies can be given by using real world experiences in a challenging context. Therefore, this study ,internalize a contextual approach for analysis of an instructional design course in terms of providing enough experiences to provide required instructional design competencies.

Competencies of instructional designers have been defined by different associations which are related to instructional design. The most reputable one, the IBSTPI (2001) defines some of the competencies as communication, application of research and theory of practice, analysis of processes and all elements of instruction, design and development by selecting suitable medium, strategies and materials, implementation, and evaluation of all processes (Davidson-Shivers & Rasmussen, 2002). Although there are varieties of descriptions of instructional designer competencies, the curriculum of IDT field still needs authentic assessment systems to certify the instructional designers. In the light of competency definitions, evaluation criteria for academic programs can be developed to guide the development of curricula and content of the courses, to provide a self-assessment for practitioners to assess their skills and knowledge (Bratton, 1990). In assessment the issue of *to what extent context influence the teaching* should also be taken into consideration (Bannan-Ritland, 2001). In this sense, to assess the outcomes and performance of instructional designer education environments, contextual factors should be examined.

The researcher of this study has several years of experience with guiding Novıce Instructional Designers (NIDs). At the department of Computer Education and Instructional Technology (CEIT), junior students take a multimedia design and development course which aims to give experience of instructional design via real life practice. The students of the course are involved in two intensive multimedia design and development projects, by working in teams under the guidance of course facilitators. They work with real clients and they communicate with them during the project. Students follow a specific instructional design process which includes analysis, design, development, implementation and evaluation. In the first project, the project groups are assigned by the instructor and in the second they choose their group members. During the project they have different roles. Since they are junior students they are assumed to have enough background to manage a project and design a product. The course has both theoretical and practical applications. The instructional design process has been given to students with an authentic and real life - like experience. Five years of experience of the researcher has shown that, students have variety of issues, problems and motivations during the semester that the course is given.

Researcher as a facilitator has to deal with the problems in the groups, problems with individuals, communication problems with target groups, tools and the rules of the course. There are also a lot of factors which cause novice instructional designers ignore the experience which is meaningful for their career in the future since they only focus on the products. Although facilitators try to show the importance of instructional design stages and

their responsibilities, there are many factors which constitute barriers to reach the goals of the course. In that environment, the assessment also becomes very complex since the end product never reflects the exact performance of each team member. Because of the complexity of factors influencing the products of the teams, the course facilitators employed individual performance based assessment technique. With this method, facilitators might give higher scores to hardorkingindividuals who are working in a team which performed poorly. On the other hand, this approach does not guarantee that the individuals who get higher scores acquire the most of the expected outcomes. Similarly in this way, the quality of products cannot be improved. Therefore, the researcher decided to develop a systematic approach to reveal the contextual factors which have an effect on experiences and products of novice instructional designers.

Although the researcher is aware of the fact that contextual factors are difficult to totally change, at least they might be moderated and improved to provide awareness of the outcomes of practices for novices and better quality of processes on the products. To reveal the contextual issues and the interaction between them, the Activity Theory (AT) is a well-suited framework for the research context since it allows seeing almost all the dynamics of this complex learning environment. To understand the context deeply, the researcher tried to observe or interview all community members such as the current students, the students who took the course in previous year, the graduates, target groups and other facilitators. On the other hand, in depth observations and interviews of current students constituted the core data for the study.

### 1.2 Activity Theory as a Framework of the Study

Complex teaching and learning activities can be investigated with comprehensive methodologies. Activity Theory (AT), which was proposed by Leont'ev (1978) and elaborated by Engeström (1987), presents a framework which can be used to understand complex human interactions (Yamagata-Lynch & Smaldino, 2007) and to describe the important components to design complex learning environments (Jonassen & Rohrer-Murphy, 1999). Jonassen and Rohrer-Murphy (1999) define the role of the AT in a learning environment as "*a socio-cultural, socio-historical lens through which designers can analyze human activity systems*" (p. 1). Therefore, AT could be a suitable framework for both designing and evaluating complex learning environments.

Components of the activity triangle model consist of a broad definition of the context. Social, psychological and physical components of the environment need to be considered

while designing educational technology (Richey & Tessmer, 1995). In this respect, activity theory has been used in different stages of educational technology research up to now (Barab, et al., 2002; Issroff & Scanlon, 2002; Lim & Hang, 2003; Lim & Chai, 2004; Collis and Margaryan, 2004; Mwanza & Engeström, 2005; Yamagata-Lynch & Smaldino, 2007; Blin & Munro, 2008). It has also been used to draw a framework to investigate external factors in learning environments, which is a new research movement in educational technology, rather than individual learning or how learning occur in people's mind, (Winn, 2002). There are other potentials need to be taken into consideration for IDT research and the researcher believes that AT implies that it can be a comprehensive approach to be used in complex learning situations.

The activity system triangle which represents AT will be used to model the combination of multimedia design and development context and also the context of the junior CEIT students. While in activity system the entire context is modeled, the researcher will also look at the perspectives of individuals to understand the system. According to Engeström (1987), an activity carries an object and it has a system that was constituted by smaller activities, actions and operations. The activity triangle model representing activity system includes a subject (ie. actor) and several components mediating between subject and object (ie. the purpose of the activity). Subject has to interact with object to reach an outcome which is transformed object (Mwanza & Engeström, 2005). In this sense subject is both the individual students and project teams since the students work as teams but also individual contributions influence the outcome differently.

Tools of the activity system are any tangible or intangible things which subject uses to achieve the object. Subject is connected to community (ie. context and people that subject interacted) by means of rules (ie. norms, regulations which influence the performance in activities). Lastly, division of labor defines the responsibilities of the community members. As assumed, alterations in the dynamics of these components of activity influence quality of outcomes and quality of performance that subject show.

### 1.3 Problem Statement

In learning environments, contextual factors might be handled to some degree, but most of the time, fitting the instruction to the context is a preferred way of instructional design (Tessmer & Richey, 1997). However, fitting the instruction into context does not guarantee a well learning process. Especially in learner-centered environments, since learners are freer to construct their learning, there seems to be a problem of monitoring and understanding this

learning process. Therefore, differentiating and handling contextual factors might be helpful in guiding learner and setting some factors to trigger the learning. Trigwell and Prosser (1991)'s study also showed that contextual issues influences outcomes differently for individuals. Many different contextual factors might cause very different outcomes for each student and different quality of artifacts of the students. Finding out those contextual factors might assist to improve the course context and consequently expected outcome and quality of performance.

In Turkey, although instructional technology is welcome and it is tried to be diffused all over the educational institutions (Bayram & Seels, 1997), instructional design which is inseparable part of it, is still not a well-known and popular field. In fact there is no program like Instructional Design or Instructional Systems Technology in Turkey. This field is combined with computer education under the Departments of Computer Education and Instructional Technology (CEIT), the graduates are mostly known as information technology teachers in elementary schools. On the other hand, Onay – Durdu and Yildirim's (2005) study showed that most of the CEIT students do not want to be a teacher in elementary schools but they want to be instructional designer, web designers or programmers. However, most of the students are not aware of their missions as an instructional designer (or technologist) since they do not know about the required competencies of the field. Therefore, Onay - Durdu and Yildirim suggest that further studies should be implemented to examine the different aspects of CEIT departments to revise curriculum needs of this department and to reveal the awareness of the students about their experience on instructional design. Revised curriculum and courses might lead students become aware of and get instructional designer competencies that are required for their further career as instructional designer. To achieve this, longitudinal analyses should be conducted to reveal students' understanding about their experience and observe the issues influencing their experience.

Instructional design is a team work which consists of internal (design team) and external stakeholders (clients, SMEs). It requires intensively practice and involvement of the client to create quality in materials and outcomes (Tessmer & Wedman, 1995). In design projects, team working has also a big role in success or failure. Therefore, a description and analysis of the team work is needed to reveal why and where the contradictions arise (Valkenburg & Dorst, 1998). Moreover there are various contextual issues influencing the performance that instructional designers showed in the projects. Most of the time, these contextual issues are ignored (Tessmer & Richey, 1997). Novice instructional designers should have experience of working in different contexts to develop different design solutions. To achieve this, the IDT

programs should be rebuilt by examining the training context that the programs provided (Larson & Lockee, 2009).

According to Patton (1987), observed outcomes might be evaluation criteria for learning environments. He argues that evaluation of learning environments requires more descriptive quality dimensions rather than quantities; it should ask the quality of the experience of the students. Therefore, qualitative methodologies can be used both to evaluate course context in terms of outcomes and evaluate students in terms of quality of their progresses and deliverables. The assessment methods taking the context into consideration might increase the quality of student progress and consequently increase the quality of student products. Therefore, there is a need of examination of different methods and theories that might be framework for qualitative assessment of complex learning environments.

To sum up, to educate novice instructional designers, there is need of strategies which provide instructional experience and quality in design process. Considering need of revision in IDT courses, this long lasting study was conducted in an IDT course context to reveal as much as contextual factors influencing the novice instructional designers' experiences, outcomes and the quality of their processes during the instructional design and development. To reveal the contextual issues in qualitative way,the AT framework was used.

### 1.4 Purpose of the Study and Research Questions

The main purpose of this study is to explore contextual issues of an instructional design course which aims to provide authentic experiences for novice instructional designers via multimedia design and development. Another purpose is to understand how those contextual issues influence the ID experiences of novice instructional designers and their progresses on projects. The results of the study are assumed to provide an assessment for the instructional design course to pose suggestions about how an instructional design practice might be structured to provide better ID experience, ID competencies and quality of products. In this study, ID context was a multimedia design and development course in which the NIDs (ie. junior CEIT students) developed two different multimedia projects for different target groups. In this design practice, the researcher was one of the facilitators who guided NIDs from the planning to the evaluation phases of the practice. As indicated before, to reveal contextual issues, AT (Engeström, 1999) was used. As seen from the Figure 1.1, there are some triangles on activity system. The system components of multimedia design and development environment can be defined as:

*Subject*: Project groups consist of junior students who were enrolled in "Multimedia Design and Development" course.

*Tools*: All tangible and intangible materials and processes and communications which influences the object such as material development platform, all resources that students use to develop project, web sites, evaluation materials, reports, feedback of facilitators, communication tools to contact with clients, and the feedback of the clients

*Rules*: The rules established by context, course, instructors and students like group contracts, rules for group working, schedule of the course, grading rules, timing issues, random or self-selected grouping.

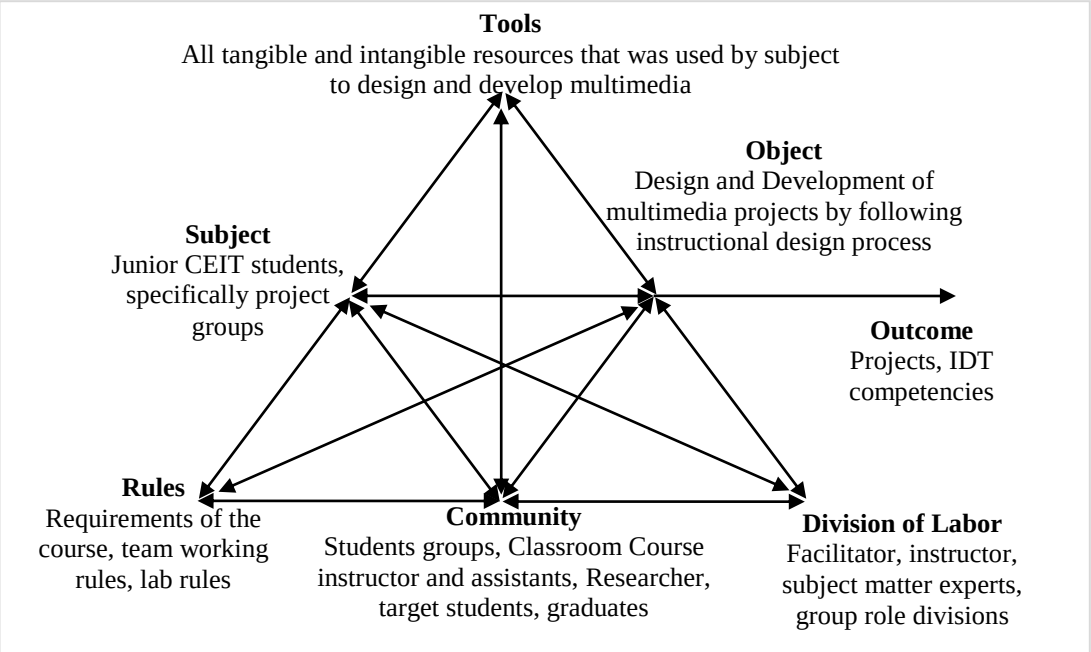



Figure 1.1. General activity system of the study

*Community*: All people and their interaction patterns in the context like project teams, instructors, assistants, friends of students, target group, and the people who assist students.

*Division of labor*: Roles that was decided by the community like students roles in group working, their roles in different stages, roles of instructors, assistants and target group.

Object: The general purpose of the activity system which was "*to design and develop instructional multimedia by following instructional design process*". There were also

different sub objectives like conducting analysis, design, developmenti, implementation and evaluation. Students had some other objects as well, like getting good grades and producing attractive end – products.

*Outcomes:* Results derived from the object such as completed projects, instructional design competencies of novice instructional designers, new knowledge or experience for facilitators.

In this study, firstly each of the components of activity system was examined and contextual issues were revealed. Reveal of the interaction between these contextual issues were used to answer their effects on instructional design processes and learning outcomes. The interaction triangles and outcomes of the activity system were revealed with the research questions of:

1. How are the potential instructional design and development experiences of instructional design students influenced from the contextual issues accommodated in the components of activity system?
2. How are the instructional design and development processes of instructional design students influenced from the contextual issues accommodated in the components of activity system?
3. What are the issues that might be combined in an activity system to provide the success of instructional design practice and products?

## 1.5 Significance of the Study

Revealing the issues influencing novice instructional designers' quality of work and experience (ID competencies) will provide frameworks to design better practices in ID related courses. The curriculum can be strengthened by considering the problems in the practices and by developing strategies to improve the outcomes of the practices (Pinar & Grumet, 1982). For this study, the researcher explored many contextual issues influencing the practice of novice instructional designers in negative or positive ways. To support the findings the researcher also benefited from the experience of previous years' students as well. Thus, how previous year's students use their skills coming from instructional design course was also examined. With this respect the results of the study might be helpful in improving instructional design related courses such that they provide the requirement of real working settings. As a second issue, by revealing how the instructional design and development processes are influenced from the contextual issues, the quality of the processes might be improved.

Although there are several efforts to define the instructional design and technology field and competencies of instructional designers (Bratton, 1995; 2007) there is still need for performance assessment methodologies of instructional designers. According to Linn, Baker and Dunbar (1991), content of assessment should cover the "*current understanding*" of the field and assessment should reflect criteria that is considered as evidence of quality. Quality of products, quality in group working and quality in progress on the projects were examined through interaction between the contextual issues. With this sense, the results of the study might be helpful to draw methodologies to assess outcomes and performance of NIDs considering contextual factors.

Social changes cause alterations in instructional methods. The assessment in complex learning environments becomes more complex than measuring knowledge reproduction (Dochy, Segers, Sluijsmans, 1999). Since contextual issues are crucial issues in authentic learning environments, they should also be considered in assessment. However, still there are the questions of which assessment methods and instruments should be used and what kind of evidences we can observe to asses students in a complex learning environments (Darling-Hammond & Synder, 2000). By adopting contextual thinking, how all assessment instruments, systems and evidences harmonically combined is also another important issue according to Darling-Hammond and Synder. In this study, the researcher aimed to provide guidance about what kind of issues the student assessment should cover in a complex learning environment. The AT components provided a framework to model the contextual issues. The problems in the interactions among the components will show which contextual issues prevent successful completition of the projects and better learning outcomes. By considering those problems, a fair assessment method can be used ın order not to demoralize the students who want to put considerable effort.

Shortly, the results of the study suggest a better design for instructional design related courses accommodating complex learning situations like learner centered and project based environments. Moreover the contextual issues which constitute barriers on the ID competencies and quality of products will lead practitioners to develop suitable assessment methodologies in these environments.

### 1.6 Definitions of the Terms

***ADDIE***: Abbreviation of Analysis, Design, Development, Implementation and Evaluation instructional design model.

***Activity system***: The triangle representing Activity Theory components, corners constitute tools, rules and division of labor which are also called mediating components. These components mediate subject, community and object.

***Community***: All people who are contributing to the object which is the purpose of the community

***Competency***: A knowledge, skill, attitude that enables one to effectively perform the activities of a given occupation or function to the standards expected in employment (Spector, 2001, p. 180) . In this context competency and skill are used interchangeably.

***Expert instructional designer***: A person with a foundation of formal training in the field, typically a graduate degree, substantial work experience and facility to anticipate design problems and quickly identify effective design solutions (Spector, 2001, p.181 ) . In this study, the instructional designers who are working at a position of instructional designer or system analyst.

***Formative evaluation***: Gathering information on the adequacy of an instructional product or program, and using this information as a basis for further development (Spector, 2001, , as cited in Seels & Richey,1994, p. 128).

***ID skills***: Those knowledge, skills and judgments that all designers should be able to demonstrate. Applied to both competencies and performance statements (Spector, 2001, p. 181 ).

***Instructional design***: Systematic instructional planning including needs assessment, development, evaluation, implementation and maintenance of materials and programs (Spector, 2001, p. 181) .

***Instructional context***: The physical and psychological conditions surrounding the learning environment

***Instructional strategy***: A general approach to selecting and sequencing learning activities (Spector, 2001, p. 182).

***Multimedia***: The integration of various forms of media for instructional puposes, typically involving computer graphics, animation, video, sound and text (Spector, 2001, p. 183) . In this study, for educational software which compose of audio visual components to teach a

subject matter, , there are three parts; content teaching module, assessment and the game. For video project, 5 minute-video to teach a procedure.

***Novice instructional designer***: A person who has received basic training and education in instructional design fundamentals, but has little or no actual on the job work experience (Spector, 2001, p. 183) . In this study, junior students studying at CEIT.

***Object***: The product which is proposed to be designed and developed by the community.

***Outcome***: Transformed object which means all outcomes that was obtained by the community and subject while progressing on the object of activity system.

***Quality***: In the study context, the minimum criteria to provide the minimum standards that were specified by the instructor.

***Stakeholders***: People with a vested interest in project outcomes (Spector, 2001, p. 184)

***Subject matter expert:*** A content specialist who advises or assists the designer. In this study, the person who suggests the content, validates the content and the content accuracy (Spector, 2001, p. 184) .

***Summative evaluation***: Systematically gathering information on adequacy and outcomes of instructional intervention and using this information to make decisions about utilization (Spector, 2001, as cited in Seels & Richey, 1994, p. 134)

***Target group***: Those persons for whom an instructional intervention is intended. In this study, mainly teachers and their students (Spector, 2001, p. 184 ) .

# CHAPTER II

# LITERATURE REVIEW

In the literature review, the researcher first presented general competency requirements of the Instructional Design and Technology field, and methodologies that are used to give required competencies to the practitioners. After this general overview, the researcher will examine instructional design practices which are used in instructional designer education and then the ways which improve these practices with extensive evaluations. Lastly, as a methodological framework Activity Theory will be mentioned.

## 2.1 Instructional Design and Technology

The definitions of the field of instructional design and technology have changed since 1920s; that is over time its definition has transformed from media view to process view. The name of instructional technology is used in a different ways by different countries and institutions and its name interchanges between "*educational technology*" and "instructional technology" (Seels, B. & Richey, R. C., 1994). Also the field is called as "instructional development", "instructional design, and "instructional systems design" as Schiffman (1995) states. As a respectable association of the field, the AECT (Association for Educational Communications and Technology) uses "*educational technology*" term and defines it as "*the study and ethical practice of facilitating learning and improving performance by creating, using and managing appropriate technological processes and resources*" (AECT, 2007) . On the other hand, Reiser prefers to use the term "*instructional design and technology*" to define the field since he believes that instructional or educational technology encompasses the media which are used in instruction and the systematic procedures to design instruction (2001). Definition of the "*instructional design and technology*" involves analyzing the "*learning and performance problems and design, development, implementation, evaluation and management of instructional and non instructional processes and resources*" (Reiser, 2007, p. 7). Resources or media might be assumed as the technologies that might be used to "*improve learning and performance*" (Reiser, 2007, p. 7).

Instructional design is defined (separately from technology) as "*a discipline that is concerned with understanding and improving … the process of instruction*" by Reigeluth (1983, p. 4). Smith and Ragan (1990) also define instructional design field as a "*systematic and reflective process*" to embed optimized instructional principles into different learning resources like materials, activities and evaluation process. As seen, there are a lot of terms to call and define the field but in fact all of them refer to the same field (Schiffman, 1995). In this study, the field will be called as "*instructional design and technology*" (IDT) which is more comprehensive and suitable for context of this study. On the other hand, the researcher will use only "ID" in ID experience, ID frameworks, ID practice, etc, because those terms are commonly used terms.

In line with its definition, instructional designers are expected to create design solutions for instruction by following a systematic way. These solutions might be an end product and sometimes instructional designer might use his own production skills to create the final instructional material (Smith & Ragan, 1999). The role of the instructional designer and instructional technologist (which is more familiar terms for Turkish context) might be described in the similar way with the definition of instructional design and technology. As Reigeluth, Bunderson and Merrill (1994) state that instructional technologists develop procedures to use learning principles to develop and evaluate the instruction but not develop the principles. Thus "*instructional designer*" and "*instructional technologist*" might be used interchangeably. In this study, the researcher will use "instructional designer" term to refer to both instructional designer and technologist.

People in instructional design and technology field might work in a lot of contexts like K-12, higher education, industry, business, health services, military and everywhere learning takes place (Rasmussen, 2002). IDT is such a multidisciplinary field that is influenced by various administrative and financial areas, mostly from computer related areas (software development, selecting appropriate technologies, human computer interaction), and of course educational fields (educational psychology, measurement and evaluation) (Sumuer, Kursun & Cagiltay, 2006). In the IDT projects, instructional designers might take a lot of roles such as a leader, system analyst, subject matter expert, developer, quality control expert, evaluator of the project as Rasmussen (2002) stated. This wide range of responsibilities of instructional designers and emergent technologies to be investigated require a dynamic curriculum for instructional design and technology programs. Since the field is also relatively new, it still requires expanded definitions, competency criteria and standards (Rasmussen, 2002).

In Turkey, although training of "information technology teachers" is the main purpose of the department, Computer Education and Instructional Technology (CEIT) department is also associated with training instructional technologists with an undergraduate program (YÖK, 1998). Except in Turkey and some Asian countries, IDT departments do not have any undergraduate programs; they only offer graduate programs in other countries (Onay Durdu & Yildirim, 2005). CEIT Departments are expected to improve the instructional practices and use multidisciplinary approaches to contribute to the modern educational system (Odabasi, Akbulut, Dursun & Coklar, 2009). Since the primary purpose of the department in Turkey is to train computer teachers for elementary education and teacher education curriculum is dominant, students have difficulty in understanding their instructional technologist missions as Durdu and Yildirim stated. Their study also showed that CEIT students and faculty do not believe that the curriculum is enough to teach about instructional technology. 42% of faculties think that most of courses are repetition of each other, and both faculty and students express that the curriculum needs to be improved to reach the contemporary needs of IDT. This indicates that courses on instructional design and technology field should be improved in accordance with the needs of contemporary technologies and needs of the society.

## 2.2 Competency Definitions and Training of Instructional Designers

As cited in Spector (2001), The International Board of Standards for Training, Performance and Instruction (IBSTPI) defines competency as "*a knowledge, skill, or attitude that enables to effectively perform the activities of a given occupation or function to the standards expected in employment*" (p. 180). Since the performance based educational techniques was born, expected learner competencies started to shape the design and development of the programs (Richey, Fields & Foxon, 2001). Besides, competency definitions are very helpful to design the courses and student assessment according to Richey et al (2001). They point out that role definitions of real settings might be used to define the competencies. Competency definitions for instructional design and technology field will assist to design instructional design courses and define assessment criteria for novice instructional designers.

Gustafson (2002) and AECT 2000 (as cited in Rasmussen, 2002) suggest instructional design competencies as instructional design (flexible design), performance improvement planning, effective communication, research, and computer based skills. After a longitudinal validation process, in 2000, IBSTPI revealed 23 core competencies of instructional designers (Richey, et al, 2001). Those competencies were summarized in Table 2.1.

Table 2.1 ID domains and competencies defined by IBSTPI (Richey et al, 2001, pp. 46-55)

| | |
|---|---|
| Professional Foundations | 1. Communicate effectively in visual, oral and written form. (Essential)<br>2. Apply current research and theory to the practice of instructional design. (Advanced)<br>3. Update and improve one's knowledge, skills and attitudes pertaining to instructional design and related fields. (Essential)<br>4. Apply fundamental research skills to instructional design projects. (Advanced)<br>5. Identify and resolve ethical and legal implications of design in the work place. (Advanced) |
| Planning and Analysis | 6. Conduct a needs assessment. (Essential)<br>7. Design a curriculum or program. (Essential)<br>8. Select and use a variety of techniques for determining instructional content. (Essential)<br>9. Identify and describe target population characteristics. (Essential)<br>10. Analyze the characteristics of the environment. (Essential)<br>11. Analyze the characteristics of existing and emerging technologies and their use in an instructional environment. (Essential)<br>12. Reflect upon the elements of a situation before finalizing design solutions and strategies.(Essential) |
| Design and Development | 13. Select, modify, or create a design and development model appropriate for a given project.(Advanced)<br>14. Select and use a variety of techniques to define and sequence the instructional content and strategies. (Essential)<br>15. Select or modify existing instructional materials. (Essential)<br>16. Develop instructional materials. (Essential)<br>17. Design instruction that reflects an understanding of the diversity of learners and groups of learners. (Essential)<br>18. Evaluate and assess instruction and its impact. (Essential) |
| Implementation and Management | 19. Plan and manage instructional design projects. (Advanced)<br>20. Promote collaboration, partnerships and relationships among the participants in a design project. (Advanced)<br>21. Apply business skills to managing instructional design. (Advanced)<br>22. Design instructional management systems. (Advanced)<br>23. Provide for the effective implementation of instructional products and programs. (Essential) |

The competencies listed in Table 2.1 were also taken as base of the outcomes of the course in that the study was conducted. Apart from IBSTPI there are several research to reveal the required competencies of instructional designers. To reveal the competencies of instructional designers, comparison between novice and expert designers take important place in instructional technology and design research. In one of the study to reveal expert designers' competencies, Liu, Gibby, Quiros and Demps (2002) reported that to be effective instructional designers, they should communicate well, be a well equipped with applications of instructional design, have good problem solving and decision making skills, and have knowledge about using new technologies. Rowland (1992) also explored that expert instructional designers interpret the learning situation as ill-defined problems, make thorough analysis, create solutions by using the analysis, create variety of strategies for the solutions, use their background, experience of target group and theoretical knowledge, think the context and contextual factors and use the time effectively. On the other hand, novices consider the learning situations as well-defined problems, make superficial analysis and create solutions quickly, needs guidance for solutions, use only target group analysis as a base and create ideas by ignoring most of the contextual issues (Rowland, 1992). Another literature review revealed that instructional designers should have several skills such as problem solving (performance improvement), team working, technology literacy to adopt new technologies, instructional design (visual, audio design, multimedia production), organization, management and guidance skills (Sumuer, Kursun & Cagiltay, 2006).

Instructional designers should be good leaders to reach a success as a team. Brill, Bishop and Walker (2006)'s study showed that effective project leaders should have experience like to know the goals of the project, know the scope of project, conduct business ethically, know the mission of the project, know the measurement of project success measured, listen effectively, know the available resources (funds, equipment, people, and the like), have strong verbal communication skills and be able to recognize a problem. In designing the learning environments for instructional designers those competencies should be taken into consideration to meet the needs of real settings where instructional designers work.

Today, to give complex instructional design skills, mostly case studies, project based approach, cognitive apprenticeship and collaborative group activities are used in ID education (Bannan-Ritland, 2001). Rowland, Parra and Basnet (1995) also reported that presentation of concepts and procedures, simple examples, exercises of instructional design and some small projects are used in training programs frequently. However, Rowland et al believe that for IDT education, iterative and cyclical processes and situations which require

generative and creative skills, studio approach and competitive environment should be created. Bannan-Ritland (2001) also admits that even all those advance techniques are not enough unless they are brought out from strict college courses. Seels (1995) points out that IDT programs have very few courses which require to work out of the college. Additionally, she suggests that academic programs should be organized to make students develop their profession by means of socialized applications in these programs. Tyler (1950 as cited in Seels, 1995) suggests trainers to create exemplary activities to provide behaviorally, emotionally and intellectually adaption to the field. Moreover, to use the ID skills in different problem situations, the ID practitioners should experience to as much as different contexts (Tessmer & Richey, 1997).

Although in instructional design training requires intense real context practice, the CEIT departments in Turkey have lack of this in instructional design practices. This might be a reason of that the finding of that the CEIT students have little awareness about the purposes of their department (Onay-Durdu & Yildirim, 2005). Not only CEIT but also other programs which proposes to train instructional designers, most of the students do not know what are supposed to do after graduation before entering the program (Simsek, 2009). In all the cases given in Simsek's study, informants stated that they learnt about "instructional design" after involving several projects. By summing all the cases up, Simsek (2009) summarizes the issues about instructional design in Turkey as;

- ID field is not known well
- ID is simply seen as development of materials
- ID efforts are far from being systematic process
- ID teams have problem of collaborative work
- Subject matter experts who took place in an ID project believe that they are instructional designers
- The more instructional designers in a project the more successful projects at the end
- Fields and markets where ID is implemented are diversified
- Designs based on virtual learning environments are increasing

As indicated by Simsek, although ID is becoming well-known field, it still has some misbeliefs. These misbeliefs might also continue while studying at the programs. In CEIT program, there are different types of courses like software and hardware courses, teaching methods, ID related courses, technology based teaching courses and other natural and social science courses. Perception of the students in terms of the importance of the courses differs in accordance with their expectations. In a study which was conducted with 130 senior and graduate CEIT students, while students believe that "Computer Networks", "Applications of Authoring Languages in Internet Environment" (Internet programming languages) and Programming courses is beneficial for their career more than the courses of "Foundations of Distance Education", "Design, Development & Evaluation of Educational Software" and "Fundations of Computer Aided Education" (Acat, Kilic, Girmen & Anagun, 2007). Interestingly in the same study it was revealed that the students also believe that "School Experience", "Classroom Management", "Introduction to Teaching Profession" courses also ranked as most beneficial courses in the department. This result might be caused because the students of CEIT believe that they could be teachers or programmers in their career. Also the methods used in those courses might have an effect in students' perspective to those courses which are supposed to provide instructional design and technology skills.

### 2.3 Multimedia Design as a Context of Training Instructional Designers

Multimedia is defined as "a class of computer-driven interactive communications systems which create, store, transmit, and retrieve textual, graphic, and auditory networks of information" (Gayeski, 1993, p. 4). Multimedia design and development which is the context of this study, has several opportunities to make novice instructional designers acquires some skills and competencies of the field oif IDT. As a design based learning environment, by means of multimedia design technical skills (Kafai, 1995), collaborative working skills (Gifford & Enyedy, 1999) and knowledge of subject matter (Kafai, 1995; Barron et al. 1998) can be obtained. Hardre, Ge and Thomas (2006)'s case study showed that when a novice instructional designer designs a learning material, they might get more self-awareness, self-monitoring skills, clear understanding of IDT practices. Besides, novices might understand the expected competencies and learn how to improve their current knowledge to reach the goals of the field.

In IDT education, media design provides novice instructional designers to follow different ID models, to create solutions, to develop technical skills, to examine real life contexts and to interact with the target group (Rowland, et al., 1995). Novice instructional designers can make collaboration with target group (teachers or learners) to develop resources which meet

target group's needs effectively. Sugar (2001) argues that most of technology-rich training systems have problem of lack of collaboration with end-users. He suggests IDT practice to have iterative system which including an administrative system, a project team, an effective involvement and communication system. Therefore, IDT practices should include activities to provide collaboration with real learner community, team members and administrative system.

Liu and Rutledge (1996)'s study showed that multimedia design provides motivation and involvement, self-efficacy, brainstorming, teamwork skills, learning multimedia tools and researching skills. The study conducted by Sherry and Myers (1998) related with design of web page of a university revealed that there is a relationship between learning and design. They concluded that "…*whenever a product emerges from the design and development process, as opposed to being constructed from a predefined blueprint, designing will require development of new skills and concurrent knowledge with the carrying out of design tasks.*"(p.129). This conclusion shows that, multimedia design reveals lots of knowledge resources, because design process requires several viewpoints and solutions for many problems. In this process, it is expected that both participants and designers have a chance to learn about development of the product.

Liu and Rutledge (1996) emphasize multimedia design is very effortful and complex process. Because the aim of the multimedia is more than presenting static information, designers should take into consideration the interaction, help and feedback components, pedagogical and graphical aspects of the software (Papert & Harel, 1991). All these processes provide meaningful and rich experiences for instructional designers. Thus it might be said that multimedia design has several outcomes which might give novice instructional designers required competencies. A systematic multimedia design activity includes several experiences like learning about the subject matter which is located into the media, collaboration, performance improvement, time management, project management, problem solving, interaction with peers, technical knowledge. Therefore, this kind of activities highly used in IDT curriculum. In higher education level, commonly multimedia design is made with a real client. However, Liu and Rutledge (1996) also revealed that in course context, because of time limitations designers cannot apply all needs of clients and evaluate their products. Therefore, it might be argued that in IDT curriculum, multimedia design based courses needs to design the context to reach real life standards.

In IDT education, design is assumed as a problem solving process (Andrews & Goodson, 1995; York, Ertmer & Gedik, 2009). The way that instructional designers solve ID problems

and apply the knowledge, the processes they go through, the goals they established and their management, monitoring and evaluation processes are the indicators of how the instructional designer promote their instructional design (Gustafson & Branch, 2007). Multimedia design which is an immersion strategy provides instructional designers an ill structured problem that makes novice instructional designers solve a problem collaboratively (Dabbagh & Blijd, 2010). All the collaborators generate a solution and knowledge base via dialogue, interaction and collaboration (Dabbagh & Bannan-Ritland, 2005). The study of York et al (2009) showed that while solving a problem an expert instructional designer use the heuristics composed of "communication, management, learner/audience, solutions, deliverables, outcomes, design process, design team, design problem, and client"(p. 499). In conclusion, they pose several questions to answer whether the novice instructional designers can be taught to be an expert instructional designer, what methods and strategies in IDT programs could present for novice instructional designers to give these heuristics, and what would be the impact of these methods and strategies.

Since novice designers do not have enough practical knowledge and insight to get competence of professional practice, the instructional design curriculum needs to integrate academic knowledge with practical experience (Quinn, 1994). Situated learning which was elaborated by Lave and Wenger (1991) proposes to providing learner a community of practice where the learner is apprentice of experts and work in a real setting. Thus, the learner become a working member of the community and practices the tasks to become mature. According to Herrington and Oliver (1999), situated learning environment can be provided via authentic activities, expert modeling, multiple roles and perspectives, collaborative construction, coaching and scaffolding, reflections of experiences, promoting tacit knowledge to explicit and assessment. All those variety of experiences have promises for rich experience. As Kafai and Resnick (1996) pointed out, there is a strong relationship between learning and design. Multimedia design and development activity which is enriched by situated learning strategies could provide designers get expert competencies of the field.

Multimedia and hypermedia design is the most complete and engaging activities in constructivist and constructionist perspective (Jonassen, Myers & McKillop, 1996). According to Jonassen et al, multimedia design environment provide learner to get project management, research, organization and representation, presentation and reflection skills. An instructional designer should make as much as design projects to grasp all aspects of the design (Galle, 1999) because in one design project designers can only focus on one aspect of the design. In their study, Gibby, Quiros, Demps and Liu (2002) posed four competencies of

instructional designers as communication, instructional design, problem solving / decision making and knowledge of technology tools. For communication aspect, instructional designers are supposed to develop good communication with other team members, subject matter expert, target group "*verbally and in writing*" (p. 218). For instructional design aspect, instructional designers should be knowledgeable in new learning philosophies and theories and they should have skills of applying those theories to the instruction. As a problem solver, instructional designers should be able to adapt themselves to the deadlines and to finish the work in time they should take different responsibilities and roles. As a last aspect, they should know about technology tools and for which part of instruction which technologies might be used. Shortly, while multimedia design development requires many instructional design skills and it might be used as an instructional designer education context.

## 2.4 Creating an Instructional Design Course for NIDs

Constructivism and contextualism influenced the IDT practices and curriculum considerably (Tessmer & Wedman, 1995). According to Tessmer and Wedman, the IDT curriculum should address the question of "*how can the curriculum help the novice designers better address the wide variety of contextual variables which should be considered in a design project*." (p. 240). Wedman and Tessmer (1993) also suggest further research to examine how a better contextual IDT practice can be given. In their examination of the methods of educating instructional designers, Rowland, Parra and Basnet (1995) reported several strategies which are currently used in IDT courses such as public presentations, real project examples which are brought to the class by visiting experts, competitions, study of artifacts, case studies, design studio and internship/apprenticeship. All those strategies encourage the NIDs work collaboratively and make them aware of real contexts while designing instruction. Rowland et al also emphasized that those strategies address creative skills and development of a rational view on instructional design.

Before designing a learning environment, "need and goals for learning, learning objectives, physical and/or virtual space, tasks and interactions, assessment methods, audience and their characteristics, domain area, community of learners and practice, technological capabilities and possibilities" (Kirkley & Kirkley, 2004, p. 43) should be considered. While designing a project based and authentic learning environment, instructor has to examine context of the project, stakeholders of the project, in what way the projects will be represented, in what way students will be supported, what kind of resources the students will have, in what way the knowledge will be constructed and how much they will be free to manipulate the learning space (Jonassen, 1999). As a complex instructional design practice,

the multimedia design and development should be designed by considering many issues influencing the outcomes and quality of outputs.

Multimedia constitutes a multisensory information environment which combines hardware and software to control the still pictures, animations, graphics, audio, and motion video (Johnston, 1990; Galbreath, 1992). Interactive multimedia on the other hand can be defined as *instructional, multiply sourced, segmented, intentionally designed and coherent* multimedia instruction environments which structured to let the user response and control (Schwier & Misanchuk, 1993). Multimedia can be used a variety of purposes in different learning environments and today with the flourish of new technologies, multimedia design become an important part of instructional design and technology field and graduates can find various positions in a multimedia design and development projects (McDaniel & Liu, 1996). In a multimedia design project, there are a lot of roles that designers have, such as project manager, instructional designer, graphic designers, programmer, animator, script author, storyboard designer, videographer, audiographers, subject matter expert and communication person (Tessmer, 1998; Liu, Jones & Hemstreet, 1998).

Multimedia development has a nature which is more complicated, nonlinear and interactive than the nature of most of the instructional design models (Liu, 1998). Multimedia production provides interaction with variety of disciplines (Kunst, van der Mast & Sodoyer, 1999). In a design project designers have opportunity to communicate with variety of stakeholders like clients, subject matter experts, team members and target learners (Galle, 1999). While designing instructional design course, instructors should also consider that novice instructional designers can also learn from each other and from other stakeholders (Kunst et al, 1999). The better communication during instructional design process the better quality instructional design (Larbi-Apou & Moseley, 2009). According to Larbi-Apou and Moseley, internal communication means that the communication among the immediate participants who are the team members, project managers and employees of the project while external communication is made between target audience, customers, and subject matter expert is he/she is outside of the instructional design team. Instructional designers should have to create meaningful dialogue between internal and external stakeholders to negotiate on the objectives, strategies and expectations. They should also evaluate feedback and synthesize to reflect the results of those feedbacks (Larbi-Apou & Moseley, 2009). Therefore, it can be said that a course on instructional design via multimedia design should provide an intensive communication and collaboration opportunities for novice instructional designers.

Multimedia design is a form of instructional design projects which includes the cycles which constitutes of development phases of the project deliverable (van Rooij, 2009). Generally ADDIE framework, which refers to analysis, design, development, implementation and evaluation, is used for instructional design projects. ADDIE is a well-known and most popular ID framework which is also base for most of the instructional design models (Hirumi, Appelman, Rieber & Van Eck, 2010). In analysis process, designers learn about the context, learner characteristics and needs, and in design select an instructional strategy in accordance with learner needs and the nature of the content (Smith & Ragan, 1999). In design part also instructional designers determine sequence of instruction and assessment methodology (Gagne, Wager, Golas & Keller, 2005). In development stage instructional designers develop prototypes, test them and make revisions and produce training material. To implement the materials, instructional designer market the materials and provide support when needed. In evaluation part instructional designer test whether the content is accurate, whether the design solved learning problems and what kind of revision can be made to improve the design (Smith & Ragan, 1999). According to Gagne et al, the evaluation consists of student evaluation, course evaluation and course maintenance and revision. All those phases should be included in an instructional design course to give real instructional design practice (van Rooij, 2009).

Project management is an important part of instructional design since it is the root of production (van Rooij, 2009). In design projects, design team is also in a research activity and there is a cycle of research and design (Erickson, 1997). In a learner as designer environment, instructor should think to include explicit design process, apprenticeship techniques, scaffolding and practice according to Liu (1998). Liu suggest that to make the multimedia design practice explicit, instructor and multimedia experts should give direct instruction, provide students a simulated environment to design multimedia, provide interaction between students, clients and local multimedia experts. Liu, in her study uses also scaffolding technique by explicating design instruction, by using variety of multimedia development tools, by interacting clients and multimedia experts. The study of Liu, Colleen and Hemstreet (1998)'s showed that a successful multimedia project can be achieved with good and continuous communication within the community, with talent of the developers, using constant evaluation and feedback and being on time to finish the tasks. Constant evaluation can be provided by weekly meetings and the success of the project team can be decided in accordance with on time delivery of the project (Liu, et al., 1998). According to Liu et al., technical aspects of multimedia can affect the quality of the projects. As a result teaching in instructional design course requires thinking a lot of issues to get successful

outcomes. Also teaching in a multimedia design and development environment it is very hard for instructors since they have to be more patient and they have to spend more time with students (Liu, 1998).

## 2.5 Contextual Evaluation of Learning Outcomes

A learning outcome can be defined as "*the products of the educators*" (Hussey & Smith, 2002, p. 223). Hussey and Smith criticize the idea of describing the learning outcomes in a strict way and with simple statements. They argue that learning outcomes should be specified by considering the important part of the subject which is expected to be learnt by the students and the skills and competencies that is expected to be displayed by the students. They think that those issues can be interpreted by the context and experiences of the students. However they admit that those things are not easily measurable entities. In complex activities there is no unique measure to assess neither the learning environment nor the students; therefore, there is a new of mix of assessment methods, instruments and source of evidence to assess the outcomes and quality of work (Darling-Hammond & Synder, 2000). While learning in a social environment, the learning outcomes come from the interactions within the community. To provide better collaboration two questions should be asked: "*which interactions occur under which conditions and what effects do these interactions have*" (Dillenbourg, Baker, Blaye & O'malley, 1996, p.201). Finding out relevant mediating variables (ie interactive conditions) might provide the finding out relevant learning conditions and learning outcomes. According to Dillenbourg et al. interacting measures has a positive effect on learning outcomes unless those interactions are conflicted.

Learning outcomes can be categorized as "*content acquisition, application, and practice*" (Michlitsch & Sidle, 2002, p. 129). To measure learning outcomes there are variety of techniques. With the constructivist philosophy, since educators believe that students are responsible with their learning, course evaluation of students become criteria to measure learning outcomes (Nehari & Bender, 1978). In a similar thought, Fenwick (2001) believes that student outcomes might be used as course evaluation. Nehari and Bender divides a learning outcome in four categories, *course valuing* (to what extent the experience is meaningful and valuable), *cognitive-content learning* (to what extent student feels that comprehend the subject matter), *affective-personal learning* (to what extent the student feels that he gained awareness and understanding of self and others), and *the behavioral learning* (to what extent the students feel that use their learning outside of the course) (p. 3). Lave and Wenger (1991) also believes that there is a social learning outcome to define the ability of participating and learning in social contexts. In the study which was conducted by Hardre et

a. (2006), researchers used processes, product, and cognition as the categories of instructional design outcomes. Once an experience is believed as meaningful for the students, it might be assumed as a learning outcome according to Nehari and Bender. In this regard, it researcher assumed that she can observe learning outcomes by asking student experiences and "the experience" and "outcome" will be used interchangeably.

In collaborative working environments, there are other issues influencing the learning outcomes and success. Baeza-Yates and Pino (2006) proposes framework for collaborative learning outcomes which assumes that collaborative working quality is influenced from the quality of the group work, time management and how much work they showed. To evaluate those issues all stakeholders might contribute the evaluation of the group work (Clark, 2005). All those assessment methods require qualitative observations. For a qualitative evaluation, rubrics are also indispensable evaluation tools to provide a fair assessment both between students and between the evaluators (Moskal, 2000). In a complex learning environment, student learning outcomes can be revealed with course-based tests and examinations, student products, student performance observation, in class observation, student reports, student self-assessment, online messages (Fenwick, 2001). Therefore, in a complex and constructivist environment, an instructor has to think many sources that might be used to evaluate students' success and outcomes (Clark, 2005). In the study of assessment in a project based learning environment, Clark (2005) used many of small sources (ie. deliverables) during the project development to evaluate the team performance. As a conclusion he suggests that with a team, instructors can easily evaluate the all process and the quality of the projects. He also suggests that in a team working, individual assessment should also be included to show individuals' weaknesses and strengths.

## 2.6 Activity Theory as a Research Framework

In the extensive literature review of IDT research, Winn (2002) suggests that "research methodologies should adjust to the demands of studying increasingly more complex interactions between students and their environments" (p. 347). As cited by Saettler (2004) "hermeneutic approach" which was proposed by Messer et al. (1988) had possible implications for educational technology research in terms of its argument of inseparability of "fact and value", "detail and context" and "observation and theory". Hermeneutic approach also does not aim to create universal laws but focuses specific case considering historical and cultural context of it. With this perspective new IDT research needs more comprehensive and contextual methodologies to examine complex environments. For example, further research should examine how ID experience is influenced from the community where the ID

is practiced (Hardre, Ge & Thomas, 2006). All these requirements call AT framework as a well suited approach. Activity theory as a methodological tool might be used in complex; tool mediated social environments to reveal key dynamics of the described reality, to point out contradictions and to show a visual representation of interaction among the dynamics of the activity environment (Kaptelinin & Nardi, 2006).

Activity triangle model provides a model to see the pedagogical and contextual issues in designing learning tools (Mwanza & Engestrom, 2005) and draws a big picture to see how learners learn when they involve in a particular learning activity (Stevenson, 2008). According to Leontev (1978) activity should be the unit of analysis to understand the complex environment where the activities are taken place. Activities can be divided into smaller units as actions and operations. According to Leont'ev the action is driven by goal while activity is driven by an object (as cited in Engestrom, 1999). Operations on the other hand, are the simplest parts constitute actions by means of conditions and tools. Instructional design practice is also an activity of a group of students and its object is to development of an instruction by using instructional design action and operations. Activity theory is well suited framework to describe different aspects of instructional design since it has some promises such as (Engestrom, 1999):

*Psychic process versus object related activity*: As stated above instructional design is an object oriented activity, rather than psychic actions of individuals. Engestrom (1999) states object oriented actions are composed of continuous psychic processes. Psychic process is defined as uninterrupted, live and not predetermined acts while object related activity requires subjects to be discontinuous. In instructional design process subjects have an object and they have decision points and they are very active. It is very dynamic process requiring the individuals move with the community.

*Goal-directed action versus object-related activity:* As Engestrom state most of the time individual actions are taken as unit of analysis to reveal human performance. However collective and cultural aspects of actions are eliminated by making clear cut beginning and end for given goals and tasks. Most of theories ignore "*continuous, self-producing, systemic and longitudinal aspects of human functioning*" (p. 22). For example, only focusing to using a multimedia product and to reveal some effects of multimedia make it difficult to analyze how the multimedia were developed to provide that goal and other historical issues that influence the production of the multimedia. However instructional design process includes lots of interaction and actions while designers work for an object.

*Internalization versus creation and externalization:* Before constructivism, theorist focused the internal state of the learning until Vygotsky proposed social constructivist view suggesting creation and externalization of knowledge (as cited in Engestrom, 1999). Today, creativity is very important clue for learning. Activity theory emphasizes that human activity is composed of creativity and transformations of given constrains. In constructionist view which this study gets some insight also proposes externalization of learning by creation of artifacts (Papert & Harel, 1991). By developing multimedia students will transform their instructional design knowledge into a product and this product will reflect their knowledge related instructional design which researcher can observe.

AT uses interventionist methodological approaches as Kuutti (1999) argued. People are not just subparts of a system, they are the creators, and they reconstruct contexts. In work organizations, this framework can be used for developmental research. As stated before, activity is the soul and unit of analysis for AT. It includes several interactive components. Subject is person who is responsible with performing the activity, object is purpose of activity which was determined community or subject. Object provides a guide for activity and it can be physical materials or mental understandings (Farres & MacDonald, 2006). The relationship between object and subject is mediated by tools, community, rules and division of labor. The components of the activity system can be defined as (Engestrom, 1987, See Figure 2.1):

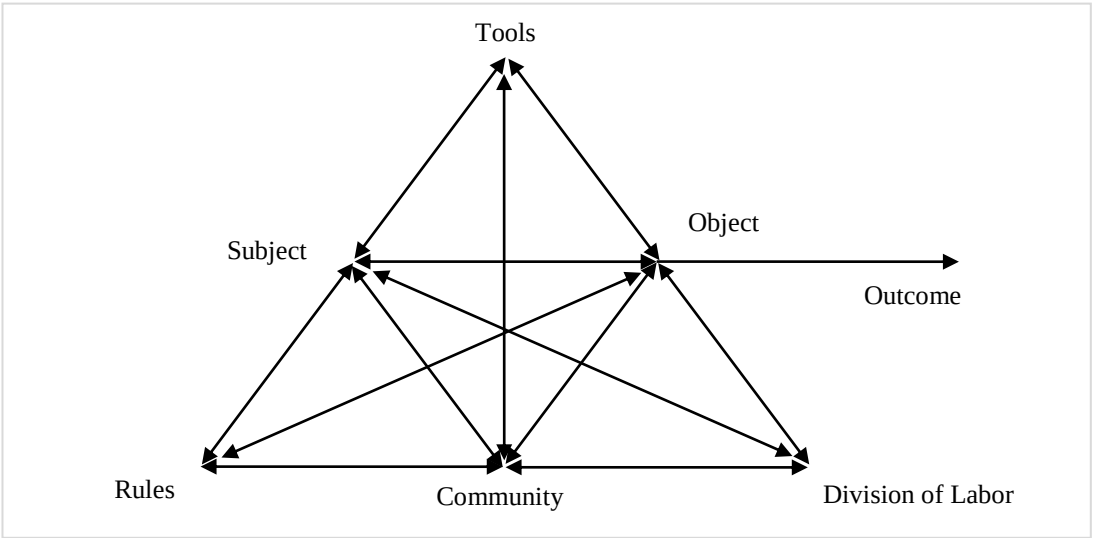



Figure 2.1 A completed model of the Activity System (Engestrom, 1987).

In Activity System whole triangle represents the context. As seen in Figure 2.1 all mediated components which has an interaction. The activity is object driven since all the components have an effect on the object (Engestrom, 2000). The components might be defined as;

*Object*: The goal of the activity,

*Subject*: Individuals who perform the actions to achieve the object

*Tools*: All the resources which are available to perform the object

*Community*: All the participants working collaboratively for the object.

*Division of labor*: The role of the each participant in the community, ie. the role which connecting the individuals to the community

*Rules*: The rules connecting subject to the community

*Outcome*: The outcomes which is reached by completing the object, ie. transformed object.

In a long term study there are varieties of activity triangles, because there are a lot of sub objects. Engestrom (2000) shows how all the triangles can be structured in different stages of the activity in his medical study. For example, in a medical center where a physician works, when a patient comes and the physician examines him, the system was showed as shown Figure 2.2.

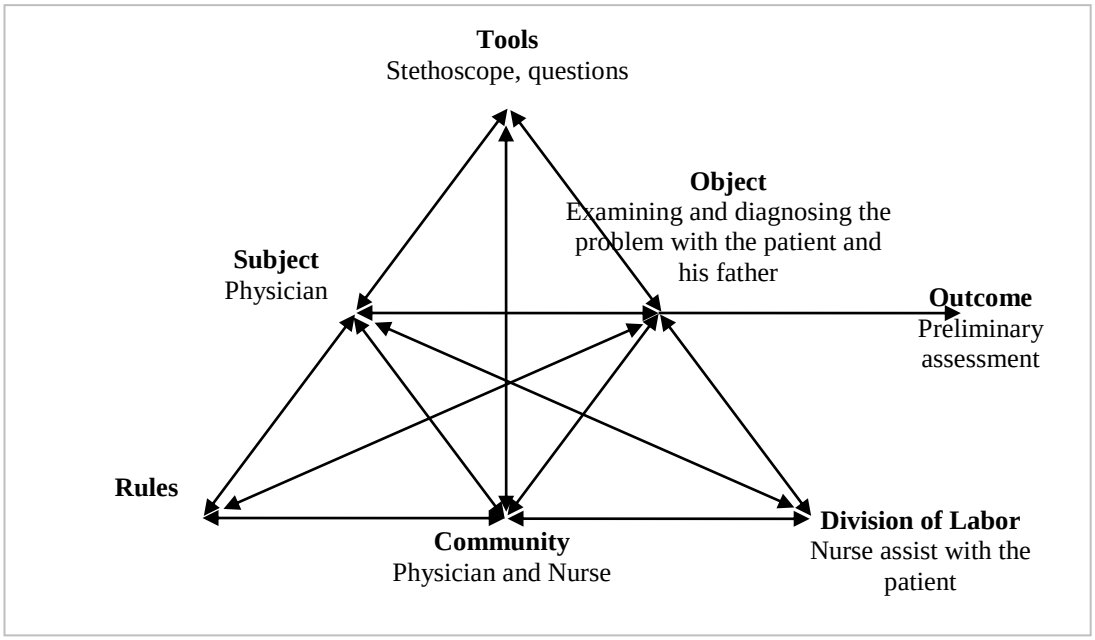



Figure 2.2 Activity system of examination of patient (Engestrom, 2000, p. 962)

The system of Figure 2.2 can be interpreted as, the physician is expected to examine the patient, and he has to use stethoscope examine the patient and question the father to diagnose the situation. In examination community nurse assist the physician and the community is consist of both physician and nurse. This is the first step of the examination and after examination physician might decide to transfer the patient to lung specialist to make further examinations since the physician cannot decide about the patient by himself. In this activity system there is no "rules" since there is no rule which work for that activity. In Engestrom's long term study, the next step was represented as Figure 2.3.

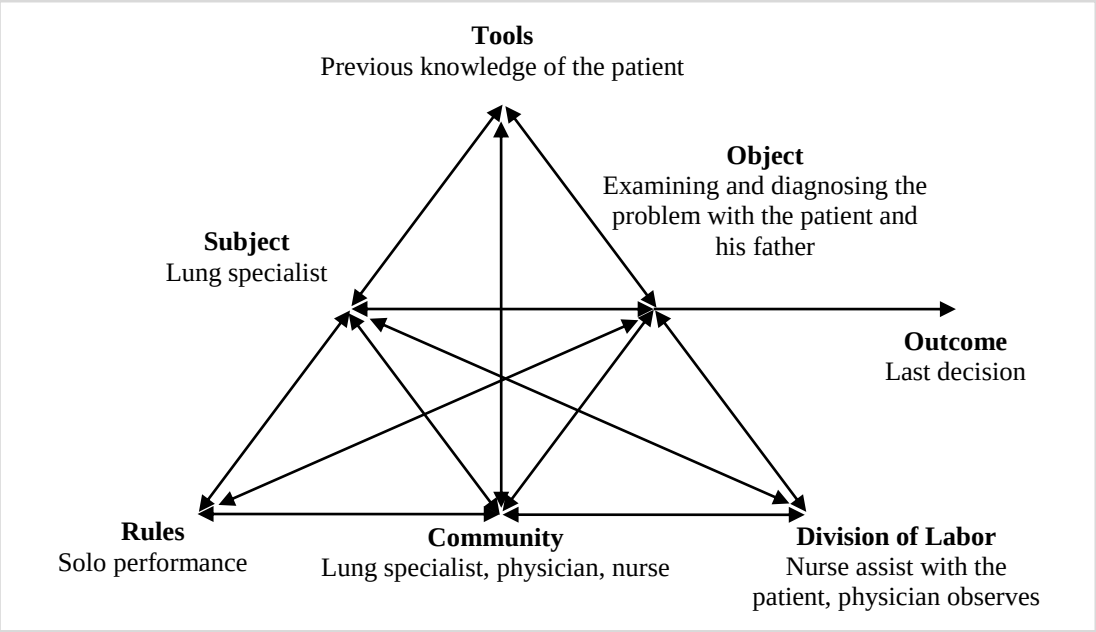



Figure 2.3 Activity system of examination of patient by lung specialist (Engestrom, 2000, p. 963)

In this phase, there are some contradictions, for example the first physician cannot make a diagnosis of the problem and he had to transfer the patient to lung specialist to put a diagnosis and make decisions and this caused the patient to move from different places and lose time (Engestrom, 2000). Also in hospital there is "solo performance" rule that prevents physicians work collaboratively. In this case that "division of labor" and "rule" had a contradictive effect on the object since the diagnosis is postponed. Contradictions do not necessarily mean that the problems but it means the things which prevent harmonic interaction between the components (Kuutti, 1999). These contradictions are very helpful to improve and optimize the system according to Engestrom (1993; 2000). To realize these contradictions long term observations are required. The historical pathway of the events and actual-empirical analysis of the context should be examined to improve the system (Engestrom, 2000).

## 2.7 Implications of the Literature

Instructional Design and Technology field requires a broad range of competencies and those competencies can only be given with complex authentic activities. In Turkey, there is still need of understanding about the field and clarify the competencies to be given in IDT related programs. For Turkish context, new research studies should seek in how those ID competencies given by different strategies and how the competencies might be assessed. Nowadays, project based, collaborative multimedia design and development in a real context

provides very rich instructional design competencies. However, in this kind of complex environment there are a lot of contextual issues influencing experience and outcomes. In educational technology research the complex learning environments become very popular examination areas. The literature implies that there is a need to methodologies to examine complex environments in terms of student learning outcomes and the quality of performance. So activity theory framework might be used a lens to examine the complex learning environments and deep analysis of outcomes. While examining the context, there are a lot of tools and resources to be examined to decide about the outcomes and quality of products. In this study there are a lot of sub activity systems to be examined since there are a lot of phases of the activity. In accordance with the activity triangle definitions, the general component of this study will be composed of:

*Subject*: Junior undergraduate students of CEIT, who enrolled Multimedia Design and Development course

Object: Purpose of the course, which is "to design and develop instructional multimedia by following instructional design process

*Tools*: Material development platforms, all resources that students use to develop project, web sites, evaluation materials, report templates, rubrics

*Rules*: Contracts, rules for group working, rules of the course

*Community*: Project teams, instructors, assistants, friends of students, target group, some people from whom students facilitate.

*Division of labor*: Students roles in group working, their roles in different stages, roles of instructors, assistants

*Outcomes*: The completed projects, students' acquisition of instructional design practice, instructional design competencies.

The components are not limited with those definitions since the further analyses will reveal the details of each component. In light with the literature, some outcomes are expected like learning about instructional design, reporting, communication and collaborative working skills, and narrative skills, time management skills as well as providing good interaction with all components related to multimedia design and development.

# CHAPTER III

# METHODOLOGY

In this part researcher will provide extensive information about the method she used and the details of the context where the data were collected. In this part especially the application of Activity Theory to the study is important to understand the results of the study.

## 3.1 Selected Methodology

In this dissertation study, a case study approach was applied to collect and analyze the data. By using the AT framework the researcher found out many of issues influencing the progress to reach the object. All the observations were made in a natural environment and there were no interventions of the researcher. The researcher was a natural part of the study. Gall, Gall and Borg (2003) define case study as "in-depth study of instances of a phenomenon in its natural context from the perspective of the participants involved in the phenomenon" (p. 436). Gall, et al (2003) exemplify phenomenon with programs, curricula, roles and events. Yin (1981) explains unique aspects of the case studies as that they explain "a contemporary phenomenon in its real life context when the boundaries between phenomenon and context are not clearly evident" (p. 59). In this study, multimedia design and development course is the phenomenon including students, instructors and the design of the course. Multimedia Design and Development course is a compulsory course for all junior level students in CEIT programs. There for the course context was natural.and the researcher was a participant in this natural context. The program is accommodated in a Mid-Anatolian university which is preferred by most of the highest ranked students taking university entrance exam. Most of the CEIT students were graduated from vocational high school because they get more score if they select a program which is parallel with their high school program. Since most of them were graduated from computer related programs, they are supposed to be good at computing.

Multimedia design and development course which is the case of this study is given in different methods and strategies. In this study, the course was given as only one section for

47 students. All the communications, experience of the students, their progresses and projects were included in the case. Since the contextual issues have a considerable effect the issues and the results might be assumed as limited with the students who enrolled in the course given in the semester of 2008-2009. Multimedia Design and Development course (the researcher also used "ID course" interchangbly) was selected because of its complex nature and of its direct purpose to teach about ID processes. Moreover, the course was designed in a constructivist perspective and qualitative assessment methods were accommodated in it. CEIT students met many new experiences by means of the course like working with a target group, working with a project facilitator, working in a team assigned by instructor and qualitative grading for the entire course. All these new applications had different effects on the students and have potentials to lead various experience and outcomes. On the other hand, because of its constructivist nature, the course needed to be organized such that ones can observe all the outcomes and understand students' processes to assess them. With these reasons, Multimedia Design and Development course was selected as a case of this study.

Yin (1984) suggests using multiple cases to predict both similar and contrary results with predictable reasons to increase the external validity. In this study, although a multiple case approach was not applied, the results obtained in the single case were supported with the experience of previous years' students. The case was the multimedia design and development course given in a particular semester, the researcher added the students who took the course previously to increase the capability of the study in terms of explaining the some issues underlying the behavior of the students. Especially in answering the first question which is related to learning outcomes (competencies) of the course, experiences of the previous years' students were important to support the analysis of the influential issues.

Bogdan and Biklen (1998) represent case study design with a funnel. At the beginning all elements of the research context was observed before analyzing data to specify rational data collection tools, time to implement some instruments, focus of the research and other issues related research context. Therefore, the researcher noted and observed everything in the context to understand the case and then she extracted important points that would helpful to understand the contextual dynamics. Then, relationship between the dynamics and how these relations influence the end products and outcomes were examined. This process is also similar to grounded theory (Strauss & Corbin, 1998). On the other hand, the researcher collected all the data once and all analysis was made with that available data. The researcher did not return back to the site again to collect more data to complete a theory.

According to Yin (1981), a case study typically is reported as a narration in which there is no predictable structure and writing and reading is difficult. Yin suggests building a clear framework in which there are open ended questions and their answers. Since the aim of the study was to reveal contextual issues and their influences on the outcome of the context, researcher needed to use a framework to explain evidences in the case and find relationships between them. For that reason, the researcher selected activity theory framework to make the reporting understandable and practical for further examinations. All the externalized tools like texts, data and discourse of all interactions, observations, communications, reactions, products, and projects in collaborative social environment was observed and analyzed with a framework of AT. The researcher tried to reveal all interaction patterns in activity system and make some interpretations about outcome. Therefore, an explanatory case study was conducted Yin (1994).

### 3.2 Purpose and Research Questions

The main aim of this study is to examine dynamics of a complex learning environment which is a multimedia design and development course to provide better experiences for novice instructional designers. Since AT was used as a framework researcher examined each triangles of the activity system firstly.

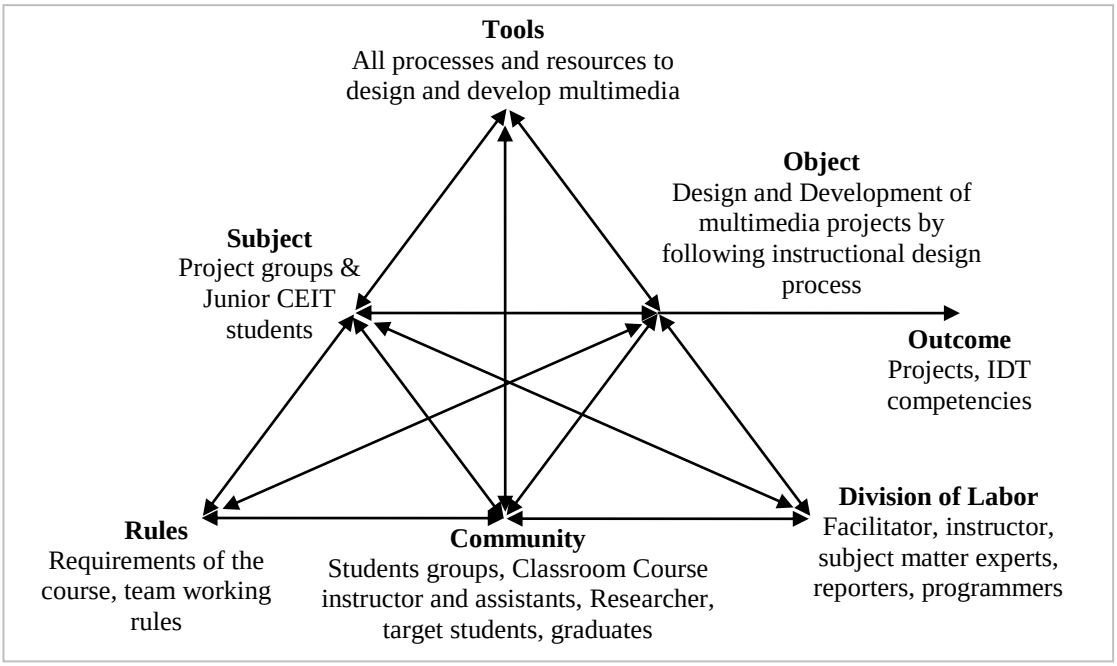



Figure 3.1. Activity system of multimedia design and development course

With the illumination of these interaction triangles and outcome research questions of study was determined as;

1. How are the potential instructional design and development experiences of instructional design students influenced from the contextual issues accommodated in the components of activity system?
2. How are the instructional design and development processes of instructional design students influenced from the contextual issues accommodated in the components of activity system?
3. What are the issues that might be combined in an activity system to provide the success of instructional design practice and products?

### 3.3 Participants of the Study

Main participants of the study were 47 undergraduate junior students (33 males and 14 females) who were studying at the Department of Computer Education and Instructional Technology. In addition to the current students, 10 previous year students, 16 graduate students (including the guest speaker), two target group teachers and two facilitators were interviewed. The current students were enrolled in the mandatory "Multimedia Design and Development" course which was known as "Instructional Technologies and Material

evelopment" in previous years. After conducting a pilot study with senior students who were enrolled in a game design course which also aims to teach an instructional design process via development of a game, the researcher decided to work with students who have no practical experience with an instructional design process. Although these students get some courses related to design and development of computer based products, the main purposes were to teach the design of the materials and screen design issues rather than the instructional design process. The junior students have some technical skills like programming, web authoring, and screen design.

Students formed groups and observations conducted on those groups during the study. Patton (1990) suggests selecting information rich cases to obtain in-depth information from sample. On the other hand, the researcher and the course instructor assigned the groups such that each group was homogeneous in terms of academic success, group working and technical skills.Researcher could get information from the survey which proposed to collect information about students' collaborative working skills, pre-knowledge on programming and academic success. To make deep observations and interviews, the researcher selected 17 students (5 project teams) for the first project and 9 students (3 teams) for the second project. Randomly selection procedure was used for the first project teams because the facilitator did not know the students and already all the teams were consisting of the students having different skills and competencies. In the second project a purposive selection was implemented. According to Fraenkel and Wallen (2006), in purposive sampling researcher, by depending on his/her previous experience, selects students instead of using available ones. First of all the researcher excluded the teams which has the students who worked with the researcher in the first project. Thus, 6 teams which were possible to select remained. Among those groups two of them were very high, three of them were moderate and one of them was very low performers in terms of team working skills, quality of processes and the end product. The researcher selected the groups considering the academical skills of the team members. She chose the teams from two moderate and one academicaly good teams. The researcher did not choose the very bad team because all of them were the senior students who were combined with the instructor and they were very troubled.

The number of the participants can be considered as large enough for a qualitative study. A convenient approach also worked for the participants, because researcher is also an assistant of the course. However, this convenience provided some advantages for the researcher like experience managing groups, giving feedback, solving group problems and using multimedia design environments.

At the end of the semester, the researcher conducted individual interviews with 20 voluntary NIDs. Gender distribution of the participants interviewed individually can be seen in Table 3.1.

Table 3.1 Gender and sample distribution of interviewed students

| Gender | Current students (CS) | Previous students (PS) | Graduates (GS) |
|---|---|---|---|
| Female | 9 | 4 | 10 |
| Male | 11 | 6 | 6 |
| Total | 20 | 10 | 16 |

Apart from the current students of "Multimedia Design and Development" course, the researcher also conducted interviews with previous years' students to triangulate data and to see the outcomes of the course. 10 of the participants were the previous year's students. Since the course was not different than the last year's course, the researcher aimed to understand awareness of experience of those students. Another 16 participants were graduated in different years, all of them took the same course but there were some differences in the tools that were used and the activities. However, since the method was not changed, the researcher wanted to triangulate "outcomes" of the instructional design practice by using current students and graduates.

To differ all those three different type of the participants the researcher used code names as CS (CS1, CS2, etc) for the current students, PS (PS1, PS2, etc) for the students who took the course previous year and GS for the graduates (GS1, GS2, etc).

The researcher also interviewed two facilitators who are very experienced on the course to triangulate the community and division of labor issues. Facilitators were named as F1, F2, F3, F4 and F5. Twenty of current students were interviewed individually. In Table 3.2 the interviewed student distributions by facilitators is shown.

Table 3.2 The number of students who were interviewed and their facilitators

| | F1 | F2 | F3 | F4 | F5 | Total |
|---|---|---|---|---|---|---|
| First Project | 2 | 5 | 2 | **11** | 0 | 20 |
| Second Project | 4 | 4 | 3 | **7** | 2 | 20 |
| Total | 6 | 9 | 5 | **18** | 2 | |

Since students formed the project groups twice and assigned different facilitators for each project, one student might have work with two different facilitators. F4 was the researcher and she interviewed 11 students from her first project teams and 7 students from the second project teams. The other facilitators, F2 and F5 were also interviewed. They were voluntary to participate in the study. F5 is the instructor and for both project he took the groups which are expected to have trouble in working since the group members have very low academic success and have trouble with the class. That is why very few students who were assigned to F5 could be interviewed.

### 3.4 Researcher's Role

The study took about 17 weeks (including last meeting on Final presentations). The researcher was the active participant of the course. She and other facilitators developed several in class and after class activities like quizzes, instructional design problems, a video to show visual design problems in multimedia projects, analysis stage questions that can be asked to clarify each analysis issue (need, content, context, and learner), improvements on the report templates and grading rubrics. She was also teaching in lab hours, she intentionally assigned laboratory groups to be with her project groups. However, since the students were juniors and they had different schedules, not all the project groups and all the members could participate in her lab sessions.

The researcher's main role was to facilitate and mentor project groups. She selected 5 groups for the first project and there were a total of 17 students in those groups. However, since she participated in all class meetings and prepared some class activities she communicated and knew about almost all of the students. The researcher's facilitator role required to conduct weekly meetings, giving feedback for the progresses of the students, reading and grading the reports and other deliverables, tracing students via online tools, managing group work and suggest solutions for group problems.

The researcher applied all the activities that she developed and collected the data by herself. Familiarity with students and active participation of all course activities provided researcher collect data without disturbing natural environment. The researcher can be assumed as the main instrument of the study (Marshall & Rossman, 1999), she tried to reveal all issues happened in the context. She tried to set up good communication with students and students approached her positively. Although an ethical approval was given by the university, students were not told they are observed for a study because this might be disruptive for the

students and the context might not be natural. At the end of the semester and while interviewing individual students they were informed about the study.

### 3.5 Group Assignment in the First Project

For the first project (concept project) project teams were assigned by the instructor. With this application, the team work experience was supposed to be used during the project. However to provide a fair distribution, heterogeneous teams were created. Students were asked their GPAs, the level of the pre-knowledge about Macromedia Flash, attitude towards team working and their gender to provide heterogeneouity within teams and homogeneouity between the team. GPA scores were categorized into three groups, from 0 to 2.50 was category 1, from 2.51 to 3.00 was category 2 and from 3.01 to 4.00 was category 3. The GPA categories and the number of the students are shown in Table 3.3.

Table 3.3 Academic success

| GPA | Number of the students |
|---|---|
| Less than 2.50 | 10 |
| 2.51– 3.00 | 13 |
| 3.01 – 4.00 | 12 |

The instructor examined several group attitude tests to increase the criteria to make sure that more personal dynamics involved into group formation. She selected SAGE (Student Attitudes toward Group Environments) questionnaire which can be used to predictive and diagnostic tool (Kouros & Abrami, 2006). The four factors of the SAGE questionnaire was *quality of product and process*, *peer support*, *student interdependence*, and *frustrations with group members*. *Quality of product and process* factor pertains to perceived advantage of group working on the quality of the product. *Peer support* pertains caring group members opinions and feeling enjoyment to involve group activities. *Student interdependence* pertains to believe each group member need to contribute equally and other group members' performance influences the total group grade, thus the group members should contribute equally. *Frustrations with group members* factor covers the statements related frustration with creation of groups, expectation of good academic success from group members or desire to form the group with friends. The researcher reduced categories into "positive" and "negative" attitudes because four categories made grouping very complex with other criteria. For each factor, a threshold level was calculated and when students' score for that factor is lower than the threshold student was categorized as "negative" side. If the score was higher

than the threshold, the student was categorized as "positive" side. Thus, this criterion had two categories for this study. As shown in Table 3.4, 20 students were close to positive side of working in a team while 15 of them were in the negative side.

Table 3.4 Group working attitude

| Attitude | Group |
|---|---|
| Positive | 20 |
| Negative | 15 |

For the group assignments students have been given chance to declare three class members who cannot get along with and no way to work with them. Then instructor excluded those class members from those students' potential group members. Another criterion was related to finding convenient target students. Since instructional design students need to communicate with a target group and teachers, the instructor wanted each group had at least one student who can easily contact with a target student and teacher. On the other hand, it was not used in grouping procedure because very few students reported that they knew someone to contact as target group. The last criterion was the level of Flash software experience; students were asked to scale their experience and knowledge on "*action script*", "*visual design*" and "*animation*" (Appendix A).

Table 3.5 Technical skills

| Technical skill | Actionscript | Visual design | Animation |
|---|---|---|---|
| Not good at | 19 | 11 | 10 |
| A little | 14 | 14 | 0 |
| Good | 2 | 10 | 25 |

By using these entire criteria instructor created 13 groups which are heterogeneous in terms of gender, GPA, team work attitude and technical skills. On the other hand 12 students did not participate first day session and they were not given any questionnaire, and they were randomly assigned to groups without any criteria. Students were not given any chance to change their group members after they were assigned a group. However, no groups brought a complain, only one male student did not want to work with any group because of personal preference, but later on he actively involved to group work. The assignment of the teams is represented in Figure 3.2 below.

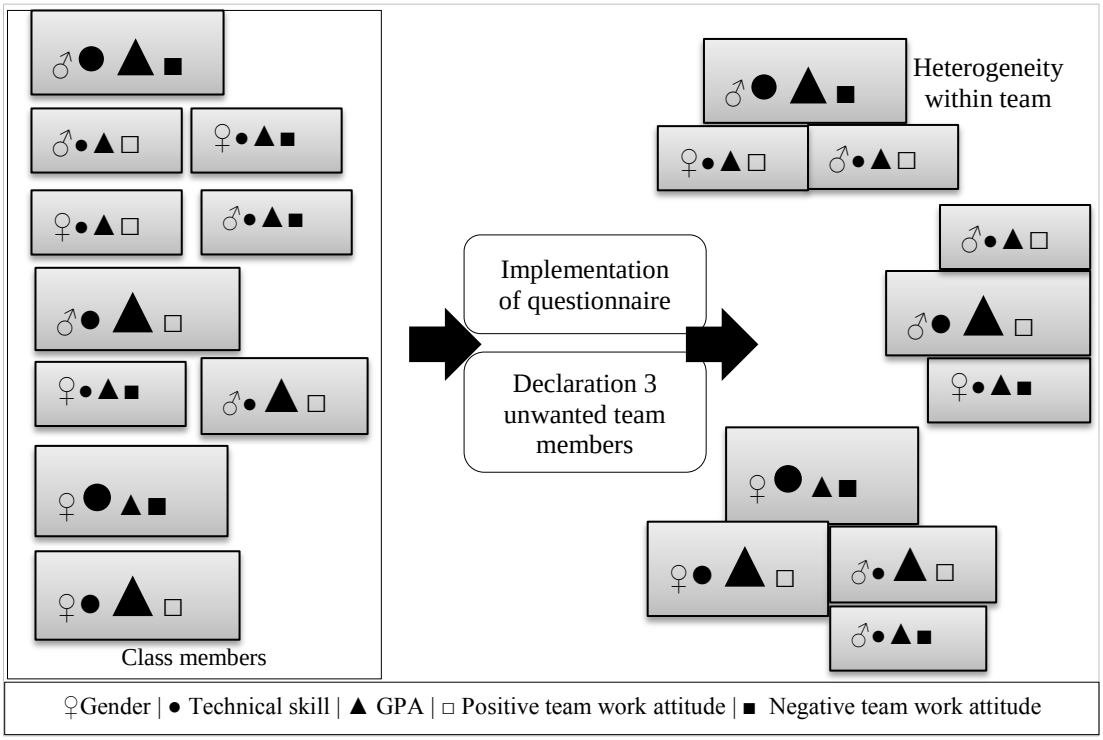



Figure 3.2 Team meber assignment in the first project

## 3.6 Concept Teaching: Flash Based Multimedia Project

For concept teaching project, NIDs were supposed to develop a multimedia module to teach elementary students. In the first week, groups identified their projects and started to work on analyses (See Table 3.6).

Table 3.6 Distribution of the groups and facilitators for concept teaching project

| Group | Student | Facilitator | Project | Group | Student | Facilitator | Project |
|---|---|---|---|---|---|---|---|
| 1 | CS1<br>CS2<br>CS3<br>CS4 | F1 | Solar System and the Planets | **8** | CS28<br>CS29<br>CS30 | F4 | Turkish Currency (Our Moneys) |
| 2 | CS5<br>CS6<br>CS7<br>CS8 | F1 | Simple Machines | **9** | CS31<br>CS32<br>CS33<br>CS34 | F4 | Light and Reflection |
| 3 | CS9<br>CS10<br>CS11<br>CS12 | F2 | Solar System and the Space | **10** | CS35<br>CS36<br>CS37<br>CS38 | F4 | Change in State of the Matter |
| 4 | CS13<br>CS14<br>CS15<br>CS16 | F2 | Energy Cycle in Nutrition Chain | **11** | CS39<br>CS40<br>CS41 | F4 | Force and Motion |
| 5 | CS17<br>CS18<br>CS19<br>CS20 | F3 | States of the Matter and Thermo | 12 | CS42<br>CS43<br>CS44 | F5 | Pressure |
| 6 | CS21<br>CS22<br>CS23<br>CS24 | F3 | Cardiovascular System | 13 | CS45<br>CS46<br>CS47 | F5 | Meiosis and Mitotic Division |
| **7** | CS25<br>CS26<br>CS27 | F4 | Human Body Systems | | | | |

The topics could be selected more than one group at a time in the concept teaching. The projects had to include “content”, “game” and an “evaluation” part. Students had to use Macromedia Flash Software; they did not have any other choice. Students were encouraged drawing pictures and making animations by themselves. Also for the content they were warned about plagiarism or using a resource without any modification. To evaluate each report and the project, different rubrics were prepared by facilitators and instructor and shared with the NIDs. Also via web site of the course, students could access to all resources of the course.

### 3.7 Procedure Teaching: Video Development Project

In the second project, NIDs were free to choose their group members, some of them chose only on friend and group number increased to 15 (Table 3.7). In this case, each facilitator

took equal number of project groups. Students were also free to choose the topic and target people. They mostly selected adults or everyone as target group.

Table 3.7 Distribution of the groups and facilitators for procedure teaching project

| Group | Student | Facilitator | Project | Group | Student | Facilitator | Project |
|---|---|---|---|---|---|---|---|
| 1 | CS15<br>CS44<br>CS34 | F1 | Sport Injuries and RICE Method | 9 | CS31<br>CS35<br>CS23 | F3 | Enrollment to METU Dorms |
| 2 | CS7<br>CS21 | F1 | Making Puppet with Rope | 10 | CS19<br>CS6<br>CS9 | F4 | How to Play TABU |
| 3 | CS45<br>CS28<br>CS40 | F1 | Customer Rights | 11 | CS17<br>CS11<br>CS3 | F4 | T-shirt Printing |
| 4 | CS25<br>CS37<br>CS20 | F2 | Writing Accident Minutes | 12 | CS10<br>CS22<br>CS13 | F4 | ILKYAR Letter Organization |
| 5 | CS27<br>CS42<br>CS1 | F2 | How to Play TaBU | 13 | CS12<br>CS14<br>CS30 | F5 | How to make Cigkofte |
| 6 | CS46<br>CS47<br>CS39<br>CS8 | F2 | Connecting wireless with cellphone | 14 | CS26<br>CS29<br>CS41 | F5 | Introduction of services of ILKYAR |
| 7 | CS2<br>CS43<br>CS5 | F3 | How to Play Backgammon | 15 | CS18<br>CS24<br>CS4 | F5 | How to make Menemen |
| 8 | CS33<br>CS16<br>CS36 | F3 | Using Library Reserve Service | | | | |

Groups selected the video editing program themselves. The video had to be 5 minutes. In the video, NIDs were expected to presenting content and they summarized the content, also they were encouraged to provide an assessment and feedback mechanism. NIDs developed a manual for the video individually. Manuals included summary of the topic, use of the video and a self-assessment test.

### 3.8 Activities of the Semester

The study was proposed to take fifteen weeks, students came to classroom for two hours then they attended one hour meetings with the researcher and other facilitators. For the first six weeks students took two-hour computer lab sessions. In lecture part attendance was not mandatory but facilitator meetings and lab sessions were mandatory. The semester was divided into two parts; in the first part students developed interactive multimedia Macromedia Flash 8® to teach a concept via and in the second they developed a 5 minute procedure teaching video. For both projects students followed ADDIE instructional design model.

First day of course, a background questionnaire was distributed to create homogeneous project groups. In the questionnaire, students' technical and academic proficiencies, group working skills were inquired. Another questionnaire was distributed to understand their pre-knowledge and experience on instructional design. By using background questionnaire instructors and facilitators formed the groups for the first project. The researcher selected 5 groups among 13 groups. Since researchers did not know about the students and since groups were homogeneous she selected them randomly. A group contract template was given students. The project groups signed a contract to arrange meetings, rules of group, what their roles, who did which tasks, penalties for late or bad quality jobs, and other things that they are free to determine. The contract constituted 2% of the project grade. In that week also students in each group came together and they collected some ideas before meeting with facilitators. Laboratory sessions also started in the first week.

Since the second week was holiday, the first meetings with groups was held in the third week. In that week students solved a problem based instructional design activity as pre-test. Students were not announced about the results of this activity. In the group-facilitator meetings some project topics were discussed. Some of the groups had already decided on their topic. In this week students submitted their lab work. Each week, one lab homework was assigned. In the third week, a guest speaker working at a private software company came to class to talk about real life conditions and working styles of instructional designers. It was a very interactive session and students asked many questions. In that week students also submitted their pre-analysis report. This pre-analysis report was to make students familiar with report structure; it was graded but omitted from total student scores. The researcher also met with students and recorded all the meetings. Since there had been holiday at the beginning of the semester students had to submit both draft and actual analysis reports in a week. The researcher gave feedback and graded the draft analysis in two days and sent it

to students, and they evaluated feedbacks and submitted it as actual analysis report in 5th week.

After finishing analysis students were encouraged to develop paper based prototypes. However, most of the groups did not bring it before design report submission. In addition to mandatory weekly meetings, some of the groups often visited the researcher and asked technical questions. After design report submission, students started their project. In the most of the project groups they divided project into three parts "content", "game" and the "test" since this was required by the instructor. Some groups also added different parts like help, dictionary, and practice. Each group member was expected to work on each part of the project equally. Weekly meetings were never omitted even if there were no lecture hours or labs. On the other hand, sometimes some of the groups did not come to meeting. During the meetings, groups had to work with a target group and facilitator helped them to find a subject matter expert to take their consideration on the project. In addition to weekly meetings, the facilitator and project groups opened an online mailing groups to share information and files, and in group communication. These online tools provided facilitator to see the contributions of each group member. Sometimes they sent their project files which have some errors and facilitator corrected them. Concept project was concluded with the submission of the project material and project report. After submitting deliverables, students sent their peer evaluations. Peer evaluations constituted 5% of total grade.

As seen on grading Table 3.8 concept teaching part covered 40% of the total scores. There were a lot of deliverables which students get scores. Only totally 20 points is based on individual work.

Table 3.8 Grading table of the course

| **Deliverable** | **1st project** | **2nd project** | **Lab assignments** | **Total** |
|---|---|---|---|---|
| Group contract | 2 | | - | |
| Analysis Report(required to proceed) | 5 | 5 | - | |
| Design Report(required to proceed) | 5 | 5 | - | |
| Instructional Materials | 13 | 13 | - | |
| Project Report | 10 | 10 | - | |
| Peer reviews | 5 | 1 | - | |
| Presentation | – | 6 | - | |
| Individual work | | 5 | 15 | |
| Total | 40 | 45 | 15 | 100 |

For the procedure teaching project, the processes were very similar. However, at that time students were free to form their groups and the researcher took three groups among 15 groups, thus each facilitator took equal number of groups in the second project. This time students were expected to prepare a five-minute video to show a procedural topic. In the first week students were taught Pinacle® which is video editing software in the lab, but they were free to use any other video editing programs. After the first, two week of procedure teaching project, class lectures was ended, but weekly meetings continued. In the first lecture hour, there was a guest who is an expert from Audio-Visual Systems Research and Production Center (GISAM). He talked about how to record quality videos, and what issues students need to consider while preparing a video. In the first week of the project, groups also signed their contract and submitted to their facilitators. During procedure learning project, their questions on reports or the project was much less than the first project. In procedure learning project students were supposed to prepare a video as group and a manual for the video individually. By doing this, instructors and facilitators wanted to understand to what extent students get visual design principles. Meanwhile, the researcher interviewed graduates and the students who took the course previous year. The students who participated in this study were interviewed in the last two weeks of the semester.

On the final day, before presentations post-questionnaires were distributed and collected. NIDs submitted their reports and manuals, and presented their videos on the final examination date of the course. On that day, each group was given totally 13 minutes to present their progresses and show the 5 minute video. While they were presenting, all the facilitators and instructors scored NIDs' performance by using a template, each NID was given different scores. After presentation, NIDs again sent their peer evaluations. All the schedule of the course and data collection times are listed in Table 3.9.

Table 3.9 Schedule of the study

| Weeks | Class & Lab activities | Deliverables | Data Collection |
|---|---|---|---|
| **Concept Teaching Project** | | | |
| Week 1<br><br>22 September | Introduction & Syllabus Overview<br><br>Assignment of Teams & Group Contract | | Questionnaire to define the random groups<br><br>Questionnaire to investigate background and demographics of the students |
| **Week 2 - 29 September Holiday** | | | |
| Week 3<br><br>6 October | Using a Model for Instructional System Development (Lecture)<br><br>Analysis Phase of Instructional Design (Lecture)<br><br>Guest Speaker<br><br>Analysis phase questions quiz | Lab homework 1 | Group meeting, Observation- decision of the projects, understanding analysis report<br><br>Instructional Design Problem Solving Task (Pre) |
| Week 4<br><br>13 October | Introduction to Concept Teaching | Analysis Draft-Report for 1st Project<br><br>Lab homework 2 | Group meeting observation- decision of the projects |
| Week 5<br><br>20 October | Design Phase of Instructional System Development (Lecture)<br><br>Reusable Learning Objects and Design of Instruction (Lecture) | Analysis Report for 1st Project<br><br>Lab homework 3 | Group meeting observation- Feedback on draft analysis report, |
| Week 6<br><br>27 October | Motivation in Instruction (Lecture) | Lab homework 4 | Group meeting observation- Evaluation of analysis report, feedback |
| Week 7<br><br>3 November | Development Phase of Instructional System Development (Lecture)<br><br>Implementation & Evaluation Phase of Instructional System Development (Lecture) | Lab homework 5 | Group meeting observation- Students' progress on the project |
| Week 8<br><br>10 November | Usability Testing (Lecture) | Design and Development Report for the 1st Project<br><br>Lab homework 6 | Group meeting observation- working on paper based prototypes |
| Week 9<br><br>17 November | Free week for groups to complete the projects, | | Group meeting observation- Revisions of the projects |

Table 3.9 (continued)

| Weeks | Class & Lab activities | Deliverables | Data Collection |
|---|---|---|---|
| **Procedure Teaching Project** | | | |
| Week 10<br><br>24 November | Introduction to Procedure Learning (Lecture)<br><br>-Carroll's Minimalist Approach<br><br>-Reigeluth's Approach<br><br>Videography (Lecture) | Submission of multimedia projects and project report<br><br>Peer reviews of the first project | |
| Week 11<br><br>1 December | GISAM Meeting<br><br>Guest speaker from GISAM | Assignment of Teams & Group Contract | Group meeting observation- first meeting with teams and topic selection, discussion on contracts |
| Week 12 - 8 December Holiday | | | |
| Week 13<br><br>15 December | | Analysis Report for the 2nd Project (Dec 19) | Group meeting observation- working on progress of the projects<br><br>Individual interviews with graduates and previous year's students |
| Week 14<br><br>22 December | | | Group meeting observation- working on progress of the projects<br><br>Individual interviews with graduates and previous year's students<br><br>Instructional Design Problem Solving Task (Post) |
| Week 15<br><br>29 December | | Design Report for the Second Project (Dec 29) | Group meeting observation- working on progress of the projects<br><br>Individual interviews with the students |
| Week 16<br><br>5 January | Free week for groups to complete the projects, | | Individual interviews with the students |
| 22 January | Procedure Project Final Presentations, Post questionnaire, Facilitator interviews | | |

After the end of the semester, the facilitators and the instructor came together and combined the grades of the students. Some students were given bonus scores since they were working at some social responsibility clubs especially ILKYAR which is a voluntary club to visiting and helping boarding schools. After finishing semester, the researcher conducted interviews with 2 voluntary facilitators to triangulate the data with student responses.

### 3.9 Summary of the Course Context

Shortly, in the course there were mainly four activities in the course, lecture times, lab hours, facilitator meetings and target group meetings (See Figure 3.3). In the first project phase each week lectures and lab hourse were conducted while in the second project there lasted soon. In both processes while designing and developing the materials same instructional design model was used.

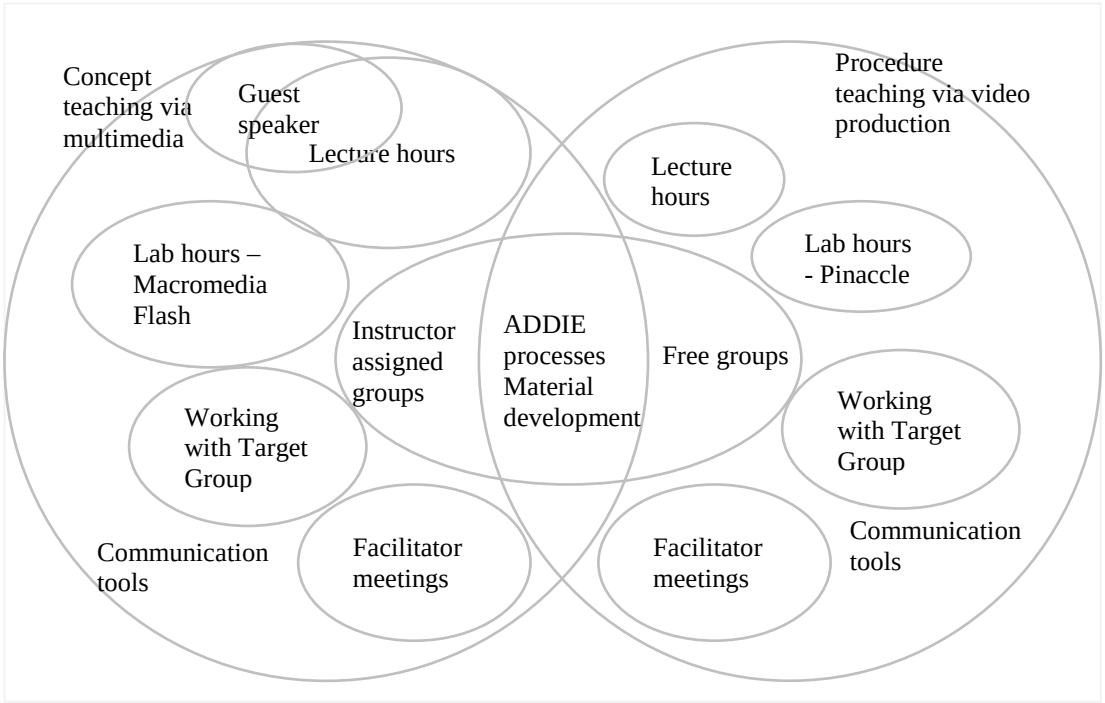



Figure 3.3 Representation of course context

In the first project while students worked as randomly assigned groups in the second one they selected their group members. For both project students used different communication channels to communicate with facilitators, target groups, lab assistants and instructor.

### 3.10 Data Collection Methods and Tools

Qualitative data collection and analysis method was used to investigate the case. As seen from the Table 3.10 the researcher used different data collection tools to answer each research question. In fact, due to the natural structure of the framework, all the data and analysis is intertwining. The main issue with analyzing the data is to find the dynamics of the system and find out the relations between all the dynamics and the components to answer the research questions. For the first 2 questions, the researcher used the data directly collected from the participants. For the last question, researcher mainly used her experience and observations on the course. Researcher used all the data sources to triangulate the interpretations on the research questions. For data analysis, researcher conducted content analyses to reveal the dynamics of the course and then set up some connections between those dynamics and their effects on NIDs.

Table 3.10 Data collection processes

| Research questions | Data Collection Tools | Participants | Data Analysis |
|---|---|---|---|
| 1. How are the instructional design and development experiences of novice instructional designers influenced from the contextual issues accommodated in the components of activity system? | • Group meeting records<br>• Communication logs<br>• Individual interviews<br>• Researcher experience<br>• Project materials | • Current Students<br>• Former students<br>• Graduates<br>• Facilitators | Narration of the some cases, citations from the participants, Content analysis of dynamics of the context and set up relationship with the experience of students |
| 2. How are the instructional design and development processes of instructional design students influenced from the contextual issues accommodated in the components of activity system? | • Group meeting records<br>• Communication logs<br>• Individual interviews<br>• Reports<br>• Project materials<br>• Researcher experience | • Current Students<br>• Project groups of researcher<br>• Facilitators | Narration of the some cases, citations from the participants, Content analysis of dynamics of the context and set up relationship with the quality of deliverables of the course |
| 3. What are the issues that might be combined in an activity system to provide the success of instructional design practice and products? | • Group meeting observations<br>• Individual interviews<br>• Communication logs<br>• Contextual issues revealed by the study<br>• Reports<br>• Researcher experience | • Project groups of researcher<br>• Facilitators | Narration of the processes of different groups and comparison of their good and poor aspects<br><br>Discussion of the suggestions of the researcher |

### 3.11 Data Collection Instruments

Main data collection instruments of the study were classroom observatıons, soun records of weekly meetings, personal interviews, several pre and post activities, documents and electronic posts. The details are given below.

**Classroom Observations**

Observations are important tools of data collection which requires systematic and detailed "*noting and recording of events, behaviors and artifacts (objects, in the social setting"* (Marshall & Rossman, 1999, p. 107) where the study is conducted. Therefore, in this qualitative study in which the researcher sought to understand the whole system, observation was one of the main tools for data collection. The researcher was observer - participant in the setting because she was a facilitator of the projects and assistant of the labs. There was no schedule for the classroom observations. In fact the researcher aimed to observe the improvement of the students' ID experience via their questions and answers to the questions of the instructor. She mainly observed questions, misunderstanding of the students and their reactions to the questions. However, because of the free attendance, not many students participated in class sessions. Therefore, in lecture hours, there were not much group activities or discussion activities, therefore in this observation there was not much to record.

The researcher attended all of the class lectures. She also graded all the classroom activities. When project groups went to target groups to take some information in analysis stage, the facilitator also accompanied one of the team and observed their communication with the target teacher. At the beginning the researcher wanted to participate in all of the target group meetings, however the students did not inform the researcher when they visit the target group teacher and they just went the schools walk in.

**Records of Weekly Meetings**

Each week the researcher talked with NIDs about the instructional design issues, visual design, technical issues, group problems, how they overcame problems and requirements the next steps. She arranged meeting hours and each group was given about 15 minutes to talk about their projects. In these meetings the researcher had a chance to understand community issues, challenges of the NIDs, their characteristics, habits, progresses in the project and their improvement during the semester. Researcher recorded the meetings with a sound recorder to triangulate the whole data. The researcher met with concept project groups 8 times and procedure project groups 6 times. Totally 47 group meetings were conducted and 37 of them were recorded with sound recorder. Remaining meetings were excluded since they were very

short meetings. In fact some groups did not want to come to some of the meetings mostly because they did not have any progress in a specific week. The researcher also took some notes about individual students and general overview of the work.

According to Bogdan and Biklen (1998) observation notes covers "portraits of the subjects, reconstruction dialogue, description of the physical setting, accounts of particular events, depiction of the activities and the observer's behavior" (p. 122). Apart from these descriptive observation notes, the researcher also reflected the notes with personal inquiry and the insights which contain "*reflection of on analysis, reflections on methods, reflection on ethical dilemmas and conflicts, reflections on the observer's frame of mind and the portraits of clarification*" (Bogdan & Biklen, 1998, pp. 124-125). In the study, all the observation audio records and researcher's notes were transferred to digital environment and transcribed. However it was not pure transcription of the conversations but they were converted dairies and memo's in which researcher also added her insights and the description about the context and the history of the situations as suggested by Bogdan and Biklen. Total 43 Office Word pages were written as memo. Apart from this an Excel file was kept to write insights about individual students.

**Interviews**

Interviews, like questionnaires, provide to collect data about any phenomena that cannot be observed directly, like inner experiences, opinions, values, interests, etc (Gall, Gall & Borg, 2003). In this qualitative study interviews, were important data collection tools since the researcher had to find in depth relationship between dynamics of the context. The researcher invited interviewees via e-mail and all participation were voluntary. According to Bogdan and Biklen (1998), in participant – observation studies, interviews like conversations because researcher knows students, most of time there was need for introduction at the beginning. Researcher not only knew the students who are taking the course in current semester but she also knew other participants well. Therefore, in interview process, she did not need to explain some common concepts to interviewees and she put made recalls about some past experiences of the students.

Students were individually interviewed about their experiences on the course, what difficulties they have, what they like about the course, what they have learned by designing a multimedia and what they experienced related to instructional design. Interview schedule was prepared by the help of an expert researcher and it was piloted with six students in a multimedia design development course which was given in the same way with multimedia development course. Interview questions were same for current students (Appendix B), and

previous year students. For graduate students, some questions related to their professional life was added (Appendix C). For facilitators another interview schedule was prepared (Appendix D) to understand their experience with course and the students. The questions of facilitators especially aimed to reveal problems.

There were 12 main questions and 2 or 3 prompts under the questions for all three groups. Researcher conducted 20 interviews with current students, 16 interviews with graduates and 10 interviews with previous year's students and 2 interviews with facilitators. All the participants were voluntary but for the graduates researcher also selected graduates which could come to the department of the researcher. Researcher also invited previous year's students in person and in that time information rich cases were selected. For the current students, the researcher sent invitations to the entire student body and she interviewed all the volunteers. Interviews took 26.4 minutes on average for each graduate, 21.0 minutes for each of the student who took the course a year before and, 19.3 minutes for the students who were the actual participants of the study. After transcribing the entire interview records the researcher digitally coded and analyzed them. The transcribed interviews took 371 Word pages by total.

**Pre and Post Questionnaire**

Students were given a background questionnaire that consists of short open ended questions and several likert-type questions related instructional design skills. 31 of the students took both pre and post questionnaire. Open ended questions were related their pre-knowledge and past experiences related instructional design such as group working habits, students' roles in group working, and their preferences about material development. The rating questions were modified version of instructional designer skills which were suggested by Richey, Fields and Foxon (2001). Researcher did very little modification and she excluded some titles which are not in the scope of the course. Students rated themselves in terms of 24 main instructional designers' skills. Scale was from 1 to 5 where 1 means very poor and 5 means very good. Researcher applied the questionnaire at the beginning of the semester and the Final day. She made qualitative content analysis for open ended questions and she compared the mean scores of participants' responses to the scale. The results were used to triangulate students' responses in the interviews (Appendix E).

**Pre and Post Instructional Design Activity**

In instructional design and technology field, one of the most important requirements is the skills of analysis and identification of the situation and developed approaches to solve the problems in that situation (Ertmer & Quinn, 1999). This was also one of the goals of the

course; therefore researcher herself designed a case which includes an instructional design problem to evaluate the students' pre and post responses. The case had been also implemented in another course before. This provided a triangulation other data collection tools for the "outcome" of the activity system. The case consisted description of the situation, role of the instructional designer, and the problem. Then students were expected to answer 8 open ended questions to solve the instructional design problem. Researcher compared each question for each student to see the improvement in the inquiry of the situation and the issues that was considered (Appendix F).

**Document Analysis**

There were variety of deliverables of the course and researcher developed several of them. Since they are not the direct data collection tools researcher considered all the deliverables as documents to be analyzed. Students have written pre-analysis, analysis, design and development and final reports for each project. They had about 1 to 3 weeks to complete the reports. Reports were summarizing all the processes which have been done and the things to be done in the next phase. Also students' instructional decisions were shown on the reports. All group members had to contribute on the reports. After finishing reports facilitators gave feedback and students used those feedbacks to correct and improve the next report and improve their project. Instructor and facilitator developed rubrics to grade the reports, all facilitators and instructor used the same rubric to grade students. This rubric also was given to the students thus they were aware of what they were supposed to write on the reports. Researcher analyzed totally 32 reports for concept and procedure teaching projects. In the first project students had a lot of problems in writing reports, they needed an intensive guidance to write some difficult parts, but in the second project groups almost did not ask any thing about writing the reports. These reports were helpful to see students' improvement of experiences on instructional process and to see to what extent they internalize the instructional design process.

Projects and manuals had a role to see the quality of work of the groups. Most of times the good projects were not done by only one student in the group, whole group contribute the project. Therefore, good project might give an insight about good group work. Researcher analyzed the projects and tried to define some criteria to decide on its quality. Projects were also object of the activity of instructional design course, therefore researcher tried to find effects of several factors with the project. The researcher especially focused on the projects of the group that she coached. There were 5 concept projects and 3 video projects to be analyzed. Individual manuals of the videos were analyzed to see the differences and

similarities between group members' design. This helped researcher to see whether division of labor influence the individual work.

At the beginning of the semester, to understand students' pedagogical and visual design principles background, researcher gave a multimedia project and students evaluated it in accordance with a reflection template (Appendix G). Students were asked motivational aspects, adequacy and flow of the content, visual design and usability of the project, its use areas in the curriculum and the changes they would do in the available project. All the students submitted the reflections. The researcher also prepared an activity to see how students analyze and synthesize information taken from target group. It was implemented in the week that instructor gave lecture about conducting analysis in instructional design process. In this activity students were given a fabricated interview transcription with a science teacher. The science teacher talked about contextual issues, learners and their needs in different parts of the interview. Students were asked to read the interview carefully and to write a piece of analysis of need, learner, content and context. This provided NIDs to give a feedback about their misconceptions and the issues that they ignored. Thus, researcher could triangulate this analysis with the reports of the groups and make interpretations on improvement of synthesis the information taken from different sources and apply it to the project.

After each project students submitted their peer evaluations, in the evaluations they were asked to rank themselves and all the group members and write some opinions about them. All the ranks given for a student were summed and divided into the group members. It was directly added to the total point of the students. These peer evaluations provided to see whether any problem in the group, since students were individually and securely did their evaluations most of time they were honest to write their opinions. Thus researcher could triangulate the results of observations and interviews related group work. As a facilitator, the researcher could see the performances of her students which were working with different facilitators in the second project. The researcher could also see whether students are more successful in different groups as well. As a conclusion, each deliverables and the activities in the class was taken as an analysis entity. This was required since the research questions required to see whole picture of the class and all the factors influencing the products of the activities and learning outcomes.

**Electronic Posts**

Students were expected to inform their processes via e-mails. Students had to create an electronic group via Google or Yahoo. The groups that researcher coached in the first project

created Yahoo groups to share their messages and files. Researcher analyzed e-mails to reveal communication habits of the groups and see how the processes shaped in course of the time. The groups have less problems shared their processes more than other groups which have problems.

**Piloting the Instruments and Data Collection Process**

According to Yin (1994) the case study design can be improved with piloting the way of inquiring and the structure of the data collection. Therefore, the researcher developed the instruments and applied them in a senior level project based game design and development course. The structure of the course was very similar and similar templates were used. Observation protocol, interview protocols and open ended questionnaire were developed by the guidance of experienced researchers who have experience on qualitative studies and implemented in that course. The evaluation rubrics, report templates, and peer evaluation templates have been used since 2005. Therefore, there was not any other pilot study was applied on those templates.

Participants of the pilot study was twenty three undergraduate students, eight females and fifteen males, who were in their senior year and enrolled in an educational game development course which was offered in the Department of Computer Education and Instructional Technology. The course was structured in a very similar way to the current course in which study was conducted. Students worked as teams and develop a 3D game by following an instructional design model. During the semester similar processes were performed. In three-month semester was divided into analysis, design development and final stage in accordance with the structure of the course. Researcher had totally 24 group meeting observation notes during the whole semester. The researchers participated in to all classes and used the observations from these sessions. Towards the end of the semester the questionnaire related instructional design preferences were distributed to class. The questions of this questionnaire were related selection of the materials, selection of the tool to develop materials and the strategies that they use in designing instruction. All questions were open ended. At the end of the semester groups were given an instructional design problem. Lastly voluntary and individual interviews were conducted.

The researcher improved her instruments by taking the pilot study students' reactions into consideration. The researcher coded and analyzed the data with another researcher who is experienced with the course and qualitative studies. In the pilot study the inter-reliability of the data were like below (see Table 3.11).

Table 3.11 Inter-reliability scores of each instrument

| Type of the data | Percentage of agreement |
|---|---|
| Observation | .80 |
| Questionnaire | .82 |
| Reports | .63 |
| ID Activity | .70 |
| Group interviews | .83 |
| Individual interviews | .83 |

With this high score of inter-reliability, researcher also made decisions on the method of collection and analysis data. For example, in the pilot study the ID activity was given to the teams and there were only one solution. It made difficult to interpret the improvement of the individuals.

## 3.12 Classification and Organization of the Data

The researcher preferred to work on only digital forms of all the data. As mentioned before, the researcher transferred all the data into computer as text or pdf format. She used tables and format tools to make analysis easier. This process made easier to find any required data. For evaluation of the projects and manuals, the researcher also made text based evaluations and recorded as text. Several rubrics were also developed to decide the performance of the groups and the quality of the projects. After this process, coding process started. The researcher worked with two other researchers during this process to provide reliability.

### Data Analysis

In this qualitative study, the researcher dealt with a large amount of data, but AT framework provided a structured data analysis process. AT triangle provided a descriptive framework to analyze and evaluate the technologies and their use. This methodological tool described the complex; tool mediated social environment, revealed key dynamics of the described reality, pointed out contradictions and showed a visual representation of interaction among the dynamics of the environment (Kaptelinin & Nardi, 2006). According to Jonassen (2000), AT provides a different perspective to analyze the learning processes and the outcomes of the context. Actually the data analysis was a parallel process with data collection since everything in the context enlarged the description of the situation. For practical use, Jonassen and Rohrer-Murphy (1999) suggested a detailed checklist to implement AT as an analysis tool. This checklist provided a structured analysis sequence. In this study, an updated version of this checklist was used to understand the study's context and focus on some important parts of the data. To report the results, the sequence as given in Table 3.12 was used. The

researcher had to analyze the reasons underlying some situations immediately after it happened.

Table 3.12 The main steps of the analysis process (adapted from Jonassen & Murphy, 2000, pp. 71-78)

| | |
|---|---|
| ***1. Clarification of the purpose of activity system*** | |
| 1.1. Understand relevant context(s) within which activities occur | • Reasons and the times that problems arise<br>• Examination of communications that surround the situation and the activity |
| ***2. Analysis of the activity system by identifying and describing its components*** | |
| 2.1 Define the subject | • Defining participants of the activity system<br>• Defining the expected outcomes of the system<br>• Expectations of the subjects, dynamics influencing the expectations<br>• Finding out how subjects' motivations and expectations influence the dynamics of the situation<br>• Generation of a list of problems that teams typically deal with |
| 2.2.Define community - communities | • Community's effect on subject<br>• The structure of social interactions<br>• The problems that community had to deal with |
| 2.3. Defining the object | • What is the outcomes and end product<br>• The criteria to evaluate the quality of the object<br>• Defining criteria to evaluate the outcomes |
| ***3. Analyze Mediators*** | |
| 3.1. Tool mediators and mediation | • The tools that are used in the activity<br>• The physical and cognitive tools<br>• Models, theories or standardized methods which guide the activity |
| 3.2. Rule mediators and mediation | • Formal and informal rules<br>• Group rules & community rules<br>• Whether rules are implemented or not<br>• Rules that students had struggle |
| 3.3. Division of labor | • Division of the tasks among all participants<br>• Roles in the groups<br>• Evaluation of contributions of each role |
| ***4. Analysis of the activity structure (activities, actions, operations)*** | |
| 4.1 Defining the activities, actions and operations | • Identification of the activities in which subjects participated<br>• Transformation of actions and operations into the activity<br>• Historical phases of the activity<br>• Motives of the activity and their relationship to concurrent goals<br>• Contradictions of the activity |
| ***5. Analysis of the activity system's dynamics*** | |
| 5.1 What are the interrelationships that exist within the components of the system and how they influenced the processes | • The dynamics that exist between the components of the activity system<br>• Formal and informal relationships between the components<br>• Individuals perception about the goals<br>• The contradictions and inconsistencies within the experiences of the groups and processes of the activities<br>• Understanding the community for successful completion of the activity<br>• Individual perception of success factors |

This sequence was helpful to understand the context in depth. All these issues revealed by researcher will be presented as a context of the study in results part. The actual research questions will be answered as a fifth step of Table 3.9.

**Coding**

Coding was the main process of the content analysis. Strauss and Corbin (1998) define the coding as "*the analytic process through which data are fractured, conceptualized, and integrated to form theory*" (p.3). While AT provided a general framework for the data, researcher coded all the themes and sub themes under the components. Thus an "*axial coding*" process (Strauss & Corbin, 1998) was conducted. Axial coding can be defined as finding connection between available categories and sub categories. There are some dimensions between main categories and sub categories. As seen in Figure 3.2 researcher coded the units in a structure of "*Activity theory component: Dimension of relation: Sub category*".

Coding was mainly applied in interviews and observation notes. In the example of Figure 3.4, an interview which was also used in inter-rater reliability is shown.

| | |
|---|---|
| PS9: İki proje vardı 317 dersinde, ikisi önemli, ikisinde de process aynıydı. Yine analiz, dizayn, development, implement, onlar vardı, analizde ne vardı diye sorduğunuzda mesela yapmış olduğum proje fizik konusuydu, kuvvetti, sabit kuvvet, biz bu analizde kuvvet nedir, biz 8. sınıf öğrencilerine bu konuyu anlatmıştık (1), öğrencilerin bu kitaplardan araştırdık hangi durumlardan (2) şimdi normal bir lise öğrencisinin görmüş olduğu kuvvetle orta 3 öğrencisi aynı şey değil şimdi 8 oldu onlar, biz bunun analizini yaptık biz, 8. sınıf öğrencilerinin şeyler nedir leveli nedir, seviyesi nedir ve kolayca bu materyal onların seviyelerine uygun mu diye kontrol ettik (3), ve tabi bunu da tek başımıza yapmadıki fen bilgisi öğretmenliğindeki arkadaşlarla beraber yaptık (4), genelde onlar içerik sağladı dediler ki, bunlar bu öğrencilerin seviyesine uygundur, biz aldık onları onların da vermiş olduğu feedbacklerle dizaynımızı yaptık analiz kısmı böyle (5) geçti, fen bilgisi öğretmenliğinde okuyan öğrencilerin bize sağlamış olduğu içerikle geçti, | (1) **Tool:** Specific properties of the project: *Project topic:Force* (-)<br><br>**(2) Tool:**Materials contributing to project: *Textbooks* (+)<br><br>(3) **Tool:** Process contributing to project: *Target group analysis (student level)* Division of Labor: (-)<br><br>(4) **Community:** People in the community:*science teacher candidates* (+)<br><br>(5) **Division of labor:** Role of the People:*Subject matter expert* (+) |

Figure 3.4 Example coding style for interviews and observations

Researcher used only (-) minus symbol to show that it is the unit which was coded only by the researcher. She used (+) to indicate that it was an agreed unit and the coded by both researcher and inter-raters. As seen on the 3rd unit of coding (as seen in the rectangle), researcher and inter-raters coded the same unit in different ways, in that case researcher also write inter-rater's answer and used (-) again. After coding the entire data researcher find out relations between the components by examining students' projects, reports, communication tools and observation notes. In that case she found out relationships between the subcodes of the components. For example gender is a community issue, and this influenced the division of labor in project groups since the girls were known with organizational skills in the community. Thus there was an interaction between community and division of labor. The representation of these relationships will be given with quotations of students as seen below;

> *"I was a leader of the group. First of the reasons is that I am the only girl in a group. Another reason is I was chosen by the whole group members" (CS28, Female, PI).*
>
> Community – division of labor: selecting females as leader

Still this interrelation between sub codes is not enough to explain the situation. Although CS28 was selected as a leader, she could not accomplish this role properly because of advance technical skills of another member and some personal problems with other member. Thus "Project management" experience of this group and of CS28 influenced from several group problems. Researcher could only find out this relationship with her observations and experience and support it with other data resources. The researcher used a narrative style, by adding citations from the students as shown below Figure 3.5.

Both girls and boys admitted that girls can plan and organize a work better than boys. A foreign student exemplifies this by saying;

> *"I was a leader of the group. First of the reasons is that I am the only girl in a group. Another reason is I was chosen by the whole group members" (CS28, Female, PI).*

Figure 3.5 An example part of results

The processes of coding and explorations of cause – effect relationships are shown in Figure 3.6.

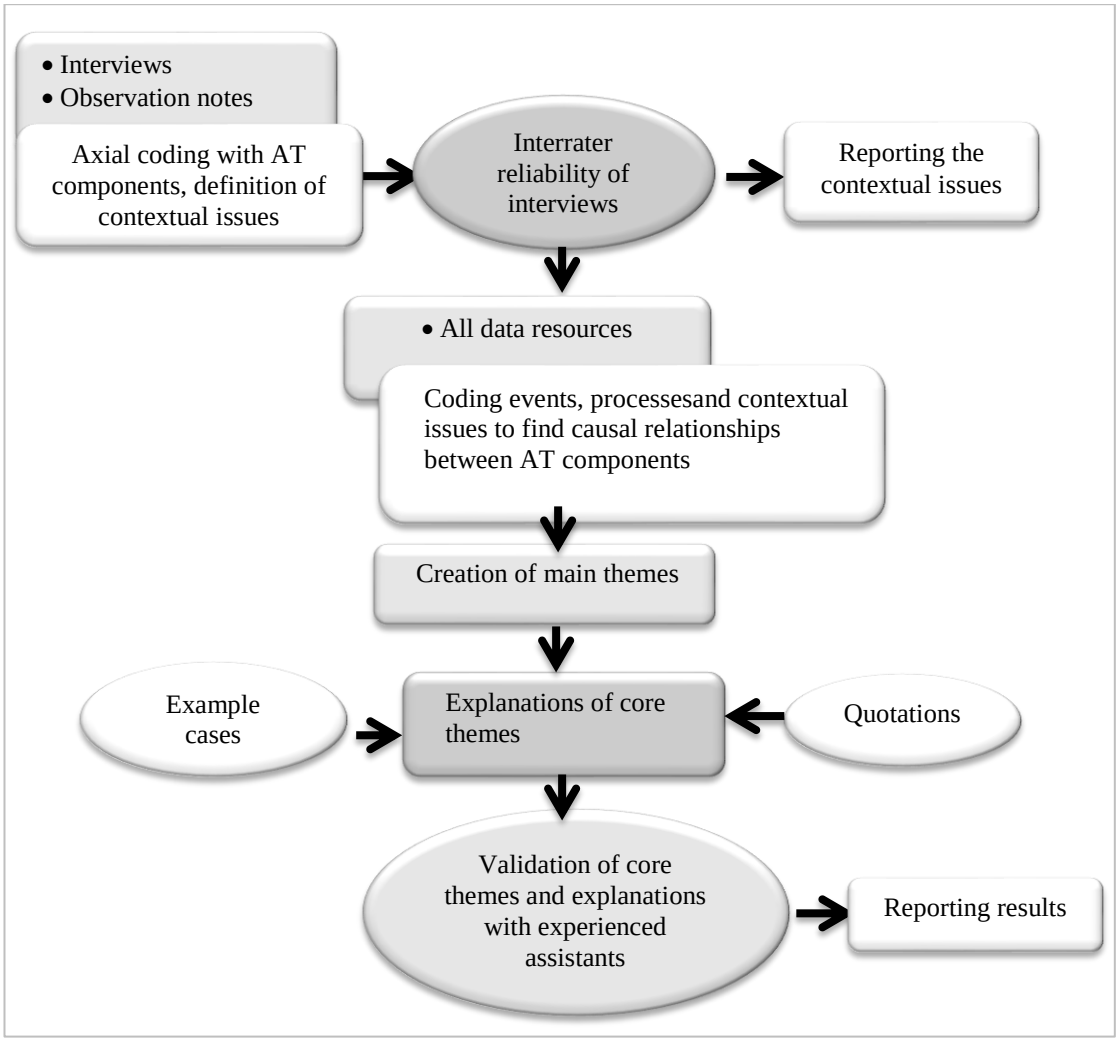



Figure 3.6 Coding and reporting process

For pre- and post- activities researcher located two answers of each student and firstly find difference between the statements like in Figure 3.7.

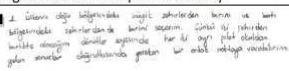
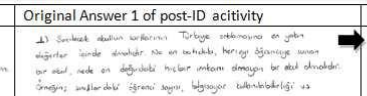
| Student | Interpretation | Original Answer 1 of pre-ID acitivity | Original Answer 1 of post-ID acitivity | Interpretation |
|---|---|---|---|---|
| CS2 | One school from a big city in east and west, it provides a mid-point to implement a program all over the country |  |  | It should approach normal Turkey conditions, not from only east or west, average students number, computer access |

Figure 3.7 Example of interpretations of pre- and post- activity

Then researcher collected all the first interpretations about the original answers like in Figure 3.8.

| | Answer 1. in the pre- ID activity | Answer 1. in the post- ID activity | Outcome |
|---|---|---|---|
| CS2 | One school from a big city in east and west, it provides a mid-point to implement a program all over the | It should approach normal Turkey conditions, not from only east or west, average students number, computer | Outcome: Awareness: Making analyses in balanced environments |

Figure 3.8 Outcome code extracted from two different answers

Since the main aim was to find out outcome issues in pre and post activities, researcher tried to find out sub themes and sub codes under "outcome" component.

As seen example of Figure 3.4, the researcher quoted the participants' statements with their coded names and added information about citation was received. While reporting the source of the data PI will be used for "personal interview". Other citation types are listed below:

Group #-#: The first number represents the project, and the second one represents the number of the group. For example Group 1-7 means, Group 7 of the first projects.

(PS#, Gender, PI): Personal interview of previous year student

(GS#, Gender, PI): Personal interview of graduate student

(Group #, Week #) : Weekly meeting observation of Group #

(CS#, Week #) : Citation from CS# in weekly meeting

(CS#, e-mail, Date) : E-mail from a student

(Group #, Type of Report): Citation from Group #'s report

(CS#, ID#, Question #) : CS#'s answer to Question# in ID# activity

(Group #, Project): Project of Group#

(Group #, Contract) : Contract of Group #

Apart from the qualitative representations, in some cases the researcher presented some quantitative data like communication channel use, grades of the students and some outcome related data to represent the outcomes.

### 3.13 Validity and Reliability Issues

Maxwell (1996) refers validity as "*correctedness or credibility of a description, conclusion explanation, interpenetration, or other sort of account*" in qualitative research (p. 87) . Maxwell (1996) states that there are three kind of validity issues; *description* (researcher inaccuracy and incompleteness of data), *interpretation* (fail to interpreting the mean of participants really want to reflect) and *theory* (without considering other explanations and understandings, putting the results into one (perhaps wrong) theory). All qualitative studies might have these issues but there are strategies to solve these problems. Since the researcher was a natural part of the context and experienced with the course, she knew the issues that might arise during the study. She also made a similar implementation in a game design course to validate the instruments and see how the activity theory matches the case. Therefore, in data collection she was more careful about getting necessary information and noted everything she experienced in the context. Thus, researcher believed that she solved the *description* validity issue.

For the *interpretation* issue she had flourished data to triangulate the issues that was posed by the participants. Researcher was the facilitators of 5 of the previous year students, 5 of the graduates and 18 of the students (from project and concept teaching). Thus she knew about all the issues, communities, students' contradictions and motivations that those students experienced. Therefore, the researcher had no difficulty to understand the issues that participants mentioned even she could complete some events that was mentioned by students inadequately, since the researcher was also witness of that events. As it will be mentioned in next paragraphs, the researcher worked with other two researchers to interpret the data. The consistency scores were high enough to provide *theory* validity. Apart from these three issues researcher also applied other strategies such as reducing researcher effect, mechanically recorded data, triangulation and inter-rater reliability calculation.

Case studies are supposed to be more subjective than other qualitative methods (Riege, 2003). To eliminate this subjectivity, like other qualitative studies credibility, transferability,

dependability and confirmability should be provided (Guba, 1981, Yin 1994). Credibility refers to the confidence in the truthness of the findings, transferability means the extend of applicability of the findings to other similar cases, dependability can be defined as possibility of replication of the study and obtaining consistent results and lastlye confirmability means the findings are logical enough such that they are not influenced from the biases and prejuidice of the researcher according to (Guba, 1981). The validity and reliability issues and the precautions to avoid them were summarized in Table 3.13.

Table 3.13 Validity and reliability procedures performed in the research (Adapted from Guba, 1981 and Riege, 2003)

| **Validity issue** | **Procedure of validity** | **Application in this study** |
|---|---|---|
| Credibility | Prolonged engagement in the research site | One semester - long observation |
| | Persistent observation | All meetings were recorded, each week observations were conducted |
| | Peer debriefing | Working with another two researcher during data analysis process |
| | Triangulation | Multiple data resources |
| | Member check | The cases were confirmed by the related people, results were confirmed by another experienced researcher |
| Transferability | Thick description of data | The contextual issues were given before answering the research questions |
| | Theoretical pusposive sampling | No purposive sampling because of the nature of the research site |
| Dependability | Using overlap methods | Similar procedures with triangulation were used |
| | Stepwise replication | Interrater reliability was implemented for the interview data |
| | Leaving audit trail | Review of draft of the case |
| | Mechnically recorded data | All data were digitalized |
| Confirmability | Data triangulation | Multiple data resources |
| | Audit trail | Review of draft of the case |

Some of the procedures which were used in this study were also explained in detail below sections.

**Reducing Researcher Effect**

The researcher believed that in this study there was no observer effect because the researcher is a teaching assistant in the department and all students know her previous courses. Moreover, most of data collection was provided without obstructing students except individual interviews. The researcher was always in the site of research, in addition to weekly meetings students met with researcher whenever they wanted, they shared their problems related project and group working. By considering these informal meetings, researcher defined the information rich cases and she tried to reach those people even the interviews were voluntary. Weekly meetings also provided researcher to observe any maturation and history effect on participants. The researcher always recorded all improvement issues of participants because one the focus of the research was to see improvement of the students as outcome. Although it cannot be possible to claim all these risks will be eliminated, with several precautions and facilitating several researchers, these risks will be tried to reduced. Persistent observation which to reach a pattern is also another validating (Lincoln & Guba, 1985) factor for our research.

**Mechanically Recorded Data**

To avoid descriptive validity problem, Lecompte and Goetz (1982) suggested that all data should be recorded mechanically. Therefore, the researcher used a sound recorder for all sessions of study, during the interviews and weekly meetings. Since all the communication data recorded with audio recorders, researcher had a chance to listen repeatedly; therefore, she never missed any details in data. This provided to hold raw data continuously and in objective way. The researcher transcribed all the mechanic data, and computer based transcriptions was used in data analysis.

**Triangulation**

Triangulation (validity) is based on the research design (Stemler, 2001). To accomplish the validity of the data collected from different sources, comparisons and confirmations can be used. In this study, the researcher was the active participant of the context, she collected a variety of data. The researcher recorded weekly meetings as observational data, conduct interviews with different group of students. Student reports, grades, peer evaluations, logs of online communications provided rich data to compare and match the interpretations. Also researcher interviewed with some students who took the course previous year, and some graduate students who took the course in different semesters and also different facilitators to triangulate the data. This was especially helpful to decide outcomes of the students since the students most of time were not aware of some issues while they were taking course. To make

sure about some outcomes (which might be noticed after the course was taken), researcher facilitated the interviews which were held with graduates and the students who took the course before. For the community problems and division of labor issues, facilitator interviews were also very helpful to make comparisons.

**Inter-rater Reliability**

To provide reliability of codes of qualitative data, researcher worked with other two researchers in two sessions. Both of inter-raters were experienced on qualitative studies and instructional design literature. To conduct inter-rater reliability, researcher selected one interview transcription of one of the most information-rich student. Stemler (2001) suggests explicit instructions to train coders in order to avoid hidden meanings which are specific for the case. The researcher prepared a guide to make two researchers familiar with activity theory.

In first session, AT components were explained and what kind of information could match with any particular component was exemplified until two researchers become confident about definitions of activity theory components. Since activity theory components were ready, a pattern coding (Miles & Huberman, 1994) was completed before inter-raters started to create sub codes under the components. Two researchers were asked to find out activity components in the interview and write two or three descriptive words of sub codes of the components. In the first session two researchers worked together, thus they discussed on some ambiguous situations and feel more confident about coding. The researcher explained more about activity theory components and what kind of issues can be categorized under these components. In that session, although some sub codes are the same, the theory component was differently stated; especially the inter-raters confused with "rules" and "tools". To calculate inter-rater reliability score Miles and Huberman's (1994) formula was used. To do this researcher summed the number of agreements and divided it into summation of number of agreements and disagreements. However, researcher made two different calculations to make sure about consistency. In the first way, agreement number was calculated by summing the number of statements which were coded both by researcher and inter-raters with similar meanings even they were coded differently. Disagreement score on the other hand was calculated by summation of the number of the statements which are differently coded and the number of the statements coded by the researchers. There were totally 41 codes in this case and the reliability score was .82 which is good level of reliability score according to Miles and Huberman. Considering that it was the first session of coding and inter-raters are not much familiar with activity theory components .82 is very good

score. Since two researchers worked together in the first implementation, the researcher conducted a second round to train inter-raters more and increase the reliability of the analysis with individual researchers. First of all researcher and inter-raters discussed the codes with the researchers and she tried to eliminate misconceptions. Researcher realized that inter-raters tended to code the sentences when they are long enough although researcher coded even a few words. Except ignoring some of statements, there were not big problems with matching the codes with activity theory components.

In the second round of reliability analysis, inter-raters worked alone and researcher presented an interview transcription including 31 statements which were coded by the researcher before. She removed codes and just underlined the sentences which were going to be coded. She asked inter-raters only write the main codes of the statements. In that time she used both Miles and Huberman's calculation and Cohen (1960)'s Kappa formula which excludes the chance factor which is the agreement percentage on some statements based on chance (Stemler, 2001). She used Cohen's Kappa formula because she used axial coding and some of the activity components might be confused like "community" and "division of labor". This case might cause agreements which were obtained by chance and the researcher wanted to make sure that all the components were understood in the same way and the chance factor is small enough. Kappa score was .60 which is moderate reliability score according to Landis and and Koch (1977). Assuming that .61 is the "substantial" category of reliability, this reliability score was good enough.

In reliability analysis experience of the inter-raters has a substantial effect. One of the inter-rater researchers was one of the assistants and facilitators of the course for the last five years. He knew the context and the events realized in the semester that this study's data was collected. Therefore, his interpretations with the researcher were parallel. The Kappa score was .87 (Almost perfect level) with that inter-rater and .90 according to Miles and Huberman's formula. Based on this reliability rate, researcher continued on to analyze the data.

**Member Checks**

While presenting qualitative data, researcher narrated the several cases of the project teams. She only applied member check for those cases because they were the pure description of the processes of project teams. She excluded some of the information that students were not aware of that, as suggested by Elliot, Fischer and Rennie (1999), like their project scores that were determined after inter-rater reliability. Four information rich students from four project teams were selected for member check of the cases (CS3, CS27, CS35, and CS40). They

were sent the narration of their case via e-mail. They were asked to report any issue that was misinterpreted by the researcher. Except very few comments like "*I could not remember this exactly*" there was no issue that was stated as wrong in the cases.

To understand the accuracy of qualitative interpretations, the researcher also worked with another experienced facilitator. Since the other facilitator was also one of the most knowledgeable people in the course context, the researcher took his approval for her interpretations. They checked the each main category of the first two research questions. For each category, many of the contextual issues were related to each other and how they influenced the experience or processes were revealed.

### 3.14 Assumptions of the Study

Participation to meetings, observations on multimedia developments and reports are important tools to obtain rich data. Students are at a computer related department so it is assumed that their technical skills are enough to develop multimedia. Also since the course was a mandatory course and there was no change in the method of the course, a natural environment could be provided. Researcher accepted that all the students cannot work equally and some groups might fail based upon her previous experiences.

# CHAPTER IV

# RESULTS

The results will be given in two different parts. In the first part, the activity system will be examined in detail to reveal all the components and dynamics of it. This part will help to understand contextual issues which have effect on students' work and experience. In the second part, the research questions will be presented by examination of the interrelationships between the contextual issues to reveal how those issues influenced the object and outcome.

## 4.1 The Context of Activities

The university which the department is accommodated is a very popular and respected university in the country. It has about 18000 undergraduate students in 40 departments. The language of the instruction is English in the university and the students are taken to one year English preparatory school if they are not qualified enough. There is a Technopolis in the campus where many students could get a part time job. There are many facilities like computer labs which are open 24 hours, library and in campus free transportation. Students could connect to wireless or cable Internet via their personal computers as well.

CEIT is under the Faculty of Education, but differently than other departments it has a separate building. CEIT students take several courses from the Educational Sciences, Physics, Chemistry, Biology, History and Turkish departments. Therefore, especially the first two years students spend their majority of course times outside of the department. In the department, there are many research assistants and most of the courses has at least two teaching assistants. Most of the time, the main roles of the teaching assistants are to teach about software at labs or leading students to make activities given by the instructor. Therefore, project facilitator role in the multimedia design and development course is an unfamiliar role for the students.

Before taking the course the NIDs took some educational courses and two courses related screen design and instructional design. Most of them are familiar with using screen capture

programs, some programming tools, video edition and office programs. They designed materials for web based instruction and storyboards. Some of the NIDs were working in different companies as part-time programmer or computer interface designer. NIDs had a considerable course load in the 5th semester not just because the course workloads increase but also many of the students had several courses from previous years. In previous years, NIDs used programming tools, screen capture programs, video editing, text editing, web design, web based instruction design, graphic animation and experience with group working. On the other hand since those computing skills were given one semester and since students did not continued to practice those tools, they were not experts of those programs. Also very few of them knew the software that was used in the course for multimedia development. In the first project, since instructor did not know students in person, he had to stay dependent to questionnaire asking students' group working skills, GPA and technical skills. Besides, since 35 of the students participated in this questionnaire and because of the lack of time to get information from other students, instructor had to assign other 12 students without any criteria. Below, students' GPAs, technical skill category and group working attitude categories were given in Table 4.1, Table 4.2 and Table 4.3 respectively.

Table 4.1 Academic success

| GPA | Group |
|---|---|
| Less than 2.50 | 10 |
| 2.51 – 3.00 | 13 |
| 3.01 – 4.00 | 12 |

Table 4.2 Technical skills

| Technical skill | Actionscript | Visual design | Animation |
|---|---|---|---|
| Not good at | 19 | 11 | 10 |
| A little | 14 | 14 | 0 |
| Good | 2 | 10 | 25 |

Table 4.3 Group working attitude

| Attitude | Group |
|---|---|
| Positive | 20 |
| Negative | 15 |

Students in the first project teams worked in heterogeneous teams in terms of academic and technical skills, gender and group working attitude which was specified with the questionnaire distributed at the beginning of the semester. There were 6 students who are at senior class, they either did not take the course before or they deliberately took the course at their senior class. This caused some trouble for them especially in the random grouping time. There was one student also who was transferred from another university and he was a bit late to start the semester. Being not familiar with other classmates has some drawbacks in the context. Since students had to work as groups, if there would not be random grouping, the students who were not familiar with class members would have challenge to join a group. As a matter of fact, in the second project when students were free to form their groups, except one senior student, no senior student set a group by own. Then instructor assigned them to some available groups. On the other hand, their problem was not only being familiar with the class but, some of those senior students might not care enough about the course.

Before the course, students took a course related message design and a course on introduction of instructional design. In message design course, they learnt about the ASSURE model but they did not practice it. In another instructional design course which is an introduction of instructional design similarly they got theoretical background about how to present a material effectively. Apart from those courses, students took courses on programming (C++, Visual basic, web programming), educational science courses, computer hardware and networking, information technology and service courses like Physics, Math, English and History. The courses that students took before their $5^{th}$ semester are summarized in Table 4.4.

Table 4.4 Previous courses taken by students

| **Courses** | **Frequency** |
|---|---|
| Instructional design – message design | 2 |
| Service courses | 11 |
| Programming | 4 |
| Computer Hardware | 1 |
| Educational sciences | 3 |
| Elective | 1 |
| Information technology | 2 |
| Total | 24 |

According to Table 4.4 it can be said that students get enough educational and technological background to apply their theoretical knowledge to the practice.

### 4.1.1 Subject

The subject is the actors who want to accomplish activity; in this case the subjects were the NIDs. Since NIDs worked as teams, the subject is consist both individual NIDs and project teams. In team working there were many issues which were influenced individuals. Therefore, individual issues in team working were also reported as subject's issues. On the other hand, teams were also assumed as a part of community when an issue is related the whole team. Through the results part, the researcher's first project groups (Group 1-7, Group 1-8, Group 1-9, Group 1-10 and Group 1-11) and the second project groups (Group 2-10, Group 2-11 and Group 2-12) will be referred frequently.

The course was mandatory for junior students. 2 students (CS3 and CS34) were transferred from another university so they were not familiar with the class. Six (CS4, CS8, CS16, CS18, CS24, and CS38) were the senior students but they took the course either they failed or withdrawn in previous year, or they did not take the course previously. The instructor has been giving the course for 7 years and all of the facilitators were experienced between 3 to 5 years. The students met with instructor and the facilitators for the first time in this course.

**Group 1-7**

For the first projects, the Group 1-7 had already contacted with target group teacher and even started to develop their project although they were expected to finish analysis and design stages before development. Researcher as facilitator warned them about this issue and they started at the beginning of the analysis and started the project again. This group worked very smoothly and they had good relationships during the project. Most of time, they were ahead of the schedule and submitted deliverables on time. On the other hand, in group meetings CS25 and CS27 were more active, although all group members shared the workload fairly.

**Group 1-8**

At the beginning of the semester, researcher tried to find a specific target group for each group but she could find only one teacher (a teacher also worked with the students in previous years) and only *Group 1-8* accepted to work with the teachers. In the group *CS28* was a foreign female student and she had some difficulty to understand Turkish if it is spoken quickly. Sometimes this language issue caused problems with other two male group members and they were dominant in the group. During the semester group members attended almost all of the meetings.

**Group 1-9**

*Group 1-9* had several troubles at the beginning since one of the members (CS34) did not want to work as group. In the analysis stage, he did not much contribute to the work, however after that he contributed the processes. Another member, CS32 withdrew from the course after the design stage, although he was very motivated to work with the group. He had some health problems and said that he could not cope with a busy schedule. As stated before CS34 was newcomer for the course and he did not know about anyone in the class and he could only start with the group in the third week however he become very active in the group. Thus the project topic happened to be decided before he joined to the group. The unique female of the group (*CS31*) on the other hand believed that they could make a good project. She was also willing to make the project of "*Our Moneys*" however other group members especially *CS32* did not want to make it because he did not think that the project is enjoyable and the thought that project cannot be made in a way that target students have fun. They found a teacher who was teaching in a public elementary school very close to the university campus. On the other hand the teacher did not help them much in later parts of the project.

**Group 1-10**

*Group 1-10* had also several troubles with group working. One of the members was a senior student and he attended only one meeting at the beginning of the semester and then withdrew. After analysis stage, *CS36* also left the team, and after design stage he joined the group again. Therefore, other two female members created their design. Since they work on design, they left almost all the work (except report) to *CS36* in development and evaluation process. They did not work with a real target group effectively. Only at the beginning they made an interview with a teacher and used the information for the analysis. *CS35* which is the female member of the group was leading the group but she had several health problems and she could not cope with the group problems.

**Group 1-11**

In *Group 1-11* the group problems were prior problem. Although everything started very good for the *Group11*, after a while especially *CS40* was very stressed with the slow progress of the group. *CS40* were very skillful with graphic design and she created very good graphics for their project but other group members did not so diligently work and she did not satisfy with the efforts with other group members although they did not think so. She had several neighbors who had elementary level children and she easily communicated with them and she was more active at the beginning stages of the project. At the end of the

semester, the group had severe problems and they had much difficulty to complete the project.

For the second project, no group problems were encountered, almost all members attended all the meetings and actively participated decision making process. On the other hand, for current semester and contrary to previous years' students they did not have any difficulty to find a procedural topic to be developed. With the experience of the first project students were more comfortable with developing their second projects. Two of the groups selected their topic in accordance with their hobbies.

**Group 2-10**

*Group 2-10* created a video project related TABU (a word game) game to be presented for ILKYAR. Like all other second project groups they never reported a team work problem. CS19 leaded the group and she could manage other members. In the meetings CS19 and CS9 were more active then CS6. CS19 also used e-mail communication much.

**Group 2-11**

*Group 2-11* developed a video related making t-shirt printing. All group members (CS3, CS11, and CS17) were active in weekly meetings. They especially used e-mail communication.

**Group 2-12**

Because CS13 is working as a member in a social responsibility community (ILKYAR), Group 2-12 selected a topic to explain an important issue for the community which was called as "*the letter organization*".

In the second projects, their target groups were also very flexible. They could work with their classmates or other university students since the projects were addressing a broad range of target people. Similarly with the first project they developed instruments, and get information from target group and they evaluate their video product with them. On the other hand they could barely make change on their projects after evaluation since they could not make additional video recording in accordance with feedback.

For the second project, meeting times were also very short since students did not have much questions or problems about the projects. In the Table 4.2 given below, students' meeting participation rates, active involvement of the students and their roles in the groups are shown. 8 meetings were held in the first project and 6 meetings in the second project. Students were rated as "very active", "average" and "not active" in terms of joining the

discussions and make decisions on the project in the meetings. For the “Active participation to the discussion”, “very active” does not necessarily mean that the member was very active in group work, in the same way “not active” does not mean the member did not contribute to the group much. This activeness is related being active discussant in the meetings and make decisions about the projects. In this respect, “very active” was defined as the ones who are active in decision making and state the progresses more than others, “average” means not contribute much in decision making but generally not spoke unless they were asked, “not active” means they were not active in decision making in the meetings. All these criteria are valid for the facilitator meetings but not the students’ private group meetings.

Roles of the students were expected to be shared fairly but in some groups some members work only particular parts. “All deliverables” mean that the members worked in each stage of the design, and some of the members led to contact with target group and they were marked in the Table 4.5.

Table 4.5 Group members and participation to the facilitator meetings

| | Student | Participation to meetings | Active participation to the discussion | Roles |
|---|---|---|---|---|
| **First Project** | | | | |
| Group 1-7 | CS25 | 8/8 | Very active | All deliverables, communication. leader |
| | CS26 | 7/8 | Average | All deliverables |
| | CS27 | 8/8 | Very Active | All deliverables |
| | CS28 | 8/8 | Average | All deliverables |
| Group 1-8 | CS29 | 6/8 | Average | Reporting |
| | CS30 | 7/8 | Very active | Communication, programming, leader |
| | CS31 | 8/8 | Very active | All deliverables, communication, leader |
| Group 1-9 | CS32 | 5/8 | Very active (withdrew) | NA |
| | CS33 | 5/8 | Average | All deliverables |
| | CS34 | 6/8 | Very active | All deliverables |
| | CS35 | 8/8 | Very active | Communication, Reporting, leader |
| Group 1-10 | CS36 | 5/8 | Average | Programming and graphic design |
| | CS37 | 7/8 | Average | Reporting |
| | CS38 | 1/8 | Not active (withdrew) | NA |
| | CS39 | 6/8 | Average | Programming |
| Group 1-11 | CS40 | 6/8 | Very active | All deliverables, communication, leader |
| | CS41 | 5/8 | Not active | All deliverables |
| **Second project** | | | | |
| Group 2-10 | CS19 | 6/6 | Very active | All deliverables, communication, leader |
| | CS6 | 6/6 | Not active | All deliverables |
| | CS9 | 6/6 | Very active | All deliverables |
| | CS17 | 6/6 | Very active | All deliverables, leader |
| Group 2-11 | CS11 | 6/6 | Very active | All deliverables |
| | CS3 | 4/6 | Average | All deliverables, communication |
| | CS10 | 6/6 | Very active | All deliverables |
| Group 2-12 | CS22 | 1/6 | Not active | All deliverables |
| | CS13 | 6/6 | Very active | All deliverables, communication, leader |

As seen in the table all group members were almost heterogeneous in terms of activeness in the meetings and contributions in deliverables. Also girls were more active than male members.

#### 4.1.1.1 Motivations and Expectations of the Subject

First of all, the activity that the subject went through was a mandatory requirement of their university education. Therefore, their prior goal was to successfully pass the course. On the

other hand, some students proposing high grades while others were fine with only passing the course. Apart from passing the course, almost all students were aiming to learn development of instructional materials. They especially wanted to learn about how to develop an interactive instructional material by using a graphic design environment. When students were asked about what should be improved about the course most of them stated in line with *"there should be more Flash training because we wanted to do more in our projects"*.

All students had good computing skills and they wanted to improve it more, therefore they wanted to learn more about programming in this course. In the lecture that a guest was invited, the guest said that *when he was a student, he was working part-time at companies because he was good at programming and he had good course projects as reference.* This also motivated many students to learn more about Flash programming. After that, two male students (*CS27 and CS9*) came and asked how they can improve their Flash programming skills and get a part-time job at companies. So it can be argued that students aimed to use their projects as a reference of their programming skills.

Since students were willing to do technical things, most of the instructional design process seemed as a burden. For example, in *Group 1-7*, no member was good at programming. They were the most successful group which employing the ID processes. On the other hand, in personal interview the female member stated;

> *Ben her şeyi yapabiliyorum gibi ama, teknik konular daha iyi sanki. Rapor yazmak çok sıkıcı geliyor, artık mecburen yazıyoruz böyle bıka bıka. Ama teknik olanlar daha eğlenceli, uğraşıyoruz böyle, bir şeyler çıkıyor ortaya bir ürün, üretiyoruz filan o daha iyi oluyor(CS25, Female, PI).*
>
> *It is like I can do everything, but I think technical things are better, it is very boring to write report but we are writing them compulsorily. However technical things are more enjoyable, we are dealing with them, and then something emerges, a product, we are producing, and it happens better (CS25, Female, PI).*

As seen from her expression, one of the motivations of the students was to improving their programming skills, learning about Flash and consequently passing the course with good grades or just passing the course. When students were asked about what they were expecting the course in instructional design questionnaire, expectations which was answered by 30 students were like in Table 4.6 below;

Table 4.6 Students' expectation of academic skills from the course

| Expectation | Frequency |
|---|---|
| Programming | 13 |
| Instructional design processes | 9 |
| Effective teaching strategies | 7 |
| Project management | 3 |
| Visual design – message design | 2 |

* Students might give more than one expectation

As seen in Table 4.6, majority of the students were expecting learn about programming in the course. Those students might believe that instructional design can be better with programming skills. Especially available projects were motivators for the students to use advance programming skills to design attractive materials. Therefore, majority of the students stated that to get better experience in the course they expected more good examples to examine. In the instructional design questionnaire the students stated that "*there should be introduction of successful projects, also failed projects should be presented to understand why it was failed*" *(CS13, Male, PI),* "*examination of available projects would increase the diversity and would be helpful for us*" *(CS19, Female, PI)* .

Some students also stated that if their project would be published to be used in a real setting it would motivate them. For example *CS15* stated "*our designs might be showed to real students in the classes that were arranged* [by the instructor]", *CS35* stated "*our projects should be used in a real setting, thus the project would be more serious and realistic*". Group 1-7 aimed to send their project for a competition another from Group 1-9 also spoke out similar expectation;

> *hazırladığımız projeler bir yerde bir amaç için kullanılabilir, ya da öğrenciler arasında bir şey olabilir, yarışma, motive eder çünkü (CS31, Female, PI)*
>
> *The projects that we prepared might be used for a purpose, or there might be a competitinon between students, this would motivate [us] (CS31, Female, PI).*

Although the students were expecting to work in a real setting, in practice it was very difficult to find and convince the teacher to implement their projects. Therefore, students expected instructor arranged classes to implement the projects. In fact, their expectation of implementation in real setting was assumed as the success of the project, they wanted to see that their projects were good enough to be implemented in a real class.

As mentioned in goals, inviting a guest speaker had a considerable role to make students motivated to develop good project and learn programming. This motivation was stated by a student who says;

> *[firma ismi]'nden GS8'in, gelmesi de çok etkili olmuştu, bölümden çıkmış bir yerlere gelmiş kişiler bizim için daha çok örnek olabilir, dışarıda bu şekilde bir kaç kişi daha getirilebilir. [firma ismi]'nin sitesine girdim, giriş düzeyinde bir animasyon projesine 15 bin dolar diyor, belki bize gösterilse hani yaptıkları şey gösterilse, büyük ihtimalle biz oraya yönelirdik. (CS27, Male, PI)*

> *"I was very effective that GS8 from [the company name] came, the people who graduate from the department and had a good position in somewhere could be good example for us, more people can be invited in this manner. I visited the web site of [the company name], they are quoting 15 thousands dollars for a preliminary level animation project, if those projects would be showed us, most probably we would head to make those projects. (CS27, Male, PI)*

As mentioned before, students want to see their projects are worth to work on it, most of time they complained about why they spent so much effort to just get a grade. Since the students had to work as groups also students had several expectations and motivations for group working like the roles, expectations for group working without any problem. Except two students (*CS35* and *CS41*), in questionnaire all other students stated that working with a group is advantageous since it *richens the experience, increase ideas, saves time and increase the quality of work*. However, they stated also for successful group working, first of all, all members should *know their responsibilities, encouraged to work, have good personal relationship, open to new ideas.*

Another issue that students were expecting this course is much less course workload. According to students' previous experience with design related courses, there were no considerable workload until the end of the semester. Also, until this course, the content of lecture and labs were very consistent in other courses. It means that, students went to lab to learn more about what they learn at the lecture. They also did not have regular meetings and structured reports in project based courses. Thus students were expecting familiar project based course structure in this course. A student for example spoke out his feelings about reports by saying;

> *Ya o rapor olayı güzel, ileride işimize yarar da bence fazladan uzatılıyor bence, yani çok aşırı ayrıntıya giriyor… biraz yani Flash ya da öğretim materyaline odaklansak o daha güzel olur (CS29, Male, PI).*

> *That report thing was good, it will definitely beneficial in the future, but I it is unnecessariliy prolonged, there are too many details… I mean, if we focus on Flash or instructional material more, it would be better (CS29, Male, PI).*

As he pointed out many students wanted to develop the materials more than learning about the processes. Students really wanted to develop projects like the examples that they saw in previous year examples and they did not imagine the processes they went through. To sum up, students expectations and motivations can be summarized in Table 4.7 below;

Table 4.7 Summary of expectations and motivation of students from the course

| Expectation category | Expectation and motivation |
|---|---|
| Academic skill expectations | Programming, message design, instructional design skills |
| Outcome motivations | Developing valuable projects, Increasing quality of projects with real examples, creating a product |
| Working environment expectation | Less workload |

Higher or lower level motivation and expectations influenced students' work much. Generally, students tended to think that they would learn something as long as it was given in the course. On the other hand, this course forced them learn much more than given at the course. Thus, a contradiction between students' expectations and course requirements occurred.

### 4.1.2 The object

As mentioned at the beginning, the object of the system was "*to teach instructional design processes to novice instructional designers via multimedia design*". At the end of the activity, two end products revealed. Students had also different outcome expectations from the course. Although contracts were not so effectively used as a guide, they were helpful to see how the students perceived the projects' purposes. The definitions of the objects were given as in Table 4.8. In the table, it can be seen that some groups preferred to define very specific purpose of the project while some of them were very general. This is because at that time, they were not much knowledgeable about the project that they would develop and did not decide specific points of the projects. Only Group 1-11 mentioned about the instructional design aspect of the project. Other groups focused on the success of the products. As seen in Table 4.8, in the first project definitions no groups mentioned about the topic while two of the procedure project groups mentioned about the topic.

Table 4.8 Purpose of the project in accordance with contracts of the students

| **First Project** | |
|---|---|
| Group 1-7 | To develop an effective instructional material which can be used in real class environment<br><br>To attend a competition which is related to educational software area. |
| Group 1-8 | To create a successful multimedia design project |
| Group 1-9 | To prepare an instructional material to teach a science and technology topic to elementary school students. |
| Group 1-10 | To prepare a course material that represents an effective learning for the 7th grade students by using multimedia program, namely, Macromedia Flash. This material will be enjoyable, effective, including games, animations and experiments. |
| Group 1-11 | To prepare an interactive learning material which is based on ADDIE learning model |
| **Second project** | |
| Group 2-10 | To explain how to play TABU |
| Group 2-11 | To illustrate the procedure of selected topic clearly and understandable to instruct target group by using camera and video editing software |
| Group 2-12 | Developing visual and audio presentation to show all the processes starting when a letter comes to ILKYAR community room and finish when the receiver receives it |

Some students were also thinking that the purpose of the course was to teach about development tools. Thus, they surprised with the instructional design processes that they had to deliver. Since their object was different than the purpose of the course also experience of the students influenced their expectations. As student CS29 stated,

> *açıkçası bu ders hoşuma gitmedi bu rapor olaylarından böyle, başta çok meraklıydım Flash yapıcaz filan sanıyordum, labda da çok uğraştığım oldu [ödevler], ama doğruya doğru şey yaptım ben de [verilen ödevleri dönüştürüp kendi ödevi gibi düzenlemesini kastediyor] yani bir değeri yok gibiydi, rapor üzerine gitmesi beni şey yaptı [hevesimi kırdı] (CS29, Male, PI).*

> *honestly, I did not like the course because of the report, at the beginning I was very enthusiastic, I was thinking we were going to make Flash, I also struggle with lab [homework], but honestly I also did [converting available projects and modify as homework] , it was like there is no value of it, the processes going on via reports discouraged me. (CS29, Male, PI).*

These different objectives of the students showed their perception about their outcomes. This perception also influenced their progresses.

#### 4.1.2.1 How Subject's Expectations Influenced the Dynamics of The Situation

Academic skill, outcome and working environment expectations and motivations of novice instructional designers contributed almost all components of the activity and especially the object. In academic skills, some students emphasized learning programming, visual design and creation of attractive animations. This expectation shaped their interaction with other community members and changes the roles. As in the Group 1-10, in the first project roles were completely separated because of the interests of the students. The programming expectation also made them think that they did not learn many things in the course. When students were asked about the outcomes that they got, many of them were answered something like "*I learnt about Flash but I would like to learn more about it*". One of the students who know programming in flash states the situation of his friends by saying;

> *Flashı öğrenmek isteyen çok kişi var ama, 7 hafta oluyor, 7 haftada bu konular hakkında kimse bir şey yapamıyor çünkü bilmiyorlar, 7. haftadan sonra artık birşeyler oturuyor ama artık yeni projeye başlıyorlar(CS9, Male, PI)*
>
> *there are many friends who wants to learn Flash, but there is only 7 weeks, in a 7 week no one can do something because they do not know. After 7th week they become familiar with it but a new project starts by then (CS9, Male, PI).*

Another student also stated;

> *bu dersi alınca hakikaten Flash uzmanı olacağım sanıyordum, ders başlayınca iki üç hafta geçince yanıldığımı anladım ve çok üzüldüm hakikaten, ben derste de [teorik kısımda] aynen böyle [lablardaki gibi] öğretilecek [Flash] diye biliyordum(CS35, Female, PI)*
>
> *I was thinking that, when I took this course, I would be really a Flash expert, when the course started, I realızed that I was wrong, and I really deplored, I was thinking that it [Flash] would be taught in the lecture time just like in the lab (CS35, Female, PI)*

Those students expecting to learn programming disappointed with the processes before the development. Especially reporting and communicating with target group seemed heavy for the students and even they were not aware of the role of the development of storyboard before the development of the project. They thought that they would just start to write scripts and create animations for their projects. That is why many projects were starting with high expectations, colorful and attractive project. This is consequently influenced subject-tool interaction of the activity since the students focused on a particular tool of the course more than other requirements. They less paid attention to the tools which are required for instructional design processes like reporting, feedback of facilitators and target groups.

The students who had expectation of learning about instructional design processes, there were not much surprise. The expectations of students also influenced the perception of outcomes of the course. For example, a student who stated her expectation as learning about instructional design processes perceived the effect of guest speaker differently than the students who focused on programming. That student stated;

> *bu ders sayesinde, ben bir materyali ya da bir iş diyelim, sadece öğretim materyali değil, bunu yapacağım zaman ne yapmam gerektiğini, tam olarak öğrendim. İlk önce bunu bir plan bir analiz önce kafada düzenleme sonra yapmayı öğrendim, bu da öğrendiğim en iyi şey (CS15, Female, PI)*

> *By means of this course, I really learnt what I should do when I start to make a material let say 'a work', not just a learning material. I learnt that firstly planning, analysing and designing in the mind and then do, and this was the best thing that I learnt. (CS15, Female, PI).*

Expectations of outcomes like developing good quality of projects also affect the components of the activity system. Especially, interaction with community was influenced from this expectation. The good quality expectation made students interact with facilitators and the target group, and using different communication channels more like happened in *Group 1-7* and *Group 2-11*. Especially the students who wanted their projects were used in real setting gave importance to using the tool. High quality expectation also influenced the rules, the students behaved more responsible to their group members like in *Group 1-7*. Community was influenced from quality expectation. If a member of a group more encouraged from others, more problems arose like in *Group 1-11*. Especially the members who wanted fair working, disappointed with the community.

Students' expectation of workload also influenced the dynamics. Students did not expect so many requirements at the beginning. This expectation most of time made them ask why so many deliverables were there and especially they inquired why there were two projects in a semester. Less workload expectation also caused some underestimation of the deliverables. On the other hand, in regular meetings those deliverables were examined with them. They most of time felt stressful about the feedback of facilitator especially if facilitator asked them add more things to their projects. Concrete examples of facilitators were applied but if facilitators just said something like "*improve it*", "*add more examples*", students did not take this feedback into account. Therefore, constructive feedback of facilitator had a considerable role on the object. General effects of expectations on the processes are given in Table 4.9.

Table 4.9 Students expectations and its effects on processes

| Expectation | Effect on processes |
|---|---|
| Programming | Ignoring ID processes, disappointment with outcome |
| Instructional design | Giving importance to processes, being pleasant about outcomes, |
| Good quality products | Working with target group effectively, using communication channels more |
| Less workload | Ignoring processes, need of more guidance |

Work load was very much for each student's perspective. However their reaction to this load was different. Some of them were fine with learning in a real-life like environment and they give importance phases of the design while some of them only wanted to submit something of which deadline came. Major disappointment came with the lack of programming teaching in the course. Individual subject expectation and motivation also influenced group work much as mentioned in next parts.

### 4.1.3 The Community

The community mainly consisted of group members, other class members, facilitators, instructor, target group teachers, target group students, guest speakers, group members' friends who help them in evaluation of the project. The roles of the community members were given in this part detailly.

#### 4.1.3.1 Team Members

Subject of the system was the team members. However, they are also a part of community. Expectations, motivations and working skills of team members are different than each other. Especially in the first project, assigned team members' were much more different backgrounds and expectations, thus the tensions in team working was much more than the second project teams. In team working *motivation of the group members, busy schedules, living in inconvenient places, different technical and academic skills of members, finding* and *working with a target group* and *member dominancy* played a major role.

**Unmotivated Group Members**

NIDs' motivation to learn more about instructional design and to show better performance was very important issues. In fact, NIDs' self-motivations had very important role on the perception of experiences and the quality of work. Getting good grade, being willing to learn about programming or design processes positively influenced the performance of the groups. On the other hand since each student had different motivations, the group working dynamics and the performance on labors changed. Students' pre-knowledge and confidence on using development platform was also very important. The students who were confidence on

development platform worked more independent while others needed more suggestions from the facilitator as *F5* reported.

Students had problems like group working and some problems caused from the individual issues. The main problem was that the students were coordinating the group working. Group problems mainly caused from the random grouping since most of them were working with other friends for the first time. They did not know about others' working habits. All the students had different expectations from the course and from the group. When students asked how they normally select their group members many of them stated "*awareness of responsibility*" is important than having good academic and technical skills. For example, one of the students stated;

> *toplantı saatinde toplantı günlerine uyabilecek, sorumluluk sahibi kişileri seçerdim, Onun haricinde az çok muhabbetim olan kişileri, bir şey söylediğimde sözümün geçebileceği kişileri seçerdim(CS13, Male, PI).*
>
> *I would select someone who could obey the meeting times, having awareness of responsibility. Apart from this, I would select someone I like more or less, and the ones who adapt when I request something (CS13, Male, PI).*

Another student also stated about her expectation from group members by saying "*I expect everyone to put as much effort as they can in order to finish the project* "(CS28, Female, PI). Motivation of the students was not only influention on awareness of responsibilities but also influential on the desire to making different and quality products. When a group member was motivated to develop better quality things and others did not pay attention, this also reduces the motivation of other member. In the first project, in *Group 1-11*, CS40 was the most motivated student to make different and interesting things. However because of community problems she could not accomplish every thing her mind. In the second group, although she was working with her close friends, she was not fine with other member's attitude of '*no work more than enough'*.

**Different Schedules**

The schedules of the junior students were very busy since most of them had additional courses which remained previous years and some of them were taking senior courses in advance. This problem was encounterd especially in *Group 1-9* since *CS33* has been taking many courses in that semester. Although group members tolerated him in sime extent, in most busy times they started to complain about him. When the course workload was very heavy (almost two deliverables each week) students had difficulties to keep up with the schedule of the course while also performing tasks for other courses. A student who took two more courses from senior class said:

*Homeworklerin ağır olması çok kötü bişiy, çünkü bu bizim tek dersimiz değil ben üstten de ders alıyorum, iki seçmeli alıyorum, alttan dersim yok, hani yoğun geçiyor [dönem] diğer arkadaşlara bakıyorum hani alttan ders arkadaş da aynı şekilde şikayetçi, hani öğrenci tarzıyla, üç kredilik ders bu kadar insanı boğar mı mantığı ile (CS9, Male, PI)*

*Being very heavy made homework very bad, because this not our unique course, I am taking senior level courses, I am taking two electives, I have no course that remained last year, it is very intense [semester], I see that other friends who are repeating the courses are complaining about this, for a student perspective, [we are thinking that] why a course with three credits overwhelms the students so much(CS9, Male, PI)*

Although CS9 was also a hardworker student the group did not have any problem, in most of the groups this became problem. Some of students were working for volunteer communities, taking different elective courses. Another student also pointed out that the schedule cause some communication problems, he said;

*İletişim konusunda biraz şey olduk [sorun yaşadık], çünkü herkesin dersi var, altan alan var, hani diğer derslerimiz var. Genelde o farklı zamana geldiği, yani sıkışma [işlerin üst üste gelmesi]" oluyordu yani (CS29, Male, PI) .*

*In communication we had some trouble, because all of us had courses, there are the ones who are taking the course from previous year, we have other courses. Commonly, there was times that all of them overlapped (CS29, Male, PI).*

The students defined rules for face to face meetings and thus it was very difficult to find available times for each other. One of the facilitator summarizes this situation by saying;

*Yüzyüze olmayi çok istiyorlar, ama yapamıyorlar, grubu toparlamak için harcadıkları zamanı projeye bazen veremiyorlar, ayarlamak için şu gün şurda buluşalımı ayarlamak için. Tamam diyorsunu muhakkak [yüzyüze görüşmek önemli] ama şey yapalım bu işleri internet üzerinden götürmeye çalışın, bakın google docsla yapin, tamam buluşmanız önemli ama buluşamıyorsunuz, buna çok zaman harcıyorsunuz, deseniz de çok bir şey yapmıyor [önerinizi dikkate almıyorlar](F2, Male, PI)*

*They really want to meet face to face, but they could not do that, they could not allocate time for the project as much as they allocate to bring group members together, just because to arrange a face to face meeting time. I say `OK, certainly meeting face to face is important but let's try to progress on Internet, use Google Docs, it is important to meet face to face but you could not do, and then you consume much time for it', but saying this useless [they do not care about your suggestion] (F2, Male, PI)*

This problem especially encountered in the first project except in *Group 1-7* which use Internet tools effectively. Also, in the second project groups, schedules did not cause problems and students were fine with using Internet communication tools to make progress on their projects. Since the location of second project groups were convenient and since they were familiar to work with group members, the situation in the second project groups was different.

**Living in Different Places**

Living different places influenced the participating and communication in group work. If there would not be instructor's group assignment most of students would have selected their friends to whom they can easily contact and meet as observed in the second projects. Many of the students were living at dormitories in the METU campus. Therefore, they prefer the work with their friends which they can easily come together. One of the students exemplified this preference by saying;

> *Ben rahat çalışabileceğim istediğim zaman bulaşabileceğim arkadaşlara dikkat ederim okul içinden [kampüste yaşayan] olmasına dikkat ederim, yani okul içi derken yüzüncü yıl [bir semt] ya da okul içinde [kampüste] olması tabi ki iyi olur (CS1, Male, PI).*
>
> *I would pay attention to select friend to whom I could meet whenever I want comfortable, or to whom from the school [living in the campus], by 'from the school' I meant from Yuzuncuyil [a district] or school [campus], it would be better (CS1, Male, PI).*

Looking at his perspective, it was very difficult to smoothly work with a randomly assigned group. The members were living different places and most of time they could not negotiate to come together and work. Especially in *Group 1-8 and Group 1-11* in the first project groups had a lot of location problems to work together. The location was a problem since the need of face to face meeting. As mentioned for schedule, for location problem the main reason was students' insistency on face to face meeting. They might believe that if they did not come together they cannot make good coordination and cannot control finishe. Previous year students also emphasized that there is a habit of finishing a work by working a whole night. The best place to work the whole night is the labs in the department. It is very common to see the labs full of students at nights towards the end of the semesters and end of the projects. Therefore, the students prefer to work with the friends who are flexible enough to stay at labs at the CEIT's computer labs. When a team member could not come to the labs, this causes some trouble between the team members.

**Different Technical and Academic Skills**

Different technical and academic skills of members were other issues which influenced the group work. First of all, although groups selected a leader, there was no professional leadership in the groups. The member who worked more than others might become leader in a time. Division of labor influenced the technical and academic skills. For example since males believed that they were much better in technical things and they left all other processes to the females and in some groups males only deal with programming. When check the lab grades, girls' average is about 63 while males average is 74 in lab homework. Actually the grades cannot be unique way of understanding this difference. Even female students believed

that they cannot do as much as males do in programming. This perspective is common in most of the groups of the researcher. Since female students believed that they could not contribute technical part of the project and they accepted to finish reports and other processes of instructional design. Although the students were not directly stated, in all the groups the programmers were male students. This caused some problems in consistency in reports and the project. Since the girls write the reports, communicate the target group and make design, when the stage came to programming, male students did whatever convenient for them and most of time design and developed project was not consistent. This was especially faced with *Group 1-10*, their storyboard and the end product was totally different than what they submitted in design report.

In Table 4.10 below, convenience of the schedule and location, technical and academic skills of students during the project are summarized. For schedule convenient means that all students have normal junior class schedule, for location and contacting column is means all members could easily come together to work. For technical skills, moderate means that all members did not know about development platforms at the beginning but they learn enough to develop the things that they imagined. Good means that members were knowledgeable about the development platform and they could have done even more for their projects.

Table 4.10 Summary table of some issues with group working

| | Schedule | Locations-contacting | Technical skills | Academic skills |
|---|---|---|---|---|
| **First Project** | | | | |
| Group 1-7 | Convenient | Convenient | All group members were moderate | The group was very good |
| Group 1-8 | Convenient | Not convenient | Only CS30 was good others left programming to him | The group was moderate moderate |
| Group 1-9 | CS33 had busy schedule others convenient | Convenient | All group members were moderate | CS33 caused problems, but others were good |
| Group 1-10 | All group members had busy schedule | Convenient | Only CS36 was good others left programming to him | The group had problems |
| Group 1-11 | Convenient | Not convenient | CS40 was good at graphic design, CS39 programming | The group was moderate |
| **Second Projects** | | | | |
| Group 2-10 | Convenient | Convenient | All group members were moderate | The group was good |
| Group 2-11 | Convenient | Convenient | All group members were moderate | The group was very good |
| Group 2-12 | Convenient | Convenient | All group members were moderate | The group was good |

**Difficulty in Finding and Working with a Target Group**

The first problem of the community was to find a convenient and information-rich target group teacher or student. In previous years' experience showed that even instructor arrange a group of target people students had difficulty to communicate and continuously work with them. Therefore, in the semester that study was conducted, students were asked to find a convenient teacher and students who can help them while developing their projects. On the other hand most of groups only contacted only in analysis stage and evaluation part of the design. They especially had difficulty to contact with teachers. A student expressed the difficulty of reaching a target group by saying;

> *Öğretmen ve öğrenci görüşmeleri tabi ki başlı başına zor bir iş işte onları ayarlamak, işte görüşeceğiz mi, nasıl görüşeceğiz ne soracağız filan, onlar bizim için sıkıntı yaratmıştı(CS11, Female, PI)*

> *Of course the meeting with teachers and students was the major problem, arranging a meeting ... 'are we going to meet', 'how we will meet', 'what will we ask them', those caused problems for us (CS11, Female, PI)*

This situation is approved by another facilitator who said;

> *Hedef kitleye ulaşma zor oluyor muhakkak en böyle uygun ve yakını seçmeye çalışıyorlar, sonunda, özellikle mesela evaluation kısmında da şey yapıyorlar, kendileri üretiyorlar açıkçası yani (F2, Male, PI)*
>
> *Certainly it is dificcult to reach the target group, they are trying to selecte most convenient, at the end especially at evaluation, appearently they are articulating (F2, Male, PI).*

On the other hand, reaching the students is easier since most of them were selected from relatives or neighbors. However this caused another problem of the community, since it was much more difficult to directly contact with students of selected teacher (the school principals do not allow it) they selected a teacher and students from different contexts conveniently. Table 4.11 shows the groups and their contacts.

Table 4.11 Target group of the project groups

| | Target Group | Topic | Teacher – Subject matter expert | Target students | Target group communication |
|---|---|---|---|---|---|
| **First Projects** | | | | | |
| Group 1-7 | 4th grade elementary class | Human Body Systems | CS25's sister's teacher | CS25's sister and her friends | They continuously contacted with the target and their project implemented in a real class |
| Group 1-8 | Grades from 1st to 3rd in elementary class | Turkish Currency (Our Moneys) | A male teacher in a private college contacted with researcher | The students of the teacher | They contacted with the target st the beginning and their project was implemented in a real class |
| Group 1-9 | 6th grade elementary class | Light and Reflection | A female teacher in a state elementary school | Two Students from different elementary schools | They only contacted with target at the analysis stage |
| Group 1-10 | 7th grade elementary class | Change in State of the Matter | One female and male instructors at university as subject matter expert | - | They only contacted with target at the analysis stage |
| Group 1-11 | 6th grade elementary class | Force and Motion | - | Students from different elementary schools and neighbors of CS40 | They only contacted with target at the analysis and design stage |
| **Second Projects** | | | | | |
| Group 2-10 | All interested people | How to Play TABU | Students themselves as subject matter experts | Classmates | After analysis they did not contacted with target group |
| Group 2-11 | All interested people | T-shirt Printing | A female craft teacher as a subject matter expert | Classmates | After analysis they did not contacted with target group |
| Group 2-12 | ILKYAR Members | ILKYAR Letter Organization | Head of ILKYAR, CS13 | Classmates, CS13 | CS13 was working at ILKYAR and he was knowledgeable about the context |

One of the most important reasons of the difficulty of finding a target group was that teachers did not want to continuously work with the students. They were very open at the beginning but students had difficulty to contact with them in further steps. For example in *Group 1-8*, although it was the teacher who asked them develop a project for his class, he did not responded most of the e-mails of the students and not answered questions of the students. On the other hand he used and evaluated the end products of the novice instructional designers. In most of groups the teachers could not implement the groups' end products. As stated above, since the instructor and facilitators did not set up a formal relationship between designers and teachers, students have not become aware of the importance of the target group and they did not take the target group expectations into consideration as much as expected. For example again in *Group 1-8*, after first meeting with target group teacher, CS30 stated that "*This is really helpful, now I am feeling that I really motivated to work on this project, knowing that our project will be used by the teacher forces me to make a good quality project.*". Most of groups were in need of these kind of first steps to contact with a teacher, because most of other groups contacted with target teachers spontaneously, and thus it was very difficult to continue to this relationship.

**Member Dominancy**

Member dominancy was the problem especially in managing the process. In the first projects member dominancy problem was especially encountered in Group 1-8. In fact in all the groups which select a female member (CS28) as a leader, one of the male members became dominant in a while because of their technical skills. In Group 1-8 they selected the foreign female member as leader. However in a while she could not contribute much because each time two male members met in one of the male member's house and she did not want to meet in his house. Thus two male members become dominant in decision making, especially CS30, and they just give some tasks to her to be performed. CS28 complained about the way that the group communicate each other. She said;

> *I couldn't express all the idea that I want to. For example, in the project, I would like to design something a little different but because the group members agreed on an idea, so I cannot say anything about it. The only thing I can do is that continue doing what was decided (CS28, Female, PI)*

In another case, in *Group 1-11*, again they selected *CS40* as leader however she was also not good at all technical issues except good graphic design. She was much more determinant than *CS28* therefore she could manage others to make what was decided in the group. In these two cases their teamwork skills and results of the products was also influenced. The

issues that groups dealt with and their reasons underlying them are summarized in Table 4.12.

Table 4.12 The problems of project teams and reasons of the problems

| Problems that subjects dealt with | The reasons making them problem |
|---|---|
| Motivation of group members | More or less contributions to project , different expectations from the course and group members |
| Different schedule | Lack of use of communication tools, insisting on face to face meetings |
| Locations that members live | Students do not want to limit time to work, not want to come from a distance, insist on face to face meetings |
| Different technical and academical skills | Making unfair division of labor, more responsibility for good students |
| Difficulty in finding and working with target group | Teachers do not tend to help to implement, facilitators did not contact with target group in advance, lack of motivation to work continuously |
| Member dominancy | Lack of technical and academical skills of some members |

#### 4.1.3.2 Class Members

Although students worked as groups other class members influenced each other in terms of motivation. Students tended to share their experience with their facilitators and group members to other members of the classroom. Therefore, although students worked as groups, all class members knew about other groups' projects and relationship with facilitators. This sometimes caused some problem like *comparison of grading styles*, *comparison of feedback of the facilitator*, *comparison of facilitator's communication habits* and *facilitators' technical knowledge*. Especially in comparison of grading facilitator encountered some problems in convincing the teams for their score. Although there were rubrics for grading, therefore a fair grading was expected. On the other hand, when some teams realized that another team get higher scores, sometimes they had quarrel with their facilitators since they believed that the perception of quality is different between the facilitators.

Apart from class members, students were also communicating people who are at senior students of the department, and moreover they were communicating with the CEIT students of other universities. All these communication enabling students make comparisons. For example some students stated that the project of the course is much havier than the projects made in same course in another university. Similarly senior students had some misleading effect on the class members. Since senior students introduced the course as Flash course and

they said that the students would learn about Macromedia Flash very well, some of the junior students came to the class by thinking that they will only learn programming in Flash.

#### 4.1.3.3 Guest Speaker

The role of the guest speakers was to motivate NIDs to create good quality projects to get a good position as instructional designers or software developers. As a tradition of the course a guest speaker comes to the class and gives a seminar about their job. Preferably they were graduates of the department and working as instructional designer at their company. In the semester of the study, GS8 who graduated in 2003 attended as guest speaker. He was working as project manager at a company located in the campus. He mentioned that he started to work in different companies during his university education. He also mentioned about the importance of the course projects and how well a project could be developed. As mentioned about two students came to the researcher to ask how they could work at a part time job at a company after GS8's visit. The researcher interviewed GS8 as a graduate student.

#### 4.1.3.4 Subject Matter Expert (External)

For most groups, subject matter expert was also elementary school teachers like target group. Also some of the groups contacted with a faculty staff as subject matter expert from different departments at METU. They also benefited from their friends who are studying at different departments of METU and especially studying at faculty of education. As mentioned about the role of group members, for the second project group members were also played role as subject matter expert. Although NIDs were suggested to work with a SME to create their actual content, not many of the teams worked with them.

#### 4.1.3.5 Target Group

Target group's role was to provide contextual information in analysis stage and give feedback after each stage of the design. Also target group teacher had role of subject matter expert. As a feedback provider, target groups were expected to understand the project and help students in accordance in scope of their projects. In the first project target group was composed of teachers were from elementary schools and students who are at elementary schools. Some project groups only contacted with teachers since they were knowledgeable about the schools context, about the curriculum and their learners. They gave feedback on behalf of their students. In Turkish context it was very difficult to directly contact with students and conduct something outside the curriculum. Therefore, if project groups did not have any relative or neighbor kids, they could not contact with any students.

For the second project, since the novice instructional designers mastered their subjects and they were also target groups they did not have difficulty to find target students because of their friends. Subject matter experts were themselves most of time and they also contacted with facilitators or instructor as subject matter expert.

#### 4.1.3.6 Facilitator

Facilitator's role was to guide the project groups, teaching at lab, providing communication between target groups and grading deliverables. There were many expectations of the students from facilitator for each role of them. Role of the facilitator and expectations of students will be listed in this part.

**Guiding Project**

As a facilitator main role was to guiding students to conduct a proper instructional design process and finish their projects successfully. They also played role to find target group, solve group problems, giving feedback to reports and design of the products. Instructor had role of facilitator and he was also conducting lecture part and supporting students logistically.

In guidance students always expected detailed and immediate feedback from facilitators since there was time limitation for the phases of the design. They appreciated when they asked a feedback via e-mail. A student stated his appreciation about getting feedback via e-mail.

> *oluşturduğumuz şeyleri gönderiyoruz maillerle geri cevap aldığımız zaman biz hemen kendimizi düzeltebiliyoruz. Biz daha projeyi yapmadığımız için kendi yanlışlarımızı kendimiz kolaylıkla göremeyebiliyoruz, ama daha bilgili olgun kişilerden öğrenince, cidden bu iş böyleymiş diyoruz, hani facilitator kesinlikle gerekli bu ders için(CS13, Male, PI)*

> *We are sending our works and when we get response via e-mail, we can immediately edit the work. Since we have not made he project yet, we might not have seen our wrongs ourselves, but when we learn it from a wiser and matured people, we are saying 'this work can be done like this', I mean facilitator is certainly needed for this course (CS13, Male, PI)*

As he implied, facilitator feedback provide clarify misconceptions about the work. Students especially need help while applying instructional and motivational strategies to their design. In this respect, facilitator had a crucial role to lead students understand how they could apply instructional and motivational issues to their instruction.

In the face to face meetings facilitator gave feedback for their submitted reports too. On the other hand, in these meetings students seemed bored since they did not want to re-work on

their available works like storyboard or reports. However, generally students expressed positive things related working with a facilitator. For example a student stated;

> *grup planlamasında ya da yeni fikirlerin ortaya çıkmasında, yaratıcı düşüncelerin ne şekilde nasıl yapılması gerektiği konusunda [facilitator] bize baya yardımcı oluyorlar (CS34, Male, PI)*
>
> *[Facilitators] helped us much in planning, in revealing new ideas orin the issue of how we could make creative ideas (CS34, Male, PI)*

In guiding projects also researcher assisted students to finish their work on time. Students believed that facilitator was the warrantor of the regular and proper work since they had to meet with the facilitator weekly.

> *facilitatorsuz olmazdı, ... bu bizim her hafta görüşmelerimizde, yaptığımız şeyleri, çalıştığımızı gösteriyoruz, ona göre feedback alıyoruz, ... kendi kafamıza göre yapsak bu kadar iyi şeyler çıkmaz sanırım, iyi şeyler düşünebiliriz ama facilitator daha iyi bildiği için ona güveniyoruz. Ve bunu yapmak için çalışıyoruz ve daha iyi bir şey oluyor ve kontrol altında oluyoruz, hakikaten insan kendini itmek zorunda kalıyor (CS35, Female, PI).*
>
> *I would not be without a facilitator… in these weekly meetings we are showing the things that we did and our work, and get feedback in accordance with it … if we would do it after our's own mind, I think something good will not appear, we can think good things but since facilitator know better than us, we are trusting them. And we are working to achieve this, and better things are happening, we are under the control, actually, it forces us to push ourselves (CS35, Female, PI).*

As seen CS35's feelings, facilitators are trusted ones to make good work. Moreover, by getting the feedback of facilitators, NIDs could get higher grades since they could improve their work. Lastly in guiding role of facilitator, they tried find a target group for the students and provide them effective communication in some extent. In this context although facilitator could not find a target group for each group, at least guide about how they could communicate with them and get required information.

**Teaching at Lab**

Facilitators provided six week training for the first project and one session for the second project. However especially for the first project students had much difficulty. Since the lab content was prepared with basics of Macromedia Flash, it was not enough for students to create attractive things that they proposed to develop. Although the lab homework were prepared more advanced manner, most of students preferred to convert executable file that was provided with homework into raw files and with small modifications they sent to their lab assistants. This caused a lot of problems for assistants. They had to develop more homework to compensate this situation. In designing the projects students also ignore their

capabilities on the development platform. They also did not examine the platform enough to understand what kind of things thing they can do in it. Therefore, many of designs do not overlap with the actual product. One of the reasons that made them stressful about lab homework that the lab homework had to be submitted on Sunday midnights. On the other hand most of students could only send them Monday mornings. Since the lab hours and the lecture hours are on Monday and almost all deadlines for each report and projects were Mondays. Therefore, Sunday evenings was very stressful for most of the weeks, and students could not pay enough attention to lab homework and just tried to send something working.

**Grading the Deliverables**

Facilitators individually graded the deliverables of the students. At the end of the second project, on the other hand, all facilitators came together to evaluate students video projects and their presentations. The students get averages of the scores given by each facilitator in these two deliverables. In individual grading, because of different backgrounds and expectations of facilitators, there were the problem of different grading habits and different styles of communication with the students. Since all assessment tools were reports and qualitative methods like observation of the groups, students expected a fair and consistent evaluation from all facilitators. One of male student explain the issue of inconsistent grading strategies of facilitators by saying

> *Facilitator ile facilitator arasında çok fark var, notlandırma açısından, bazı facilitatorlar en düşük 94 vermiş, bazıları en yüksek 71 vermiş (CS31, Female, PI).*
>
> *There are difference between different facilitators, in terms of grading, some facilitators gave at least 94 while others gave 71 at most (CS31, Female, PI).*

This student was in the first project groups of the researcher and then she worked woth another facilitator in the second project and she complained about the grading manner of the facilitator.

#### 4.1.3.7 Problems that facilitators dealt with

Facilitator as part of the project also had to deal with the problems of the project groups. Each facilitator was scaffolding students about instructional design processes. One of the most important problems that facilitators dealt with was academic skills of the groups like understanding the instructional design processes, good reporting skills and the habit of applying the feedback to the design. Plagiarism was also an important issue influencing the academic work. Some students did not hesitate to plagiarize some parts of the reports and the projects. Plagiarism on the reports was rather low comparing previous years because instructors use a plagiarism checking software. On the other hand in projects most of the

groups used available animations, even one of the groups took all the animations from different resources (Group 1-10, Concept Project).

**Bringing NIDs in Instructional Design Processes**

Some students were not aware of the instructional design process that they were going on. Those students only focused on deliverables and they did not realize that each part is an integrative part of the design. That is why some students only focused on end product and missed that without an intense planning, they would challenge to finish their project. Especially in first project, the most frequent phenomenon with student projects was very fantastic and colorful designs require advance programming skills and a large time. Those groups did not realize that effective materials are not necessarily only full animated, interactive, fantastic and colorful things. Since they focused on visual attractiveness of design, they ignored the cognitively engaging strategies, and the content was most of time simple texts in a colorful, animated and fantastic things. Those groups also assumed as the groups who developed not good quality projects. For the second project on the other hand since the nature of the projects are different they did very minor changes in stories. Major reason for that the time limitation of the video. For attractiveness they also did not have many options, except video effects because they had to use minimalist approach to teach the procedure. They also use cognitively engaging strategies much easier than the first project because in the video they could easily add those strategies to the scenario. Therefore, it can be said that programming skills influenced the effective message design of project much. In Table 4.13 groups instructional design performances are shown.

Table 4.13 Summary table of some issues with group working

| | **Design-Development Consistency** | **Visual Attractiveness** | **Cognitively engaging strategies** |
|---|---|---|---|
| **First Project** | | | |
| Group 1-7 | Very consistent | Moderate | Moderate |
| Group 1-8 | Litte changes | Attractive | Moderate |
| Group 1-9 | Little changes | Moderate | Moderate |
| Group 1-10 | Not consistent at all | Not attractive | Not at all |
| Group 1-11 | Medium changes | Very attractive | Moderate |
| **Second Projects** | | | |
| Group 2-10 | Very consistent | Moderate | Good |
| Group 2-11 | Very consistent | Moderate | Good |
| Group 2-12 | Very consistent | Moderate | Good |

As seen in Table 4.13 in the first projects dynamics of the projects are very different among groups. Especially consistency between processes and developed projects was important issue in the first projects.

**Bringing NIDs in Applying Feedback**

For each report and deliverable students were provided a feedback and they were expected to corrected them in the final stage. Also each week facilitators provided ideas about the project, however although students looked like understand and accepted those suggestions most of time they came to next meeting by forgetting about the suggestions the facilitator made and the things that facilitator asked them to bring to the meeting. For example from Group 1-10, CS36 reported their attitude toward facilitator meetings as;

> *Biz sadece bildiğimizi okuduk yani, sadece gelmek için geldik fazla şey aman gidelim de bakalım feedback nasıl gelicek gibi bir şey yoktu, sadece notu düşündük, daha fazla not nasıl alırız, cidden onu düşündük(CS36, Male, PI).*

> *We were just took our own way, we were coming just to come, we did not tought "let's go and see how our feedback is", we only regarded our score, how can we get higher score, seriously we tought this (CS36, Male, PI).*

Since facilitator also knew that some of NIDs like CS36 do not want to meet every week, especially when they do not have something to share with facilitator, she always used e-mail groups to remind the issues that were mentioned in the meetings. Without a rigid monitoring, students tended to ignore the things that would take their time. Also those feedbacks should have been applicable format, without giving a concrete example students had difficulty to apply the expectations of facilitator.

Another example with no implementation of facilitator feedback was encountered in storyboarding process. Storyboard was a part of design report. First of all, facilitators (researcher) asked students bring their storyboards in two weeks in advance of design report because she knew that storyboarding is a painful stage, there are lots of decisions, and there would be parts which might be ignored by the students. However some groups did not bring in advance and submitted it with design report. And thus they also had very short time to get feedback and apply feedback on their projects and most of places they ignored the suggestions of facilitator on the storyboard. For example in the example storyboard part of *Group 1-8* (Figure 4.1), they allocated very small part for the main content and they allocate more space for unnecessary things.

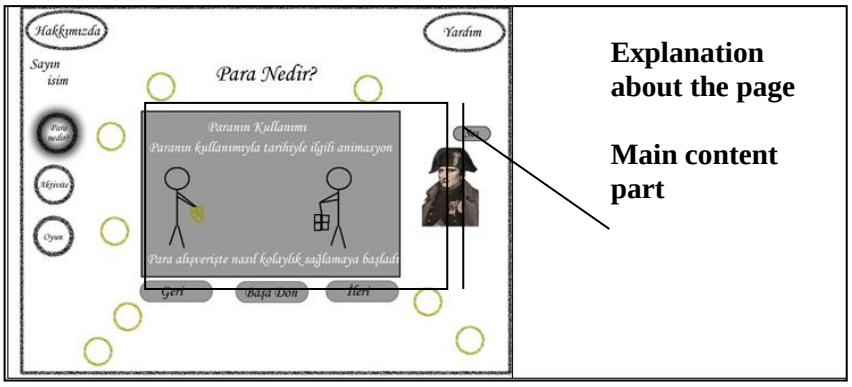



Figure 4.1 A storyboard scene of Group 1-8

Facilitator suggested this group allocate more space for the main content part and delete unnecessary texture. However as shown below Figure 4.2 although they expanded the main content part a bit and improve their design with attractive things, it was not enough as much facilitator suggested and still there were unnecessary, disruptive texture.

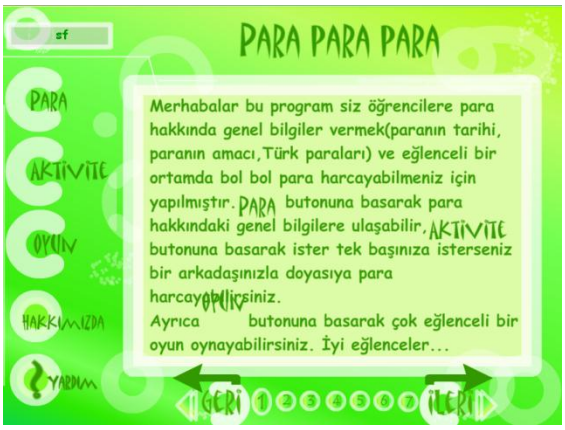



Figure 4.2 Final version of the project of Group 1-8

Although Group 1-8's design has very attractive graphics and colors, they could not use the screen effectively. This was caused not only because of ignoring the facilitator feedback but also not taking the feedback of target group teacher. In this case the facilitator might have more insisted to make them use the screen effectively. However from the development of the storyboard to the project students did not bring their projects to show the progress. Again the time limitation influenced the end products.

**Solving Group Problems**

Each facilitator had different styles and different approach to the students. And in some cases students had problems with the facilitators or facilitators had some trouble to manage some students to make them work with their groups. One of the facilitators' roles is to orchestrating the groups and monitor whether all group members work fairly. In case a member does not contribute enough, facilitator dealt with individually with those students. And facilitators were free to give bonus grades for the students who spent more effort than other group members. On the other hand, in some cases it was very difficult to understand which member contributes how much for the project. First of all, most of time group members looked like everything was smooth with the project because they did not want to spoil their personal relationships with their friends. And secondly, sometimes teams just ignore the members causing problems and continue without that person even they were fine with working without that member and they did not state any problem about that person. In some groups wanted facilitator to understand the problems in the team and manage the problems. Thus facilitators had to carefully observe the project teams to see the problems by asking different questions. The issues related team work problem and facilitator intervention is shown in Table 4.14.

Table 4.14 Team problems and facilitator notice

| | Team Problems | Stated by the students | Facilitator notice | Stated in Peer evaluation |
|---|---|---|---|---|
| **First Project** | | | | |
| Group 1-7 | No problems | NA | NA | No |
| Group 1-8 | Personal problems between members, one person had much responsibility, One member was dominant | Yes | Yes | No |
| Group 1-9 | A member with his own academic problems | Only one time stated | Yes | No |
| Group 1-10 | One person had much responsibility, A member with his own academic problems, lack of coordination among group members | No | Yes | No |
| Group 1-11 | Personal problems between members, One member did not respect others | Yes | Yes | Yes |
| **Second Projects** | | | | |
| Group 2-10 | No problems | NA | NA | NA |
| Group 2-11 | No problems | NA | NA | NA |
| Group 2-12 | One member did not much contribute | No | Yes | NA |

Peer evaluations might be considered as a way of taking NIDs real toughts about their team members; however NIDs did not tend to report the problems honestly. For example in the Group 1-8, CS28 was not pleasant with the other two male team members. However, she gave 5 and 4 points to those members. In another team, although a CS36 caused many trouble for the Group 1-10, other two girl members gave 5 and 4 points to him. Only, CS40 from Group 1-11 gave lower scores for other two male members respectively 2.5 and 3.75, and even these are not much low when comparing her complains about them. Thus, facilitator's role in providing fair division of labor and grading become much more importan.

In the second project peer evaluation was not applied since most of students tended not to rate their friends with their actual attitudes. Even in the random groups, although there were apparent problems in the groups and they were encouraged to state the problems they did not state anything in their peer evaluations and most of them gave full point for their friends.

**Dealing with Plagiarism**

Plagiarism was one of the problems in the context. However it was very common in previous years. In this context students were encouraged to create their original content, pictures and animations even they were very simple. In previous years plagiarism on reports was very much however in current semester thanks to plagiarism detection tool, students did not copied others' work however, they tended to write something that they never performed. In that case facilitator had to recognize that issue and go over it, which is not an easy process. As mentioned before, in labs also conversion of available homework was also a common issue. After converting executable file of lab homework students change some parts of the scripts and send them to the facilitators. Facilitators could solve it just by canceling some of the homework. The issues that facilitator dealt with and reasons are listed in Table 4.15.

Table 4.15 Problems that facilitators dealt with and the reasons

| Problems that facilitators dealt with | Reasons |
|---|---|
| Academic issues | Lack of familiarity with a course requiring weekly regular work, lack of reporting skills, lack of understanding what instructional design means |
| Plagiarism | Lack of time, postponing the responsibilities, desire to use attractive visual components, lack of understanding of some deliverables, concern of grade, |
| Inconsistency between instructional design stages | Lack of examples, taking the project just as a course, focus on deliverables, |
| Lack of application of feedback | Lack of time, forgetting to apply the feedback, lack of monitoring of facilitator, |
| Group problems | Random grouping, lack of observation, lack of communication, difficulty to understanding problems without they state |

#### 4.1.3.8 Instructor

Instructor's role was to providing students theoretical framework of their processes. In two hours lecture time, the instructor presented the importance of the instructional design steps and how to conduct them. Also he provided some examinations to help students practice their learning. On the other hand since the attendance has not been taken many of the students did not participate in the classes. Also students expected instructor present about project development software although it was being given at lab sessions.

#### 4.1.3.9 The Patterns of Social Interactions

Communication was held between instructor, facilitators, project groups, individual students and target group. Face to face interaction was most frequent way of communication.

Students were between the facilitators and the target groups. In some cases the initial contact was sat up by facilitators. Normally, students get ideas from facilitator about target group, contact target group, share their decisions with facilitator, develop their prototypes and turn their projects to target group to take their opinions. This relationship can be showed like Figure 4.3 below.

As seen in Figure 4.3 after development of prototype a loop of communication starts until the summative evaluation time and at the end students submit their end products. In this graphic it should be reminded that instructor himself was also a facilitator. So he had two labors. As an instructor he provided theoretical knowledge and provided several activities to make sure that students understand the instructional design steps. As facilitator, with other facilitators the main roles was to guiding students about finding resources, contacting target group, application of expectations of target group and providing formative evaluation. Except instructors facilitators were also conducting labs to teach project development platforms. Thus they also communicate with students in a different channel. To get technical skills for their projects they set up a relationship with the facilitators. The students' lab assistants were not always their facilitators at the same time. On the other hand, students also contact with their facilitators to solve their technical problems.

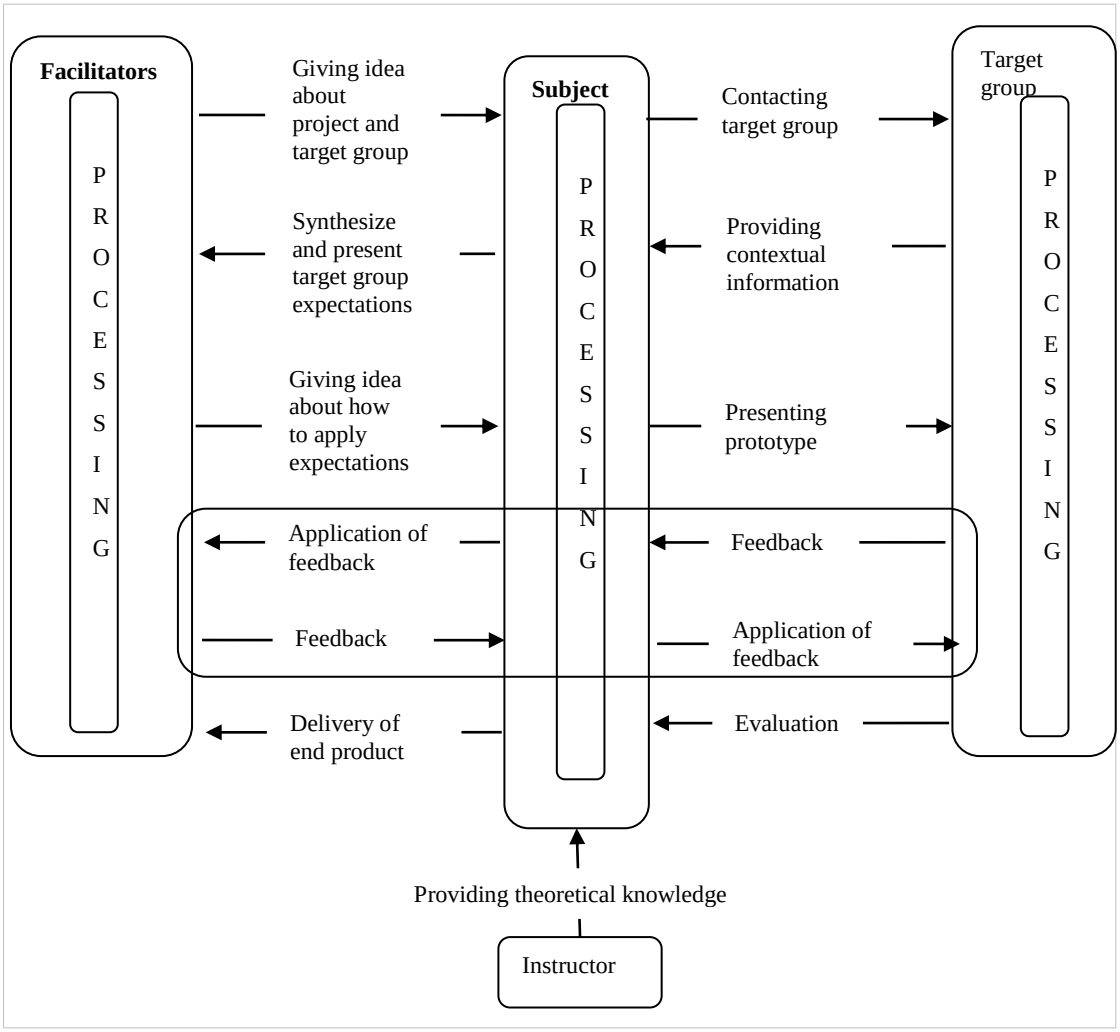



Figure 4.3 Flow of communication among community members

In dual communication of students-facilitator and students-target groups there were differences. For example Group 1-7 were very good at communicating with the facilitator, they met with her apart from their regular weekly meetings. On the other hand Group 1-10 only appeared on weekly meetings. Only CS36 of Group 1-10 communicates with facilitator via e-mail to ask some technical problems of their project. In Group 1-11, only CS40 was the student who communicated with facilitator more than other members, but most of time she came with a personal problem with her group. For the first project, students' communication with facilitator was more frequent than the mid-part of the project and towards the end of the project the communication again increased because of group problems and the issues of the project that students could not solve. For students- target group communication also there was a different pattern. As mentioned before some groups continuously communicate and get feedback from target group, while some of them only contact with them at the beginning

and end of the project. Also there were groups of which target groups who contacted were different at the beginning and end of the project.

For second project all groups followed similar communication patterns however in this phase their communication with facilitator reduced. No groups came with group problems and all communications were related to the project. Those groups used online communication tools more effectively than the first project groups. They shared all resources, reports and project files online.

Shortly students mainly communicated to facilitators to ask her feedback, to ask about the feedback and their scores, about deadlines, to inform their progresses. Facilitator contacted with them to remind deadlines, to remind the expected work, to let them know about the grades, to provide resources for their projects, to provide feedback for their work and to ask the problems that she observed. Except regular meeting times facilitator and students come together if students ask help. Especially before the submission of products, students brought their draft projects and they asked if there was any trouble with it. As happened in *Group 1-11*, towards the end of the project a student also brought the group problem and asked help from facilitator. In the second project the communication was very intense at the beginning but when the final term started their communication reduced considerably.

Facilitator contacted with target group teacher for just one group project. She only contacted at the beginning of the project and after a face to face meeting with both the *Group 1-8* and the target group teacher, she had no considerable communication. At the end of the project he thanked the facilitator and instructor for the project. Students' communication with target group was based on getting information about their context and about learners. They only [if they could] contacted with target learners in evaluation phase to show their products and get their feedback. It can be shortly said that students tended to communicate facilitators and target groups especially to ask their questions.

In the first project and the second project, students formed different groups, worked with different facilitators, different group members and target groups. Therefore, there was effect of previous facilitators and target group on the work of new groups. Different grading styles and communication styles of facilitators influenced the second projects. As mentioned before, *CS40* worked with different facilitator in the second project. In their first project the facilitator suggested very specific things to be applied on the projects. On the other hand their second facilitator tended to make them think on the project more and asked them "*find more interesting idea"* and then *CS40* came to researcher and asked her about a specific

topic to be made. The first facilitators were dealing with many problems and then groups get used to the course requirements. For example, another student who worked with F2 at the beginning and then F1, stated;

> *F1 şu anki facilitatorumuz, F1 hani o kadar şey sorun görmedi raporumuzda, F2 mesela çok uğraşıyordu bizle,' şurası olmamış burası olmamış' o zaman biz de bilmiyorduk tabi [rapor yazmayı] ondan olabilir (CS15, Female, PI)*

> *F1 is our current facilitator, F1 did not see many problems on our reports, F2 for example was dealing with our reports much, he had said 'this part is not ok, that part is not ok' , that time we did not know [writing report], may be because of that (CS15, Female, PI)*

In the second projects like CS15's group many group did not have much trouble with writing reports or finding target groups and communication with them. Therefore, it can be argued that the first project community had very positive effect on the second projects.

In community also there were some problems in communication with facilitators especially when the two sides understood and expected the things differently. Expectation of facilitator was one of the important reasons that cause facilitator- student contradiction. Although facilitators were expected to explain each confused points, sometimes students ignore the importance of some pieces of the template or since they ignored the facilitator suggestions they might made mistakes on the report. One of the male students explained this situation as;

> *Facilitatorun beklentileri çok farklı, siz orda yetmiş kelime bekliyorsunuz, ama orda bizim anladığımız belki otuz kelime, o yetmiş kelimeden dolayı not kaybediyoruz (CS9, Male, PI)*

> *The expectation of the facilitator is so different, you are [facilitator] expecting seventy words there [on report] but we are assuming that it requires thirty words, we are missing points because of that seventy words (CS9, Male, PI)*

Researcher herself also had a lot of debates with the students since her evaluations. In several cases she revised her evaluation due to students' objections. In group problems facilitator had a crucial role, facilitators had to see the problems and take some cautions for the students who do not contribute the projects. When the facilitator does not solve the problems the groups work, students substantially solved their problems by themselves. Since students hesitated to state their problems they expected facilitator notice all problems in the groups. Thus some communication problems aroused. In one case for example, one of the facilitator observed that one student did not work as much as her group members. For example CS40 told about her friend's (CS37) experience with her second facilitator by saying;

*Facilitatorların öğrencileri iyi gözlemlemesi ve iyi iletişim kurması gerekiyor. Arkadaşımın deneyiminden onu çıkardım. Bir sözü, 'sen hiç bir şey yapmıyorsun' gibi, bunu söylemeden önce bir konuşmak gerekiyor, bu şekilde o arkadaşın da motivasyonu azalıyor (CS40, Female, PI)*

*Facilitators need to observe and communicate with students well, I deducted this from my friend's (CS37) experience, one statement like 'you do nothing', to talk is needed before saying this, in this manner my friend's motivation reduce (CS40, Female, PI)*

In group communication was also influenced from spatial distance as mentioned in group problems. This project required meeting with group several times to take decisions on the project, but in that case students who are living in the campus and living outside the campus had some problem to make team meetings. Students saw being spatially closeness as an advantage, for example a male student states;

*Random gruplarda şöyle bir sıkıntı oluyor, birisi evde oluyor birisi yurtta oluyor ortak bir zaman bulamıyorlar, ama dört kişilik grup kendi seçtiği zaman aslında onlar her zaman birlikte oluyorlar, istediği zaman hadi böyle yapalım diyebilecek havadalar yani(CS9, Male, PI)*

*Such a problem happens in random group, one of the member is living in a house and one of is living at dorm, they could not find a common time, but that four-person group is formed by the students, they would be always together, they are in mode of 'let's do it like that', whenever they want (CS9, Male, PI).*

In some cases students had difficulty to meet a negotiated place, one of the students who had difficulty to work with a female friend expressed;

*Diyorum hadi laba gideceğiz zaten bir tanesi eve gelmiyor hiç [evime], yani en azından anlaşabileceğim biri olsa daha iyi olurdu, en azından eve çağırdığımda, gel beraber çalışalım dediğimde gelebilecek biri olsa daha iyi olurdu (CS30, Male, PI).*

*I was saying lets go to the lab, one of them never comes to the house [his house] already, it would be better at least if there would be someone who I could get along, it would be better at least if there would be someone who could come to the house when I call them, when I say come and work together (CS30, Male, PI).*

As a conclusion, students like very convenient communication with community. They would like to be close to their group members, they expected facilitators observe and handle the group problems and they preferred to communicate with target group when they really have to do it.

## 4.2 Analysis of the Mediating Components

Tools, rules and division of labor are the mediators of the system. All these components, has a function to provide interaction between subject-community, community – object, subject and object. Details of the mediating components are given below parts.

### 4.2.1 The tools

Tools are the tangible or intangible things that contribute or affect the projects. Apart from materials and processes researcher added communications that contribute the project. The tools in the context were project topic, textbooks, reports, books to understand learner, the first project (for the second project), internet search for the content, old reports, literature to understand learner, theoretical part of the course, target students' challenges, context analysis, video project equipment, context analysis, interview with experts, internet search to learn software, development tools, instructional and motivational approaches that NIDs use in their project. NIDs also used their previous experiences with projects, searching activities, evaluation of the project, meeting notes with target groups, facilitator feedbacks, and literature and lecture part of the course while organizing the processes which were made for the project. Among these issues technical issues related using software was most important problems.

#### 4.2.1.1 Tangible tools

Tangible tools can be listed as report templates, sample works and projects, lab homeworks, development software and hardware, course web site, other online resources and online communication tools. This list might be extended however here more important ones will be mentioned.

**Report Templates**

Report templates have been used for about 5 years and each template included the ADDIE model steps and operations in each steps. The analysis report template was including executive summary, existing knowledge, goals of the instruction, needs, context, learner and content analysis, selection of instructional approach, timeline of the project. In design report template there were executive summary, description of the project, description of the setting that the project will be used, motivation, feedback and assessment components, task analysis of the project, instructional approach and content development, visual design sketch, storyboard, maintenance and distribution requirements. And for the final report, in addition to analysis and design reports, an evaluation part was added. For evaluation part students

reported methods used to evaluate their design, findings and revisions according to the findings.

Templates were helpful for students to structure their findings and taking feedback of the facilitator. Also since reports were very important deliverables of instructional design they were major contributor of the projects. They were also expected to show the students the required operations that they had to perform. On the other hand, some students stated that reporting was most painful part of the course. NIDs found the templates are very repetitive and they felt that they were writing same things in each time.

**Sample Works**

Students were provided old projects and also after guest speakers' seminar some students examined the project that his company developed. At the beginning of the semester students were also given a multimedia project for evaluation. It was very interactive project which constitute a good example for the students. Apart from multimedia samples many students wanted to see the samples of the reports although an extensive explanation given by facilitators. A student stated;

> *[instructional] approach kısmında işte şeyle karşılaştım [zorlukla], çünkü uygulamasını görmediğim için sadece kitaptan okuyarak onu bir yere uygulamak zor oldu … [feedback] aldık ama hani bunu böyle yapın demek kafada çok soru işareti bırakıyor, elimde bir örnek olsa bunlar bunu böyle yapmış diyebilsem kendime güveneceğim (CS1, Male, PI)*

> *I had difficulty in writing [instructional] approach, since I did not see any application of it, it was difficult to apply it with only reading from the book, we get [feedback] but saying only 'do this like that' remains question mark in the mind, if I have an example in my hand, if could say 'OK they did like this' I would feel confident (CS1, Male, PI)*

Therefore, sample works were very important for the students. In fact no students took notes in weekly meetings and even facilitator gave broad information about deliverables most if time they forgot about the expectations. Another female student expressed her expectation as "*I would like to look at a sample of what I will be doing and start to work on my work*" (CS28, Female, PI).

The concrete samples were more effective to explain expectations. On the other hand in that case there was a risk of copying the ideas from the samples as experienced in previous years.

**Lab Homework**

There were 6 lab sessions; each facilitator took between 12-15 students. For five lab topic homework was given and students had to submit them in one week. The first homework started with drawing a still picture to improve students' drawing skills. The students were

encouraged to draw their own characters and backgrounds. In the second and third homework the way of development of different kind of animations were showed. In the fourth homework students had to use scripts since it was including user interactivity. It was a bit complex for the students and almost all students converted the executed file to raw file and submit almost same project with only small changes. Therefore, those students who made plagiarism were graded with zero point. In the fifth homework there was some advance use of files, calling learning objects, sounds and videos. Apart from homework there were two quizzes, and quizzed were derived from the homework to see whether students comfortably did them second time.

In perspective of students, lab content was a bit difficult but helpful to learn about the development tool. They expected lab homework was parallel with their projects. Since lab homework did not match directly their projects, most students saw the homework as a burden.

> *Laboratuar ödevlerinden en azından [projede] yapabileceklerimize en azından bir öncülük etmesini beklerdim, yani tabi ödevlerin bizden tam olarak ne beklediğini kavrayamadım, Laboratuarda aldığımız bilgiler üzerinden ödevlerle kendimizi geliştirmemiz mi bekleniyordu? (CS10, Male, PI)*

> *I expect the lab homework at least lead us about the thing that we can do in our projects, actually I did not understand what we were supposed to do. … Was it expected we improve ourselves via the knowledge that we get from lab homework. (CS10, Male, PI)*

said one of the student. Like CS10 many students stated that they expected lab homework such that they develop a part of their projects. However via the lab homework students were expected to transfer their learning from lab sessions. In lab sessions the time was very limited with many questions of the students very limited content was shown. The homework were developed by thinking that students would make search and trial and errors and learn much about different properties of the tool. On the other hand the complexity of homework did not encourage many students to do the homework by themselves. They could find many easier ways and plagiarism to understand the logic of the homework. Thus many of them did not learn much about the tool although they came to the course by expecting to learn much about programming in Macromedia Flash. Many of the students could not manage the complexity of lab homework and they found easier way to make them without learning about it. And then many students argued that they did not learn at labs much. This issue could be interpreted that students were expecting that all expected outcomes of labs was given at lab hours or lecture times, not via doing homework.

**Macromedia Flash Software**

For the first project Macromedia Flash Software was used. Macromedia Flash is a graphic design and animation program. It has two important properties for the course. Firstly graphical interface can be developed. And secondly via scripting interactive interfaces can be developed. The students were not challenged with graphic design but they had big challenge to use scripts although they get C++ courses in previous years. Today many leading companies use Flash and develop Flash based applications. Thus it was also very popular among students since learning about it make easier to get a job from a software company which are especially e-learning developers.

**Video Editing Software**

Students were free to choose software for video editing. They were taught Pinnacle ® software which has very simple interface and enough features for the course projects. Very few of the students used more advanced ones and some of them used another simple video editing program, Windows Movie Maker ®. No student stated any difficulty about using video editing tools. It does not require any advance knowledge or scripting.

**Video Recording Equipment**

Video recording equipment was provided by instructor for the second project. The equipment was composed of a video camera without a DV cassette, a tripod and firewire cable to transfer video records to the computer. To borrow there equipment students had make an appointment and they signed a contract to turn them in time without any problem.

**Course Web Site**

All course materials were provided on course web site. The resources that students could find were report, storyboard and contract templates, rubrics, course syllabus, grading policy, lab homework, lab handouts, some tutorials about concept and procedure learning, presentation files of lectures, announcements, the projects of previous years' students, APA style guidelines, rules of the lab and the course and contact information of instructor and facilitators. Students were encourages to visit the web site frequently. On the other hand very few of them visit there and check the previous projects, resources and the announcements. Each week researcher had to remind her students that a resource or an announcement was added to the course web site.

**Communication Tools**

Also there was a course e-mail list and announcements and news were posted to the list as well. Except instructors and facilitators no students posted anything to the mail list however

they used the e-mail groups which were formed for facilitator-group communication. As seen in Table 4.16 facilitator has considerable number of e-mails in the group e-mail lists in the frist project. The researchers send many remind messages and feedbacks about the processes in the first project.

Table 4.16 First project groups and number of e-mails

| Group number | Student e-mails | Facilitator e-mail | Group mails total |
|---|---|---|---|
| Group 1-7 | 41 | 21 | 62 |
| Group 1-8 | 5 | 16 | 21 |
| Group 1-9 | 13 | 10 | 23 |
| Group 1-10 | 32 | 20 | 52 |
| Group 1-11 | 34 | 16 | 50 |
| Average | 25.0 | 16.6 | 41.6 |

In the second project, students used Google groups, they also worked on shared files thus researcher also traced their process instantly. As seen in Table 4.17, students used e-mail communication more than previous project groups. More project and process related e-mails were sent in the second groups. They asked fewer questions about report templates and deadlines.

Table 4.17 Second project groups and number of e-mails

| Group number | Student e-mails | Facilitator e-mail | Group mails total |
|---|---|---|---|
| Group 2-10 | 29 | 8 | 37 |
| Group 2-11 | 34 | 7 | 41 |
| Group 2-12 | 24 | 11 | 35 |
| Average | 29.0 | 8.7 | 37.7 |

Although students like to get feedback via e-mails, they did not pay much attention to reminds of the facilitator. Even in that case the resource which was uploaded by facilitator was not paid attention if it is only a resource. For example in the second project groups she added rubrics to evaluate the reports and evaluation criteria for final presentations. But when she asked her students they stated they did not check them although facilitator also sent an e-mail to inform about these resources. Students also used instant messaging much for in group

communication. Especially *Group 1-7* used instant messaging tools effectively. They made many of the division of labor and combining the deliverables via instant messaging.

#### 4.2.1.2 Intangible tools

The most important intangible tools of the activity were the project topic, feedback of community and facilitator, class lectures, framework of ID process, instructional and motivational strategies.Details will be presented in further parts.

**Project topic**

Project topics were the tools which make students guide to find resources and the tasks to be given. . In the first project, students had difficulty to decide their topic since they had to find a convenient target group to select a topic. To select a project topic, firstly they had to contact with a target group. In accordance with the needs of target group, they tried to select a topic that is more suitable for multimedia learning. No project groups selected any social science topic. The observations showed that most of the groups selected a topic which is suitable to develop in a multimedia, allow interactive animations and find interesting animations on Internet. Therefore, almost all groups selected a topic from science especially physics and biology.

**Feedback of Community**

Feedback of community members was a resource for the reports and designs. The feedback resources were mainly target group teacher, target students, subject matter experts and facilitators. On the progresses and outcomes of the activity, the feedback of community and the extent the groups' application of those feedbacks played an important role. Also feedbacks clarified the issues that students challenged. One of the students who worked in a project related environment stated this issue by saying;

> *Eğitim fakültesinden bir asistan ismini unuttum, [F2] gidin filan dedi, ... baştan yararı olmayacağını düşündüm, ... ama biz oraya gittik çok yardımcı oldu, hemen hemen kafamızda netleştirmemize çok yardımcı oldu (CS15, Female, PI)*

> *I forgot her name but she was at Faculty of education, [F2] asked us to went and talked to her, at the beginning I thought there would not be helpful, but when we went there she helped much, she helped us almost completely clarify in our minds (CS15, Female, PI)*

Another student told about their experience with target group teacher. The *Group 1-7* worked with target group teacher effectively on the other hand after they developed a piece of the project the target group teacher changed many things and this caused some more

workload for the students and thus some part of their storyboard did not match with the project.

**Class Lectures**

The role of the class lectures was giving the theoretical information about importance of instructional design, ADDIE model phases, storyboarding, screen design issues and videography. Lecture part lasted 7 weeks. The main instructional strategy was presentation. The instructor used PowerPoint slides to present topic. There were two paper based activities were also applied as quiz, however this quizzes were not added total grades since the attendance was not taken by instructor. Because of attendance issue, many of students did not participated in class as well. There was no effective class discussions since students did not participated in it much. One of the class lectures was allocated to guest speaker's speech.

All class lectures was uploaded to course web site. These caused students believe that they could learn lecture part by reading those resources. A student stated;

> *teorik kısmın o kadar da bize faydası olduğunu düşünmüyorum açıkçası, ... öğretim tasarımının bazı metodlarını bize tabi anlattı [öğretim elemanı] tabi ki anlatması gerekiyor ama ben yine kendim oturup okuyup öğrendim yani, bizim teorik derslerimiz olmasaydı, bir eksiklik olmazdı(CS11, Female, PI)*

> *Honestly I do not think that the theoretical part [of the course] was beneficial for us ...Certainly [the instructor] told about the methods in instructional design, which he had to do, but still I learnt by my own by reading, I mean, if there would not be our theoretical class, there would not be a difference (CS11, Female, PI)*

With this perspective, it can be said that many students believed that the information which helped them to write reports and develop the project was enough. In the theoretical part the logic of the operations which was performed in instructional design was not so important since they did not use that information. Moreover, models, theories or standardized methods which guide the activity were already given by means of facilitators and the templates of the reports. Therefore, NIDs' main concern was to conduct the processes as it was expected by instructors and facilitators. Thus, majority of the NIDs did not participated in class lectures.

Content of the class lecture was similar to previous courses as stated a student who compared previous instructional design course experience with the current course. He stated;

> *Teori kısmında çok benzerlik var diyebilirim yani açıkçası çok fark göremedim, ders kısmında ... yani lab konusu kesinlikle farklıydı ama ders içerikleri olaraktan yani kendi adıma konuşayım, fark fazla göremedim, (CS13, Male, PI)*

> *I can say that there is much similarity with theoretical part, honestly I did not see any differentce in the lecture part .. the lab is certainly different but in terms of the content*

*of the lectures, if I speak on behalf of me, I did not see much difference (CS13, Male, PI)*

This perspective might also cause NIDs to not interest in the lecture times. In fact the NIDs had learnt about theoretical background of ADDIE, and this might made them saw the lecture time unnecessary despite of many ID activities and the different content in the video production part.

**ADDIE Framework**

ADDIE framework which is also called ADDIE model (Bichelmeyer, 2004; Dick, Carey, Carey; 2005; Smith and Ragan, 2005) stands for Analysis, Design, Development, Implementation and Evaluation. Each week, one phase of ADDIE framework was presented in lecture times. The reports were also shaped by the activities in each phase. In the context the time was limited so students needed a linear process to finish their products in time. Therefore, ADDIE framework was the most feasible one for the NIDs. On the other hand due to some holidays and other commitments of the students the major time was spent in analysis and design phases. Also since students had to learn about development tools they had very short time to develop, implement and evaluate their products in about two weeks. Therefore, it was highly suggested to develop only one project in a semester.

Many of the students stated they first time experienced an instructional design process. In other courses they did not conduct the analysis and design phases. That was why there was a need of clarification of the need for these phases. For example a student called the stages of ADDIE as reporting phases by saying;

*Bu rapor kısımlarında da bir şey nasıl analiz edilir nasıl dizayn edilir, bir şey üretirken aşamaları nelerdir en başta bunu öğrendim (CS40, Female, PI)*

*In the reporting part I learnt how something is analyzed, how it is designed, what were the phases while devleoping something (CS40, Female, PI)*

For the students reporting was very effortful and difficult process. Since there were strict templates for the reports, they saw processes as the requirement of the report not the requirement of instructional design. On the other hand there were also students who realized the importance and the roles in unique phases of the design. When they were asked about what they did in the different phases of instructional design they could answer like the student who says,

*bir proje oluşturacaksak en başta yapmamız gereken analizleri öğrendik, hedef kitlemiz neydi, öğrenci analizimizde onlar için neler gerekirdi [yi düşündük], needs analizi neden yaptığımızı öğrendik ... Psikolojik olsun, işte bilgi deneyimi olsun learner*

*[öğrenci] analizi yaptık. Bu analizlerde aslında dediğim gibi neden yaptığımızı ayrıca nasıl daha iyi yapabiliriz mantığını da taşıyoruz (CS9, Male, PI)*

*We learnt about the thing that we need to do if we create a project, what were out target group,in our learner analysis [we considered] what they would need, we learn why we did needs analysis. We made learner analysis by considering pscychology, their pre-knowledge. In these analyses, as I said, we are carrying the idea of why we do these and how we can make it better (CS9, Male, PI).*

As seen when the students were asked about the experience of individual phases of the design they could answer it easily. But when they were asked about the general outcomes of the course very few of them mentioned that they practiced an instructional design model. Without making students aware of that all the processes are the parts of a whole, their project management skills cannot be improved.

**Reigeluth's Concept Teaching Strategy**

Students had to use an instructional approach in their learning module. In concept project students had to use Reigeluth (1997)'s concept classification definitions as a basis of the strategies that they use in their learning module. The resources about this classification were provided on course web site. In this classification there were general principles, routine tactics and enrichment tactics. As a general principle, students had to provide prototype examples, discrimination of concepts and generalization. Students also considered routine tactics like presentation, practice and feedback. In presentation also they used generalization and examples as suggested by Reigeluth. Reigeluth also provides some examples to enrich each routine tactics. For example for the generalization focusing the learner attention and variety of representations, for the examples increased number of examples, easy to difficult sequence and variety of representations, for the practice easy to difficult sequence and prompting and for the feedback praise and encouragement, attention focusing and variety of representations. The manuscript given to students was expected to be helpful to think on the strategies that they use in their projects. The students especially paid attention to feedback, practice and example issues in their design. On the other hand in reporting they mostly challenged in the instructional approach. The thing that challenged was that they tried to mention almost all principles, routine and enrichment tactics and match them to a part of their design. A student states this problem by saying,

*Approack kısmında gerçekten zorluk çekiyoruz, yazılı olan bir şeyi oluşturacağımız materyale empoze etmek çok zorladı bizi açıkçası. Empoze ettiğimizden de şüpheliyim ama, yani o kısmı özellikle çok zorladı, hatta raporları bölüşüyorduk diyordum o kısmı bana vermeyin ama raporun kalan kısmını ben yazayım" (CS1, Male, PI)*

*We challenged with that approach part, in fact imposing something written to a design challenged us much, also I am not sure wheter we could impose, I mean that part was*

*very challenging. In fact we were sharing tha parts of the reports, I was saying 'do not give that part to me but I can write all other parts (CS1, Male, PI)*

In the statement of the student, it can be understood that they had difficulty to apply a theoretical knowledge into design. In the first groups researcher had to explain each ot principles and tactics and gave examples. Without examples students did not develop their ideas, and most of time they wrote the examples given by the facilitators. Even in the second project although they were experienced to write that part, one of the female students (*CS11*) stated that that she could not write instructional approach since in the first project the nature of the project was different and she could not apply those examples to the new project. On the other hand like the other parts of the reports, students improved writing in that part as well. Also there was a vice versa approach, after developing the project it was much easier for the students talking and giving example about the instructional strategies that they used in the project. But they challenged to use theoretical knowledge to develop ideas about their project. Therefore, students mostly needed help in design part since it was the time to convert theoretical background to the practice. One of the facilitators also spoke out this issue by saying;

*İnstructional approachı uygulayamıyorlar [öğrenciler için] problemli bir bölüm tamam örnek bir tane, çünkü bir kaç tane verdiğin anda instructional approachı orda uygulamış oluyorsunuz o da sıkıntı oluyor. Bakıyorsunuz ki öğrenciler, cidden o bir taneyi aldıktan sonra geliştiriyorsa tamam, ama baktın yapmıyorlarsa, benim söylediğim şeyleri aynen yazıyor başka bir gelişme yoksa artık yani onlara bir şey vermenin anlamı yok (F2, Male, PI).*

*They could not apply instructional approach, it is aproblematic part [fort he students] ok, there ıs one exampleö because when we gıve several examplesö you happened to apply the instrucitonal approach there and this cause trouble. When you look students, if they improve that one example it is ok, but if they do not do that and if they direclty write there what I said without any improvement, there is no sense to give them then (F2, Male, PI).*

As interpreted the facilitator's statement, students need an intensive guidance for transferring theoretical knowledge to the practice.

**Carroll's Minimalist Teaching Model**

In the second project students were free to choose the strategies derived from Reigeluth's classification or Carroll's minimalist teaching model. According to this model designers should provide student activeness, produce authentic tasks to teach procedures, recognize, prevent and recover student errors, and provide enough assistance before students work on the procedure (Carroll, 1992). In fact Carroll's approach was more suitable for hands on procedure teaching. Since the students only developed a material to teach procedure, they did not have chance to apply the Carroll's criteria completely. Only one of the second project

groups of the researcher selected Carroll's approach as their project's instructional approach. However they could only assume that they provided the criteria, because they did not implement their procedure teaching in a real setting but they could only show the project to the target group. For example in their analysis report Group 2-10 wrote;

> *Firstly, to be able to make students more active, we will want the students to make some notes about the game by using our manual while watching our video. Furthermore, students will answers some questions on manual that provides students with being willing to play game and having meaningful understanding about the game (Group 2-10, Analysis report)*

With the activeness in fact students were expected to be active while learning about the procedure this means they should practice the playing the game. However since the video material was the teaching environment itself, the activeness remained being cognitively active while learning the procedure. The groups who used Reigeluth's classification also challenged to apply the theory since in the video assessment, giving feedback, creating a scenario to ask a question or give a feedback and practicing was very difficult. For this reason, it can be argued that there was a need for another approach which most suitable for the procedure teaching via multimedia.

**Keller's ARCS Model**

To provide motivation, students were provided Keller's ARCS model's categories listed in Keller (1987). This was the way of making students think more about motivational issues rather than using unnecessary elements in their projects. ARCS model constituted the attention, relevance, confidence and satisfaction. Each category consists of different principles as well. Those principles are perception arousal, inquiry arousal and variability for attention, goal orientation, motive matching, familiary for relevance, learning requirements, success opportunities, personal control for confidence and intrinsic reinforcement, extrinsic rewards and equity for satisfaction. Students did not have any problem to find attentiojn taking strategies. However, they especially challenged to provide examples of relevance and satisfaction. To make students familiar with all those categories and their reqirements a checklist was prepared to make students understand what kind of questions and issues are covered by any category. It was offered on course web site however since students did not tend to check course web site most of them did not check it.

### 4.2.2 Rules

The rules was divided into two groups, the rules of the community which is also rules of the course and the rules of subjects which was determined by the project groups for their work.

The rules of the course were also divided into three parts; rules of meeting with facilitator, general course rules and lab rules.

Generally, there were deadlines for the course, for analysis, design and final reports and the products. However due to students' other exams or national holidays, some extensions provided to students. Especially in the first project there were several postpones and then for the second project the time became much more limited. Another course rule was to work as groups and random group work in the first project. They had to work with a target group as well. To follow students had to create an e-mail list and share it with their facilitators. The general rules that were established by instructor can be listed as below Table 4.18.

Table 4.18 General rules of the course

| |
|---|
| Deadlines |
| Using a specific development tool for the first project |
| Using templates for deliverables |
| Team work |
| Working with a target group |
| Using an e-mail list and update progresses constantly |
| Each week facilitator meeting |
| Two projects in one semester |
| In group each member work on each deliverable fairly |
| Working with different facilitators for each project |
| Free attendance to lecture part |
| Phases of the design |

There were not much strict rules for the lecture times, there was no mandatory attendance, and thus must of students did not participate in many lectures. However facilitator meetings were mandatory as a part of lecture time. Students had to bring what the facilitator asked them to do that week. Weekly meetings were helpful to bring group members together especially those who do not meet by themselves. A student who was transferred from another university stated,

> *Grup görüşmelerinde çok faydasını gördüğüm en azından yeni gelmeme rağmen bazı insanlarla kaynaştırdı beni (CS34, Male, PI)*
>
> *Group meetings were very beneficial for met, at least, although I came to the department late, it made me integrate with different people (CS34, Male, PI)*

He also stated that he surprised with the constructivist structure of the course. In his old department, instructors always provided all available resources for each deliverable. In this

course NIDs had to make searcha and transfer their learning with challenging tasks. Therefore, at the beginning he had to improve himself. Lab attendance was also mandatory and it had strict rules as listed in Table 4.19.

Table 4.19 Lab rules

| |
|---|
| Students cannot change their lab session and the assistant |
| Using specific software |
| Compulsory attendance |
| Every week homework and two quizzes |
| Total score should be 9 at least to pass the course |
| Rule related being late to the lab |

Groups had to specify their group work rules and they stated them on their contracts. The template of the contracts was provided by instructor and students had to specify their work policies, absence policies and penality if the work would not be done. The general pattern of rules of 5 first project and 3 second project groups were listed in Table 4.20.

Table 4.20 The rules specified by project groups

| **Work policy** |
|---|
| Each week meeting and compulsory attendance |
| Task distributions |
| Monitoring the work of the members |
| Obeying deadlines |
| Solving group problems |
| Each member let others know about his work |
| **Absence Policy** |
| Valid reasons to not participate in meetings |
| Emergency situations |
| Letting know others in advance |
| Busy exams |
| **Penalties** |
| No penalty |
| Treating other members |
| Letting facilitator know the situation |
| Monetary charges |
| Asking facilitator to reduce the grade of the member |

In work policy they defined what they will do every week for their project. Absence in a group meeting was also tolerated in some cases and groups specified in what situations they tolerate it under the “absence policy” heading. And lastly the penalties were specified.

Almost all groups add a monetary penalty like "*treating tea or a meal*". Also most of groups stated that they will let facilitator know about the problem and let him/her to give penalty. Some of them specified how much score will be reduced for an incomplete work as well.

#### 4.2.2.1 Problems in Implementation of Rules

Since students were in 5th semester, they had experience of courses which are based on project development, collaborative work and student centered strategies. They were familiar with writing reports and get feedback for their works. On the other hand they did not experience random grouping, regular work on the project, weekly meetings with facilitators, and different content at lecture and lab times, intense work for two projects, working in a real context and qualitative assessment methods. The students were surprised with the situation that there were no mid-term or final exams, which is an exception for undergraduate students of the department.

Strict reports, report templates, group formation related rules, peer evaluations, working with real target group, using a specific software for the first project, weekly meetings with facilitators are the rules that was established by instructors. Groups also established their rules like meeting regularly, everyone has to work equally and doing the tasks on time. Time limitations of the projects caused especially skipping the evaluation part of the projects and writing articulated evaluation parts. Random assignment rule for the first project was one of the main complained issue but some of the students like it. They believe close friends cannot work effectively because they cannot warn each other comfortably and when they meet, they spent too much time with having friendly chat.

Both course rules and the rules that were driven by groups were subjected to change. In practice especially obeying the deadlines was very difficult due to holidays and busy terms of the semester. When most of students asked instructor to postpone the assignments, facilitators and the instructor decided to postpone some of them. There was no change on report templates, or group work policies. They could find a target group as ruled by the course. On the other hand working target group was not proper in most cases because of the limitations of target group. E-mail lists were also had some problems. For example after submission of reports students were expected to upload their papers to e-mail group file systems, but each time facilitator had to remind students to do that.

In the second projects facilitator and group meetings become much more flexible. Since students become confident about the project, they did not want to come to the meetings. After the first week of the second project term, the lectures and lab hours were ended. Thus

students only had to come to the department to meet with facilitator for 20 minutes. Also second project came up to the term projects deadlines and final exams. Therefore, after second week of the second project term, very few members of groups came to the meetings and meetings was not take much time. Students were expected to work on each deliverable fairly, but this was not provided in most of the groups. As mentioned above, each member took a complete deliverable since they thought that they were good at doing those deliverables. All students used report templates but they since the report templates were almost same for two projects, they had difficulty to find required information for the second project, especially in feedback and assessment parts. Same storyboard templates also caused problem for the first project because there was difficult to specify some information like duration of scene. The rules and their application in practice is shown in Table 4.21.

Table 4.21 Problems in application of general rules

| **General rules of the course** | **Problem in application** |
|---|---|
| Random grouping | It was implemented |
| Deadlines | Holidays and other commitments caused postpones |
| Using templates for deliverables | Problems in storyboard templates, same first and second project report templates had problem in the second project |
| Group work | No problem |
| Working with target group | Not effective and proper interaction with target group |
| Using an e-mail list and update progresses constantly | Not all progresses updated on the list |
| Each week facilitator meeting | In second project, most members did not come to meetings |
| Two projects | No problem, but complains about busy schedule |
| In group each member work on each deliverable fairly | Not fair division of labor |
| Working with different facilitators for each project | Because of some obligations some students matched with same facilitator for both projects |

Students worked with different facilitators and they did not have the chance to select their facilitators. On the other hand, in very few cases the same students worked with same facilitators in two projects. The researcher's group no students worked second time with her. Apart from course rules, some lab rules also could not be implemented. First of all, many students changed their lab sections due to other classes. Most of them attended all lab sessions as stated in the rule and most of them sent their homework as well. On the other hand assistants had to omit one of the homework due to many copy and paste or converted homework. Students were expected to collect 9 of 17 points from all homework and quizzes. On the other hand, many students who were actually hard worker could not get 9 points and

several students said that they would withdraw the course since they already failed in the labs. Therefore, to not lose those students, this rule was omitted. Also late coming policy was omitted, since this might have caused some debate between assistants and the students. Summary of rules and the problems in implementation of the rules are listed in Table 4.22.

Table 4.22 Problems in application of lab rules

| **Rules** | **Problem in application** |
|---|---|
| Students cannot change their lab session and the assistant | Due to other courses some student changed the session, during the semester also some students attended another session since they had some commitment in specific times |
| Using specific software | No problem |
| Compulsory attendance | Sometimes students did not attended |
| Every week homework and two quizzes | Due to high rate of plagiarism, one homework omitted |
| Total score should be 9 at least to pass the course | Many hard worker students could not pass 9 points, so this rule was omitted |
| Rule related being late to the lab | To not cause debate, assistants tolerated late comers |

Lastly students' group rules had some problems in application. Actually no groups checked the rules that they specified although they had the problems of which they specified penalty. Most groups especially in the first group did not apply any penalty when they come across a group problem. They did not asked help from facilitator either, except two cases. Also they really hesitate to say facilitator to reduce the point from a specific member since they did not want to have trouble with that friend as *CS31* stated;

> *Direk facilitatora gelirsek beni sen söyledin ispiyonladın gibi, grup içinde çatışmalar çıkardı, biz kendi aramızda çözmeyi seçtik(CS31, Female, PI)*

> *There would be quarrels like 'you snithched me', if we came and said the problems to facilitator, therefore we preferred to solve it in the group(CS31, Female, PI)*

In fact, '*solving in the groups'* meant that tolerating and ignoring problematic members and sharing his/her role with other members who worked well. In their groups they did not stated any problem except a light implication during the meetings. The summary of the rules that was specified by students and problems in application were given in Table 4.23.

Table 4.23 Group rules and problems in application

| Rules | Problems in application |
|---|---|
| **Work policy** | |
| Each week meeting and compulsory attendance<br>Performaing responsibilites | Most of them come together towards the deadlines |
| Deciding task distributions as groups | In some groups tasks were given by leader or they selected their role |
| Monitoring the work of the members | In consistent reports showed that they did not monitor others' work, even if monitored the member might not have revised his/her work |
| Obeying deadlines | Except one group all groups could only finish on the deadline, in first project a group exceed the deadline |
| Solving group problems | They did not deal with problems, they ignored or tried to solve it by quarrel |
| Each member let others know about his work | Not all of them used e-mail list effectively, in face to face meeting they could do this |
| **Absence Policy** | In some groups members did not inform others when they would not come to the meetings |
| **Penalties** | |
| Treating other members | They did not applied it |
| Letting facilitator know the situation | In only two groups they applied |
| Monetary charges | They did not applied it |
| Asking facilitator to reduce the grade of the member | They did not applied it |

Shortly, it was facilitator to check students' rules and apply the rules for them. In fact facilitator had to remind many rules to students. Like using e-mail lists, obeying deadlines, talking to target group, showing all scenes of the projects on storyboard templates, and letting her know about problems in the group. Each week she asked those things to the students.

#### 4.2.2.2 Strugles of Students with Rules

Students did not have any experience on working with different people, following a systematic process of ID and writing report, attending weekly project meetings and developing more than one project in a semester.

**Random Grouping**

In the current state can be assumed as the context where all random groups were assigned. Before that, novice instructional designers did not experience any random group working. As a common issue for the department most of students had favorite team members with who are always form the teams. Therefore, they both have objection at the beginning and they were prejudiced to work with the class members who were not their close friend. After group assignments on the other hand most of groups were fine with their group members. Working

with a real target people was also new for the students. That is why they were anxious about finding a target people and they were not experienced to get rich information from the target group. For example *Group 1-9* found a teacher as target group teacher but they said that they could not get information since the teacher started the talk about their problems of lack of infrastructure and problems of intensive curriculum. They said that they could not get enough information to apply their projects.

**Using Report Templates**

Reports were one of the main assessment tool for groups' work. Students were especially had difficulty in writing the report, in previous years although they wrote reports, they stated that those reports were very superficial. For example, in interview *CS17* who is a male student said "*I realized that in our previous work the reporting had not been as much as important that our current reports, we were writing unconsciously in that time*". That is why students were given chance to send a draft analysis report which was excluded from grading. With that report, students were given feedback about how they were supposed to write the reports. Also students were given rubrics to show grading criteria of each title of the reports. On the other hand since most of the students did not check the web site properly, most of them did not noticed them. Rubrics were also expected to fair grading, however since the quality perception was different for each facilitator, it cannot be said that fair grading was guaranteed. This grading issue was one of the main problem and even one facilitator (*F3*) asked researcher to check a report which *F3* gave very low score because the students objected their score and argued that other facilitators always gave higher scores to their groups. Researcher did not know the score of that report but it got very similar score from the researcher as well.

**Regular Mettings and Work**

In interviews all students stated that regular work and weekly meetings were very helpful and informative. However in practice, groups were not very willing to come each week and say something related their projects. Researcher witnessed several cases which the students come to office and say "*we do not have to ask to you or no progress, so do we have to meet today?".* In the course even if they did not do anything for their projects, facilitators and groups had to meet, so see why they did not progress or whether there was any group problem. This situation might have been from the previous experience since students went and got feedback when they had something to show the instructor.

**Two Projects**

Students were not familiar with developing two projects in a semester and those projects were much for the students. As previously stated students suggested that one project would be enough for one semester and they could mastered the instructional design. In previous courses students developed only one project but as they stated they made the project at the end of the semesters and they did nothing until the end of the semester. To avoid this, the course made students work every week, with quick phases. Most of the students in interview stated that if there would not be two project in this course their semester would be very comfortable. They also stated their main problem was caused because of busy schedule of the course. For example one of the students stated;

> *Verilen süre çok kısıtlıydı, direk ders başladı biz projeye başladık ilk haftadan işte grup belirlendi, kontrat imzalandı işte çok hızlı başladı, çok hızlı gitti, yani bu Flash [bu ders] olmasaydı herhalde bizim çok rahat bir dönem olurdu (CS31, Female, PI).*

> *The given time was very short, we started project as soon as we started the course in the first week, the groups were assigned, contract were signed, it started very quickly, and went on quick, I mean if there was not Flash [this course], probably this semester would be very comfortable (CS31, Female, PI).*

Two projects meant short deadlines for the students and making similar progresses in two times. Therefore, two project rule was the one about which was most complained.

### 4.2.3 Division of Labor

Division of labor is a inseperable part of the community. Roles of the facilitator and problems that facilitators encountered while performing these roles were listed under "community" section. Besides, role of target group, instructor and other community members were summarized in the same section. In this part mainly roles defined by the team members are given.

#### 4.2.3.1 Division of Labor in Project Groups

Division of labor can be defined as the roles in the community. In the community there are some fixed roles, the roles assigned by others, and the roles changing over time. Students had role of test developer, content developer, game developer, coder, programmer, visual designer, leader, data provider, guide, reporter, evaluator, manager roles during the project. Instructors had role of facilitating and supporting. They support students in terms of pedagogical and technical issues and solving the problems of the groups. Target group teachers also were the subject matter experts and evaluators of the projects. Guest speakers had a motivator role since they encourage students to develop good quality projects to get a job while are students.

Some students characterized themselves as coder, reporter or graphic designer. The students who like coding, most of times tended to exclude themselves writing the reports and or the students who do not like coding preferred to work on reporting only.

In line with gender, previous knowledge, technical skills and preferences of the students, the roles changed within the groups during the semester. The roles of the students as an individual meeting the requirements of the course, like submitting lab homework, taking class quizzes and working with their groups properly. In the groups there were several roles of the group members. The roles of the group members specified in the contracts were;

**Leading**

In the contracts, leader of the groups were mainly responsible to arrange the meetings, divide the tasks, determining the meeting times. Also they were responsible to combine the reports, projects, checking whether tasks were accomplished as expected, reminding the members their tasks and implementing the penalties. Although those tasks were specified, group leaders did not or could not apply all their responsibilities. Especially since the leaders were most of time girls, they could not provide authority much. For the second project on the other hand one group was only formed by the males and in another one although there were two girls the male member was selected as a leader. Groups selected girls as leaders since, they were believed as more organized, consistent and determined. In the *Group 1-10* of first project for example, CS36 did not want to be leaders by saying;

> *CS35 lider olmalı bence, çünkü sınıftaki kızlar çok tutarlı ve işlerine daha sahip çıkıyorlar, ben o kadar düzenli değilim, çalışmayı seviyorum ama düzenli olmuyor, bir de sen bunu yap sen şunu yap diye direktif verme huyum da yok (Group 1-10, Week 1)*

> *CS35 should be the leader, because in this class girls are so consistent, take care of their jobs. I am not so tidy, I like working but not so coordinated. Also I do not like to say "you do this, and you to that", I do not have habit of directing people (Group 1-10, Week 1)*

The role of the leader was most of time assumed as determining group meeting dates, and distributing the responsibilities, monitoring the work of the members and combining the works as defined in the contracts of the groups. These roles seemed as burden for most of males. One of the male students who saw leadership as dealing with group members stated;

> *aslında lider olabileceğimi biliyordum ama bir şekilde liderliği baksa arkadaşıma verdim, sebebi de grupta tanımadığım iki erkek vardı, hani grupta toplanma var, bu durumda sorumsuzluklar olduğunda, onlarla yüz göz olmaktansa başka bir şey alayım aradan kaçayım dedim, yani erkekler, daha kötüye gidiyor sonuna doğru (CS17, Male, PI)*

> *I know that I could be a leader but in some way I passed leadership to another friend, the reason was that there were two males in the group, there would be meetings in the group. In that case if there would be irresponsibilities, instead of dealing with them, I prefered to escape from leadership, I mean males, become worse towards the end of the project (CS17, Male, PI)*

Males also believed that girls would be more comfortable to monitoring the tasks and give feedback. However in practice there was no effect of leader in this context. In *Group 1-8'*s leader was selected her as a leader on the contract too. However, she could not manage the group and *CS30* become leader. *CS30* had to deal with other group members and he had to take almost all responsibility of technical part of the project. At meetings also he was the most active students and he took almost all the decisions about the project.

**Reporting**

Although groups were expected to work in each phase and deliverables of the design, students divided their roles in the contracts. In reporting main role was to combining the information came from the target group and synthesizes that information, use the report templates and write the parts. In the groups of which each member work on a part of the report also there was a problem of inconsistency between parts especially in terms of the quality. Therefore, students had to write which part of the report they wrote. At the beginning students were writing without any synthesis, for example they presented their interview scripts without any analysis and they did not set any connection between the findings and their projects. After the first analysis reports, they improved themselves more.

In reporting students also made drawing like visual design sketches and storyboard. For both projects students had to prepare a storyboard. Students were given a storyboard template and it required the sketches of each screen or frame and information about the duration and scripts of the screen.

**Communication**

The students who had close relationship with a subject matter expert, teacher or target student were determined as responsible for communication. In the first group all responsible were the girls. Although not all the girls knew a target group person, they were more willing to go to the schools and interview with teachers. The responsibilities of communication persons were to interviewing with target group for analysis, pilot testing with target group, and evaluation with target group.

**Graphic design**

Graphic design required to design of interface, the characters, buttons, and animations. All those things do not require scripting. Thus, girls could also contribute graphic design. Especially in *Group 1-11*, CS40 and in Group 1-8, CS28 were very good at drawing and they made very colorful designs.

**Programming**

To meet programming role, the members had to learn writing scripts in Macromedia Flash. By scripting, developers could provide interaction between the product and users. They could prepare games and students assessment parts via scripting. Also some groups tried to develop a scenario which gives lecture like a story which makes users solve a problem during the instruction. Those projects also required complex scripts. Scripting was required for only the first project. In the class there were a concept of "*being coder*". When a student is asked about their favorite roles, some of them stated "*I am not a coder person*" or "*I do not have logic of coding*". This belief has been coming from the previous years' courses. The students had taken several programming courses which are very similar to the script structure of Macromedia Flash. The students, who were not so confident to solve programming problems in previous year, carried same attitude in this course as well. Especially females had more trouble than males in programming.

**Subject Matter Expert**

The role of the subject matter experts was to define the most important parts of the content, misconception of the students and the places that students had difficulty to understand. In the first project most of groups find an external subject matter expert but in the second projects, the members also played a role as subject matter expert. For example in the projects of ILKYAR *Group 2-10 and Group 2-12* prepared their content without any expert.

**Content Development**

Content developers' role was to make task analysis and decide which parts will be presented in which ways. In the first and second projects, students developed the content with the suggestions of subject matter experts, MoE resources, text books and some internet resources. In this process also facilitators played an important role in selection of the content.

**Scenario Scripting**

For the video projects students had to prepare a scenario script, it was a text of what will be voiced in the video. In the scenario also they had to explain the background story of the video. In video projects all students tried to start with an attention taking story, for example

in t-shirt printing project, a girl who was wearing a printed t-shirt and her friends asked where she bought that t-shirt. She said that she made it, and all friends were surprised and asked how she did it. Then the actual procedure teaching started. In other projects also, always friends or people wants to learn something at the beginning. Since they had to add assessment and feedback components, they asked a question and gave answer in the video. All groups also added a summary of video, which is a quick version of the video.

**Arranging Location For Video Record**

The groups of whom the projects related to present a place and its procedure to perform something had to take permission to record the video, for example, using library, sport center (to show a first aid in sport injuries), METU dormitories and GISAM studio. For the permission instructor also assisted the students if that place asked any request from the instructor. On the other hand, those groups had problems if they could not make recording in the day that they get permission. They could have to make another request for the permission. For inside recordings, also students had to consider the space of environment, because small places did not allow students to make recording in different angles and shots.

**Video Recording**

For each group one or two members had a role of recording. The video cameras were given by instructor and they were given short training on using the cameras and transferring to the computer. For video recording also students were given training on the tips of video recording like light, white balance and angle. The training was given by a professional documentary director of the university at Audio-Visual Systems Research and Production Center (GISAM). Some of project groups also used the studio of GISAM for their projects. Students recorded their videos in different locations. Some projects were feasible to record inside like t-shirt printing or TABU playing. For some of them students had to use different places of a building like library, medical center, sport center or ILKYAR. And very few of them required an outside recording like "Preparing traffic accident inspection minutes". Especially outside recording was a bit difficult because the weather conditions might have caused problems. Also sound was one of the main problems. Some groups preferred to record sound separately and added it to the video. In recording process, students had to be careful about making different records in different angles.

**Video Editing**

After recording and transferring to the computer, the video had to be edited. In editing, students were free to use different tools but in one hour lab session assistants gave Pinnacle ® training for the students who do not know anything about video editing. Students were

showed splitting the video, adding labels and text, adding transitions, adding background sound and voice sounds, adding still pictures and converting the project in video format. Students were suggested not to use redundant transition effects. Students had to make a 5 minute video, so students had to make good decisions to split the video and add sounds, pictures and the labels.

**Acting**

Students also played as actors in the videos. Apart from students the people who were working at the places that students made video recording, the friends of the group also played as actors. Acting was not the important part of the project and the students had not to play in the video, they could have used their friends as well.

#### 4.2.3.2 Evaluation of Contributions and Roles

One of the issues with division of labor that those roles were not emphasized much; they were the natural part of the design. To see which project part conducted by which group members, at the end of the reports students made a table to show each member's contribution. However all that wrote in tables was the parts of the reports that each member wrote. They did not mention for example who worked as subject matter expert in the group. On the other hand facilitator had chance to see which members did what tasks via e-mail lists and meetings. However, even in that case there were no clear criteria to evaluate all these roles. Although there was evaluation while considering the amount of contribution, the quality of contributions was not evaluated. For example in the first report of the first project, one of the members of *Group 1-9* did not write his part as expected. And most of the score was reduced in his parts. Although other group members imply that there were problems only his parts, facilitator had not chance to only reduce his points since all group members were responsible for each part of the report. If they would have stated that he did not contribute any part, then facilitator had chance to reduce his score or give zero point. Since the total quality of project was evaluated, individual work quality was not considered. After giving a score for the project, then individual scores was calculaled if needed and this calculation was subjective.

### 4.3 Analysis Actions and Operations to Reach Object

The whole activity is composed of actions and operations which are the smaller units of activity. Each action has its goal and all those goals are combined to constitute the whole activity. Operations on the other hand are automatic processes which are done to achieve the actions. The whole activity was to design and develop a multimedia by following ADDIE

model. However, the basic activity had for important activities analysis, design, development, implementation and evaluation. All those activities had specific actions and operations.

### 4.3.1 Analysis Activity

The purpose of the activity system is to teach instructional design processes to novice instructional designers via multimedia design. Although students developed two different multimedia products during the semester, the processes were almost same for both of them. So their activity structures are similar. So there are two major points in the activity. One of them is to teach about what instructional design is and how an instructional design project can be conducted. Another basement purpose was to developing well designed project which might be used in real learning environments. On the other hand there are a lot of small activities that are the part of these main activities. First of all the students have to complete some instructional design steps before start to develop their projects. The activity system of analysis process can be summarized on activity triangle like below (Figure 4.4).

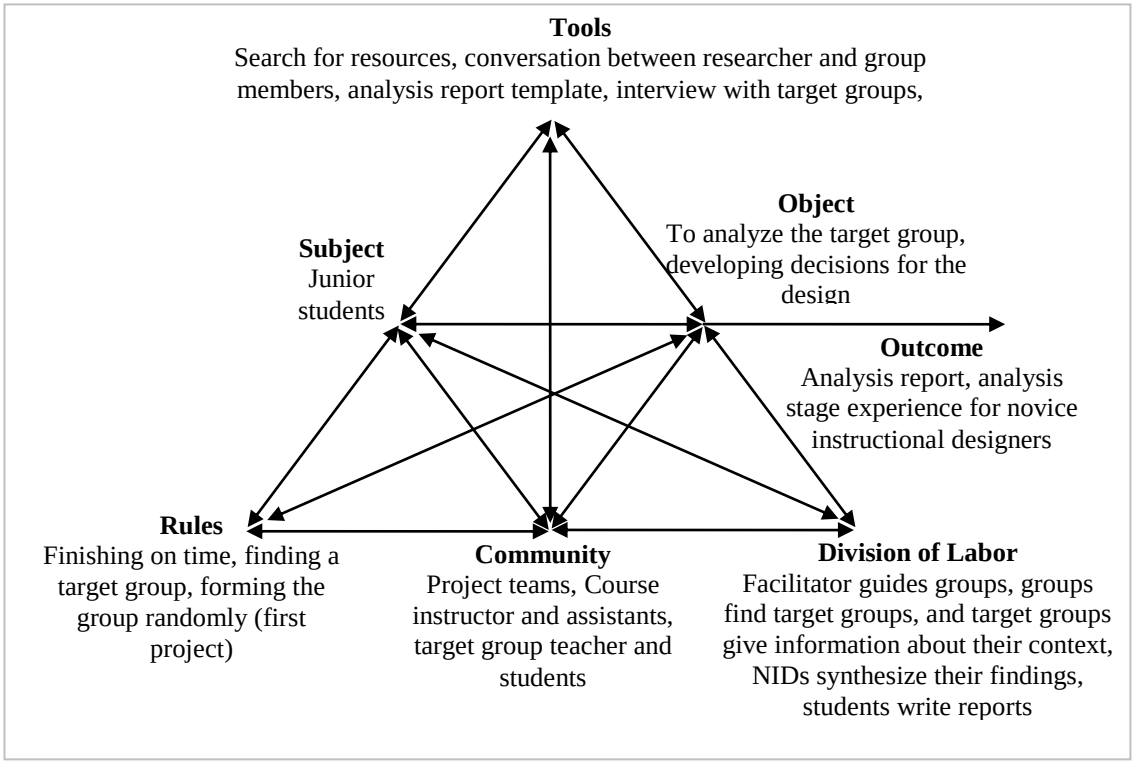



Figure 4.4 Activity system of analysis stage

Analysis process can be divided into actions. For example finding a target group teachers and students is very important object for the analysis stage. One of the students in the group might know about a teacher or have teacher relative. In that case it is very easy to reach target groups. They might use different ways to get information, develop surveys and interview schedules to get information. For example in the "*Group 1-7*" of the first projects, *CS25* has a sister studying at 4$^{th}$ grade of elementary schools and *CS25* know about her teacher. Then, they could easily get in touch with the teacher and since the teacher was familiar with *CS25* she helped them a lot during their projects. In the analysis stage students were expected to synthesize the information received from the target group and develop their design in accordance with this information. Also they were expected to show their communication skills, time management skill during the analysis. The actions and operations performed in analysis activity were listed in Table 4.24.

Table 4.24 Actions and operations of analysis activity

| Actions | Operations |
|---|---|
| Selecting project topic | Literature search for learner analysis<br>Checking examples<br>Content analysis |
| Learning about analysis process | Using course web site<br>Internet search for content<br>Forming the communication tools<br>Using communication tools<br>Attending class lectures<br>Taking lecture notes |
| Finding a Target group | Facilitator suggestions about target group<br>Visit of schools |
| Getting feedback from facilitator | Noting feedback of facilitator<br>Using communication tools<br>Visiting facilitator |
| Working with group members | Face to face meeting<br>Sharing the roles<br>Using communication tools<br>Solving group problems |
| Analyzing target group | Visiting schools<br>Asking questions<br>Writing interview notes<br>Getting information about learner |
| Creating group rules | Group meeting<br>Using previous experience of students |
| Writing different parts of report | Sharing roles<br>Using analysis report template<br>Combining the report<br>Review of reports |
| Submitting analysis report | Combining report<br>Using communication tools |
| Learning about development tool | Attenting lab hours<br>Submitting lab homework |

### 4.3.2 Design activity

Another activity system can be drawn for the design stage. In this process students were expected to develop their scenario and storyboards for their projects. They also had to contact with target group (either teacher or a student) to get their feedback. Meanwhile they had to examine the development tools and understand to what extent they can do the things that they propose to develop. The system can be summarized as shown in Figure 4.5.

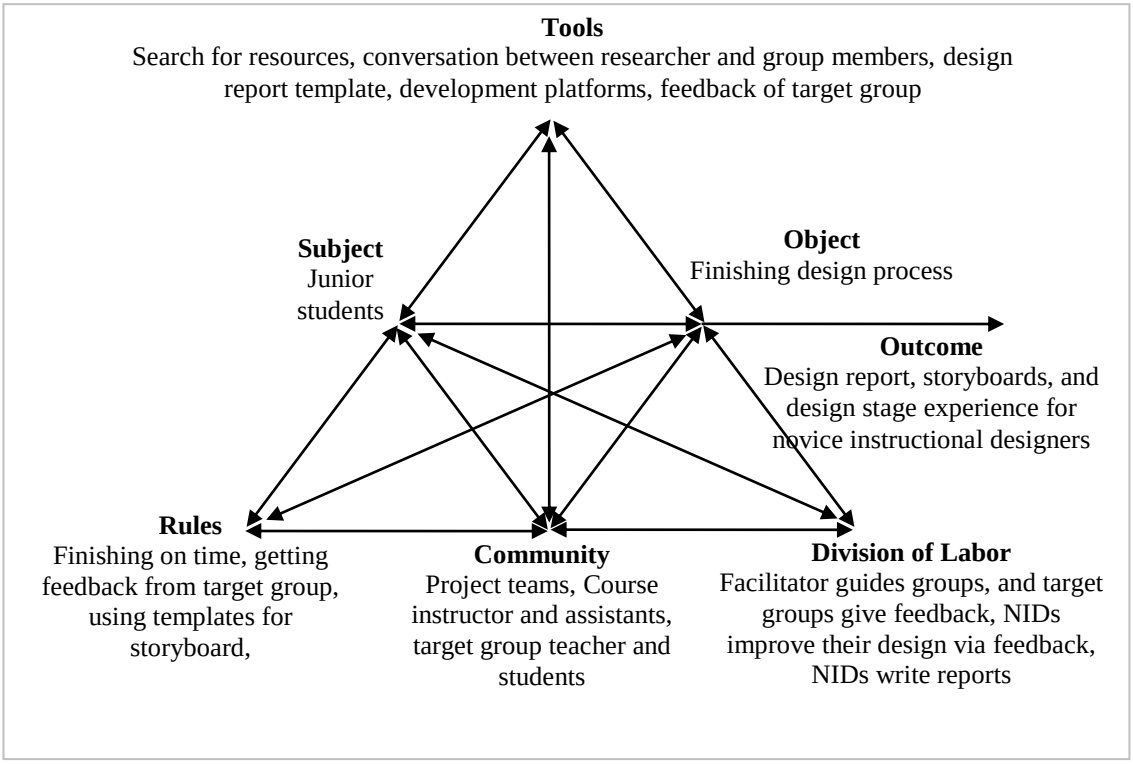



Figure 4.5 Activity system of design stage

In the design stage, students experienced how the transfer their analysis to design of instruction. They had to create a detailed storyboard and show every single detail on it. They got feedback for their storyboards both from facilitators and target group and then they applied the feedback to the design. They were not expected to show their artistic skills but they had to give enough detail to make programmer understand the design enough. Meanwhile the group problems started to arise, since the process become complicated. Therefore, they also dealt with group problems and finish the process smoothly. The stage was expected to provide novice instructional designers experience reporting and storyboarding skills, communication, problem solving and synthesizing skills.

In analysis activity, students prepared for the design. Therefore, the products and deliverables of analysis activity became the tool of the design activity. The role of the community did not change but division of labor changed in each activity. Thus for each activity the roles and experience changed. The actions and operations of design activity are shown in Table 4.25.

Table 4.25 Actions and operations of design activity

| Actions | Operations |
|---|---|
| Finding content | Internet search for content |
| | Checking textbooks |
| | Getting feedback from target group |
| Learning about design process | Using course web site |
| | Using communication tools |
| | Taking lecture notes |
| | Getting feedback from facilitator |
| Creation of prototype | Using design and development report template |
| | Using storyboard template |
| Working with group members | Using communication tools |
| | Coming class meetings |
| Meeting with facilitator | Noting feedback of facilitator |
| Working with target group | Asking questions |
| | Writing interview notes |
| | Getting feedback about prototype |
| Writing report | Dividing parts to be prepared |
| | Sharing the roles |
| | Using analysis report as base |
| | Combining the report |
| Developing storyboard | Using storyboard template |
| | Scenario scripting |
| Submitting the report | Combining report |
| | Using communication tools |
| Learning the development tool | Following lab rules |
| | Submitting lab homework |
| | Attenting lab hours |

### 4.3.3 Development activitiy

In development process for the first project, they were expected to use particular development software. Therefore, in this stage, tool was most important factor influencing the design Pre-knowledge of group members influenced this stage much. In this stage students were expected to expertize on development tools, use artistic skills, use different kind of audiovisual effects, solve group problems and think on the maintenance of their products. Facilitators continued to give feedback in this stage. The activity system of development is shown in Figure 4.6.

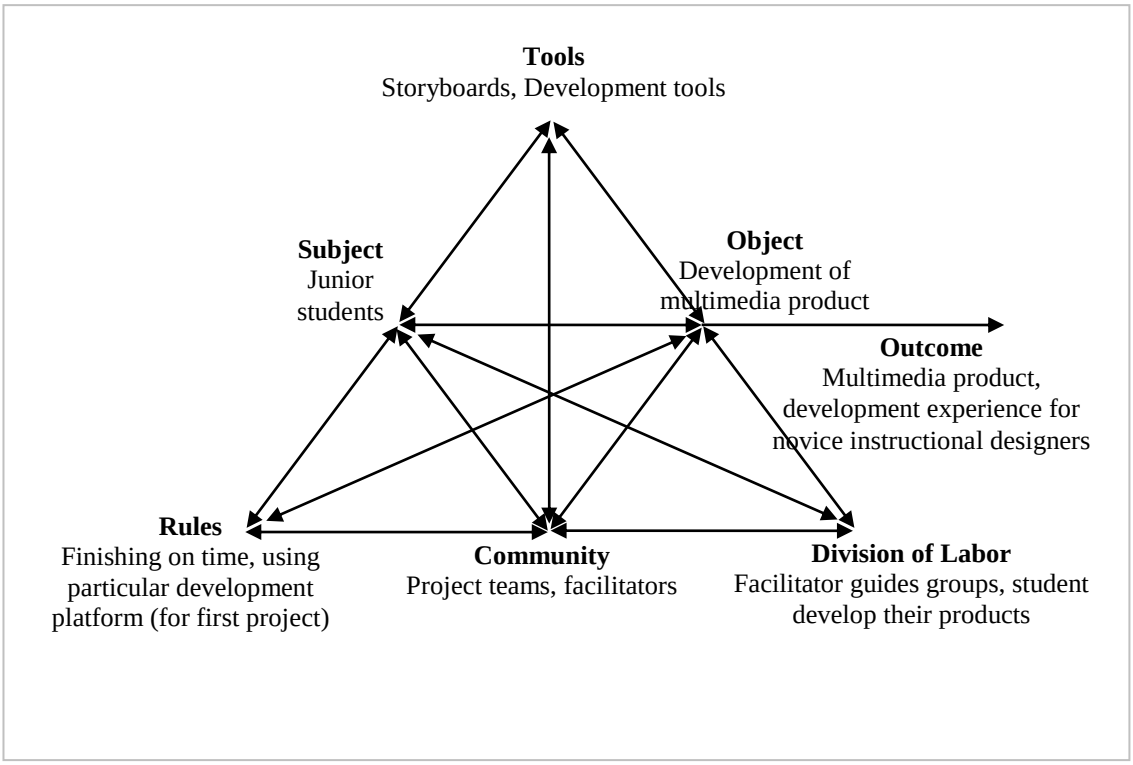



Figure 4.6 Activity system of development stage

In development activity the design activity (Table 4.26) became the tool of the activity. For both projects in the development process, lectures and lab sessions was not held. Thus students had more free time to develop their projects. The rules of the activity system were not strict in this activity.

Table 4.26 Actions and operations of development activity

| Actions | Operations |
|---|---|
| Working with group members | Using communication tools<br>Coming class meetings<br>Dividing roles |
| Meeting with facilitator | Noting feedback of facilitator<br>Asking questions |
| Creation of actual product | Learning about development tools<br>Using available storyboard<br>Using specific development tools<br>Getting feedback from target group<br>Getting feedback from facilitator |

### 4.3.4 Implementation and Evaluation Activity

After development students had very short time for implementation and they had to combine their implementation and evaluation stages. Students again contacted with target group and get their feedback on their products. They used several tools for evaluation. They prepared observation schedules, usability testing procedures, measurement tests to evaluate their products with the target students. This stage was proposed to provide novice instructional designers get evaluation skills and in what way they could evaluate their instruction. Facilitators gave feedback to students' instruments for the evaluation. After evaluation students revised their projects and write an evaluation report. The implementation and evaluation stage's activity system is shown in Figure 4.7.

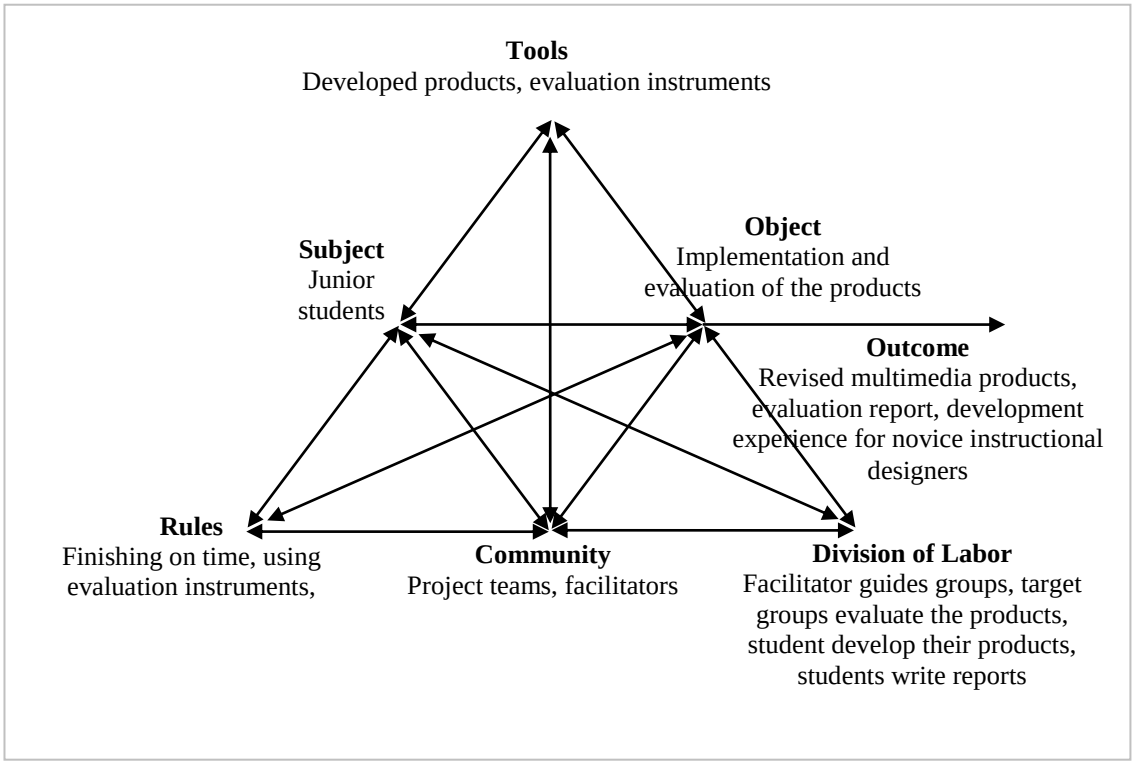



Figure 4.7 Activity system of implementation and evaluation stage

In implementation and evaluation activity the projects which are the outcome of development activity became the tool of the activity. Students also wrote the final report in this activity. Table 4.27 shows the actions and operations of the implementation and evaluation activity.

Table 4.27 Actions and operations of implementation and evaluation activity

| Actions | Operations |
|---|---|
| Learning about evaluation process | Taking lecture notes<br>Getting feedback from facilitator<br>Using course web site<br>Using communication tools |
| Working with group members | Using communication tools<br>Coming class meetings<br>Dividing roles |
| Meeting with facilitator | Noting feedback of facilitator<br>Asking questions |
| Evaluating the project | Using instruments<br>Analysis of evaluation<br>Using developed projects |
| Writing final report | Using final report template<br>Using previous reports |
| Delivering report | Using communication tools<br>Visiting facilitator |

As mentioned before the processes in two multimedia projects are same. On the other hand for the first project teams were randomly assigned and the development platform was determined by the instructor. In the second project, students were freer to select their group members, development platform. With these two projects it was proposed to make students experience two different learning problems, two different target population and different tools. Thus the experiences of novice instructional designers were proposed to be richened. As given in introduction the whole activity system can be set up as shown in Figure 4.8. As seen on activity systems there are a lot of dynamics under each component of the activity system. Therefore, first of all, researcher revealed the dynamics of the activity system.

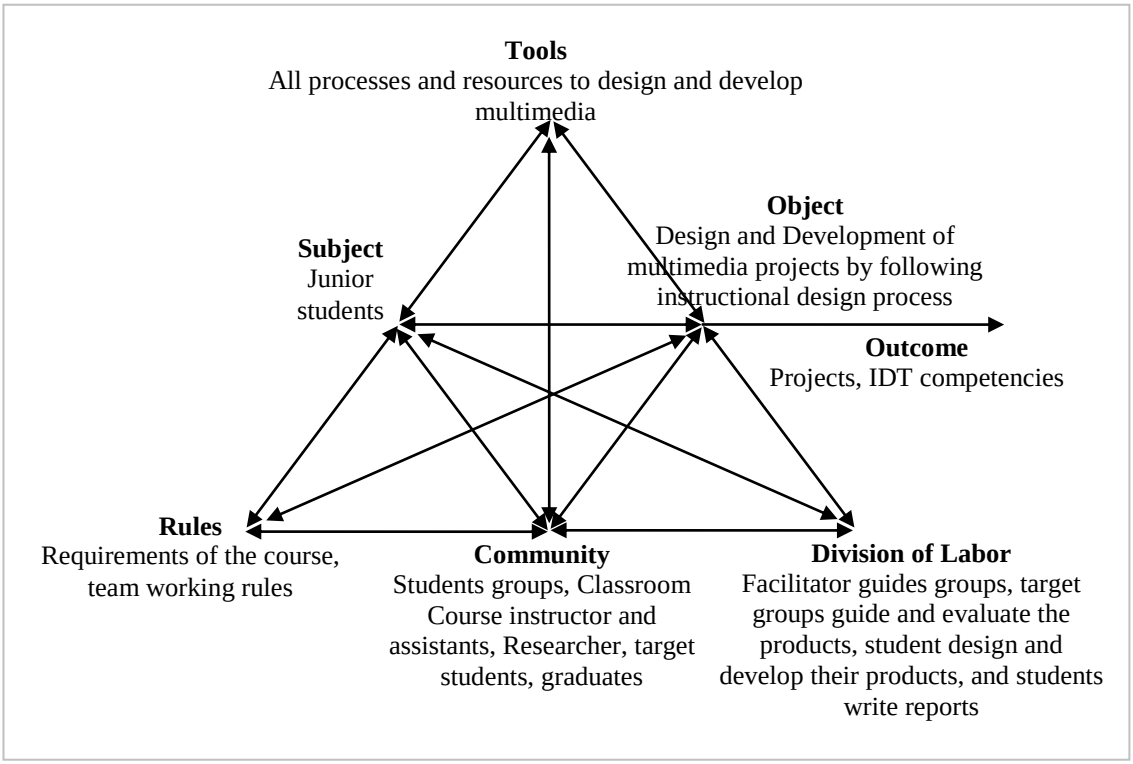



Figure 4.8 Activity system of multimedia design and development environment

### 4.3.5 Times that Problems Arise in Community

The first problem arose in the random grouping of the students. In this stage students had many worries about their new groups. The students were not familiar with working the people that they were not close friends. However, after group assignments of the groups most of the students were fine with the assignment. Although grouping stage had no effect on progresses of the students, it is difficult to make students convince with different people at the beginning. It was very difficult to make students convince that they could make good projects with different people. They were always given the example of real companies where the people who even do not like each other could work coordinately.

At the first meetings, students were very encouraged. When asked about new group members, all groups stated that they matched with the friends that they have no problem. In analysis stage, also there were not problems. Analysis report had a simple structure, and after conducting several interviews, students could easily write the analysis. Actually, analysis was the beginning of the semester and the students had not become busy with other courses. Most of the problems started after analysis process and continued until the finish of the

project. For analysis process also groups were more tolerated. Even, one member worked more than others they believed that it might be compensated in further steps. For example in Group 1-9, CS31 and CS32 worked much more than other group members. CS34 had not been attended group yet and CS33 had some personal issues. For the first two week CS31 and CS32 always advocated the CS33 and they said that he had some trouble. And after analysis stage, in one meeting CS32 stated that "*we tolerated him enough*" and CS31 stated that "*everyone having similar problems*" by implying that CS33 always pretending like having lots of troubles. This meant that every group had a tolerance level.

In design and development stages, the processes became more complex. Groups had to develop visual design sketches, storyboard, pilot the story board, and write the design report. They had 3 weeks to do that and they also had to submit their lab homework and lab homework became more difficult as well. This stage was most difficult stage since the pressure of the mid-semester. Therefore, one of the time spans when the problems arise is the design and development stage of the design for the first project. The students, who left the group, left the group in this stage. In development stage, as mentioned before students realized that they designed the projects much complex than they could do. They understand the limitation of development platform and limitations of their programming skills. Thus they modified their design in the development process.

Second problem time is the implementation and evaluation part of the design. Because of time management problems, groups tended to finish their project almost the last day of submission. Thus, most of them could not make any application with target groups. Even the *Group 1-8* sent their project via e-mail, and then teacher provide his feedback via e-mail. Although facilitators forced students finish their projects in advance of submission deadline, it was not accomplished because it was not stated in the schedule of the course. Moreover, students also had to deliver the final report with the product and this also overwhelmed the students. Therefore, the second place when the students had problem is the delivery of the first project. Although the group problems reached the top level students were motivated with the finish of the project. Especially the students who wanted to be successful in the project ignored the group problems and just focused on the finish the project.

Passing from the first project to the second project took very short time. While students were submitting their first project, the second projects' schedule started. In the first week of the second project they set up their groups, selected topics and conducted the analysis stage. Although it was very busy week, students were ready for the second project since the group members were specified. In the second project, students did not have major problems in

analysis and design parts. They have problems especially in development process, not because of their technical skills but the context that they made video record. In accordance with their scenarios, they recorded the videos but they had problems like; weather conditions for the groups making outside video recording, light conditions, permission problems for some official places, and lack of equipment for recording. Students specified a date for video recording and they had taken the permissions if they were going to make recording in an official place, but sometimes they had to postpone their recording time because of equipment problem. The equipments which were tripod and video cameras were provided by the course instructor. The groups made appointment to borrow the equipments and they had limited time to finish their recordings. If they could not finish recording, they had to make another appointment. This caused some time loss for the groups. Moreover taking the permission from the official places for the second time caused problems too. If students did not do any rehearsal before actual recording, they had timing problem as well. For example in *Group 2-12* of the second project, because they obey their storyboard, their video was very quick and the scenes were very short. Therefore, it can be said that most problematic stage of the second project is finishing the recording. On the other hand editing was very easy for the students. Almost all of them were familiar with video editing programs and if they made a smooth recording they completed the project matching with their design.

The development, implementation and evaluation phase of the second projects matched with final dates of the students. Therefore, although students did their recordings and not have any problem with editing, they postponed editing towards the final date of the course. On final date students had to deliver their second projects and final reports. Thus they were in a rush again. But the main reason for this situation is that they had examinations of other courses.

As seen the times that problems arose towards the middle stages of the designs. The group problems were also dependent to the intensiveness of the design stages. The problem times can be summarized like in Table 4.28.

Table 4.28 The times that problems arose

| Time span | Problem |
|---|---|
| Random grouping | Convincing students who are not ready to work different class members |
| Design stage of the first project | Group problems arose, busy mid-semester |
| Development stage of the first project | Development platform, group problems |
| Implementation and evaluation stage of the first project | Lack of time |
| Development stage of the second project | Equipment problem, students dependent equipment provided by the instructor |
| Implementation and evaluation stage of the second project | Having final exams during the implementation and evalution stage |

## 4.4 Outcome

Outcome of the projects were the instructional design skills of novice instructional designers the end products of the multimedia design and development projects.

### 4.4.1 Instructional Design Outcomes

In the course many instructional design skills were proposed to be gained by the students. As shown in Table 4.29 goals of the course were mainly related the employ an instructional design and development process for a target group. As seen under the categories, main categories might be grouped as *awareness of ID processes, knowledge on ADDIE model, analysis and synthesize of information taken from target group, design of instruction, message design, storyboarding, using computer based development tools, evaluation of instruction, teamworking and project management, and ethical issues*.

Table 4.29 Stated goals of the course in the syllabus and category of the goal

| **Goals of the course** | **Category** |
|---|---|
| Discussing the rationale for using a systematic and systemic approach | Awareness of ID |
| Discussing the nstructional development models and comparing/contrasting their emphases<br>Discussing the rationale and procedures for formative evaluation and revision<br>Discussing the approaches to successful implementation of the instruction or intervention | Knowledge on ADDIE |
| Analyze performance problems to determine the need for instruction | Target group analysis |
| Analyze necessary inputs (characteristics of learners, learning environments and learning tasks) in order to make good instructional design decisions | Synthesis of analysis |
| Specify appropriate objectives and measures for given learning tasks and learners<br>Select appropriate instructional strategies and formats<br>Design and develop course outlines and small lessons<br>Use effective message design in the creation of instructional materials | Design of instruction, storyboarding, message design, |
| Produce quality instruction using a variety of media | Use of development tools |
| Conduct formative and summative evaluations of instruction | Evaluation of instruction |
| Use group-process skills to work productively in a team | Team work |
| Use computers effectively in the instructional system development process | Effective use of technology |
| Show sensitivity to ethical issues and concerns | Ethical issues |

As mentioned before the researcher used competency definitions of IBSTPI by considering the course's competency objectives and asked NIDs grade themselves in terms of these competencies. In the pre and post questionnaires students scored their competencies from 1 point to 5. The expected outcomes of the system were listed as shown in Table 4.30.

Table 4.30 Pre and post perceived instructional design competencies

| | Pre-Questionnaire | Post-Questionnaire |
|---|---|---|
| Improvement of communication and organization skills | 3.9 | 4.1 |
| Working collaboratively in teamwork | 4.0 | 4.2 |
| Project management | 3.7 | 3.8 |
| Interaction with other cultures and communities | 3.5 | 3.8 |
| Consulting and supporting others | 3.8 | 3.9 |
| Conducting and reporting research | 3.1 | 3.8 |
| Improving pedagogical knowledge | 2.9 | 3.2 |
| Using image editing programs | 3.5 | 3.7 |
| Audio/video editing | 3.3 | 3.6 |
| Using multimedia development programs | 3.2 | 3.8 |
| Hardware knowledge | 3.5 | 3.7 |
| Knowledge of instructional technologies | 3.4 | 3.8 |
| Conducting instructional design processes | 3.0 | 3.6 |
| Effective use of technological resources for instruction | 3.4 | 4.0 |
| Assessment of instructional materials | 3.0 | 3.6 |
| Working under supervision | 3.5 | 3.8 |
| Content development | 3.4 | 3.6 |
| Knowledge of usability issues | 3.4 | 3.7 |
| Development of storyboards | 3.1 | 3.9 |

As shown in Table 4.30 for each skills listed there are slight mean differences. The researcher did not apply any statistical comparison to not argue that all these differences were caused just because of this course and this study's scope is actually related how these competencies were influenced from dynamics of the course and context of NIDs.

The qualitative analysis of interviews revealed the some outcomes which are parallel with the objectives of the course. The outcomes which were mentioned by the students are listed in Table 4.31.

Table 4.31 Frequency of the outcomes which were mentioned by NIDs

| Outcome | Frequency |
|---|---|
| Understanding ID process | 15 |
| Learning multimedia development tools | 14 |
| Reporting | 10 |
| Teamworking | 8 |
| Communicating with target group | 4 |
| Project management | 4 |
| Real life experience | 3 |
| Storyboarding | 3 |
| Content development | 1 |
| Video production | 1 |

As seen in Table 4.31 NIDs mainly mentioned about understanding ID process, learning the development tool, reporting and teamworking. On the other hand not all that issues mentioned in a positive ways. For example for the development tool, 3 of the NIDs stated that they had difficulty in learning development tool. For reporting some of the students complained about strict templates and difficulty in writing some parts of the reports. However, there were several reasons triggering this kind of negative attitudes.

Lastly, previous year stundents and graduates were also inquired about the outcomes which they experienced in the course. The combination of outcomes which were mentioned by graduates and previous year students can be listed as "*project management, learning ID process, working under supervision, reporting, material evaluation – usability, team work, message design, technical skills, video recording process, video editing process, understanding target group, time management and visual design*". Although the researcher does not argues that it is directly related to the course, the graduates also associated the course with the the skills of "*project management, message design, step by step process, guiding colleagues, reporting, technical skills and tool analysis*" which they are using in their current jobs. Since, after the course the students get more ID design related courses, it is difficult to find a direct connection with the learning outcomes which are used in the jobs.

When combining, course objectives which are also evoked from IBSTPI competencies and the outcomes mentioned by the participants, the researcher clarified the main themes. In main theme selection also the issues which were more influenced from the contextual issues were considered. For example "*working under supervision*" was not included because in the analysis, almost all the students stated that facilitator was helpful and they did not mentined about any different dynamics influencing these outcomes. The main outcome categories are shown in Table 4.32.

Table 4.32 Main competency themes and sub issues

| **Main category** | **Sub issues** |
|---|---|
| Awareness of ID | Learning analysis process<br>ADDIE model<br>Learning planning process<br>Learning step by step processes<br>Learning about evaluation |
| ID practice | (similar issues with awareness but observations of practical issues were combined) |
| Real context experience | Understanding that some processes in the course is similar with real projects<br>Working with a real target group<br>Working in a school which representes the whole country<br>Feeling of working in a real project |
| Understanding target group | Learner analysis<br>Synthesiz of target group information<br>Communication with target group teacher<br>Implementation of target group expectations |
| Team work | Solving team problems<br>Defining and implementing team work rules<br>Learning to work with different people<br>Developing ideas with different people<br>Guiding the team |
| Project management | Time management issues<br>Leadership in the team<br>Monitoring the team work<br>Planning and dividing the processes |
| Message design | Visual design<br>Task analysis<br>Using target group information to design<br>Usability issues<br>Selecting suitable approaches and methods to design<br>Selecting visuals<br>Selecting characters and story |
| Storyboarding | Understanding the importance of storyboarding<br>Change in perception of storyboarding<br>Understanding what a storyboard is<br>Creating detailed storyboard |
| Content development | Searching actual content<br>Creating content by using textbooks<br>Creating visuals – animations<br>Being subject matter expert in the project |
| Research & Reporting | Knowing what to write in report template<br>Synthesizing information obtained from different resources<br>Being comfortable in reporting<br>Overcoming challenges in writing report |
| Learning about development tool | Overcoming challenges in using development tools<br>Using development tool effectively |
| Educational video production | Overcoming challenges in video recording and editing<br>Understanding video production process<br>Learning procedure teaching<br>Using video editing tools |

### 4.4.2 End Products of Projects

The first end product was Macromedia Flash ® based multimedia product. Via this product development students interacted with many instructional design issues and skills. The project started with the formation of project groups and selection of the topic. Students most of time selected a topic of the first project which has a lot of resources. The previous projects were available for students. After contacting with target group and determine the subtopics of their projects, students started to learn about Macromedia Flash ®. They were also instructed about writing reports and developing storyboards. The Flash based projects had to compose of lecture, game and assessment parts. For lecture part, groups contacted with subject matter experts and target group teachers. With their suggestion the content became ready and then they designed required automatic or interactive animations, still pictures, examples and feedback for the lecture part. An example page of lecture part of Group 1-11's project is shown in Figure 4.9 below.

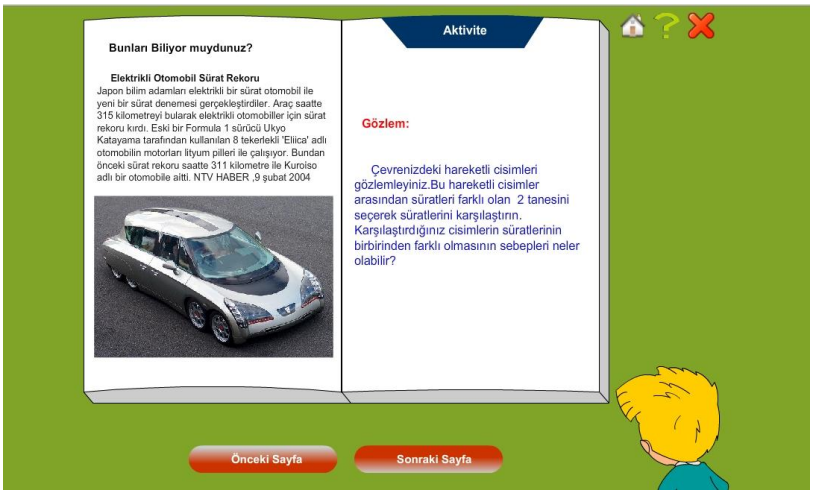



Figure 4.9 A page of lecture part of Group 1-8

In the lecture parts there were not many problems generally; students could draw still pictures and add some animations. However they had problems in development of assessment and games since they required scripting. Although they were encouraged to find interesting, game-like and challenging assessment methods, most of them preferred to make multiple choice tests and fill in the blank questions.

They also had problem with development of game part of the project. At the beginning they designed very interactive and animated games, and in development most of the games were like a test as shown on the example below (see Figure 4.10)

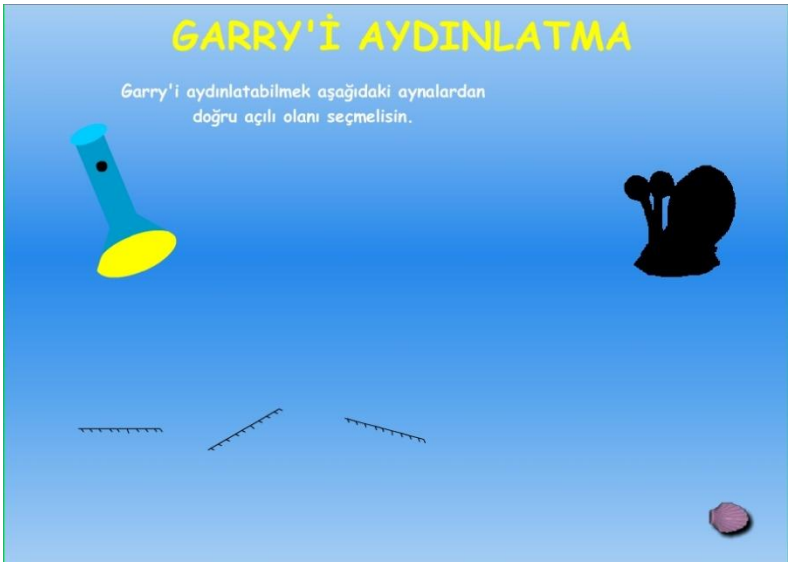



Figure 4.10 A page of game part of Group 1-9

Since the end products were most of time different than the design, it must be argued that the groups mostly ignored the tool that they were going to use and the content that they wanted to present in the material. Although facilitators warned the students about possibilities of the projects, because of good examples on the Internet, they proposed more than they can do. They mostly designed the things that they would not accomplish with their technical background. Another problem was students generally saw the process as *"Flash project"* not an instructional design project. Thus the processes, reports, importance of communication with target group were not assumed as an outcome of this course generally.

In the second project groups developed a video project which is limited with 5 minutes. 5 minutes sounded very short for the students and they were challenged while developing storyboards. They had to include motivation, assessment and feedback components as well as lecture part. They made a presentation to show their projects and all facilitators graded each project. Students uploaded their projects to YouTube therefore they could publish their projects to all public.

Two different criteria were defined for the outcomes. One of them was evaluation of end products and the other one was experience of students. For the first one the rubrics were used for each deliverables of the projects. For the second one, deliverables, observations and interviews were used.

Although the facilitator of the first groups was the unique one who graded his/her groups' projects, in the second project all facilitators evaluated the end products of all groups. The students presented their end products. In those presentations facilitators both graded the project and the presentation of each individual student. The rubrics which were used for each deliverable had been used several years. On the other hand researcher preferred to evaluate first and second projects of her groups second time with facilitators again. In this second evaluation researcher demonstrated all projects to two experienced facilitators in one session and provide a general guideline for evaluation which derived from standard rubrics. In evaluation criteria were *attention strategies, general motivation strategies, interaction, examples and practice, well processed content, emphasize of important information, visual design, originality of the scenario, originality of visuals, consistency of game and the content, originality of game scenario, originality of assessment strategies, variability of assessment questions, feedback strategies, guidance, suitability with target group, user control, use of suitable colors, use of suitable font and style, general usability* for the first projects.

For the second project same procedure was applied. Three facilitators evaluated the projects by using criteria of suitability to procedure learning, well processed content, examples and practices, emphasis of important information, motivation strategies, originality of scenario, video production quality, assessment strategies, feedback strategies and suitability to target group. In accordance with these criteria, the mean score of two project groups were given in Table 4.33. Inter-rater reliability score was calculated in Cronbach's Alpha statistics and found to be .98 for the first projects and .99 for the second projects.

Table 4.33 Project scores for the first and second project groups

| First Project Groups | Average grade of three facilitators after inter-reliability | Facilitator grade in the semester |
|---|---|---|
| Group 1-7 | 59 | 86 |
| Group 1-8 | 72,3 | 84 |
| Group 1-9 | 60,5 | 88 |
| Group 1-10 | 35,8 | 60 |
| Group 1-11 | 89,7 | 83 |
| **Second Project Groups** | | |
| Group 2-10 | 57,7 | 89 |
| Group 2-11 | 80,3 | 93 |
| Group 2-12 | 62 | 90 |

The scores in Table 4.31 do not reflect the qualitative assessment of the progresses. By considering the quality of processes facilitators increase or decrease the individual scores for the projects. In actual evaluation also consistency between design and the material and application of feedback of the facilitator was taken into consideration. In fact the most successful group was the *Group 1-7* in practice. They well communicated with the community and they applied what was suggested. On the other hand as an end product they had several technical inabilities and they tried to keep their project simple as much as possible. On the other hand, project of *Group 1-11* which is a moderate group had many group problems and they did not progressed well but they could produce a colorful and attractive project because of *CS40*'s graphic design skills. This evaluation showed that only focusing to end product does not exactly reflect the real efforts of the project groups. Therefore, researcher preferred to evaluate the processes by observation and in practice groups were given effort-driven scores.

In this study the aim is not to evaluate instructional design outcomes but the contextual issues influencing outcomes. Therefore, there was not real life observation of the outcomes. On the other hand, by the interviews with different years' students outcomes was compared and proved in some extent.

## 4.5 Summary of the Contextual Issues

The context was modeled with the components of the activity system and the details were given. Below, in Table 4.34, the the issues derived from the interviews and observations, directly related subject and its interaction with other components were listed.

Table 4.34 Issues related to subject

| | **Subject** |
|---|---|
| **Subject** | Being a favorite team member,<br>Not being a favorite team member,<br>Not being good at technical issues,<br>Knowing instructional design superficially<br>Lack of conceptual knowledge of instructional design<br>Underestimating the object of the course<br>Having lots of workload in the semester<br>Very busy semester because of failed courses<br>Lack of time<br>Belief of theoretical part of design courses are boring,<br>Believing that lecture time is needles<br>Belief of not being good at coding<br>Belief of visual design skill is not required |
| **Subject - Tool** | Having expeirence of programming,<br>Not being good at using English<br>No attendance to the lectures<br>Experience of message design,<br>Experience of material design<br>Experience of graphic animation<br>Experience of screen capture programs<br>Experience of programming,<br>Experience of ASSURE model,<br>No experience of strict reports<br>Experience on web design,<br>Previous experience on team working<br>Experience of web based instruction design<br>Experience of failure in a course requiring reporting<br>Documantation experience in previous courses<br>Expectation of making attractive project in the course<br>Expectation of learning dev tool,<br>Expectation of learning more about development tool with only one project<br>Challenging to write instructional approach<br>Rubrics in understanding missing points<br>Need of examples to learn something<br>Difficulty in writing the first report<br>Expectation of the project content provided by instructor<br>Belief of theoretical part was boring<br>Expectation of giving more importance to labs<br>Expectation of learning development tool more<br>Gaining awareness of real life examples similar to the course products<br>Lack of knowledge about software<br>Need of sample work to do a task<br>Different learning levels in learning the development tool<br>Liking step by step process of the course<br>Expectation of use of projects in a competency<br>Expecting parallel lab works and project parts<br>Expectation of learning development tool more and disappointment<br>Being influenced from the examples of previous years<br>Liking working on Macromedia Flash<br>No knowledge about development tool at the beginning<br>Believing that project and template incompatible<br>Expectation of consistency between workload and credit of the course<br>Getting bored in video project reports<br>Having trouble with storyboard template<br>Not liking reporting |

Table 3.34 (continued)

| | |
|---|---|
| | Liking technical work<br>Liking only lab part of the course<br>Liking visual design |
| **Subject - Community** | Expectation of being with same grade level students in a group<br>Selecting team members in accordance with living location<br>Believing that working with known members is more comfortable<br>Expectation of constructive feedback from facilitator<br>Expectation of responsibility from team members<br>Expectation of more communication from facilitator<br>Having fun when working with the best friends<br>Having a fixed team members for free grouping projects<br>Believing that instructor alone provides fair grading,<br>Expectation of grouping with well-known team members,<br>Expectation of the people who are responsive to the things they were supposed to do,<br>Reducing motivation because of other irresponsible members,<br>Disappointment with the team members,<br>Believing that no good work with a particular member,<br>Selecting team members in accordance with technical skills<br>Difficulty in working with an unknown friend<br>Being pleasant with the team members in the second project<br>Expectation of working in time with team members<br>Expectation of excluding more class members in random grouping<br>Expectation of good examples from guest speakers<br>Expectation of not complaining about the task given to a member<br>Expectation of respect<br>Expectation of helpful feedback from facilitator instead of complaining<br>No pleasure with guest speaker<br>Expectation of coordination between members<br>Believing that team work narrows the creative ideas<br>Not pay attention to team working,<br>Expectation of face to face meeting with team members<br>Positive success expectations because of a particular team member<br>Selecting any friend because lack of favorite team member<br>Previous bad experience with a team member<br>Expectation of being informed about any problems of members in time<br>Believing that boys are more reckless about their responsibilities<br>Expectation of openness to different perspectives |
| **Subject - Division of labor** | Expectation of more technical help from the facilitator,<br>Selecting technical role<br>Expectation of facilitator control the processes<br>Working on the reports alone<br>Working individually on the parts<br>Avoiding being leader to not deal with problematic people<br>Perceiving that the role of facilitator is not important |
| **Subject - Rules** | Expectation of less workload<br>Expectation of selecting one friend for random group<br>No pleasure with working randomly assigned group<br>Pleasure with weekly meetings<br>Familiarity of working random group provided comfort<br>Expectation of not being group with previous year students<br>Expectation of reporting more unwanted friends before random grouping<br>Expectation of longer deadlines<br>Informing instructor about nonworking member<br>Expectation of the course in a more comfortable semester<br>Expectation of only one project in a semester |

Table 3.34 (continued)

| | |
|---|---|
| | Expecting making meeting with facilitator in every 15 days<br>Believing that each week meeting is not necessary<br>Time limitation in evaluation phase<br>Very short deadlines<br>Difficult semester because of the course<br>Busy schedule of semester<br>Busy schedule of the course |

In Table 4.35 the issues related community and its interaction with other components are listed.

Table 4.35 Issues related to community

| | **Community** |
|---|---|
| **People in the community** | All the Class members<br>Facilitators<br>Instructor<br>Teachers<br>Elementary students<br>Persons who known as problematic<br>Guest speaker<br>Other departments' students<br>Team members' friends<br>Teachers at a close school<br>Close friends |
| **Interaction in the community** | Working hard to not disappoint beloved facilitator<br>Hard work of members more than ones having experience<br>Facilitator's lack of understanding in the problems of group members<br>Selecting a convenient target group<br>Facilitator monitoring on division of labor,<br>Neighbor's as target group<br>Teachers at a school close to the campus<br>Solving the problem with troubled member<br>Selecting a target group which is average for Turkey<br>Working with family members as target group,<br>Pleasure with facilitator's immediate response to the e-mails,<br>Tolerating members non-working members<br>Being active in group e-mail<br>Better team members in second project<br>Working with convenient target group,<br>Family member of a team member as a target group<br>High motivation of target group,<br>Finishing tasks earlier and getting feedback from facilitator<br>Taking information about the course from the upper level students<br>Easy communication with best friends<br>Selecting team members from best friends<br>Expectation of higher grades in reports- ignoring experience<br>A convenient target group<br>Working with roommates as subject matter expert<br>Working with well-known friends in the second project<br>Target students' challenges<br>Determinacy of a team member to do something<br>Different communication preferences of the members<br>Effect of upper level students in expectation from the course |
| **Problems** | Problem of working other two troubled members<br>Comparing different facilitators' grading styles<br>Believing different facilitators has different grading style<br>A member does not work because of other's lack of work<br>No regular private group meeting,<br>Problem of reaching a target group,<br>Problem of different schedules,<br>Tension between facilitator and team members,<br>Members do not want to deal with other members' quarrels<br>Students taking course second time have trouble<br>Difficulty in meeting with subject matter experts<br>Reduce in motivation because of irresponsible member(s)<br>Reduce in motivation because of late feedback of facilitator<br>Communication problem with a new upper grade level student<br>Reducing motivation of an encouraged member, |

Table 4.35 (continued)

| | |
|---|---|
| | Dominant members have difficulty to make a plan,<br>Having problem with upper grade level team members<br>Problem of reaching facilitator in time<br>No friendship in randomly assigned teams<br>No help from target group teacher<br>Hard work but not respect to others<br>Not caring the idea of a particular member<br>Problem of meeting location<br>Difficulty in meeting at house of a different gender member<br>Difficulty in communication because of the schedule<br>Dominancy of a member<br>Problem between particular members<br>Managing other two members' quarrels<br>Different culture of team members<br>Doing all the work to not beg others<br>Difficulty in reaching a conveniently selected target group<br>Problem of withdrawer team members<br>No complain about lazy member(s) to not have problem with them<br>Withdrawer member reduced motivation<br>Problem in meeting with members despite of easy location<br>Difficulty in warning the well-known friend<br>Lack of responsibility reduce effective work<br>No effective work when the members are close friends<br>Irresponsible group members assigned by instructor<br>Ignorance of group members<br>Disappointment with a trusted team member<br>Problem of living different locations<br>Team work problems becoming personal after awhile<br>Reducing the motivation because of lack of interest of the group members<br>Inadequate feedback of target students in evaluation<br>Problem of finding SME for the second project<br>Different understandings between facilitator – student<br>Believing that students come from vocational high school are not so hard worker, |
| **Community - Division of labor** | One member taking more responsibility than others<br>Class members as evaluatiors of project<br>Expectation of facilitator contributing some parts of the project<br>More work from knowledgeable members<br>Females are the leader<br>Leaders' role of editing others' work<br>Avoiding being leader to not deal with problematic people<br>Facilitators help in target group analysis<br>Particular members taking majority of workload<br>Dividing roles equally<br>Dividing tasks and reviewing the entire work<br>Facilitator role in help in focusing the goal<br>Change in leadership because of dominant members<br>Lack of application of storyboard because of division of labor<br>Being alone to make a whole job<br>Having to do another member's work<br>Sharing roles in accordance with the skills<br>Sharing all the work at the beginning<br>Unique member's responsibility of the entire technical part<br>Re-doing a job of others<br>Spend effort to have the team members worked<br>Females as leaders of the team |

Table 4.35 (continued)

| | |
|---|---|
| | Problem of some members reject working because they cannot do it<br>Leader knowledgeable about all processes<br>Having different roles when needed<br>Two leaders taking roles in turn<br>Role of arranging meetings and times<br>Equal division of labor<br>In second project fair division of labor<br>Having role of animating since no need of script<br>Different ID roles of a member<br>No effective leadership<br>Leader role of sharing the roles<br>Designing the video project<br>Working in different roles at a time<br>Facilitator role of solving technical problems<br>Facilitator guidance<br>Facilitator's role of providing time management<br>Facilitator role of solving group problems<br>Facilitators role of correcting misconceptions<br>Facilitator feedback provider<br>Elementary students giving feedback<br>Facilitator's role of reminding the existing situations and progress of the group<br>Facilitator's role of providing step by step work |
| **Community - Tools** | Expecting reports formatted well by instructor and assistants<br>Misunderstandings in report templates<br>Using sample works to understand expectations<br>Learning the tool without asking to facilitator - assistants<br>Enjoyable lab hours because of a specific facilitator<br>Expectation of facilitator knowing the development tool well<br>Selection of easy to develop topic<br>Expectation of lab hours leading to finish the projects<br>Believing that the tool was learnt well<br>Pleasure of using communication tools,<br>Need of explanation for report templates<br>Perceiving reports as unimportant<br>Having quarrel with facilitator about lab assignments<br>Meeting with target group teacher for learner analysis<br>Not getting enough information from target group<br>No application of facilitator feedback<br>Plagiarism in the lab homework,<br>Selecting the project topic in accordance with the experience of a member<br>Believing theoretical part as boring<br>Believing the lab hours were not enough to learn the development tool<br>Asking software problems to facilitator and friends<br>Web based communication with community<br>Believing the facilitator warns possibility of the project ideas<br>Difficulty in coordination of the group because of lack of knowledge about the software<br>Dominancy of member in topic selection<br>Distant member's desire to collaborate on Internet<br>Problem of online communication with the facilitator<br>Using communication tools effectively |
| **Community - Rules** | Difficulty in arranging meeting time with other members<br>Postponing the work to the last day because of busy semester<br>No warm relationship because of random grouping<br>Believing that weekly meetings provide planned work |

Table 4.35 (continued)

| | |
|---|---|
| | Problem in working with unknown friends because of lack of experience<br>Reminding members' responsibilities<br>Obeying division of labor<br>Separation of good friends because of at most 3 student in a group<br>Problem of not obeying meeting times<br>Difficulty in adaption to different teaching method for newcomer<br>Assignment of the groups by instructor in the second project<br>Random grouping no problem because of familiar friends<br>Believing that weekly meetings provide planned work |

The patterns related division of labor was showed in Table 4.34 and Table 4.35. Below The issues only related division of labor are listed in Table 4.36.

Table 4.36 Issues related to division of labor

| | **Division of labor** |
|---|---|
| **Division of labor** | Test development<br>Game development<br>Providing data<br>Decision making<br>Leadership<br>Programming<br>Communication with target group<br>Content development<br>Subject matter expert<br>Leadership<br>Content provider<br>Development<br>Reporting<br>Graphic animation<br>Communication<br>Combining report<br>Decision on meeting times<br>Advising about the project |

Like division of labor the interaction between tool, community and subject patterns were given tables above. Below, Table 4.37 shows the remained tools related patterns.

Table 4.37 Issues related to the tools

| | **Tool** |
|---|---|
| **Tool** | Project topic<br>Textbooks<br>Reports<br>Books to understand learner<br>The first project<br>Internet search for the content<br>Old reports<br>Literature to understand learner<br>Theoretical part of the course<br>Target students' challenges<br>Context analysis<br>Video project equipment<br>Context analysis<br>Internet search<br>Interview with experts<br>Internet search to learn software<br>Feedback of facilitator<br>Peer feedback on project<br>Guest speaker talk<br>Interview with experts<br>ADDIE framework |
| **Problems** | Too many repetitive parts on the reports<br>Mistakes in storyboard templates<br>Unexpected technical problems |
| **Rule** | specific tool limit learning about different tools |
| **Division of labor** | Lack of knowledge on software limited the contribution of the member |

Like the tools, issues related the rules were given with subject and community tables. Remained issues related the rules are given in Table 4.38.

Table 4.38 Issues related to rules

| | **Rules** |
|---|---|
| **Established by instructor** | Strict reporting phases<br>Weekly meetings with facilitator<br>Using a specific software to develop project<br>Report templates<br>At most 3 student in a group<br>Working with different facilitators in different projects<br>Random group assignment in the first project<br>Two project for one semester<br>Phases of the design process<br>Using a specific software to develop project<br>Working with a target group<br>Using an e-mail list and update progresses constantly<br>In group each member work on each deliverable fairly<br>Free attendance to lecture part<br>Students cannot change their lab session and the assistant<br>Compulsory attendance to the labs and weekly meetings<br>Every week homework and two quizzes for labs<br>Total score of lab assignments should be 9 at least to pass the course<br>Rule related being late to the lab |
| **Established by the groups** | All group members come together in all meetings<br>Moderating responsibilities in accordance with characteristic of the member<br>Compelling group member to do his task<br>Weekly meeting with group<br>Group members did what they were expected<br>Each week meeting and compulsory attendance<br>Task distributions<br>Monitoring the work of the members<br>Obeying deadlines<br>Solving group problems<br>Each member let others know about his work<br>Valid reasons to not participate in meetings<br>Emergency situations<br>Letting know others in advance if not atten the meetings<br>Tolerance in busy exams<br>No penalty<br>Treating other members as penalty<br>Letting facilitator know the situation as penalty<br>Monetary charges as penalty<br>Asking facilitator to reduce the grade of the member as penalty |
| **Problems** | Problem of using same templates for both concept and procedure teaching project<br>Difficulty of using a ADDIE framework in each learning condition<br>Difficulty of evaluation of student in video project<br>Passing another project when students are just learn about for Flash |

## 4.6 Research Question 1

How are the potential instructional design and development experiences of instructional design students influenced from the contextual issues accommodated in the components of activity system?

As seen in Figure 4.11 all interview and observations, reports, projects and ID activity were used to answer the researcher question 1.

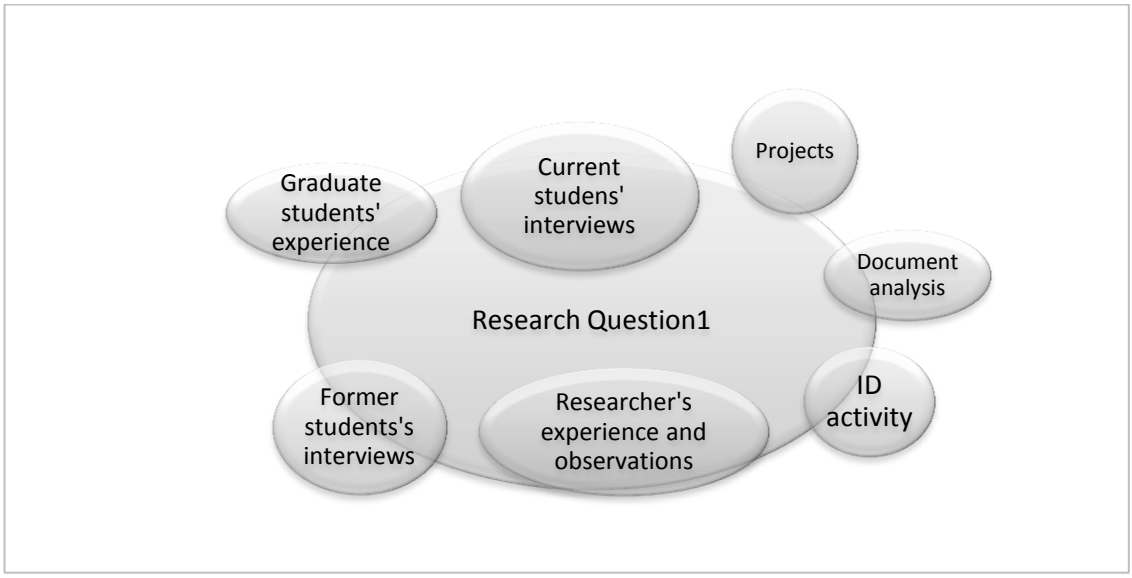



Figure 4.11 Data used to answer research question 1

To answer the first research question main categories of experience of NIDs were specified and for each experience "causal" and "intervening" issues were narrated. In addition to the case of the current students, previous years' students' experience are also used to triangulate the cases. As stated in previous part community has different groups of people and a dynamic context. All the community and the context had several positive and negative effects on the experience of the NIDs. In this part under the titles of each ID experience, NIDs' challenges, problems and expectations will be examined. For the first research question twelwe main themes were created to explain the ID experience of NIDs. There were;

- Awareness of ID process
- Practicing ID process

- A real context experience
- Understanding target group
- Team work
- Project management
- Message design
- Storyboarding
- Content development
- Research and reporting
- Learning about development tool
- Educational video production

These themes will be explained more in the sections below.

### 4.6.1 Awareness of ID Process

One of the issues with novice instructional designers is that they could not notice a lot of processes they had went through and most of time they inquire the necessity of the processes. They could not see the logic behind of them and their importance for the next steps. There were several issues which influence the experience of awareness of ID processes in positive and negative ways. The details are explained below.

**Effect of Community**

In becoming aware of ID especially guest speaker and facilitators were effective part of the course. To show the importance of the processes real life examples had crucial role. In this sense, the guest speaker, despite of very short contribution to the course, provided a rich real life example for the NIDs. For example, one of the students reveals the mission of the guest speaker and he explains that guest speaker provided him to see the importance of the processes with the words of;

> *hangi adımlar ne için var ya da onları yaparken hangi öğretim teknikleri ne için hangisine daha uygun ya da yakın gibi nitelikler daha çok ön plana çıkıyor teorik ders olarak, hani dışarıda çalışıp da derse katılan [GS8] onun da hem bölümümüz mezunu*

*olması sayesinde hem de piyasanın içinde haşır neşir olması nedeniyle bize anlattıkları doğrultuda bizim de aynı şeyi yaptığımız hissi uyandı (CS34, Male, PI)*

*As a theoretical part which and why some steps are available, which and why intructional methods are more suitable or close to be suitable while performing the steps come forward, you know, [GS8] who participated into the class and working at a job, I felt that we were doing same things in accordance with he talked to us since he was the graduate of our department and was practiced in the market (CS34, Male, PI).*

As seen his explanation, guest speaker provided to see that the course context was providing a feeling of a real project experience. He showed the reports that they use in the company. A student explained the effect of guest speaker via their reports;

*[GS8]'in şirkette kullandıkları raporlarını inceledim de neredeyse hani aynısı, aynı şeyleri yapmışlar mesela onlar da bizim gibi hazırlıklar yapmışlar mesela, ben orda anladım yaptığımız iş gerçekten geçerliliği olan çok iyi bir iş(CS15, Female, PI)*

*I examined the reports which was used at the company of GS8, they almost same with our's, they did almost same things, for example they had made similar preparations, I saw that the things that we did is a valid process in real setting (CS15, Female, PI)*

A student also stated how he could realize the importance of reporting by means of guest speaker by saying;

*GS8 mesela bir ara derse gelmişti, o da anlattı bu süreçler hep aynı şekilde ilerliyor. Hani sonuçta bir ürün sunuluyor ama ürün sunulana kadar raporlama kısmının önemini, kesinlikle bu derste anladım (CS13, Male, PI)*

*For example GS8 visited one of our class, he also told about that these processes goes on in the same way. Actually, a product is presented, but certainly it was this class where I understood the importance of reporting until the product is presented. (CS13, Male, PI)*

The guest speaker emphasized the importance of reporting in their company. Many times, instructor also reminded that if someone in the team leaves the project, the team could continue with available reports. These examples were also effective to understand the importance of reporting.

**Effect of the Tools**

The class activities and report templates were effective tools in understanding the processes of ID. The NIDs tended to not look at the processes as a whole in the practice. When they were asked about the processes in a project they could say something about ADDIE framework like that *they learn to plan a project, they understand that before starting a project they need an extensive analysis and design process.* In the first and second implementation of ID activity, almost all the NIDs stated that they would use ADDIE framework in their projects. This showed that NIDs were theoretically aware of the ADDIE

framework. They first time practiced it with this course. In practicing, NIDs stated that they benefited from the report templates. However, although NIDs were aware of step by step processes, they most of time could not see the connection between the two sequential steps of the framework. Sometimes they tended to think that the all deliverables are separate from each other. That is why they called the processes as "*reporting*" phases. CS10 explained this by saying;

> *Raporların bütün aşamalarında, ne tür bir gayret gerekiyor bu konuda çok bilgili durumdayım şu anda. Dönemin başına göre düşünürsek bu süreçte neler yapılır sorusuna çok rahat cevap verebilirim. Ya da bir eğitim materyali tasarlanrken hangi süreçlere önem verilmelidir bu konuda fikir sahibiyim (CS10, Male, PI).*
>
> *Now I am knowledgeable about what kind of effort I should spend in the all phases of reporting. Comparing at the beginning of the semester, I can easily answer the question of 'what should be done this process'. Or, I have the idea of 'what are the steps that should be given importance while designing a material (CS10, Male, PI).*

Another student pointed out that she did not learn the processes in the class but learn by reading about them. She also pointed out the class activities were also helpful to see the ID model's processes. In that activity they had a role of an instructional designer. They had to think about a real context. She said,

> *Hoca işte kullanacağımız modelin bazı metodlarını bize anlattı, tabi ki anlatması gerekiyor ama ben yine kendim oturup okuyup öğrendim yani, bizim teorik derslerimiz olmasaydı, bir eksiklik olmazdı diye düşünüyorum. Ama o sene başında ve sonunda dağıttığınızı geçen gün yaptığınız, şeyler [ID aktivitesi] çok güzeldi, çünkü direk böyle kendi gelişimimizi görmüş olduk. O sorulara ne cevap verilir öğrenmiş olduk yani(CS11, Female, PI).*
>
> *Instructor told about the methods of the model that we were going to use, of course he had to tell about them, but still I learnt them by reading them, I mena, if there would not be theoretical part of this course, there would be nothing insufficient, I think. However, the things [ID activity] that you distributed at the beginning and end of the course was very nice because we could directly see our improvement. We learnt how to answer them (CS11, Female, PI).*

Understanding the details and importance of all ID processes was some difficult in busy processes of the course. In previous years' students there were students who stated that they realized the connection of the phases after the semester that they took the course. For example PS8 stated;

> *…o şeyler oturdu yani ama dediğim gibi en sonunda anladık, ilk başta bunun [değerlendirme]önemli ya da kullanışlı olduğunu anlayanlar mutlaka vardır, kendi adıma ve bir kaç arkadaşım adına konuştuğum zaman, biz bu evaluation hakikaten uygulanmalıymış dediğimizi hatirliyorum (PS8, Female, PI).*
>
> *All those things were settled [in mind] but as I said we understood at the most end, surely there were friends who understood the importance or benefit of it [evaluation] at*

*the beginning, but on behalf of me and some of friends, when we talked about it, I remember that we said this evaluation phase certinly should have been implemented (PS8, Female, PI).*

As another tool the first project had an impact on the experience of the second project. A graduate student also stated her thoughts by saying;

*o kadar farkında olmuyorsunuz açıkçası biz çok farkında olmamıştık, Flash projesi bittikten sonra biz tamam dedik… Kafada yavaş yavaş oturmaya başlıyor süreçler biraz daha. İkinci projeye gelene kadar [bu süreçleri] yavaş yavaş kafanıza oturtuyorsunuz (GS16, Female, PI).*

*You do become aware honestly we did not become aware, after finishing Flash project we said OK. Gradually the processes was settled in our minds more. Until coming to the second project, you are grasping it [that processes] (GS16, Female, PI).*

Another graduate student who believes that she paid much more attention to the end product stated,

*İlk projede çok panik oldum, çok düsük not alacagimi falan düsünmüstüm, çünkü yetismedi yani yaptigimiz materyal ... burda önemli olan ne yapacagimizi planlayip neyi yapmayi gerçekten raporda yazmak... bunun ilk basta ögrencilere açik bir sekilde anlatilmasinin daha iyi olacagini düsünyorum. 'Burda güzel bir süper çok profesyonel bir egitim materyali beklemiyoruz ama bu süreç içinde sizden bir seyler bekliyoruz' denmesi daha mantikli olur diye düsünüyorum (GS6, Female, PI).*

*In the first project I worried much, I though that we got very low scores, because the material was incomplete.. here the important thing is that planning the thing that we are going to do and report them.. I think it would be better to tell to the students clearly at the beginning. If the students are told that 'we are not expecting very professional super educational materla bu we are expecting a progress' it would be more reasonable (GS6, Female, PI).*

As she pointed out their expectation and biases caused them to give more importance to the end product development. Lack of understanding the all processes while practicing them might be caused because of lack of time to think on them much. Moreover, in understanding the importance of ID processes, real life examples were very important as stated by the students.

**Effect of Division of Labor**

NIDs' roles had an important effect on understanding about In ID activity it can be seen that students' roles influenced their perception of the roles. The effect of division of labor in the project teams were revealed by the ID activity. In ID activity, students were asked about to who would be included in their ID project team. The answers of NIDs changed in accordance with the roles that they took in their projects. They almost defined the processes they made during their projects. Therefore, their perception of the roles in an instructional design project was limited with the course context. A student, who stated that he would need

web designer, graphic designer and statistician in the pre- ID activity, in the second implementation of the activity stated;

> *Proje ekibinde öncelikle pilot okulda hedef öğrencilerle röportaj yapmak için, içerik hazırlamak için, storyboard hazırlamak için, design kısmını hazırlamak için ve evaluation kısmında hedef grupla tekrar görüşmek için personele ihtiyaç duyardım (CS14, ID2, 3)*
>
> *In the project, I would need staffs to make interview with the target students at the pilot school, to develop content, to prepare storyboard, to prepare design part, and to re-interview target group in evaluation phase (CS14, ID2, 3).*

One of the male students in Group 2-11 stated;

> *Hedef grup analizi yapacak birisine, elimdeki ekonomik gücü nasıl kullanmam gerektiğini gösterecek birine, web [programlama] konusunda deneyimli bir grup elemanına ve her adımda kontrol edip eleştirecek birilerine ihtiyaç duyardım (CS17, ID1, 3)*
>
> *I would need someone who maketarget group analysis, someone who can guide me for economical issues, someone who is experienced about web [web programming] and someone who can control and monitor in each phase (CS17, ID1, 3)*

In the statement the student might have referred to the facilitator by saying "*someone who can control and monitor in each phase*". This showed that in students' mind, a project team structure is like in the course. In the second implementation it can also be seen that CS17 were very influenced the reporting role of the team members, he stated that;

> *Proje ekibinde rapor hazırlayıcı elemana ihtiyaç duyardım özellikle. Çünkü raporlar projenin oluşturulabilmesi için gerçekten önemli. Bu yüzden raporların hazırlanması için en az 2 elemana ihtiyacım olurdu. Tabi her raporun ayrı bölümleri olacağı için bu eleman sayısı arttırılabilir. Uygulama aşaması için ise teknik özelliklere sahip donanımlu bir elemana ihtiyacım olurdu (CS17, ID2, 3)*
>
> *In the project team I would need a reporter staff especially. Reports are very important for the project to be prepared. Therefore, I would need two staffs for reporting. Of course there might be more staff since each report has many parts. For implementation phase, I would need who is equipped with technical skills. (CS17, ID2, 3)*

In CS17's statement it can be also seen that he gave very importance in reporting. On the other hand, since he believed that there should be different people for reporting, he might have assimilated reporting role with instructional designer role.

In the activity very few students mentioned about the leadership role in the project team. This might be reasoned that they assumed that they would be the leader automatically. Also, very few students mentioned about the evaluator role in the project team. Only 8 out of 34 students who took the post ID activity mentioned that they would need someone to evaluate the project.As understood current students' attitudes, they believed that lectures in the class

is not necessary while they are experiencing them with reports. NIDs did not paid attention to theoretical part of the course did not seem much important because they believed that they already have enough resources to learn what was given in the theoretical part. Attendance was already low because of lack of attendance rule. As stated by a previous year's student the importance of the phases are difficult to become aware because most of them could only finish their projects shortly before the submission time because of intense schedule. In Figure 4.12 the dynamics which are helpful to become aware of the processes are shown. Generally speaking whole processes of the course provided students grasping about ID model.

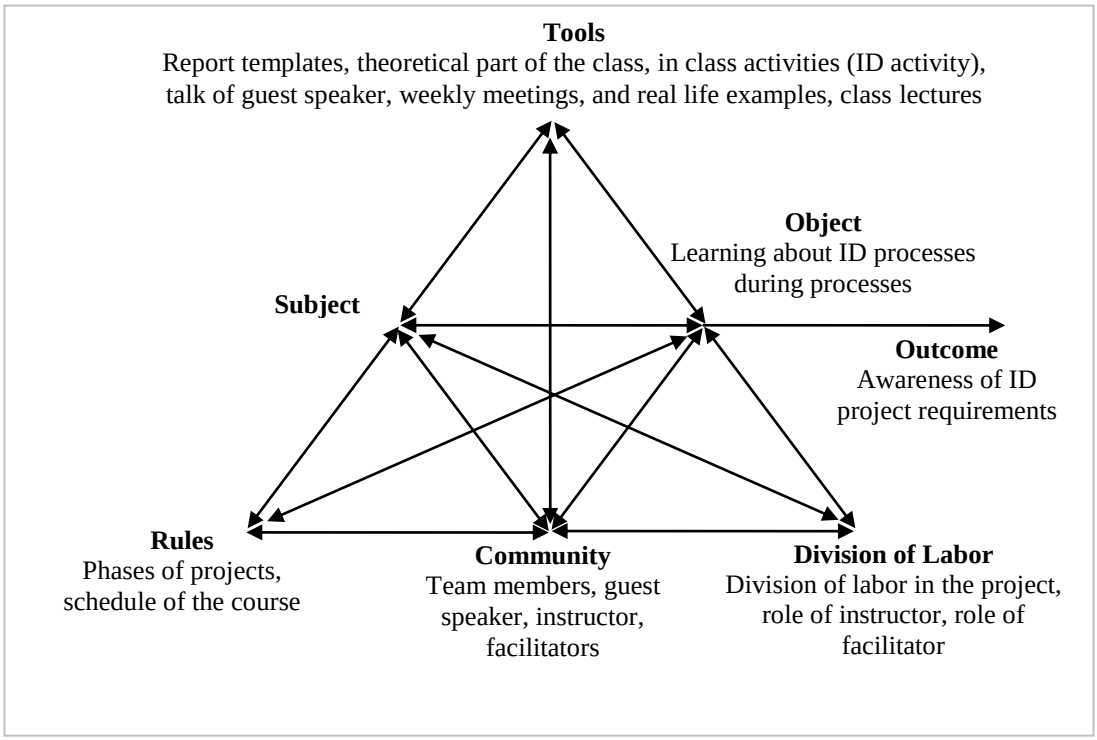



Figure 4.12 Influential dynamics on awareness of ID processes

When students were asked about the outcomes that they got from the course 10 out of 20 current students stated that they leant the steps that they need to go through while developing the projects. On the other hand they did not call it as ID process but as "*reporting phases*", "*starting work with good plans"*, "*ADDIE model*", "*planning of the processes*", which are not give any detail about which processes of ID.

### 4.6.2 Practicing ID Process

NIDs generally were fine with the step by step processes, except the time limitations. The thing that made students understand the design model was especially reporting.

**Effect of Community**

It can be argued that in implementation of ADDIE model steps, working target group had a crucial role for formative and summative evaluation. Although facilitators and report templates were also important to provide the awareness of the processes, target group was the way of practicing the ADDIE model and generally ID processes. Therefore, convenienve of the target group was important issue. If the students did not have a convenient student group they could not easily enter the schools and talk to students. In *Group 1-7* for example they could not convince the administrator of the school to implement their projects in a class. However, since *CS25* knew one of the teachers in person, she could work with some students in that teacher's class. Therefore, it is important to contact with a target group officially and get promise for assistance during the project. This official contact might be organized by instructors.

At the beginning of the course all students could contact with a target group teacher or a student either in formal way or just paying a visit to a randomly selected school. They were not so busy at the beginning of the semester and they have not become tired if the semester yet. Therefore, they showed better performance than the expected by facilitator. On the other hand, after several weeks, group problems emerged and they became busy with many commitments of other courses. Moreover since they could not keep their communication with teachers' they could not conduct formative evaluation except Group 1-7. Another issue with working with target group was to convince administration of the schools. Since there was no official permission, NIDs could not set up a continuous communication with teachers and students. That is why the NIDs worked with different teachers or students for the analysis and evaluation phases. Probably, since NIDs could not make any proper formative and summative evaluation because of lack of a static target group, most of current students did not state any issue about evaluation. On the other hand, in the second project NIDs had chance to reach a target group because of the nature of the project. They could work with their friends. A student explained their evaluation process in the second project by saying;

> *[Hedef kitleye ulaşabiliyoruz] yerleşik olarak aynı ortamda bulunmamız hem de etrafımızdaki insanların olma durumundan kaynaklı, daha avantajlı oldu (CS34, Male, PI)*

*[We could reach the target group] because of being in the same context and being friend with them, it is advantegous (CS34, Male, PI)*

Target group problem was almost solved in the second projects since groups were free to choose to the target group. Most of them could use their class friends for formative evaluation.

*olaya [projeye] daha ciddi yaklaşıyoruz. Mesela şu anda önce sadece görüşme sorularını yaparken hem anket hem hedef kitlenin eksiklerini görüp [gözlemleyip] hem de konuda uzman insanların görüşlerini alıp, onların tecrübelerinden faydalanacağız (CS34, Male, PI)*

*We are approaching the project more serious. For example while we were only developing the interview questions, now we will apply a survey, observe the needs of the target group and also taking the ideas of experts, we will use their experience (CS34, Male, PI).*

Despite this explanation, it cannot be argued that NIDs applied a proper evaluation in the second project. They still challenged with evaluating an instructional video. Lack of time was also a problem for the project groups.

As a part of the community facilitators were also effective factors in practicing ID; their feedback and monitoring were helpful to apply the phases of the ADDIE framework. A previous year student exemplifies this;

*ADDIE modelini inceledik işte analizler değerlendirmeye kadar izlemesi çok zordur. Hocanın tüm grupları asistanlara bölmesi ve o asistanların koçluk yapması, onu verimli anlamda ilk defa bu derste gördü herkes diye düşünüyorum.(PS8, Female, PI).*

*We examined ADDIE model, from analysis to evaluation, it is difficult to monitor. I think everybody saw for the first time in an effective way that the instructor divided the groups into assistants and the assistants made facilitatorship (PS8, Female, PI).*

As mentioned before, facilitators were the warrantors of the processes. Their attention to the processes and communication of the NIDs were helpful in guidance. On the other hand, without an authority it was difficult to make sure that NIDs performed each work that was suggested by the facilitators. Experience of the facilitator showed that NIDs tend to report unperformed work easily because the facilitator did not ask any evidence of the work.

**Effect of the Tools and Rules**

ADDIE framework was the tool of the system. The course presented a practical application of ADDIE. Students theoretically knew about ADDIE steps. In the first ID activity 24 out of 35 students who answered the questions, drew an ADDIE framework for the ID project given at the activity. Theoretical part of the course and feedback of facilitators were important to explain the importance of each step and the application of each step. Without

emphasizing the process students could not imagine that they are in an instructional design process.

In this context it can be easily seen that the thing that remained students' mind is the analysis and design process of ADDIE model. The context might influence this perception since they much worked in analysis and design but they did not have much time to implement and evaluate their projects. Therefore, this time limitation influenced their perception of importance of implementation and evaluation phases of the model. In the context as said before it was difficult to become aware of all the phases of the design since implementation and evaluation processes were not performed properly.

Among the first project groups only *Group 1-7* could make an evaluation with learners. They prepared some instruments to evaluate their instruction. It was only a summative evaluation though. For formative evaluation they only contacted with the teacher. Other groups although reported that they made an evaluation, in personal interviews students stated that they made an evaluation. For example in Group 1-9 in the first projects, reported;

> *We show our project to four 6th grade students. we tested our projects efficiency and defiency. Before we were showing the project to the students, we explain some information to use while they using the project …. (Group 1-9, Final Report)*
>
> *students both boy and girls like characters bob in game parts. All of the students know it and besides they love. Test is enjoyable because they did on the computer without using pencil, paper etc. (Group 1-9, Final Report)*

In the personal interviews on the other hand CS31 stated;

> *öğrencilere [projeyi] uygulatmak istemiştik ama olmadı zaman kısıtlı olduğu için (CS31, Female, PI)*
>
> *We wanted students implement [the project] but it did not happen because the time was limited (CS31, Female, PI)*

Another group member of Group 1-9 also approved;

> *Hedef kitlemize [projeyi] gösterme şansımız olmadı işte kendi arkadaşlarımıza bir bakın nasıl olmuş diye göz atar mısınız diye rica ettiğimiz oldu. Ama işte raporda hedef kitlemize gösterdik desek de sınıf arkadaşlarımıza gösterdik (CS34, Male, PI)*
>
> *We did not have chance to show [the project] to the target group, we requested our friends to have a look to say how it is look like. However, although we reported that we showed our project to the target group we showed to our friends actually (CS34, Male, PI).*

Although CS34 stated that they showed their project to their friends it also did not seem realistic. Since the researcher was the facilitator of them, he might have hesitated to say they

did not make any evaluation and write everything by articulating them. Although students dıd not practice the each step of ADDIE they argued that they learnt how to conduct the phases. For example in interview CS31 stated;

> *En azından, biz projemizi uygulayamasak da, bir Flash [kavram] projesi nasıl hazırlanır, hangi süreçlerden geçmesi gerekir, hazırlayan kişilerin [kimler olması gerektiğini], nelerin gerektiğini biliyoruz. Tamam, uygulayamıyoruz hani zaman kısıtlı olduğu için, yoğun olduğumuz için ama farkındayız yani nelerin gerektiğinin(CS31, Female, PI)*

> *At least we know, even we could not applied in our projects, how a Flash [concept] project is prepares, which processes are required, the people who prepare it [who should be them], what is required. OK, we could not apply it since the time was limited and we were busy, but we are aware of what is needed (CS31, Female, PI).*

Shortly, although students find a target group at the beginning, they could not go on to work with them because of the busy schedule of the semester and limited time to finish their project. Both projects and final reports submitted at the same time and this also put the students in rush. On the other hand again by means of the templates of the reports and feedback of facilitators they become aware of the processes and their importance. This awareness can be seen in the first and second application of ID activity.

In analysis and design steps students had challenge to write reports. In practice it seemed that students conducted good analysis and design processes, because of strict templates of each phase students sometimes reported something they did not perform. For example, in Group 1-8, students only met with target group teacher however when reporting their learner analysis process they also reported,

> *We observed our target group students their rhythmic counting and calculating abilities. As a results our observation we realized that the learners who have required knowledge about using money are good at rhythmic counting and the four arithmetic operations. According to this research we decided that all students need to learn the money and they need a platform on order to practice using money and/or shopping (Group 1-8, Analysis report)*

As seen they also reported that after observing the students, they decided to develop a material about money. In fact teacher had asked them to develop a material about the "Our Moneys". In the second week meeting, CS30 stated that he examined Math curriculum and "*Our Moneys*" topic is under the topic of Rythmic counting. It seemed that they combine their existing knowledge with teacher's expectation and they reported in the language of the students.This might caused both report templates and instructor urged students find a target group student. Fearing of reduction in the grade might lead them report some unperformed

taks. This issue especially caused lack of available target group students to give information to novice instructional designers.

Therefore, for both of the projects, reaching a convenient target group was important dynamic to get the knowledge of ADDIE model. All these issues are located in Figure 4.13.

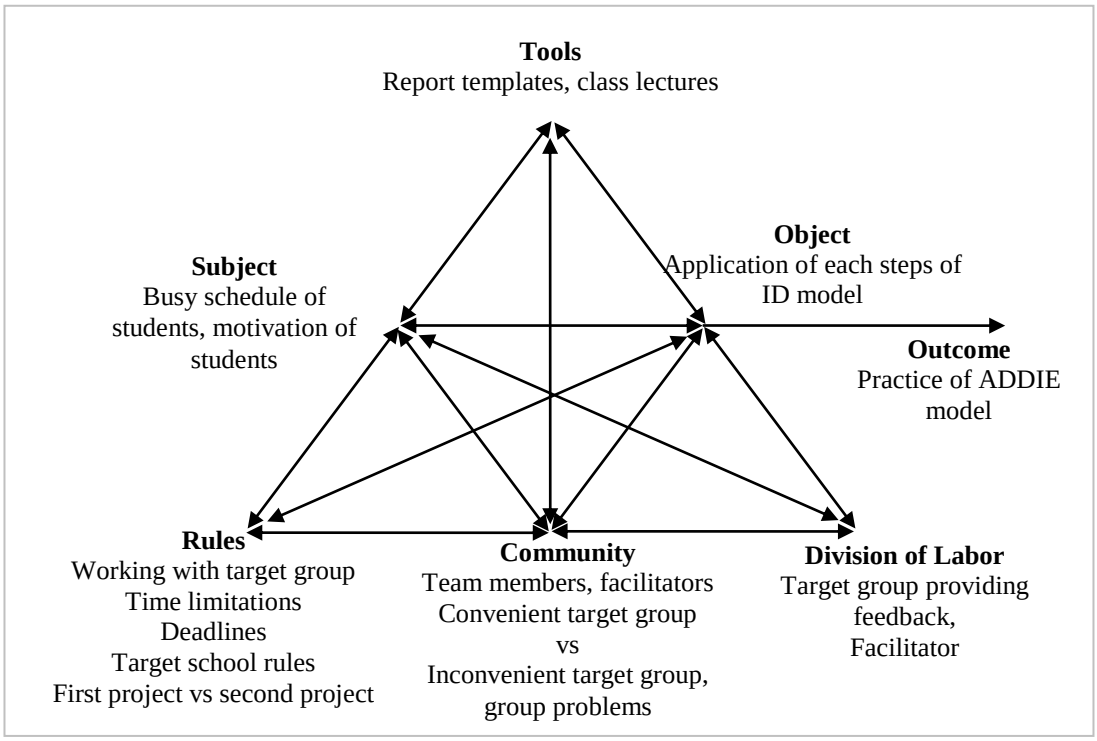



Figure 4.13 Influential practicing the ID model

### 4.6.3 A real context experience

In getting a real context experience relationship between students and target group was very important. Also systematic ID process and weekly meetings are listed as a factor providing real life experience.

**Effect of Community**

Working with a target group was a rule of the course and as mentioned working with a target group provided them to enter a real setting and take the target group's need into consideration. In fact, at the beginning the students had problem to find a target group. On the other hand once they found a target group they get many ideas and insights for a real

school setting. A male student also explained how they found a target group teacher in a school which is representative for whole country. He said;

> *Yüzüncyıl'da bir okula gitmiştik, 8. sınıfların fen bilgisi dersi öğretmeni ile bir görüşmemiz olmuştu, … Hanımla, ee, ondan önce öğretmenler odasında diğer öğretmenlerle işte ilkokulda, ilkokul öğretmenleri ile bir görüşmemiz olmuştu, az buçuk Türkiye ortalamasına göre bir okul seçtiğimizi düşünmüştüm, ama Ankara'nın göbeğinde, laboratuara dönüştürülmüş sınıf vardı ama bilgisayarları yoktu, öyle bir ortama girince hani dedim Türkiye için yaklaşık bir yer bulmuşuz, hatta sevinmiştik aslında arkadaşlarla, yani ara yüz kısmında onlarla birlikte olduk (CS13, Male, PI)*

> *We went to a school at Yüzüncüyıl,… we had a meeting wiht the science teacher of 8th grades. With Lady …, before that we met with other teachers at teachers room, and the elementary teachesr at the elementary school. I thought that we selected an average school for Turkish conditions, but in the middle of Ankara, there was a lab which was transformed from a normal class, but there was no computers, when I entered that kind of place, I said that we found a place that is moderate place for Turkey, moreover me and my friends became happy, we were together with them [the teachers] in interface phase [development phase] (CS13, Male, PI)*

A student stated her experience as;

> *Analiz yaparken mesela ben dış dünyada neler oluyor onları da öğrendik, o bir deneyim kattı. Öğretmenlerle sonra gidip o konumda oturmak beni çok iyi hissettirdi, "ben bir çalışma yapıyorum öğretmenler bize dertlerini anlatıyorlar şöyle olsa böyle olsa" bu da benim için çok iyi bir motivasyon sağladı, hem öğrenciyim ama hem de yararlı bir insanım şu okulun dışına çıkabildim (CS15, Female, PI).*

> *While doing analysis, for example, we learnt what is going on the outside world that provided an experience. Visiting teachers and talking with them made me feel better; "I am doing a study, the teachers are telling about their problems, let it be like that or like that". This provided very good motivation form me. I am both a students and a beneficial person, I could go out of this school (CS15, Female, PI).*

Like CS15, almost all teams could talk to a target group teacher at the beginning. On the other hand, in the study context, although students could contact with teachers, in other phases they could not communicate with them well. Even in the *Group 1-8* which the target teacher was willing to work, the effective communication was not set up as mentioned before. This caused students not to get enough interaction with the target group like in real life. Except Group *1-7*, no groups could work with target group effectively. This was not only caused by the groups but also the teachers' motivation to work with groups.

In real case the students had several problems to find and convince a target group to work for a project. Most of them went a convenient school to find a target students and teachers. Although at the beginning the teachers were very encouraged, most of them did not give feedback when the students asked during the project development. Convenient selection of target group influenced outcomes on how to select a target group to practice the project to make it feasible in any context. First of all they did not make analysis to select a target group

except considering whether the schools are private or public as one of the female student indicated with the words of;

> *Kendimize okul seçtik, okul seçerken, gerçekten hocaya işimizi anlattık, ODTÜ kolejine gitmiş o arkadaş, biz bunu yapmadık, dedik ki ODTÜ kolejin gelen öğrenciler zaten belli[yüksek sosyoekonomik seviyede], Yüzyıl'a [Yüzüncüyıl] gittik dolaştık işte bir okul bulduk(CS15, Female, PI).*
>
> *We selected a school for ourselves, while we selecting the school, we really explain our project to the teacher. That friend had gone to METU College [it is not celar to whom is indicated], we did not do that, we thought the students who come to METU college are specific [they are in higher level SOS], then we sought Yüzüncü Yıl and then we found a school (CS15, Female, PI).*

In this statement two things might be interpreted. As understood from the statement, students did not spend too much effort to find a good target group which would be more helpful for their projects. On the other hand, they considered that even they chose a convenient target group, they selected more representiative one to feel that they were working in a real context. However, in a time, novice instructional designers found out that in the convenient place they might not find enough resources to implement their projects and the teachers might not be willing to help them always. At the beginning very few students were aware that they will work with the target group for each phase of their project. Therefore, most of them did not consider the technical infrastructure of the school and they did not negotiate with the teachers to work with until finish the project. This might have been reminded by instructors.

To understand whether NIDs are realistic in selecting a suitable target group for a broad project they were asked to select a target group to conduct pilot studies and formative evaluations. In both activities, most of the students stated that they would choose a moderate school which is located in different parts of Turkey. Some of the students considered technological infrastructure of the schools as well. According to students, the schools should have had average technological resources, the students who are in similar socioeconomic status and similar gender ratios.

> *Gerekli araştırmalar yapıldıktan sonra gerek altyapı bakımından olsun, gerek öğretmen ve öğrencilerin farklı özellikleri olması bakımından olsun gerekse de sosyo-ekonomik farklılıklar bakımından olsun, benim pilot okul olarak seçeceğim okul bu saydığım özellikler bakımından en ortada olan okul olurdu. Böylece her iki uç noktaya eşit mesafede bir strateji izlemiş olurdum. (CS27, ID1, 1).*
>
> *After making required analyses, the school that I choose as pilot school would be the most moderate on in terms of insfrastructure, different characteristics of teachers and students and socioeconomic differences. Thus, I could trace a strategy on equal terms to the two edges. (CS27, ID1,1).*

On the other hand in the second implementation most of students emphasized that they would select the places that they could really make implementation. They consider technical infrastructure of the school more than being in ID1. The same student stated in the second implementation of the activity like below;

> *Materyalimizin kullanılması için bilgisayar ve internetin olması zorunlu olduğundan okulda kesinlikle bir bilgisayar laboratuarı olması gerekir. Öğrencilerin ekonomik durumları bakımından ise bazılarının evinde bilgisayar olduğu bazılarında ise olmadığı homojen öğrenci kitlesi oluştururdum (CS27, ID2, 1).*
>
> *Since it is compulsory for our material to be used via computer and Internet, certainly there should be a computer lab at the school. I would form homogeneous student groups such that some of them have computer at home and some of them not in accordance with their economic situation (CS27, ID2,1).*

In analysis stage many students realized that even urban schools near the campus had no computer labs or other technological resources. This might be effective on their consideration of technical infrastructure requirements in selecting a target group.

Although students get real life awareness, they could not implement their projects in a real setting. For example in Group 1-7 although they could work very effectively with target group and teacher promised she would implement their project, they could not implement it in the class. Target group studied that topic much before the development of novice instructional designer's project finished. Therefore, they made summative evaluation with several students who were suggested by the teacher. They worked individually on the developed project and gave feedback. Although for Group 1-7 this did not cause any loss of motivation, lack of implementation of the projects in a real setting caused students' underestimating the importance of target group. A previous year student explained a similar problem by saying;

> *Çok inter aktif kullanışlı bir şeyler yapmıştık dönem boyunca biz projemizi yaptık sonunda bitti o proje bir daha tekrar kullanılmadı hiç kimseye bir yararı olmadı hiçbir okulda kullanılmadı biz kendimiz bir şeyler öğrendik ama onu başkalarına aktaramadık o yüzden belki bazılarımız da bir şeyler öğrenmedi çünkü zaten bildiğimiz şeyleri uyguladık eğitim [pedagoji] anlamında (PS7, Male, PI).*
>
> *We made very interactive things, during the project we made our project, it finished at the end, but it was not used any more, it was not beneficial for someone, it was not used in any school, we learnt somethings by ourselves, but we could not transfer it others, may be because of that some of us could not learn something because we applied things in terms of educational [pedagogical things] that we already knew" (PS7, Male, PI).*

Shortly having a convenient target group was most crucial issue to get real life experience in this context. Facilitator's should have monitor students to make them work with target group. On the other hand, this issue was not much traced by facilitators since they did not contact

with target group people. Another important issue was guest speaker working in a real setting. With guest speaker novice instructional designers realized that their practices are compatible with the company setting.

**Effect of the Tools - Rules**

In the lecture times instructor many times emphasized that their processes were like in real life projects. That is why the instructor invited a guest speaker; he wanted to show how instructional design process is conducted in real setting. Guest speaker was very important to show students their processes in that course are real-life like experience. For group working also instructor many times repeated that they need to manage to work with different people because they will work unknown people in their real companies. For example a male student stated;

> *Bu dersin en sevdiğim yanı teorik ile uygulamanın bir arada gitmesi, ki bu da gerçek yaşamdaki şirket yapılarına benzer şekilde sıralama ve adımda olduğu için gerçek yaşamda ben bunu yapsaydım, böyle yapmam gerekiyor diyebiliyorum (CS34, Male, PI).*

> *The thing that I liked most in this course was that theory and practice was parallel, and since the same sequence and steps are available in real companies, I can say that 'If I would do this in real life, I would do it in this way' (CS34, Male, PI).*

**Effect of the Rules**

Random grouping was one of the issues which provide a real context experience. Although NIDs had many trouble with team member in the first project, they believed the benefit of it as well. A student *Group 2-12* stated a positive view about being group with unknown friends, he said;

> *İş dünyasında da iş arkadaşlarımızı her zaman kendimiz seçemiyoruz... Bu tanımadığımız kişilerle, yani az çok bir tanışıklığımız vardı gruptaki kişilerle ama hiç bir grupta yer almamıştım, yani farklı kişilerle nasıl uyumlu şekilde çalışılabileceğimiz[i görmemiz] çok güzeldi (CS13, Male, PI).*

> *In business life we can not select our colleagues ... those people that we did not know, actually we knew them very less, but we have no group working experience with them, to see how we can coherently work with different people was very nice (CS13, Male, PI).*

The issues influencing real life experience was showed in Figure 4.14.

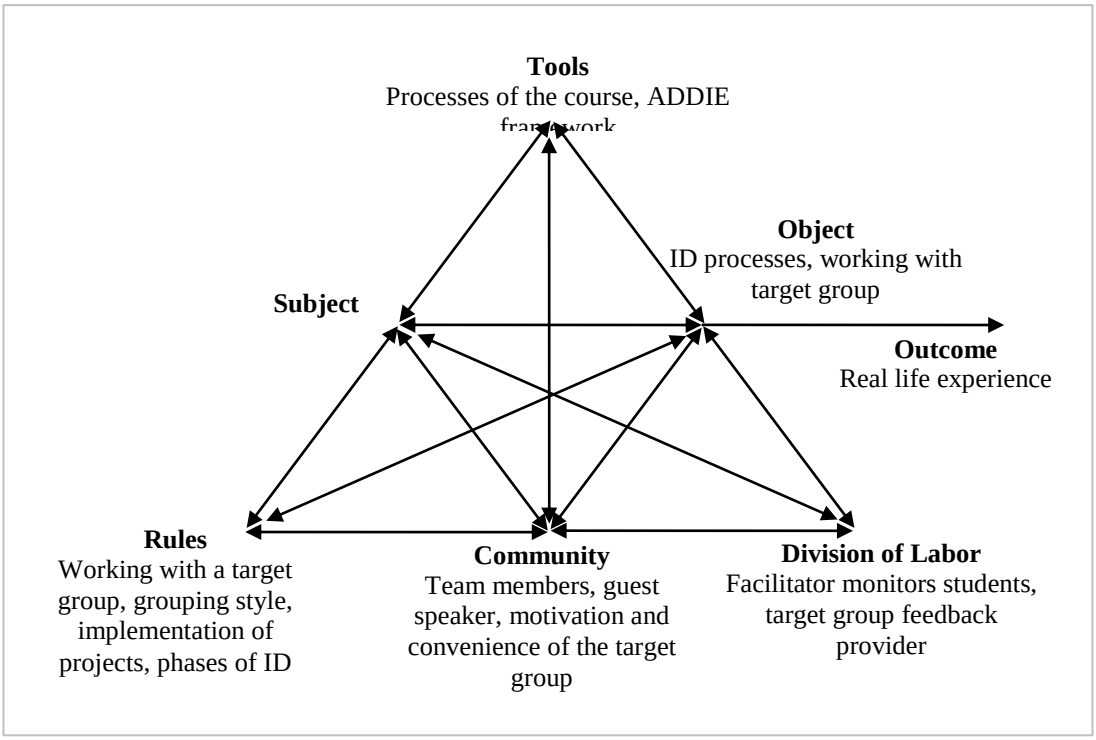



Figure 4.14 Influential dynamics on real life experience

### 4.6.4 Understanding target group

Understanding the target group was one of the ways of getting real life experience. The course was the first context that students consider the target group needs in their projects. In fact, the motivation of the target group was very important to guide students. In other words, motivation of target group was as much important as the motivation of project group. In researcher's first project groups only one group worked with the target group effectively. The effective means, they made formative evaluations several times and reflected the target group expectations to the project.

**Effect of the Subject - Community**

If the groups were worked effectively with their target group they would get much experience of understanding the target group and develop their projects suitable for them. A male student expressed his pleasure to work with a target group said;

> *[hedef kitleden birileri ile çalışmak] çok yararlı olmuştu açıkçası, o bence şart olmalı, çünkü biz öğrenci gözü ile bakıyoruz bir de öğretmen gözü ile öğrencilere bakmak daha farklı bir şey (CS17, Male, PI).*

> *Apparently it was very beneficial [to work with target group], it should be requisite, because we always look from our own perspective, looking from the perspective of teacher and students is different (CS17, Male, PI).*

A previous year student also proved that working with a real target group provided an awareness of working with a target group. He said;

> *[Öğretim] Materyalinin geliştirilmesinde neler yapmamız gerektiğini, neler seyrettirmemiz gerektiğini öğrendim. İşte biz bu resimleri nerde kullanmalıyız, hangi yaş grubunun nasıl bir şey öğrenmesi gerektiğini… Yapılan bu işleri sanallıktan ziyade gidip birebir uygulama şansım oldu (PS1, Male, PI).*
>
> *I learnt about what we should do in development of learning material and what we should make the target group watch. I mean, where we should use the picture, which age group learn in what way… I had chance of hands of practice instead of virtually learning it. (PS1, Male, PI).*

Besides, since all the class had to work with them, it was a driving force for all the students to be consistent with the class. In the current semester although *Group 1-8* worked with a target group which instructor arranged, their communication was not as strong as the students who took the course two years ago. The reason might be that there was no community effect on working target group properly. Although facilitator helped them to meet with the teacher, they could not work effectively. They only met with them in analysis stage. However this was not only caused from the project group, but teacher was not willing to give feedback continuously. After the first meeting he expected the project be ready soon.

Convenient but randomly selected target group selection was not helpful much. The groups who visited a teacher randomly could not get enough information from them. First of all those teachers did not know what the project would look like. Most of them were not familiar with these kinds of projects, since they also had no chance to implement it in their teaching they also had almost no idea about what project included. A student from *Group 1-9* stated their experience with target group teacher by saying;

> *Bizim soru sorduğumuz öğretmen bize direk soruların cevabını değil de, onun şikâyetlerinden, okulun eksiklerinden, filan bahsetmeye giriyordu, onunla konuşurken başka öğretmenler geliyordu, bizim de şöyle ihtiyaçlarımız var diye, yani tam cevaplarını alamıyorduk (CS31, Female, PI)*
>
> *The teacher who we asked our questions did not give the direct answers of the questions, instead she mentioned about her complains and the shortages of the school. While we were talking, other teachers were coming, and they also mentioned about their needs, I mean we could not take the proper answers (CS31, Female, PI)*

As CS31 pointed out, many teachers were not aware of their projects and the purposes of the students. Therefore, randomly selected target group was not helpful for the groups. Since the students were novice they also could not select a proper target group and work with them effectively.

Even the groups, who could contact with a student to make summative evaluation of their projects, did not get rich information from them since they did not know the strategies to get enough information. Also elementary students were not much aware of what they were supposed to do while evaluating the end products. CS40 explain this difficult by saying

> *Öğrenci benim gözlemlediğim kadarıyla çok içine kapanık bir öğrenciydi ve hani cevap vermekte ve beklediğim yanıtları vermekte ve benim gözlemlediğim eksiklikleri söylemede çok yetersiz kaldı aslında yani şey geri dönütleri çok zayıftı(CS40, Female, PI)*

> *The students, as I observed, was very self conscious students, I mean he did not give satisfactory to state the inadequate issues that I observed and to respond in a way that I expected (CS40, Female, PI)*

CS40 expected very complete answers like "*there is lack of this, lack of this*" but 6th grade elementary school student could not do that. This was actually related the novice instructional designer's lack of experience with children. Like children also novice designers expected teachers provide information like a recipe, it means directly contribute to their projects. However it was impossible for teachers to give a description of the project by considering the contextual issues, learner characteristics, curriculum and their needs and the limitation of development tool. Therefore, a conflict was not avoidable between target group and novice instructional designers. This issue might have been solved several in class activities to make novice instructional designers synthesize information received from target group.

**Effect of the Tools**

In ID case activity students were asked about what kind of evaluations they would conduct during the project development. In accordance with their own project, they were expected to remember about analysis processes, prototype development, formative evaluation, material evaluation in terms of effectiveness, quality, usability, student learning and content accuracy. The answers of the students for evaluation process showed that they tended to define criteria for evaluation and they developed more concrete ways of evaluation. For example in her first answer, CS31 only mentioned the pre-analyses and prototype evaluation. In the second implementation she mentioned accuracy of the content, evaluation of prototype and evaluating end product with target group. In the *Group 1-7* which applied a proper evaluation CS27 answered that like below;

> *"Tasarım değerlendirmesi, içerik değerlendirmesi, geri dönüt" (C27, ID1, 9)*

> *Evaluation of design, content evaluation, feedback" (C27, ID1, 9)*

In the secod implementation he answered the same question like below;

> *İçerikle dizayn iyi oturmuş mu? Materyal hedef kitlenin ihtiyaçlarını karşılayacak düzeyde ilerliyor mu? Materyalin uygulanabilirliği var mı? Materyal beklentileri karşılıyor mu? (C27, ID2, 9)*
>
> *Is content and design compatible? Is the material is being developed in accordance with the target group needs? Is there feasibility of application of material? Does the material meet the expectations? (C27, ID2, 9)*

In this answer also "*target group*" which was another important issue emphasized in the second implementation of ID activity could be seen. In the first implementation although there were several answers related assessment of student learning in the second implementation more ways of evaluation related target group like "*satisfaction*", "*feasibility*", "*accessibility*", "*usability*" were stated. In the first ID activity although students proposed more developer based evaluations but in the second activity they emphasized the target group more. One of the female students' explains her evaluation process as like below;

> *Uygulamalar yaptırırdım. Ayrıca öğrenciler yapılan projeyi incelerken ne gibi tepkiler gösterdiklerini inceleyerek yargılar çıkarırdım. Projenin teknolojik kısımlarını, bu yöndeki eksiklerini de inceler buna gore düzeltmeler yapardım. (CS3, ID1, 9).*
>
> *Yapılan işleri sürekli olarak hedef kitleye ve uzman kişilere gösterip dönütler alarak ona göre düzenlemeler yapardım. Bittiğinde ise genel bir değerlendirme için tekrar gösterirdim (CS3, ID2, 9).*

As seen in her statement although she also takes the target students into consideration, in the second statement she emphasizes the role of target group more.

**Effect of the Rules**

In this sense the major issue was to find out a target group who would work with project groups effectively. In two years before the current semester, instructor had arranged a school which provided target teachers and students. Two teachers from a private school came and they explained what would be the procedure that they would apply and what they expected from the projects. This provided a step for a good communication with target group, and a consistency and continuity in feedback. A graduate student told this experience by saying;

> *… Biz bir kaç çizim yapıp, tekrar tasarlayıp, ekrana çizdiğimizde evet budur dediler zaten hani bizi çok yönlendirmişlerdi… Bu aradaki iletişimi de maillerle sağladık. Toplam 3 kere falan gittik, bir girişim gösterdik, şurası şöyle olsun diye bize dönütler verdiler onları düzenledik (GS1, Male, PI).*
>
> *… They said "yes that it it" when we made a few sketches, re-designed and drew on the screen, they already guided us much… We provided communication via e-mail in this process. We went there totally 3 times, we attempted, they gave feedback by showing "make this like that", then we re-design them (GS1, Male, PI).*

The influential issues in understanding the target group was summarized on activity system in Figure 4.15.

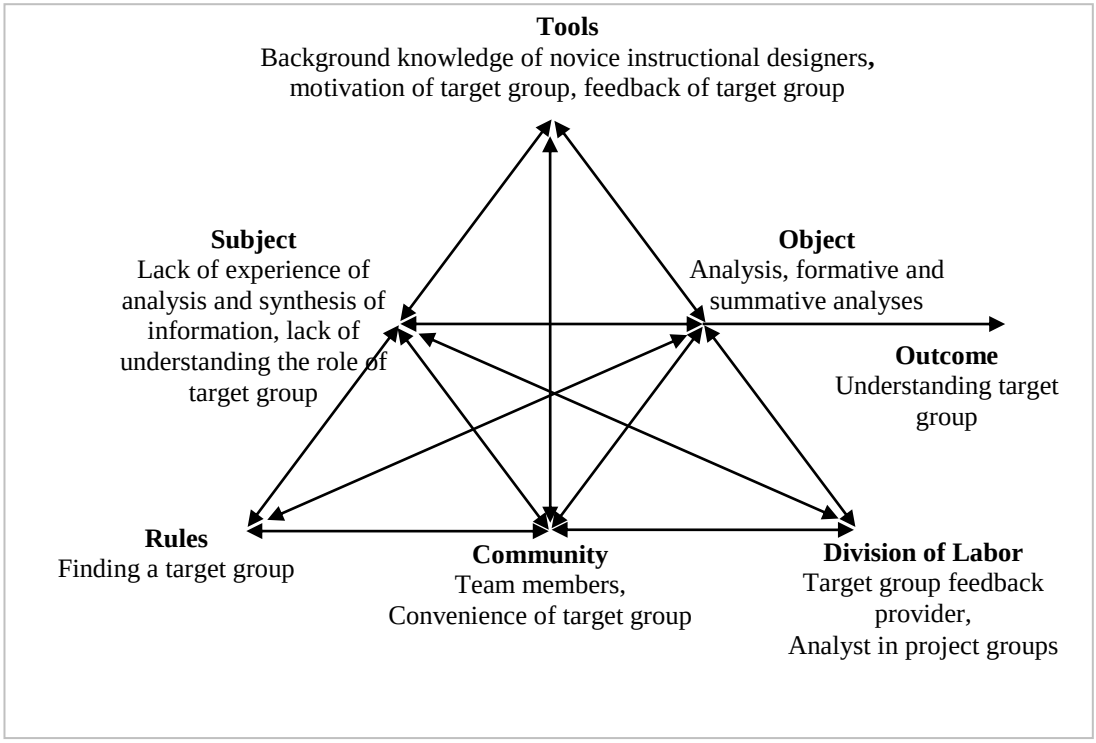



Figure 4.15 Influential dynamics on understanding the target group

### 4.6.5 Teamwork

As stated in instructional design competencies, "dealing with the friction among group members" is an important issue (Richey, Fields & Foxon, 2001). In team work students were expected to collaborate effectively, share all the work fairly, and finish the tasks in time and with quality. On the other hand, personal characteristics, expectations, personal relationship within group members, academic and technical skills influenced the smooth progress in team.

**Effect of the Subject - Community**

One of the problem was that there are group members who want very quality work and they expect all group members lead the group, ask '*what we are doing now'*, or finish the tasks as earlier as possible like *CS40* in *Group 1-11* and *CS30* in *Group 1-8*. The groups who have some trouble with one or more members had different experiences and they took cautions in different ways. In some cases groups tried to solve the problem or they just ignored that

member and continued without them. For example in *Group 1-11*, *CS40* had to deal with group members and convince them to work in time. This caused many troubles and further personal problems and loss of patience. On the other hand, *CS30* was not dependent to others, if someone did not do what he asked, he did not deal with it and just made himself. In both cases however, they did not have an effective teamwork experience because of the characteristics of group members.

In fact team work skills were also obtained from previous courses; however, in this context students cope with more group problems because of random grouping. It was the first time that they worked in randomly assigned groups. Although at the beginning most of the groups started well, towards the end in most of groups the one or two person who spent more effort than other group members. The context was helpful to make students inquire the group work and find a strategy to solve group problems. On the other hand, in some cases students just took all the responsibility of others to not beg them for working. As an example, in Group *1-8* there was a problem among two members (CS28, CS29), and they always accused the other one with not working well. Although the project ended well, the CS30 was the one who had to finish most of the parts to not listen complains of others. He also mentioned about this issue in individual interview by saying;

> *Tam birbirleriyle zıt anlaşamayan insanlar yani, o nedenle ben ortada kaldım hani şunu yap diyene kadar, bi tanesine işte o niye yapmıyo dedikleri zaman, iyi tamam deyip geçiyordum yani [kendim yapıyordum] (CS30, Male, PI).*

> *They were exactly the people who are opposite and cannot negotiated, that is why I standed between them, instaead of saying them do that,if the one said why the other one did not do that, I was saying OK and I did not deal with them [doing the task by himself] (CS30, Male, PI).*

This problem in communication was remained unsolved during the project and this caused member dominancy in the decisions. In the cases in this context teamwork competencies mostly derived from the problems of the group. However, the group members showed reactions differently. In this respect facilitator's role was very important to guide students in solving their group problems. For example one of the students (PS9) who took the course in previous year had to be a group with two another people who were known problematic. In individual interview PS9 stated that he had to be group with them since he had no specific friends to form a group. But he stated that he had no problem since the facilitator knew the other two problematic students and took cautions to make them work. He stated his experience with the problematic person with;

*Selim'in bir önceki dönemden bir sıkıntısı var hatırlarsanız, bu dersten dolayı uzattı diye biliyorum, bir önceki döneme nazaran Selim daha sorumlu bir yoldaydı, daha sorumlu bir insan profiili çizdi..Akif'le dedik ki Selim sen şunu yapacaksın, yapamam yok!, yapacaksın bunu artık, dedik o da onu yaptı… Selim'i bırakan F5 hocamızdı, ondan F5 hocamızdan çok çekindiği için bir önceki dönemde yapmış olduğu hataları bu dönemde yapmamaya gayret etti (PS9, Male, PI).*

*If you remember, Selim had a trobule at the previous semester, I know that he could not graduate because of this course, comparing to the previous semester, I think he draw more responsible profile. Me and Akif said that Selim you would do that, there is no chance to say "I can't", You would do that and then the did it. It was facilitator F5 who failed Selim, since he feared from F5, he tried not do the faults that he made in the previous semester (PS9, Male, PI).*

As understood the statement of the student, facilitator moderated the work of the group, the leader of the group could manage the group work by taking the confidence from facilitator. Since the problematic student was hesitating from the facilitator he did the tasks given by other group members. In some groups also facilitator had to divide the roles and graded each member for their own work. Thus the work progressed fluently according to the student. In team working it can be said that each student had different experience. Personality of the students and authority of facilitators also influenced the teamwork habits. In fact via random grouping students were expected to learn how to manage difficult situations of group working. On the other hand not many students could make their group members work effectively. Most of time hard worker students did more jobs than other group members, or they expected the facilitators to distribute the tasks. Thus they were free from the responsibility of others' part.

The group members who tried to make the others work might be assumed as they used the skills of solving group problems. For example, CS13 explained his experience with a troubled member;

*İşte o arkadaşla bir sorun yaşadık, bazı görevler yerine getirilmedi ama bir şekilde işte dışlamak yerine içine katmayı denedik ve oldu yani hocam, gruba katıldı o da sonunda (CS13, Male, PI)*

*We had problem with him, some tasks were not performed, but in some way we tried to incorporate him into the project instead of excluding, and it happened, he participated in the group at the end (CS13, Male, PI)*

In the second projects groups seem to work very well. At least they never stated them. Although the researcher observed that some group members worked more than others, in interviews they did not stated any negative issue about their second groups. This situation might be because of close friendship between the group members.

In team working the role of the facilitator is also very important. Facilitator made students work effectively as much as possible. Although the strategies that facilitator used were not always successful, but most of time it worked. For example F2 explained the situation in one of his groups by saying;

> *Bir öğrenciye toplantının iki tanesine gelmedi, baktım üzerindeki diğer elemanlara göre aktif değil, bir kaç uyarı yaptım bireysel görüşmelerimizde, ... mesela şu an süper, çalışıyor... hiç düşünmediğiniz bir şey söylüyorsunuz, o yetiyor, onun arkasından, rahatlatıcı bir mail yazıyorsunuz aslında işi daha şey [iyi] hale getirebiliyor (F2, Male, PI)*

> *One of my students did not come to two meetings, I felt that he was not active as much as other group members, I warned him a few times individually... And now he is working excellent. You are saying something without thinking on it, and it might be enough, and then you are sending a relaxing e-mail, and actually the work become well. (F2, Male, PI)*

In this situation warnings of the facilitator were enough, but in some case students do not care about those warnings. For example in Group 1-9, facilitator could not convince one of the members withdraw from the course. In Group10 also, CS36 stated he did not want to work with his group anymore and he did not care about others' and facilitator's insistences.

**Effect of the Rules**

Although students had some trouble in team working, the problems that they encountered provided some positive outcomes. For example CS40 summarizes her experience with working a group as;

> *Bu projelerde daha yakından tanıma şansı oluyor, tanımadığımız özelliklerini tanıma şansı buluyoruz, insanların hani ne kadar sorumluluk sahibidir, işine ne kadar özen gösterir önem verir, bunun ne kadar iletişimimizi kurabilir, ne kadar iyi iş yapabiliriz bunları anlıyoruz bu projelerde (CS40, Female, PI)*

> *In these projects there is chance to know [the person] closer, we could find the chance of knowing [people's] characteristics, how much they have responsibility sense, how much they take care of their work, how we can communicate with them, how much we can work well, we could understand these. (CS40, Female, PI)*

Random grouping was the most controversial issue in the first projects. However not many group had serious problems in working. Moreover, at the end of the first project the students realized the worth of working with different people. They recognized that being group with an unknown person provide them awareness of coping with different kind of people. CS13 student from Group 1-8 in the first project stated "*For group assignment, I will use the same strategy because if we do not do it this way, students will never have chance to learn how to work with different group members*" (CS28, Female, PI).

Another student stated that

> *Her ne kadar şikâyet ediyor olsak da bu grup konusunda, farklı insanlarla çalışmayı da bir şekilde öğrendik, bazı yöntemler geliştirdik kendimizie göre, bu çok önemliydi (CS11, Female, PI).*
>
> *Eventhough we are complaining about the group working issue, we learnt working with different people in a way, we developed some methods for us, and this was very important (CS11, Female, PI).*

Although towards the end of the first project students had positive attitudes for random grouping they also expected more criteria to create random groups. For example students let instructor know three students with whom they can never work. Some students asked instructor whether he could increase this number but instructor did not allow them. For example CS13 suggested that in pre-questionnaire students can be asked their favorite roles or the roles that they are good at doing that.

**Effect of Division of Labor**

The way that groups made division of labor also showed their teamwork awareness. For example, in *Group 1-7*, *Group 1-9* and Group *1-11* all work was shared equally. In *Group 1-8*, although at the beginning the work was shared equally, towards the end *CS30* undertook the most of the end product. In *Group 1-10* the division of labor was made very distinctive, girls were responsible to write reports and one male member was responsible to development of the project. Except *Group 1-10*, all the reports and the projects were consistent. Especially it was surprised that although in *Group 1-8* and *Group 1-11* there were group problems, the products were consistent since some of the members had more tasks to finish the project. In that case, teamwork experience was affected from a particular member.

To achieve a good teamwork, members need to make division of labor meaningfully and help others if needed. For example a student who worked with another facilitator in the first project stated;

> *Raporlama, analiz kısmında grup üyelerimle aktif bir şekilde rol aldım, Flashta development tasarım kısmı yani geliştirme kısmını alan arkadaşlarda tabi ki öncelik [iş yükü] fazlaydı yani kod kısmında ben yetersiz kaldım, .. Development kısmında onların yetiştiremeyecekleri kısımlarda ben devreye girdim ve ben hazırladım bazı sayfaları (CS13, Male, PI)*
>
> *I had an active role with my group members… For development in Flash, I mean the development part, the workload of other group members were more, I was incompetent in coding part… In the development part, I stepped in the parts that was not possible to be fulfilled by others, and I prepared that screens (CS13, Male, PI)*

As exemplified before, in CS13's group, they were also accomplished to involve a member who did not work with them. This success of group working might be reasoned by the harmony of the work between the members. In another group also a female student had trouble with other group members because of lack of collaboration in the group. She worked in each piece of the work. She says;

> *Başlarda rapor yazarken gittik gezdik [okul ziyareti] bir arkadaşla birlikte yaptık ikimiz raporları filan. Sonra geliştirme kısmına gelindi, o tamamen çekildi. Ben de başka bir arkadaşımızla bu sefer şey yaptım, onların işlerini de biz ikimiz yapalım dedik (CS15, Female, PI).*

> *At the beginning while writing report, we visited schools with one of the friends, we did report, etc together. When the development phase came, he withdrew[from working ]. That time, I started to work with another group member; we thought we would to others' work (CS15, Female, PI).*

She also mentioned she had a health problem because of the stress of this project. She was not pleased with the quality of work as well. When she saw other members' work, she felt it needed improvement and she worked on those parts again. In this case also her personality played a role on the perception of teamwork. As understood she did not try to make others work as much as her. She focused on finishing the whole work. Therefore, their group, division of labor was not clear.

As seen there are many different issues related teamwork. Although many students liked the idea of working with different people, not many of them manage the problems. The issues influencing teamwork skills located on activity system as shown Figure 4.16.

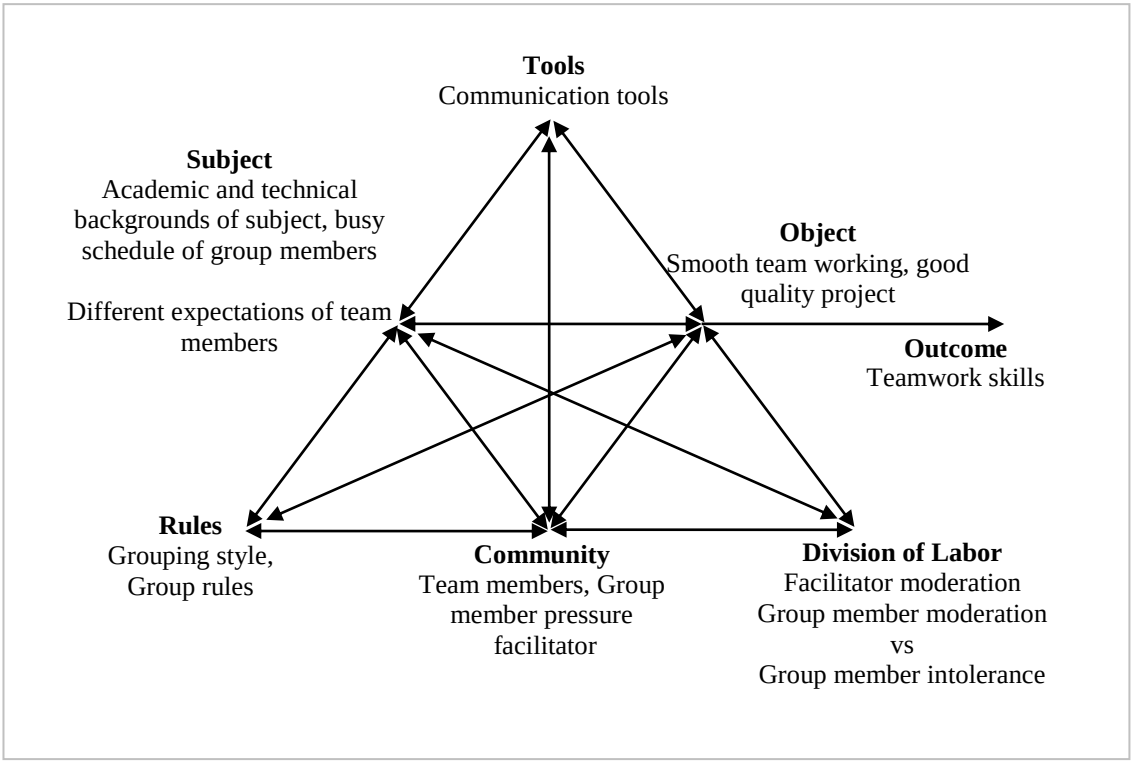



Figure 4.16 Interaction between the influential dynamics on teamwork experience

As seen in Figure 4.16 grouping type, expectations and background of students, interventions of facilitator and other group members had an effect on teamwork experience. The groups who had problems investigated how to cope with other members if they could manage other members smoothly.

### 4.6.6 Project management

Project management influenced from the community and especially from group members' characteristics. The resources were specified and the facilitators were managing the processes already, thusfor the NIDs project management was "*to manage the group members*" rather than "*to manage resources and processes*".

**Effect of the Subject - Community**

The problems in teamworking prevented effective project management. A leader in the first project complained about the quality of the parts that were made by different members. Her expectation caused working on the parts that was finished by others. She stated;

> *Ben hadi şu kararlaştırıyorum tamam yapıyoruz ama, şeyde sıkıntı var. Mesela sen bunu yapar mısın diyorum tamam yapıyor ben tekrar kontrol ediyorum, çok kötü olmuş ondan sonra iş bana kalıyor (CS15, Female, PI).*

*I was determining something, ok we are making it, but there is problem there. For example, I am asking whether you do that, s\he do that and I am checking it, it happened very bad, and then that part remains to me (CS15, Female, PI).*

Since the facilitators were the one who manage the work, students did not feel much responsible to manage the group well. They had to cope with the problems in the project, the group problems and the target group, and all those things at least provided experience to solve problems.A group leader who had problem with a group member states his experience by saying;

*Bir de şöyle bir şey var, karşı taraf benim ne dediğimi anlıyor mu o da var, benim dediğimi anlayıp da yapıyor mu yapmak istiyor mu, çabalıyor mu, bunlar birer sıkıntı grup çalışmasındaki sıkıntılar, ama nasıl yönlendirilmesi gerektiğini anladım, feedbacklere [facilitator feedback] göre bunu yönlendirdiğimi düşünüyorum (CS9, Male, PI)*

*There is another thing too, whether the other person understand what I mean, whether he understand and do or want to do what I said, whether he strove for it, each one of these are troubles, troubles in group working, but I got how to guide [those issues], I think I could guide in accordance with the feedbacks [facilitator feedback].(CS9, Male, PI)*

As student stated facilitator feedback provided students to see their improvements and thus leader students took the feedback as object of the group work and they regulate the work in accordance with facilitator feedback. In this statement, it can be understood that the group had some trouble at the beginning and then the leader could cope with the problems and accomplish to have group members work in accordance with feedback of the facilitator.

**Effect of Division of Labor**

Leadership role was important to see the possible team problems. Although leaders were expected to manage the group, most of time another responsible student helped them. Because of the heterogeneous structure of the groups, in the first projects except a few groups, a member had trouble either with working or the group members. In this case there were different solutions for the groups. In Group 1-11, CS40 put much effort to make others work because others were not much motivated to create different things. In Group 1-8 for example, CS30 could not manage the others to work as much as him, and then he finished most of the project. He was not the leader on the contract but he had to behave like a leader because of the problems between two members in his group.

In project management leadership role was very important to manage the processes and the group problems however this role was not implemented well as mentioned before. These roles most of time are given upon the skills of the students and gender. Without exception, in all groups of researcher, females were the leaders of their groups. Both girls and boys

admitted that girls can plan and organize a work better than boys. A foreign student from Group 1-8 exemplified this by saying "*I was a leader of the group. First of the reasons is that I am the only girl in a group. Another reason is I was chosen by the whole group members (CS28, Female, PI).*

On the other hand this leadership always did not mean leading the processes and organized the tasks. Although at the beginning leaders tried to lead group, shared the tasks, monitored the tasks, in a time they could not make others work. Roles changed, for example, in CS28's group, CS30 turned to leade. In Group 1-10 CS35 was the leader but at the end CS36 ignored all the work done by leader and other member and he did whatever he imagined.

In some cases it was understood as the combining the work and finishing the parts that was remained incomplete by other group members. One of the students exemplified this by;

> *Ben şeyde lider durumundaydım, birleştirme kısmını ben almıştım (CS9, Male, PI)*
>
> *I was in the role of leader; I took the part of combining (CS9, Male, PI).*

In the *Group 1-10,* at the beginning CS36 insisted on that CS35 should be the leader, and on their contracts they wrote that she was the leader. CS36 explained his perspective on this by saying;

> *CS35 lider değildi, aslında projede lider yok gibiydi, kararlaştırıyorduk hep beraber aslında CS35'i lider yapmak istiyordum çünkü iyi biliyordu hangi bölümü kim yapsın, rapor olayını da çok iyi biliyordu işte diyordum CS35 sen ol, sen paylaştır herkese öyle de yaptı zaten (CS36, Male, PI).*
>
> *CS35 was not the leader; in fact it was like there was no leader in the group. We were deciding all together, I wanted CS35 to be leader because she knew which part should be made by whom, she knew about reporting as well, I was saying 'you should be the leader, you share the tasks' and she already did what I said (CS36, Male, PI)*

In the statement of *CS36* it can be interpreted that leadership meant that working more than others, combining the work and share the tasks. Although he accepted CS35 as a leader, during the project she could not manage the group because of lack of motivation of others. Since her technical skills were not good enough, she could not continue without others either.

In fact, beliefs of females are better in writing comes from the previous courses. Their previous experience also made them to think that girls are most suitable for leadership since their organization skills. On the other hand, as this role required, they did not try to solve the group problems, motivate group members to produce quality work, and manage the time.

Therefore, there was a need of explanation about the role of the leader and monitor the each role in the group. In Figure 4.17 issues influencing project management skills are shown.

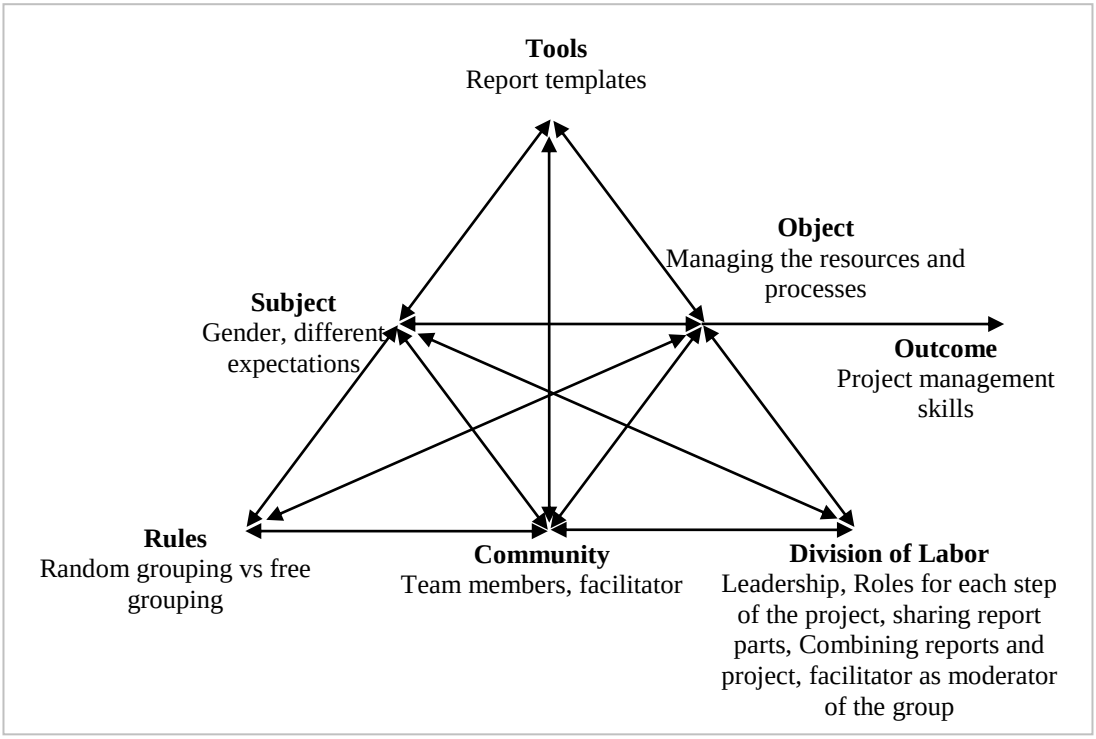



Figure 4.17 Influential dynamics on project management experience

As seen in Figure 4.17 personal characteristics are important because of random grouping. However like being in teamwork, facilitator's role might be tracing the issues in the group and apply some interventions to solve problems. For example, one of the most important problem is that students eaily withdraw themselves if they challenge in working in a certain part of the project. Thus facilitator should recognize these issues and manage the division of labor process and support students to improve themselves.

### 4.6.7 Message design

In this course context especially screen design was considered by the students. Although they considered their target group in analysis and design processes, towards the end they just did whatever they could do without thinking their analysis and design processes. In effective design *report templates*, *priorities of the NIDs, time limitation*, and *understanding of effective instruction* played important role. Although they also used examples, real life examples and practices, the student especially thought visual attractiveness and game like

design will provide the effective learning. In the meetings their main concerns were the visual design of the project more than thinking how the target group would perceive the project. This might be an advance skill; however in this context also cognitively engaging strategies for different target groups should be emphasized.

**Effect of Community**

Although NIDs could not conduct any evaluation process, most of the time facilitators and NIDs discussed on design of the projects in the meetings. This might have provided a perspective of usability issues as stated by PS9. Students' preferred motivation providing strategies in message design also might have been changes during the course. To check this, in ID activity students were asked about what kind of motivational strategies they should implement in the project. In first ID activity 34 students answered the question related how to provide motivation in the project while in the second one 35 students answered it. 26 of the students answered that question in both of activities. As seen in Table 4.32. Although students believed that audio visual elements are important since the beginning, towards the end preferences of target group was considered much more than in the first implementation of ID activity. Secondly, beloved cartoon or comics characters were stated as motivator in the second ID activity. These two preferences seem to be influenced their processes. Especially since they were encouraged to use a character to provide interactivity and feedback, their motivation perception might change.

Table 4.39 Motivational issues students preferred in ID1 and ID2

| | **ID1** | **ID2** |
|---|---|---|
| Audio - visual elements | 9 | 14 |
| Motivation elements in accordance with target group expectation | 1 | 13 |
| Beloved characters | 4 | 12 |
| Games | 15 | 9 |
| Feedback | 4 | 8 |
| ARCS | 3 | 6 |
| Interactivity | 1 | 5 |
| Funny elements | 3 | 0 |

As a conclusion, effective message design was mostly influenced the tools that was used like report templates and storyboard templates. Report templates forced students use definite approaches and methods. On the other hand students get awareness of the importance of target group's expectations in designing instruction. In this context, all groups developed effective message design strategies in design, but since they could not apply everything on development tool, some group's end products did not reflect their actual design.

**Effect of the Tools**

In development different issues emerged like difficulty in using development tool. In weekly meetings many ideas emerged about the projects. At the beginning for example in *Group 1-11*, *CS40* had many ideas for target group; she brought the idea of using Cedric as the character of the project. In the *Week 2*, she mentioned why that character is suitable for their project, she believed that both girl and boy students would like it. She also stated that they did not want to give any text content she said they would prepare completely interactive, audiovisual and animated project. In their mind, the project would like a game. In interview *CS40* reported this process by saying;

> *Tasarlamak istediğimiz şeyi nasıl yapacağımıza karar verdik; aşama aşama neler yapacağız, belirlediğimiz konuyu nasıl sunacağız, nasıl görsel bir içeriğe taşıyacağız, onu nasıl cezbedici bir hale getirebiliriz. Bunlardı bizim için önemli olan. Daha sonra bunları modelimize nasıl uyduracağız. onlara birebir uyacak mı o [düşündük] (CS40, Female, PI)*

> *We decided how we will do the thing that we would do; what will be do step by step, how will we present the topic that we determined, how we will transfer it to visual content, how we will render it as attractive. Those were the things that important for us. Then, [we considered] how we will match them to our model, will they match properly. (CS40, Female, PI)*

As she reported, they considered the instructional approach. In this context, students felt that each of their decision should be suitable to instructional approach that they chose. Like Group 1-11, in Group 1-8, CS30 also stated that their project would like a game in the fourth week. The sample project which was showed in the class was effective on this idea. With interesting ideas novice instructional designers especially focused on the motivational issues like taking attention and visual attractiveness. They also used many cognitively engaging strategies.

Revisions of the material were important to develop an effective material. Students had no time to make revisions on their materials. At the beginning also this idea was very surprising for them. When mentioned in the meeting, CS32 was very surprised for example and he said "*Oh will we changed in the program as well*". No students made any revisions in their developed project except Group 1-7. For effective design evaluation was very important but they did not have time to do that. Although students could not implement any evaluation process, one of the former students who is also working as a programmer stated his experience of message design by saying;

> *Geçenlerde bir program yazdım… Delphide yazdığım prograalarda şimdye dek renk uyumu olmazdı, benim tek odaklandığım nokta yaptığı işti. Ben mesela bir buton yazarım, bu butona kırk tane satır kod yazarım, çok harika işler yapar ama o butonun*

*görüntüsü çok kötüdür ve kimse buna güvenmez yani öyle bir iş yaptığını zannetmez ama bir de onu güzel sunmak var, bu dersın projesında bunu farkettım ben (PS9, Male, PI).*

*Recently, I wrote a program … Up to now, there was no color harmony in the programs that I wrote in Delphi, the thing that only focused was the job that it perform. For example, I create a button, I write forty lines script and it does perfect job but its appearance is bad, nobody trust it, nobody think that it makes good job but it differs if we present it a nice way, I realized this in the project of this course (PS9, Male, PI).*

A graduate student also had similar experience in her work places, she admitted that engineers in her workplace could thinkg of programming but she said;

*Ben şeyi düşünebiliyorum yani bir kullanıcı bunu bunu kullanır mı beğenir mi? Onun için efficient user-friendly mi? bunları ben düşünebiliyorum, o yüzden de bunlar sence böyle olsun mu diye bana sormaya başladılar anladınız mı bu güzel bir şey yani bu da benim o derslerden aldığım eğitim backgroundundan aldığım bir şey (GS3, Female, PI).*

*I can consider whether the user use it or like it. Is it efficient, user-friendly for him. I could thinkg them, therefore they started to ask 'is this happen like this' , do you know what I mean, this is nice thing, and this is a thing that I got from those courses (GS3, Female, PI).*

The issues are summarized on activity system given in Figure 4.18.

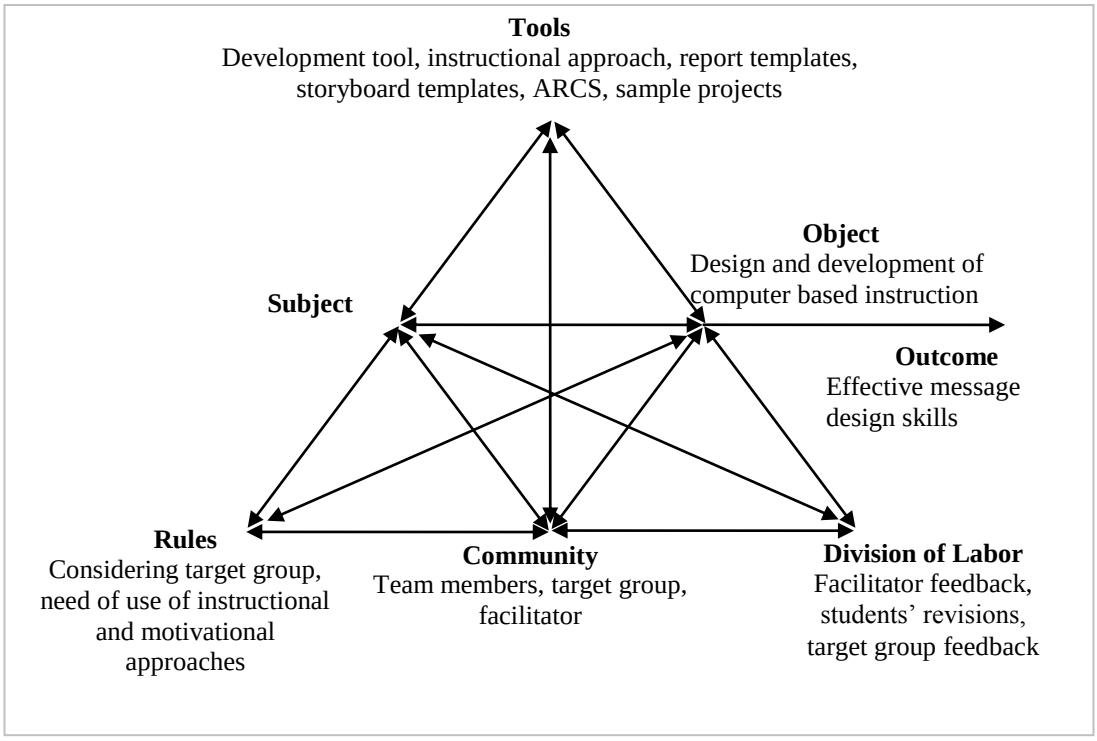



Figure 4.18 Influential dynamics on effective message design experience

Although students designed motivational elements and cognitively engaging strategies, they could not apply them because of lack of skills to use the tool. The time limitation was also effective issue to develop all the designed parts. On the other hand, students get many feedbacks about their design and facilitators tried to make novice instructional designers through the lens of children. Thus, since even they could not work with target group effectively, they could get awareness of effective message design. On the other hand, still there was a need of understanding the expectation of target audience with continuous feedback.

### 4.6.8 Storyboarding

In stodyboarding first of all the template of storyboard, misunderstanding about storyboarding and lack of analysis of development tool influenced the experience of NIDs. Especially lack of tool analysis caused NIDs to devbelop unfeasible storyboards. Since NIDs underestimated the importance of storyboard they did not provided most of the details.

**Effect of the Subject - Community**

Although he complained about storyboard template, in fact it was given an example, however, because of students' expectation of exact examples; they sometimes spoke out issues related lack of examples. Further he also mentioned that they needed many back turns in their scenario and the storyboard did not allow them to do that. On the other hand, same student stated that he learn what they had to do with storyboard with the feedback of facilitator, he said;

> *[storyboard'ı] ilk yaptığımızda çok güzel olmuş dedik, götürdük [facilitator'a] feedback almak için, bir sürü eleştiri aldık ki ki haklıydı hocamız [facilitator] da, orda anladım storyboard ne demek olduğunu (CS9, Male, PI).*

> *When we developed [the storyboard] at first, we thought that it was very nice, and took it to [facilitator] and then get many criticism, actually facilitator was right, I understood what a storyboard meant (CS9, Male, PI).*

Like CS9 the students always needed a reasonable explanation for each of their steps. Storyboarding was important to analyze the limitations of development tool and making concrete decisions on the methods and strategies to be used. On the other hand storyboarding process was not effective since students did not bring their storyboards in time and not get feedback from the facilitator.

**Effect of Subject - Tools**

Storyboarding seemed unnecessary for the NIDs at the beginning. They argued that they could not draw a storyboard before developing their project. Therefore, it can be said that was a misconception about storyboarding. Since NIDs had very short time to develop their project after design report the facilitator asked them to develop their storyboard properly. They submitted their design report in 8th week but the facilitator suggested them prepare the storyboard draft in 5th Week in the first project. However, the facilitator had difficulty to make NIDs draw a storyboard before submitting design report. No project team brought their storyboard until the submission of the design report. As a reason they posed that "*you did not ask us storyboard for certain*" . Because of the lack of storyboards, during three weeks, students only brought their tentative ideas; they tried to create a certain idea in the meetings. On the other hand in next week they happened to forget about their previous ideas. In the first project, no groups made a satisfactory storyboard. After developing reasonable and feasible ideas on storyboard, realized that storyboard made their job easier. For example from Group 1-9, which debated with facilitator about storyboard, CS34 summarized their storyboard experience as;

> *Storyboardı hazırlarken daha projemiz hazır değil ne alakası var niye yapalım ki, ürün çıksın bir ondan sonra yapalım diyorduk başında. Ama bunun materyali hazırlarken onun önümüzde olmasının ürünün kalitesini arttırabilecek nitelikte olduğunu düşünüyorum/ Çünkü biz bir öğretim yöntemini seçip o öğretim yöntemin nasıl uygulayacağımıza karar verip ondan sonra storyboardları hazırladıktan sonra materyal kendiliğinden ortaya çıkıyor (CS34, Male, PI)*

> *While we were preparing storyboards, we were saying that ' why we do that, out project has not been ready yet, after the product is developed we shall do it'. However, I think getting the storyboard available has potential to increase the quality of material. The material automatically emerges after preparing the storyboard by selecting the instructional method and the way we use to implement the method (CS34, Male, PI).*

One of the reasons that students postponed the storyboards was that it seemed too long process. They had to make decisions on each screen, draw it and write the function of that screen. That is why each group asked '*how many pages of storyboard we are supposed to draw'* and when they were said they had to show every single page of project and they were surprised much. Another reason was that the first project was difficult to represent on a storyboard structure. In storyboard students had to show each possible actions of the users that meant they had to show same screen in several times. Unless making this, their storyboard was like a normal visual design sketch without the flow of the project. Lastly, they claimed that they cannot draw good graphics with hand. Facilitator asked them draw very tentative sketches like stripe characters. Yet, all storyboards of the first projects were not like a real storyboard but like a detailed visual design sketches.

Apart from aforementioned problems, the templates and example of storyboard might lead students have misunderstanding, because as an example a storyboard of a game was given. A student stated the problem as;

> *Dizayn raporunda sorun vardı, o storyboard [şablonu] normal bir storyboard değil ki bana göre çok yanlış bir storyboarddı, çünkü orda bizim projemize uygun değildi, bu bizim için bir sıkıntıydı, [projemizi] ona uydurmaya çalışıyorduk (CS9, Male, PI).*
>
> *There was problem in design report, that storyboard [template] was not a normal storyboard, yet it was very wrong storyboard, because it was not suitable for our project, it was a trouble for us, we tried to adjust [our project] to it. (CS9, Male, PI).*

In the second projects storyboarding process was more effective. Not only students experienced from the first project, but they were also aware that without a storyboard they would have difficulty in video recording. In the second project, before the approval of facilitators, they did not start video recording. Facilitators examined and approved the storyboards. On the other hand, because of the lack of practice in video recording site, students had to change the angles, distance of the camera or the time that they allocated for a scene. A student in the second project groups said;

> *Biz çekmeden önce farklı ortamlar düşünebiliyorduk, hani arkadan çekeceğiz diyebiliyorduk, bir şekilde nasıl görebiliriz['i düşündük], bir de zoom yapmamayı düşünürsek o konuda bir değişiklik oldu. Ama storyboardda [tüm konuyu] birbirinden kopmadan güzel bir şekilde yansıtmaya çalıştık (CS13, Male, PI).*
>
> *Before making video recording, we were thinking different angles, we could say we will record behind of it, [we considered] how we could see it, additionally when we considered that we would not do zooming, there were some change. However, we tried to reflect [all the topic] without interruptions on the storyboard (CS13, Male, PI).*

In CS13's group there was also an exception, they made their video record before submitting the design report. Therefore, they developed their storyboard much before the design report. Although this was against the rule of the course, they could only get permission for a specific time before the submission of design reports. They got one revision from the facilitator and record their video.

In the course, students had problems with storyboarding in the interactive multimedia projects since students had difficulty in specifying many things before development and because of lack of tool analysis. Therefore, only the first project was not enough to provide a good storyboarding experience but at least it provided an awareness of importance of storyboarding. The effective issues on storyboarding skills are shown in Figure 4.19.

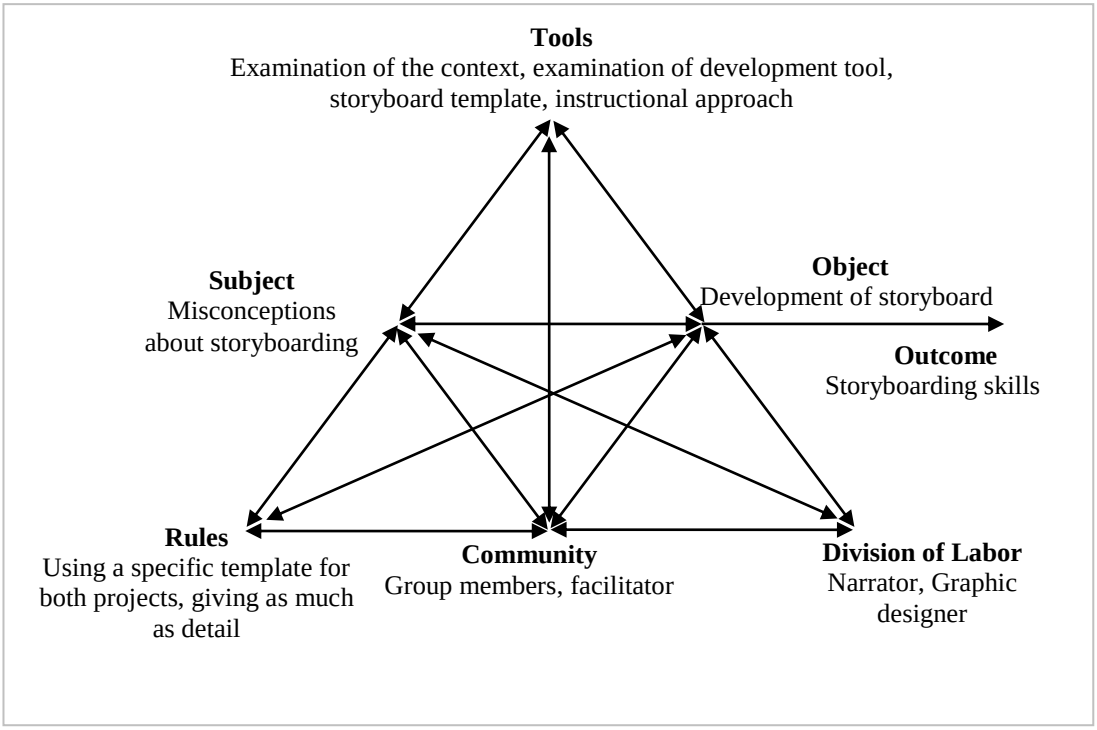



Figure 4.19 Influential dynamics on storyboarding experience

### 4.6.9 Content development

One of the roles of team members was to develop content. Content development included searching and narrating the topic, developing assessment questions, scenario of the game, still pictures and animations, and appropriate navigation between the content. Facilitators emphasized that the content should be narrated in accordance with the target group. They were also encouraged to use as much as visuals and animations to support their instruction. Thus they would be expected to have content development experience. On the other hand division of labor sometimes shadowed or increased the experience on content development.

**Effect of Community**

In the first project although students talked to teachers as subject matter experts, teacher's assistance was limited with suggesting a resources and some misconceptions of their students. Apart from it, students created the content by themselves. That was some painful process since while students tried to create a visually rich environment while specifying content and find good strategies to present them. CS13 uttered their content creation process by saying;

> *Ben fen ve teknoloji kitabına baktığımda çok yetersiz gördüm mesela. Biz kitaptakinin aynısını yazmış olsaydık, içerik olarak projede hiç bir şey görünmeyecekti … her gün*

*detaylı araştırdık, içerik konusunda biraz daha yardımcı olunsaydı, neyi anlatsak mesela, onu anlatsak mı acaba bunu anlatmasak mı gibi ikilemlerde kalmazdık (CS13, Male, PI)*

*When I checked the Science and Technology textbook, I felt that it was insufficient. If we would have written the content directly from the textbook, there would nothing appear on the project. Every day we made detailed search, if there would be help on the content, like what we need to present, whether tell about something or not, we would not have been in a dilemma (CS13, Male, PI).*

As understood his explanation, he expected an available content rather than thinking on it to select the important parts of the content. On the other hand, this dilemma was helpful to get insight to consider the target group and their characteristics while creating the content.

**Effect of Division of Labor - Tool**

The problem in division of labor and extensive burden of different parts of the project caused lack of experience on content development. In the groups which each deliverable was shared by each group member had more experience with content development. In Group 1-9, all members worked on each deliverable, although their project was not good in terms of usability and suitability to target group, they made their project very interactive. They used less text more visuals. CS31 explained her role in the group as;

*Animasyonları ben yaptım, projede kullandığımız animasyonları. Zaten bölüştürmüştük [projeyi], üç kişiydi bizim grubumuz, tabi yapmak zorundaydık [bölüştürmeyi], yaptım çünkü script [yazmak] gerekmiyordu animasyon yapmak için (CS31, Female, PI)*

*I prepared the animations that we used in our project. Already we had divided [the project], there were three people in our group, of course we had to [share], I did because animations were not required [writing] script (CS31, Female, PI).*

Development of the lecture parts was also very important. In project most of time students use the text directly from textbooks. However, *Group 1-11* provided very good narrative and suitable visuals in their development. *Group 1-7* developed the most creative idea by singing several songs. They narrated their songs and *CS27* sang it. However the melody was familiar with elementary students since it was taken from a children song "Bugün 23 Nisan" (Today is April 23). Although all groups designed their projects with sound Group 1-7 could do that. *Group 1-11* also used sound but it was much more limited than they stated in their design. The groups who proposed to use sound realized that adding sound to animation is not easy. Especially since they had to voice those sounds, they had no much time to develop a narrative, find suitable place to voice it, use sound editing programs and match the sound with the animations. Therefore, those groups could not experience on using sound in multimedia. In *Group 1-10* also students took the majority of the content from Internet

because of the time limitation. In their instruction they did not use any motivational strategy and instructional principles.

In the second project one of the members from each group had a role of subject matter expert. In the first meeting of second projects, Group 2-12 brought their project topic as the Letter Organization in ILKYAR. It seemed not worth to make a project. On the other hand, CS13 who is experienced member of ILKYAR provided good explanations why that topic was important for ILKYAR. He also knew the head of ILKYAR in person. Working in ILKYAR, CS13 also knew about the context, therefore they had comfort of creating content and knowing about what they would record. He explained this;

> *ben bu süreçten [ILKYAR mektup organizasyonu] haberdardım o nedenle analiz kısmında sıkıntı çekmedik. [ILKYAR'da] Gönüllü olduğum için orda çekiden sıkıntıları az çok biliyorum, odaya her gün gittiğim için ihtiyaç analiz kısmında orda cidden farkındaydım. Orda yazılan şeyler [yazılı materyaller] yetersiz oluyor mesela. Bu [proje] da tam üzerinde oldu [denk geldi] (CS13, Male, PI).*

> *I was knowledgeable about the processes [the letter organization in ILKYAR], so we did not have problem in analysis part. Since I was voluntary [at ILKYAR], I knew about the problems in there, since I go there every day, I was aware of the needs. For example the printed things [printed materials] are insufficient. This [project] exactly matched with this need.*

The issues influencing content development are summarized in Figure 4.20.

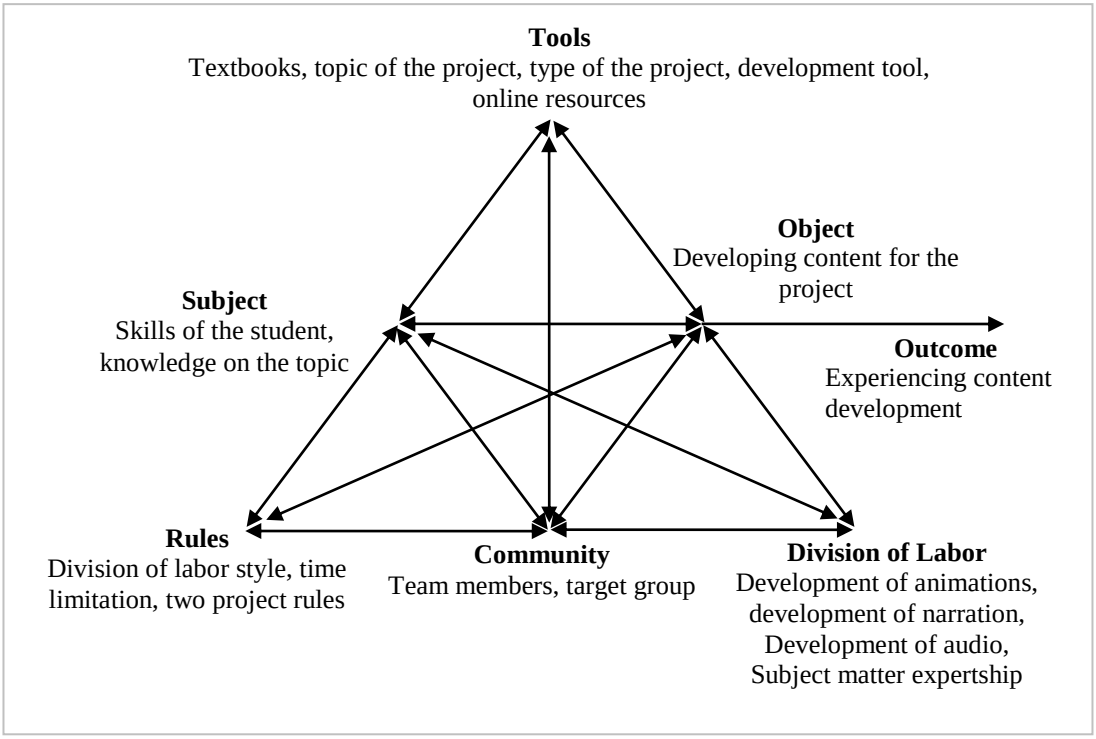



Figure 4.20 Influential dynamics on content development experience

### 4.6.10 Research and Reporting

Reports were very important to understand the instructional design perception of novice instructional designers. Reporting, interviewing with target group and search for topic were the processes which lead students make a small research. Some reports were written with lack of synthesize of the information or lack of understanding of the learners, teachers, instructional approaches and strategies. The NIDs were experienced with writing a report before the course. On the other hand, it was the first time that they use strict templates. In the reports they also needed to use their analysis and synthesize skills. This made students see the reports as a burden and they believed that there are people "*those who write good* report" and "*those* who *have no reporting skill*". In fact in this context, it is not wrong to say that for the NIDs reporting meant "*knowing what to write on the templates*" rather than "*analysis and synthesize of information and reporting necessary data*". Therefore, NIDs background and misbeliefs had crucial role in experience of research and reporting skills.

**Effect of Community – Division of Labor**

As mentioned in the first part in many groups the females were responsible with writing the reports. This strict division of labor caused lack of improvement of skills of reporting. For

example in *Group 1-10*, CS36 never contributed to the reports since he did not like to work on report. Similar cases were available in the teams in which there is a male member who is responsible with development of the project. The group members only wrote reports could not paid attention to development of the project like in *Group 1-10*.

Except from students' division of labor, community's division of labor was also important for reporting skills. The role of the facilitator was to eliminate the misconceptions on the reports. At the beginning of the first project, in analysis report the researcher had longest meetings since students had a lot of objections about her feedback. The main reason was that in reports they added directly what target group stated and did not synthesize the requirements of the target group. After a long debate the groups understood what they were supposed to do in the reports. As student stated his experience with writing report says;

> *birinci projede biz görüşmeleri [hedef kitle görüşmeleri] rapor içinde kullanmıyorduk, facilitatorumuzun etkisiyle şimdi onları rapor içinde de yazıyoruz (CS34, Male, PI).*
>
> *In the first project we did not use the meeting notes [of target group meetings] in the reports. Now, with the effect of our facilitator we are writing them in our reports (CS34, Male, PI).*

As CS34 facilitators had positive effect on the clarifying the missed points in the reports. This also provided advantage for the students to not ask many questions about the parts of the reports.

In the first projects students had no clear idea about the parts of the reports. Most of time in group meetings facilitator explained each part of the report to clarify in students' mind. On the other hand, sometimes facilitator guidance was ignored by the students. For example, the researcher accompanied with *Group 1-8* to talk with target group teacher. The teacher was teaching in a private school and he asked project group develop their projects for only one hour of their lesson of 1 to 3rd grades. He mentioned a lot of contextual issues which should be considered for the project. He mentioned about the specifications of the computers in their labs, expectations of his students, he also mentioned about what he did not like about the previous project that he used and what he really expect from the project. However except technical aspects of the computers the students ignored to report all other things. By ignoring to report those issues, the group also forgot about locating many of those issues in their design as well. Apart from taking the ideas of target group, students were encouraged to collect data from as much as they could collect. On the other hand, although they reported that they used literature, resources of Ministry of Education they did not presented their synthesis of these resources.

In the first project, meeting times took much time and they send much more messages to ask about "*what we are supposed to write in that part*". In the second project they only had struggle in storyboarding part since it was different than the first project's style. They had to show each angle and time for the scenes. A student explained how reporting in first project influenced his second project progress;

> *Rapor konusunda, kendime baktığım zaman baya bir kendimi geliştirdiğimi düşünüyorum. O yüzden, baya bir deneyim aldığımız için, ona gore [rapor] yazabilmenin rahatlığı var, [eski] raporumuzu tekrar okuyoruz, kendimiz de eleştirebiliyoruz en azından (CS9, Male, PI).*

> *When I ask myself, I think I improved myself about reporting much. Therefore, because we had much experience, there is the comfort of writing [reports]; we are reading our [old] reports, at least we could criticize ourselves (CS9, Male, PI).*

**Effect of the Tools - Community**

In the reports it could be easily seen the NIDs' understanding about their learners, understanding of the context that they present their projects and skills of matching instructional strategies to their task analysis. To improve this skill, in lecture time also an activity was implemented. In the lecture time students were given an interview and they were asked write need, learner, and content and context analysis by using the interview.

With the experience of the first project, in the second project students did not have any difficulty in writing the reports. Especially those who experienced on reporting posed better reports. A student who worked with researcher in the second project stated;

> *Rapor açısından, ben fazlasıyla kazanım aldığımı düşünüyorum çünkü ikinci projenin analiz raporunda, [instructional] approach kısmını ben yazmıştım, arkadaşım demişti ki ne yaptın bir sayfa filan yazdın demişti, şimdi artık neyin nerde olması gerektiğini anladığımı düşünüyorum (CS9, Male, PI)*

> *In terms of reporting, I think I get far beter outcome, because in the second project's analysis report, I wrote the [instructional] approach part, my friend said, 'how did you do, you wrote almost one page'. Now, I think, I understood what should be in where (CS9, Male, PI)*

In fact the students could write more detailed *'instructional approach*' parts. However, even one page instructional approach seemed as a success for the student CS6 who CS9 mentioned. This showed that it seemed like a burden for other student. Although these two students worked very well in the first project, in interviewing with CS6 it was apparent that he had not a good group working and good division of labor, he says;

> *Yani o ayrıntılara [dizayn raporunda] fazla giremedik daha önceden bir tecrübemiz olmadığı için yani tam araştıramadığımız için, ne yapacağımız kafamızda oluşmadığı*

*için dizayn raporumuz eksik kalmıştı aslında… Belki üstünde çok düşünmüyorduk, bir de grup projesi olduğu için, zaten çok buluşma olmadı. (CS6, Male, PI).*

*In [design report] we could not give details, since we did not have any experience before, I mean since we did not study accurately and the thing that we would do was no formed in our mind, our design report stayed defficient actually. Perhaps, we did not thought on much since it was a group project, after all there were not many group meetings (CS6, Male, PI).*

It can be interpreted that CS6 had not good group experience in the first project, but CS9 also had many complains about the first project group. On the other hand, since CS6 did not deal with group members who were not hard worker and did not go for solutions. In interview with CS6 his perspective was very negative about the first project. That is why he surprised with the work of CS9 and found his work very detailed. It should be noted that CS6 and CS9's GPA's were not so different, and even CS6's is slightly more than CS9'S. CS6's GPA was 3.3 while CS9's GPA was 3.19. This was a good example that the group members had an effect on the perception of experience. Shortly, it can be said that CS9 in the first project dealt with reporting much. In interview in many places he inquired and criticized the templates of the reports. On the other hand this inquiry helped him develop a good sense of writing a piece of report. They got a full score in their first report of the second project.

**Effect of the Tools - Rules**

In the reports sometimes students just wrote something just because it required like that. For example in a weekly meeting in *Group 1-9* a debate was raised, students argued that everything is ready in report templates and it was impossible to write something different than the template. They had to adjust all their design to a specific instructional approach. CS33 also stated that everything was restricted with the templates therefore all the processes were ostensible. He said;

*Üç beş seçenek olsa bu şekilde çıkarım yaparız ama rapor yazılırken sorular da sonuçlar da belliydi, o nedenle sadece gitmek için gittik öğretmene (CS33, Male, Week5)*

*If there would be several options, we could make an interpretation in this way, both questions and answers were apparent while writing the report, thus we went to teacher just to say we did that (CS33, Male, Week 5)*

It can be said that students' experience in analysis and design phases was limited with the report templates in some extent. To write the reports students had to finish some processes, collect data, communicate with target groups and observe the resources. After collecting resources they had to synthesize the results which can be applied to the projects. The report templates were crucial for understanding the processes. There were explanations and

guidance for each part of the phase. That is why each phase of ID project mainly sounded as "*writing reports*" for the current students.

The isues might be listed in Figure 4.21.

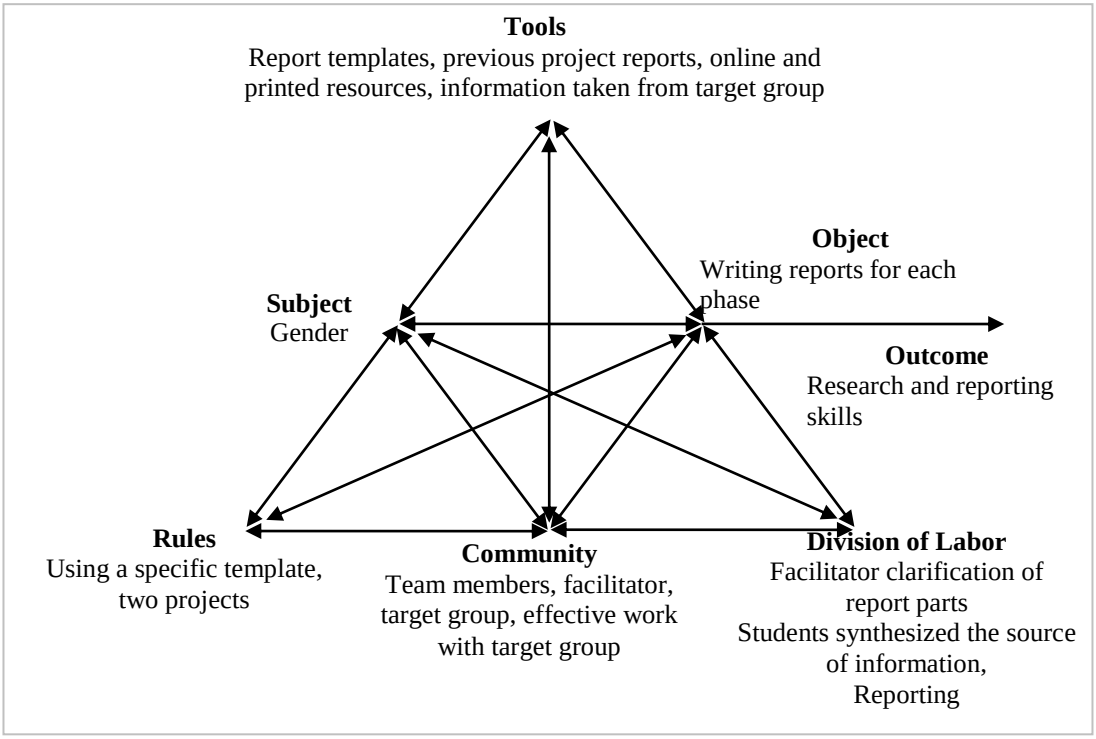



Figure 4.21 Influential dynamics on research and reporting

### 4.6.11 Learning about development tool

In this course students learnt about Flash and Pinnacle video editing tool. It can be said that all students could learn them within their capabilities, background and their roles in the project.

**Effect of the Subject - Tool**

In the personal interviews only one out of 9 female students stated that they were satisfied with the content given for Flash. Alltough some of male students did not satisfy with the content given at the lab, all the male students expresses that they improved their knowledge on Flash development tool in a way. In this difference between females and males, especially division of labor played an important role. Male students worked in development more than

females. A female student stated that if all the students did the lab home works properly they would have learnt well about Flash. She said;

> *Bence derse [lab'a] gelen ve özellikle lab ödevini kendi yapan herkes projeyi çok rahat çıkartabilir ama bunu herkes yapmıyor (CS15, Female, PI)*
>
> *In my perspective, everyone who came to the lab and especially who did lab homeworks by own can complete the project easily, but not everyone do that (CS15, Female, PI)*

Another female student in Group 1-8 stated;

> *I found that not giving the lessons about Flash is a weak point. By giving an explaination of the flash in two hours a week and have to work on something new is not something that I can follow (CS28, Female, PI)*

It should be emphasized that in the project her role was to drawing, she did not make programming or animation in development tool. She were very good at graphic design. On the other hand knowing about Flash meant "*creating attractive animations and functions*" and thus most of students believed that they did not learn about Flash well. Besides, they did not have much time to improve their skills on development. Although not all students expertized the programming tool, they at least recognized the opportunities and the limitations of the tool. They also realized the importance of tool analysis before design. Most of ideas which could not be applied were because of that they did not know about tool much. As mentioned before many students came to class by intending the learn programming and mastering it. Most of students who satisfied with their learning on the programming assumed that they fulfilled their intentions like CS27 who states;

> *Teknik olarak kendimize bir güven geldi. İlk başta ben yaklaşırken işte programa işte ben zor kullanıyorum, bunu nasıl yapacağım diyen insanlar bile Flash öğrendiler. … Bu da işte insanın kendine güvenini arttırdı. Benim karşıma yeni bir program gelse ben bunu öğrenebilirim, bende potansiyel var şeklinde bir düşünce oluştu (CS27, Male, PI)*
>
> *We became confident in technical aspect. At the beginning, even the people who thought "I have difficulty to use, how do I do that", learnt about Flash. This increased the confidence. A thought aroused like "If I came accross with a new program, I can learn it, I have potential (CS27, Male, PI).*

**Effect of Community**

Many students learnt about the development tools by asking other friends. As stated in the problems, many students worked collaboratively on lab homeworks. Since lab content was not enough for development of the projects, the students had to learn about it with different sources. Again the facilitators were the ones who mostly asked their help. Then they asked the problem to their experienced friends. CS28 who had trouble to learn about Flash in the lab hours stated;

*I had a big problem with it since I have no any information about it. I have never taken any course about Flash before. However, to solve those problems that I had during the process of the Project I did research on the internet asked facilitator, and asked the friends of mine who know about this (CS28, Female, PI)*

This was a simple way summarizing that students learnt from each other. On the other hand, in this context especially towards the end of the projects, many students worked together in the labs. These times were the most interactive times that students learnt from each other.

*grupla sıkıntı çekmiştik mesela çünkü herkes sıfırdan öğrenecek dedik başka yolu yok, [Flash'i] biraz bilen bir arkadaşımız olsaydı grupta takıldığımız bir yerde ona sorup hani hemen bir şeyler yapabilirdik biz kimseye soramadık hocalarımız haricinde (CS13, Male, PI).*

*We as group had trouble, because tought everybody had to learn it from the rough, there was no other way, if there would be friend who know [Flash], we could ask him when we challenged, we could do something immediately, we could not ask anyone except our instructors (CS13, Male, PI).*

In addition to teaching at lab, facilitators they helped students technically if the request. Students expected facilitators helped them all their technical problems related their projects, a student exemplifies this by saying

*facilitatorlarımızın kullandığımız programa biraz daha hakim olmasını beklerdim, şu var, şurdan şurdan yapılıyor değil de, örneği kendi gözümüzün önünde yapabilseydi, belki daha iyi olurdu(CS9, Male, PI)*

*I was expected our facilitator be expert on the program [development platform] more, if they could show how to do something in front of us instead of saying that 'you can do this from there', it would be better (CS9, Male, PI)*

Although several students also stated that they learnt about the processes in instructional design, planning the processes and improve the team working skills it was not the intentions of them at the beginning. This contradiction between the objectives of the course and students' objectives was main problem in the context. Therefore, instructor and facilitators had difficulty to convince students increase their instructional design skills rather than programming skills. For example CS36 expressed;

*Derste [teorik kısımda] Flashla ilgili birşey öğrenmiyoruz sadece kavramları görüyoruz (CS36, Male, PI)*

*We do not learn about Flash at class [lecture time], we only learn concepts [theories] (CS36, Male, PI)*

**Effect of the Rules**

Like CS36, some students could not realize that the purpose of the course was not learning about Flash. Therefore, they believed that the course was not satisfactory in terms of learning

about development tool. Moreover since they had very limited time in the development phase they could not drill and practice the tool enough. A student stated this issue by saying;

> *Ama o aşama kısmı [ÖT aşamaları] program[programlama] kısmının çok üstünde kaldı, yani mesela ne bileyim tamam bunları biz çok iyi kavradık ama projeyle ilgili bir şey de yapamadık [geliştiremedik] (CS29, Male, PI)*
>
> *However, that phases part [ID phases] were stayed much more prior than the programming part, I mean for example, OK we acquire them well, but we could not do much thing about the project [we could not develop]. (CS29, Male, PI).*

The students' expectation influenced their perception of outcome much. The students who were highly expectant to learn about Flash programming disappointed with the busy processes of the course. Shortly, the issues might be shown like in Figure 4.22.

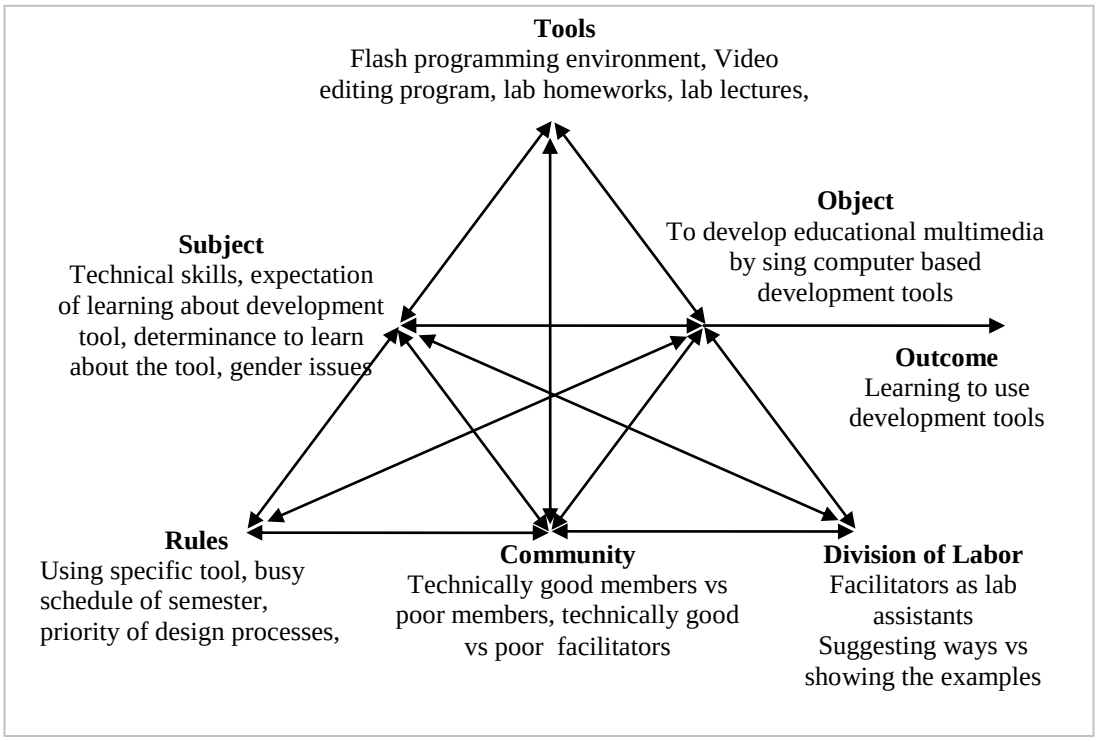



Figure 4.22 Influential dynamics on learning about development tools

Students had never stated any problem with video editing program. Both females and males used the software. In fact, it was also not the first time that students used video editing program. Therefore, only issue with development was to recording the video well.

### 4.6.12 Educational video production

Video production was a new experience for the NIDs. Although students believed that video development (procedure teaching) project was much easier than the first project they realized there were many issues in video production.

**Effect of the Tool - Rules**

*Analysis of the video recording context, equipment, storyboards* and the topic of the project were important issues influencing the video production experience. First of all 5 minute rule of the project has some advantages and disadvantages. It was advantegous because NIDs realized that even shortest video is not easy to develop, the shorter the duration of video the less recording time. It was disadvantegous because NIDs had difficulty to create a scenario with many instructional and motivational strategies, give the procedure properly and summarize the content at the end of the video. This chanllenge enabled NIDs to make very extensive analysis and storyboarding process tough.A student explained the video production process as;

> *Çektiğimiz videolar sadece 5 dakika ama bu gerçekten zormuş, ... o anda sunulması istenen[in] ne kadar zor anlatıldığı [nı farkettik]. İşte kendi aramızda hatalarla tekrar tekrar çektiğimiz sahneler oldu... bir beş dakikanın oluşturulması şimdi filmlere bakış açısını bile değişiyor, yani sahnelerden bakıp' şurası çok iyi çekilmiş, burası ilginç' gibi bakış açıları kazandırıyor (CS10, Male, PI).*

> *The video that we recorded was only 5 minutes but we realized that it is difficult… [we realized that] it is difficult to tell about the thing they was intended to be presented. There were scenes that we recorded repeatedly because of the mistakes between us.. Creating the 5 minutes even change the point of view on movies, you can get a perspective that you can say ' that part was taken very well, that part is interesting' (CS10, Male, PI).*

The main problem with video project was that students did not make a good context analysis (analysis of video recording site) and they did not have any equipment except the ones that instructor provided. Lack of equipment caused some problems because some groups realized that they made some mistakes when they start to edit the video. And then they asked to borrow the camera more than one time. Among facilitator's groups this problem did not arise. Another problem was that students were not much experience with recording devices. Therefore, they had some problems with sound recording, balancing the colors and lighting. Since they had limited time to turn the video cameras, they had to use time effectively. The students were encouraged to examine the context well and make a practice in video recording site. The groups who applied this suggestion did not have any difficulty to finish their project. On the other hand, because of permission issue Group 2-12 of the second project had no chance to make a practice. They just created a storyboard and make recording.

When editing it, since they had to feel that they should obey the storyboard, their project become very fast. Although the flow was good it was very difficult to grasp the instruction for the learners. They explained this issue by saying;

> *Storyboardu [videonun sonunda] özet olacak şekilde oluşturduk ve özetin kaldırılmasını çok ciddi bir değişiklik olarak gördük. Bu yüzden özet kısmını videodan kaldırmadık (CS10, e-mail)*
>
> *We created the storyboard to show the summary part [of the video], and we felt that removing the summary part would be very major change. That is why we did not remove the summary part from the video (CS10, e-mail)*

While creating the video students employed a procedure teaching. They were expected to create a clear instruction to teach a procedure. The thing that students especially focused on was an attractive introduction of the video. On the other hand they also used many instructional approaches in design. In procedure teaching project students prepared storyboards much more detailed than ones in the first projects. For procedure learning the most challenging part was to assess the learners and provide feedback in video. However in all the projects they could provide them. They also provided a manual which was another deliverable of the project.

Without available project topics, in procedure teaching projects, the main difficulty is finding a step by step topic which can be assumed as procedure. To be assumed as procedure, the topic should have several steps which are connected to each other and the steps should be showed in the video. Therefore, the topic should be concrete to show and easy to implement. Other issue the topic should be feasible to make video record. For example there were some groups who want to create videos in some official institutions and they had to take formal permissions to do that. However since they could not take any permission, they had to change the topic. Another issue with procedure project topics is that students had difficulty to find an interesting topic which could allow attention and different teaching strategies. CS15 explain the difference between concept and procedure teaching project by saying;

> *İlk projede daha iyiydi daha yaratıcı bir konu olduğunu düşünüyorum, bu projede yok, konusundan dolayı pek bir yaratıcılık olduğunu düşünmüyorum, 'spor yaralanmalarında ilk yardımı' anlatacağız, Flashtaki [projesi] gibi değil, ilkinde mesela o girişleri çok beğenmiştim ben mesela, şimdikinde öyle değil, bu biraz daha soyut bir şey oldu gibi (CS15, Female, PI).*
>
> *In the first project it was good, I think it was more creative topic, in this project there is no, I think there is no creativity because of its topic, we will prepare 'first aid in sport injuries, it is not like in Flash [project], in the first one I liked the intros much for*

*example, but it is not the case for current one, this is more like an abstract thing (CS15, Female, PI).*

As CS15 stated, project groups pay attention to create projects providing visual attention and motivation. In the procedure topic they were expected to provide similar motivational, instructional and assessment components. Especially in motivation, assessment and feedback issue they had difficulty to integrate the topic with their video scenarios.

**Effect of Community –the Tools – the Rules**

The NIDs in this study did not have difficulty to find a procedure project topic since they were provided some topics that might be developed. For procedure projects ILKYAR community provided 11 topics to be developed and instructor encouraged students to select among those topics. Two of researcher's groups selected ILKYAR projects. On the other hand some other groups had difficulty to find useful topics to develop. For example although in the second projects she was not in researcher's groups, CS40 came and asked a good project topic, the group did not want to develop a project which was ordinary (which means the topic was used in several times in previous years) and they were seeking a useful project topic. At the end they found a topic that was not developed before.

In video project, differently than the first project, novice instructional designers felt that they need to know about the topic to show how that procedure could be applied. That is why most of the students selected a topic which they were familiar with it. Sometimes instructor suggests some topics and that time students have more challenge. For example nowadays in the same course some students developed videos related "Internet safety" because their facilitators strongly suggested and encouraged the students. Some example videos were provided related this issue but most of them were like a short-movie, presenting an event. Therefore, it was very difficult to transfer that topic into a procedure. There is one group that could elaborate it very well, but other two groups could make their videos similar to the ones that they watched. Like this issue, in previous year of the study, some students were suggested something that they have never seen before. A student who worked on calibration of a device which was used in engineering told that they had challenge to present it because they even did not know which issue is important or where to start. She stated;

*İlk basta biraz zorumuza gitmişti, ilk hafta ama çok kisa bir zaman, sonra da zaten aslında biz burda bir extra emek [harcadık]. Aleti önce kendim ögreniyim, herseyini ben bir bileyim ondan sonra anlatayim [dedik], bu ilk asamayi çogu grup yasamadi. Yani pizza yapmak, bisiklet tekeri değiştirmek, vs gibi tamam onlar da güzel seyler ama hiç kimse bunu bilmiyor degildi veya kimse sifirdan öğrenmedi. Ama bizim grup ilk defa gördügümüz bir aleti önce kendimiz ögrendik özellikleri neymiş, söyle anlatabiliriz diye (PS8, Female, PI).*

*At the beginning it was resented us, one week was very short time, moreover, in fact we spent extra effort. 'We ourselves need to learn about the device first, we shall know about it, then we shall tell about it' [we said], but nobody survived this first phase. I mean making pizza, changing bycycle wheel, etc OK they were also good thıns but nobody happened to not know about it, or nobody started from scratch. However, our group learnt the topic that we saw it first time, by considering 'what are the properties of it, we can explain it like that (PS8, Female, PI).*

Although PS8 expressed that they challenged with creating the procedure video with an unknown topic, she also added that they were proud of creating such a quality video with an extra effort. It was the first video about calibrating that video. Another issue, since their video was going to be used in a real engineering course, this caused another anxiety to develop good quality project. To sum up all the issues to influence instructional design experience of novice instructional designers were shown in Figure 4.23.

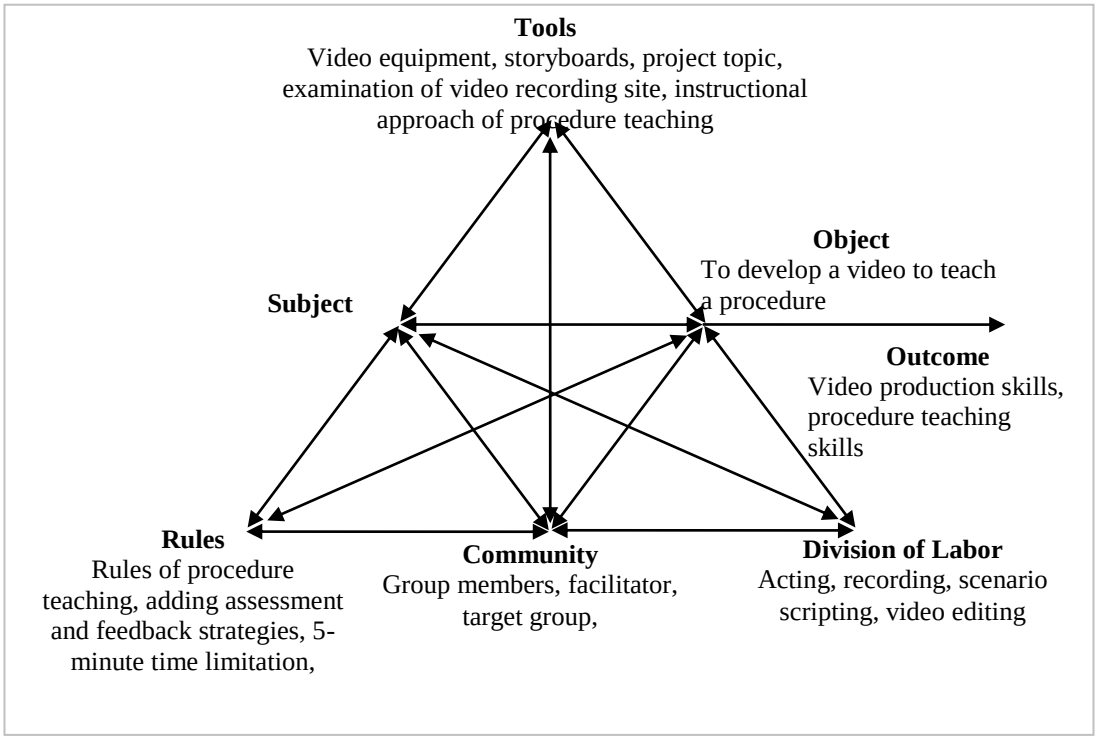



Figure 4.23 Influential dynamics on video production

### 4.6.13 Summary of Contextual Issues and Their Effects on Experience

As seen in each issue of instructional design experience, working in a real context and working with a motivated target group were very important issues. A motivated target group pushes students to develop better quality work. On the other hand, undergraduate novice instructional designers have difficulty in coping with most of the issues caused from their

team members and working with target group effectively. Group problems were most of the important and demotivating issue which prevent the awareness of instructional design processes. Schedules of students, difference motivation and expectations caused group problems. Most of time students did not deal with others to make them work. In groups which have many group problems, most of time other processes could not be conducted properly. Apart from group problems, students' awareness about the processes were important issue to make them put effort on each phase of ID. This awareness was provided via guest speaker in some extent. Report templates also lead students thinking on their instructional design processes. However strict templates of reports lead them write the reports without developing reasoning about their choices about their design. In fact, it is very difficulty to differenciate the issues which influence the instructional design experience in positive and negative ways. For example intervention of facilitator sometimes worked much, troubled members involved in group working in this way. However in some cases it was not helpful, it is depented to the student in some extent. The issues that might improve the ID experience can be listed as;

- Guest speaker who are working in real ID companies
- Feeling of working in a real setting
- Students' awareness about the aims of the course
- Working with a motivated and convenient target group
- Being motivated to working with a target group
- Report templates to understand processes in ID
- Course resources
- Random grouping for some students
- Improvement of leadership skills of students with support of facilitator
- Assigning a team member which can lead others
- Continous feedback and monitoring from facilitator
- Facilitator intervention in team problems

- Making same processes two times

It is difficult to say any specific issue had negative effect on instructional design experience; however some issues prevented the awareness of experience as soon as they practice it. For example most of the students understood the importance of storyboarding while developing their project. They also realized that they had to make a tool examination before developing their design. This problem mainly caused from lack of time in analysis process. Firsly the unavailability of the issues listed above might be considered as a disadvantage for the instructional design experience. Other issues influencing this kind of experience negatively might be listed as;

- Lack of time to understand the ID processes consciously
- Group problems
- Busy schedule of the semester
- Random grouping for some students
- Report templates to prevent develop reasoning for choices
- Lack of communication with facilitators

## 4.7 Research Question 2

How are the instructional design and development processes of instructional design students influenced from the contextual issues accommodated in the components of activity system?

To answer the second research question especially weekly observations, e-mail communications, and documents were used to see the processes in product development

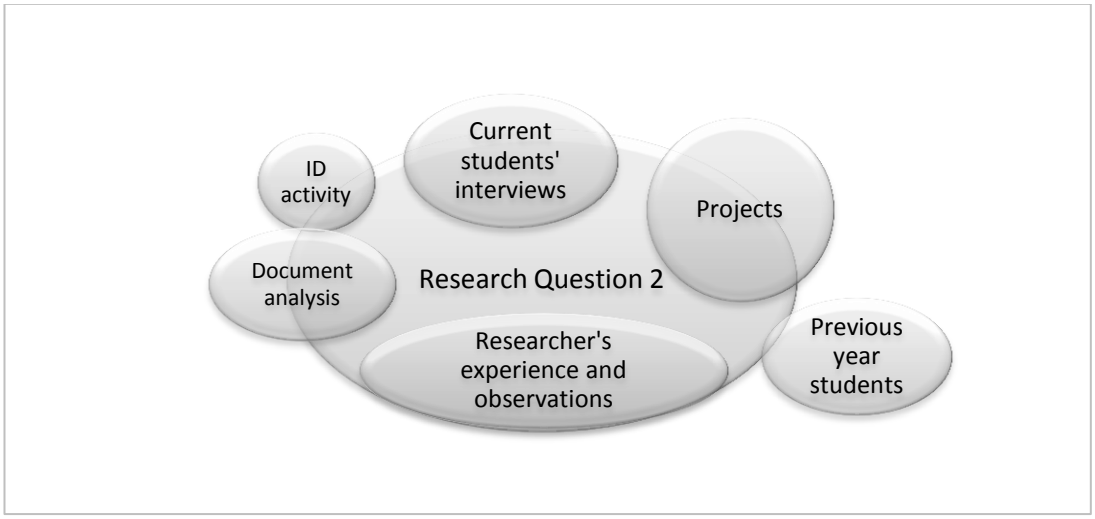



Figure 4.24 Data used to answer Research Question 2

Like in the first question, main categories were explained with cases and examples of current students. To have good progress on project development, students had to use time wisely and use as much as resources to improve their design. Group dynamics and contributions of the facilitator were also effective on smooth progresses. In this part how students' progresses were influenced from the contextual dynamics will be examined. For this research questions ten main themes were created. There are;

- Decision making on the project
- Use of examples
- Implementation of target group expectations
- Visual design and graphic design process
- Consistency between design and development

- Quality of deliverables
- Dealing with technical details
- Comfortable process because in the second project
- Submission of deliverables and deadlines
- Ethical work

These issues will be explained in further sections.

### 4.7.1 Decision Making on the Project

NIDs had to decide the topic of the project, target group, the story, characters, instructional and motivational strategies during the project. The issues in decision of these issues are detailed under the activity system components below.

**The Effect of the Tools**

Especially in the first project, students had some hard times to decide on the project topic. They wanted something easy to develop, find more resources and open to make as many animations. This, actually, was an indicator of that they found their target group in accordance with their topic rather than selecting the topic in accordance with the target group.

In this process facilitator helped groups to select a topic and especially she suggested groups to prepare something up-to-date. In that time for example, in Turkey there was issue of "*Crimean-Congo hemorrhagic fever*" and she suggested groups prepare something related viruses and focus on that virus. On the other hand, students could not imagine how they could do that. For example, in the meeting, facilitator convinced *Group 1-10* to prepare this topic, but same day in the night they sent an e-mail to ask to change the topic. CS35 wrote

> *Bugun sizle biraz konusmustuk grup gorusmesinde virusler uzerine ama projenin daha sonraki asamalarını ve yapacagımız seyleri dusununce, biz konuyu degistirmeye karar verdik, konumuz 'Maddenin 3 temel hali ve hal degisimleri' (CS35, e-Mail, 6 Oct)*
>
> *Today in the meeting, we talked to you about viruses, but when considering the further phases of the project and the things that we will do, we decided to change the topic, our topic is now '3 state of matters and change of status' (CS35, e-Mail, 6 Oct).*

Those did not accepted since they believed that the expectation of that teacher would be high and one group had already contacted with a teacher. They believed that the teacher's expectation high since he had sent an e-mail and said that he did not like the previous year's

project and he could not use it in his class. This made groups hesitate to select that topic which is "*Our Moneys*". In fact Group 1-9 also was like accepted but then they also change it. This change in minds might be caused because students made some research and select more convenient topic. For example, in interview CS40 from Group 1-11 also stated that they specified the topic which they could make easily. She wrote in mail;

> *Biz konu olarak 7. sınıflar için Kuvvet ve Hareket'i seçtik. Para [konusu] hususunda [konuyu] animasyona dökecek kadar tasarlayabileceðimiz bir fikirgelmedi aklımıza" (CS40, e-mail, 12 Oct).*
>
> *As a topic we selected, "Force and Motion" for 7th grade. For Moneys [topic] no idea came to our minds such that we transfer [the topic] to animations (CS40, e-mail, 12 Oct).*

The processes that students went through in selection of topic, can be exemplified the case of CS9. He explained the process detailly by saying;

> *Oturduk kütüphanede, internetten hangi konuyu seçelim diye, genellikle zaten bizim BÖTE öğrencilerinin seçtiği konulardan bir tanesi fen ve teknoloji, yani matematik ve sosyal [bilgiler] konuları anlatamayız korkusuyla ..., fen ve teknolojide her zamanki gibi, hangi konuları yapabiliriz, hangi kitleye hitap edebiliriz, bu arada bizim konumuz güneş sistemiydi, [hangi konuda] daha fazla kaynak bulabiliriz, daha fazla animasyon bulabiliriz, onları taklit edecek animasyonlar yapabiliriz diye düşünerek, onu seçmeye karar verdik. Hem bizim için kolaydı, hem de ilgi çekici bir konu olduğunu düşündüğümüz için güneş sistemini seçmiştik (CS9, Male, PI).*
>
> *We went library to select the topic on Internet, generally one of the topic which CEIT students select was Science and Technology and Mathematics, with the fear of that we cannot prepare something for social [science] topics. As usual, in Science and Technology, which topics we could do, which target group we can address, by the way our topic was solar system, for which topic we could find more resources, find more animations, by thingking we could get insight from them, we decided to select that topic. We selected solar system since we tought that it was easy for us and interesting topic (CS9, Male, PI).*

One of the dynamics of the projects were the content of lecture part, which requires resources, examples, animations, still pictures and questions – feedbacks. Students especially facilitated from the instructional approach given at report templates. In the reports, they wrote an example for each principle of the given instructional approach like giving examples, non-examples, constructive feedback, making generalization, ARCS components. However as usual they avoid giving specific examples like *Group 1-9* made in their design report, for the giving relevancy of the topic, they wrote;

> *When introducing the topics, daily examples are given by animations and videos to students in order to link the content and real life, so learners can understand the today and future usefulness of the content. Also, we give a responsibility to the students in game part as a coach to make Bob ready to Olympic Games, they feel themselves take a mission (Group 1-9, Design report)*

Although students created stories, all of them selected something like a character will be rescued from somewhere or win something after studying on the topic which is very similar flow with example project. Not for the test part but for the game also students had very interactive ideas at the beginning. However most of the games were like drag and drop at the end because of the lack of time and technical skills.

At the beginning of the first projects, since students tried to find original stories some groups lose too much time to come up with an idea. In *Group 1-10* without tool analysis students tried to develop very complex ideas. Although facilitator tried to moderate those ideas, since students did not take any note they continued to develop idea. In group meetings before the submission of design reports, since students did not prepare any storyboard, they just told whatever came into their minds in the meetings. For example in one of the meetings CS36 talked about many ideas. Their project was related "*the states of the matter*", he said that a character will be imprisoned in a room, and to escape he had to change the state of some matters, for example there will be ice covering a door, firstly the character should unfreeze the ice, then in somewhere that character should be evaporated and so on. The facilitator asked how he could do something like that because to apply this idea a good graphical design was required. He answered "*I do not know how to do that I am just thinking now"* (CS36, Week 6). This issue was caused because they did not prepare any storyboard although facilitator asked them and they tried to show that in fact they have an idea but they just did not reflect them into the paper. However since those ideas are not in the paper, every week they brought another idea. Another problem was that, those group members did not come together before the facilitator meetings, thus there was no decision on the projects before facilitator meetings.

In other first project groups, *Group 1-11*, also students could not come up with an idea easily. They were honestly wanted to develop an original story. Although they did not spent too much time for lecture part of the project they challenged to develop game and test idea. Again, lack of note taking and of group meeting before the facilitator meeting were the factor in late decision making. Also, *CS40* had many ideas and she produced many ideas in the group meetings too, but since she could not convince others it was very difficult to negotiate on a specific story. Since they could not develop an idea in time, *CS40* started to draw several characters and the background before developing a storyline for the project. This group also spent much time because *CS40* dealt with many details in the project like where a score table would be shown in test part.

**Effect of the Subject - Community**

In fact selecting the topic before meeting the target group is not a case in real context. They should have met a target group and then make decision of the project topic. On the other hand in one week students were asked to select a topic and prepare a contract. Students could only meet target group in analysis process to learn about their needs. In video projects selection of topic mostly made based on the convenience of the video recording site, interest of the students and convenience of the target group. For example CS36 explained his second project topic selection by saying;

> *Ben kütüphanenin reserve bölümünde çalışıyordum, öğrencilerin reserve bölümünü tam kullanamadıklarını gördüm yani, etkin kullanamıyorlardı, ondan sonra [gruptaki] arkadaşlara söyledim, böyle bir konu var, işlemesi kolay olur, yararlı da olur okul adına, tamam olur dediler (CS36, Male, PI).*
>
> *I was working at the Reserve room of the library, I witnessed that the students could not use the Reserve room effectively, then I told this to my [group] friends, 'there is a topic like this, it would be easy to handle, it would be also beneficial for the school' and they said 'OK' (CS36, Male, PI).*

In also Group 2-12 students selected the 'ILKYAR Letter Organization' topic since CS13 was working at ILKYAR. It was needed by ILKYAR and CS13 was experienced in there and knew the head of the community. In Group 2-10 they selected the topic of TABU which is easy to handle. This topic was one of the topics suggested by instructor, when they explained about their selection they said that they talked to instructor and he suggested them to select the simple one in their e-mail *(CS19, e-mail, 3 Dec)*, which is also in favor of the group.

Although selection of topic was not made in accordance with the need of target group, students, at least in the design, developed their characters and stories considering target group's age and expectations. That is why Group 1-11 selected Cedric's story for the topic of "*Force and Motion*", Group 1-7 selected Ghost Casper's story for 'Body systems', Group 1-8 proposed to use Napoléon Bonaparte character for the topic of 'Our Moneys', Group 1-9 used Sponge Bob and his friends for the topic of 'Light' and Group 1-10 proposed to tell a story of a young child which was called "Engin". Although facilitator suggested using a character for their project, the group themselves decided about the characters and its story. They tried to select attractive characters however in some cases they get feedback from target group or subject matter expert. For example, one of the group which developed a project of '*Energy Cycle in Nutrition Chain'*, CS15 explained how they selected and changed their character after getting feedback from the subject matter expert. She said;

*Tazmanya canavarını [çizgifilmdeki] seçmiştik karakter olarak, şey dedi tamam hadi onu soyu tükeniyor ama çocukların bildiği bir şey olsun dedi, tazmanya canavarı öyle bilindik bir hayvan değil bir çizgifilm kahramanı dedi, ondan sonra biz baykuş seçtik (CS15, Female, PI).*

*We had selected Tasmanian devil as a character[cartoon character], he said 'OK, yes it is becoming extinct but it should be something that children know, Tasmaninan devil is not a well-known animal, it is a cartoon character' then we selected owl [as character] (CS15, Female, PI).*

Although many of the groups could not apply whole story that they designed, in design part they created attractive stories. Although the researcher in previous years suggested a story-like multimedia project no groups designed their projects like that. In the current semester on the other hand by means of the example project on which students prepared their reflections, they could imagine how they could make their projects like a story.

One of the issues of the course was consistency with the topic and games. In some groups the game does not require any knowledge about topic. For example most frequently used idea is that catching objects (like stars, viruses, moneys etc) which are related the topic and getting points. These kinds of things are not acceptable in fact, however developing an interactive and educational game in addition to an attractive lecture and test part is very difficult in a short time. In the current semester, all students could make their game related the topic and they were educational however they could not use much interactivity in *Group 1-7*, *Group 1-9* and *Group 1-10* game parts was like asking questions in advance way. Group 1-7 left their game simple because of the target group. In *Group 1-9*, all members designed the game by considering their available skills. In *Group 1-10*, they were proposed attractive ideas but they could not apply it because of aforementioned issues of *Group 1-10*.

The last issue was deciding which content would be added to the instruction. Interestingly, most of time, they focused on the strategy to give the content rather than the content itself. On the other hand, the students who were working with a promising target group cared about the lecture content itself more than others but they could manage it with the help of target group teachers. However, even in this case target group teachers did not provide them actual content, they just made suggestion. As mentioned previously, CS13 complained about the dilemma they had while creating the content because of the lack of guidance about actual content. In case of *Group 1-9*, in fifth week meeting, they could not come up with a clear lecture content because of teacher's general suggestions. *They said that although they asked about the actual content, the teacher only suggested to use a textbook without saying 'you can take this, this and this' (CS33). They also added that the teacher said that the students did not have any difficulty or misconception about Light topic however they just need some*

*additional activities* (*Group 1-9, Week 5).* With these general suggestions, *Group 1-9* mainly used Internet resources and created animations if it was needed).[Community – tool – object:problem: unclear expectations led using available content]. Thus it can be said that while working with a target group selecting actual content is more complex for the students, once they could not get any feedback or concrete suggestions, they tended to use Internet resources.

In addition to convenience of the issues, member dominancy was effective on making decision for the project. For example in the Group 1-8, CS28 was a foreign female student and she had some difficulty to understand Turkish if it is spoken quickly. Sometimes this language issue caused problems with other two male group members and those two members were dominant in the group although *CS29* was not hard worker as much as *CS28*. Member dominancy was a case when someone took more responsibility for a certain part of project. When someone made all the development work, then her/his decisions about the project become dominant. A female student also mentioned her dominancy of the first project group since her efforts for the project. Since she worked in each part of the project and did other's job sometimes, she could make decisions for the entire project. In the second project on the other hand, she was working another two dominant members and she explain the situation by saying;

> *Şimdi üçümüz de baskın karakter, [diyoruz ki] 'o olmaz bunu yapalım bu olmaz şunu yapalım filan, böyle de olabilir…', diğerinde [önceki proje] çok rahat oluyordu ben şunu yapalım diyordum peki öyle yapalım diyorlardı, şimdi herkes şey yani baskın olmaya çalışıyor orda bir sorun var, ama güzel çalışıyoruz… (CS15, Female, PI).*

> *Now all of us are dominant character, 'that would not be like that, lets do this, that would not be like that, lets do this, it might be like this', in the other one [previous project] it was very comfortable, I was saying 'lets do this' and they were saying 'ok lets do it like that'. Now, everyone try to be dominan, there is problem there but we are working well (CS15, Female, PI).*

Different motivations of other group members played important role in being dominant members. For example for the second project time, CS40 mentioned about her experience;

> *Ben tasarlamaya hani kafamda bir plan oturtup arkadaşlarıma anlatmaya başladım ama karşıda bir fikir gelmedi hadi şunu da şöyle yapalım böyle daha güzel olur gibi bir fikir gelmiyor yani o yüzden ben ne dersem o olacak gibi oluyor o da beni çok memnun etmiyor (CS40, Female, PI)*

> *I started to design in my mind to develop a plan, and to tell to my friends but no idea came from other side, an idea like 'lets do it like this like that, it would be better like this' never comes, thus it is like that whatever I will say it will happen, and this do not make me happy (CS40, Female, PI)*

As she mentioned although she selected her group members in the second project, she was not fine with group members who did not give effort to develop interesting ideas.

**Effect of the Rules**

Although they argued that they would provide something to provide relevancy but there was no clear examples about how they would do it. They also did not show these details on their storyboard. This was mainly caused from the requirements of the templates which lead students enter whatever they supposed to write there. When asked about whether design report is transferred to developed project CS31 stated;

> *Hocalar bize diyorlar ki 'instructional approachı projenize uyarlamıycaksınız, genelde projemizi approacha uyarlayarak yazıyoruz rapora, yapmak zorundayız (CS31, Female, PI).*
>
> *Our instructors says 'you will not adapt the instructional approach to the project, generally we arewriting the reports by adopting our project to the instructional approach, we have to do that (CS31, Female, PI).*

With this respect, templates were limiting the students' ideas on the reports, however they finished their project especially based in their storyboards and if they could not apply all the storyboard, they made more convenient things. Although in weekly meetings facilitators exemplified the instructional strategies, since there were many instructional strategies given in the template, it was not much possible to use all those strategies. Although students were suggested to narrow their topic to make their project more effective, in that small amount of content, it becomes very difficult to find questions, feedback, examples, and motivational strategies for a small topic.

The time that the groups spend in developing a design in fact normal in real setting however in this project they have very limited time after analysis part. So students had to keep their project simple as much as possible. In the groups who could not challenge to develop the design, this simplicity had an important role, although they also tried to make their projects like a story a character, the role of the characters were not complex they were only assistants in the instruction. In *Group 1-7* and *Group 1-8* also there was the comfort of taking target group expectations and they created project storyline easily. In *Group 1-8* although they were not working regularly, since *CS30* was dominant both in development of design idea and development, all other members accepted what he proposed and their decision making process did not take much time since only one student decided almost everything. As seen in Figure 4.25 the dynamics on decision making on the projects is shown.

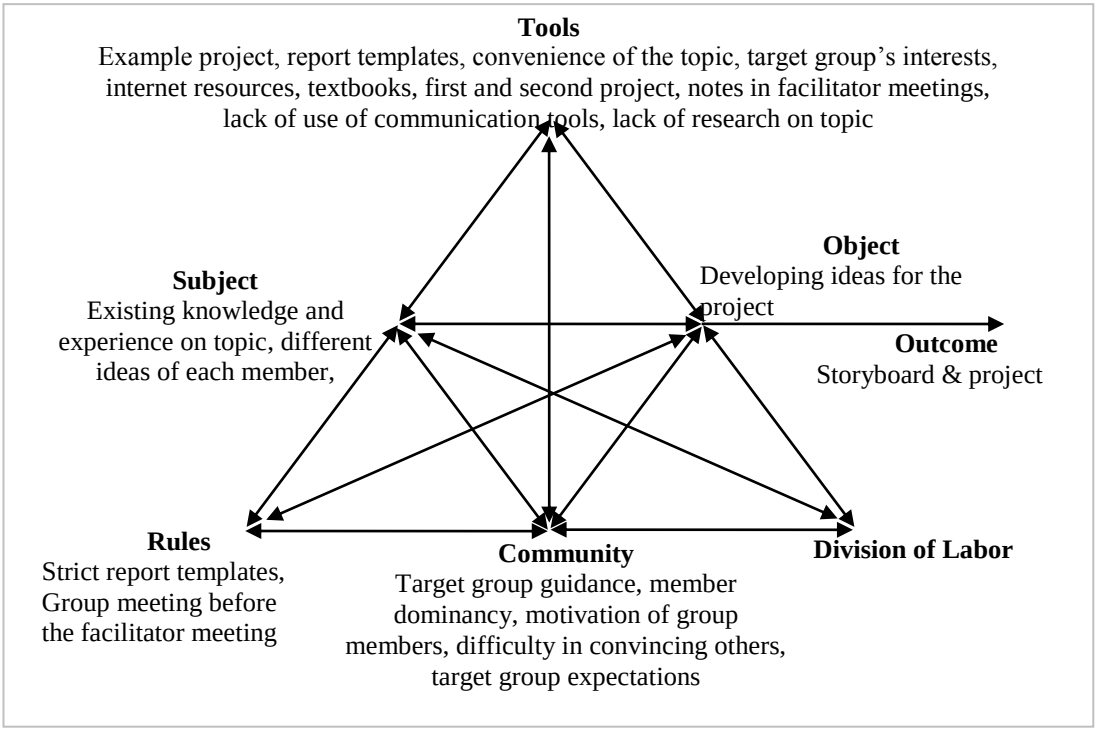



Figure 4.25 Influential dynamics on decision making about the project

The main dynamics of the projects were *the topic, character, instructional and motivational strategies, actual content and story*. While selecting making decision on them students tended to select and use convenient ones. For the story they influenced from sample works. Moreover, while deciding motivational and instructional strategies, report templates had a major role. As seen in Figure 4.25 rules of the group and community dynamics are influential on the development an idea for the project. Also, it is important that students take note to bring their ideas together and not forget about their previous ideas.

### 4.7.2 Use of Examples

Report templates were including all the processes that students did. It was carrying a mission to show the ID processes. In most of the cases even a detailed template is provided, students might interpret it different than facilitators.

**Effect of the Tools - Community**

Although in the weekly meetings facilitators tried to clarify each step, because of lack of note taking or since they believed that they understood it, they might have made something which is different than expected. Therefore, the sample reports and the projects were very helpful to see the problems in them and get some insight.

NIDs also examined the old project to see which topic can be made more interactive. On the other hand, although NIDs were encouraged to examine old projects, very few of them paid attention. At the beginning of the semester students were presented a student multimedia project and they wrote a reflection on it. They evaluated it in terms of pedagogical strategies, navigation, usability, feasibility to target group and visual quality. Most students wrote positive things about it. That multimedia project was like a whole story and user was the problem solver in that story. After examining that project many of the groups designed their projects like a story. Even some groups designed it very with similar story. In the example there was a well-known cartoon character which imprisoned in a building and user (the character) should have to study on the topic to solve the problems and escape from the building. In interview a student mention about their project with the words of;

> *Bizim konu hikaye tarzındaydı, bir adam bir odanın içinde hapis kalıyordu, kullanıcı onu kurtarmaya çalışıyordu, pek zorlamadı rahat rahat çizdik [film şeridini] (CS17, Male, PI)*

> *Our topic was like story, there was a man was staying imprisoned in a room, the user was trying to discard him, it did not force us, we could draw comfortably [the storyboard] (CS17, Male, PI)*

In reporting also sample issues was very important. In previous years students were provided some sample reports. On the other hand, it caused many plagiarism issue and students were submitting very similar reports. Then it was removed, however current students always stated that they need some example in their hand and facilitator had to exemplify each part of the reports. As a conclusion most of time students were only used the examples which were given by the facilitator. It was not much possible to facilitate from the other group's reports, since most of them finished their report shortly before the deadlines and even most of them brought their reports just at 17:00 on the submission date which was the last minute. A student who mentioned about they needed examples stated that because of lack of time they could not facilitate from other's ideas. He said;

> *Diğer gruptaki arkadaşlar neler yapmış onlara bakıyoruz, ondan sonra artık onun kombinasyonu bir şey yapıyoruz da en son zamana geliyor [ödevin son tarihi], o son zamana geldiğimizde [facilitator'dan] feedback almamız zorlaşıyor (CS9, Male, PI).*

> *We are checking about what other friends did, then we are making something like its combination and it happens towards the deadline, and this makes difficult to get feedback [from facilitator] (CS9, Male, PI).*

**Effect of Community – Division of Labor**

Although students were said to develop simple thing but using effective motivational issues like using narration, they most of time wanted to develop advance animations and graphics.

Since they are not experienced, 8 weeks was not enough to become proficient to develop everything. Thus while the projects started with advanced animations and graphics, the content and evaluation part of the projects become very static. In some cases they wanted to use a well-known character but they had to draw different states of the characters, because of lack of time consistency between the parts of the project could not be provided. As mentioned in end products, in assessment part many groups used same structure with one of the lab homework. For example in a first project group *CS9* spoke out;

> *bir arkadaşımız test bölümünü yapacaktı, ben istediğim testlerimi almadım … Ondan beklenenin baya dışına çıktı, ben ona iki haftalık bir süreç vermiştim, labdakiödevin aynısı idi, o benim için bir hayal kırıklığı idi (CS9, Male, PI).*
>
> *One of our friends were going to test part, I did not get the test that I desired… He diggressed what he was supposed to do, in fact, I gave two weeks time to him, and it was just same with the one in the lab homework, and it was disappoinment for me (CS9, Male, PI).*

In this group, division of labor made equally, however, while one of the group members did his job well some of them did not obey the storyboard and they did whatever they wished.

**Effect of the Rules**

Developing original ideas and examples are difficult in this project because of time limitations. For example, in the first project, they were asked to prepare a storyboard of their project. Although the template storyboard was prepared for a video, and it was only an example, NIDs wanted to see a template exactly fit to a concept teaching multimedia project. They students always seek an example to make sure that they were on the right way. However their habits of using examples directly prevent improvement of instructional design skills and originality of their work. The issues related getting insight from sample works are summarized in Figure 4.26 below.

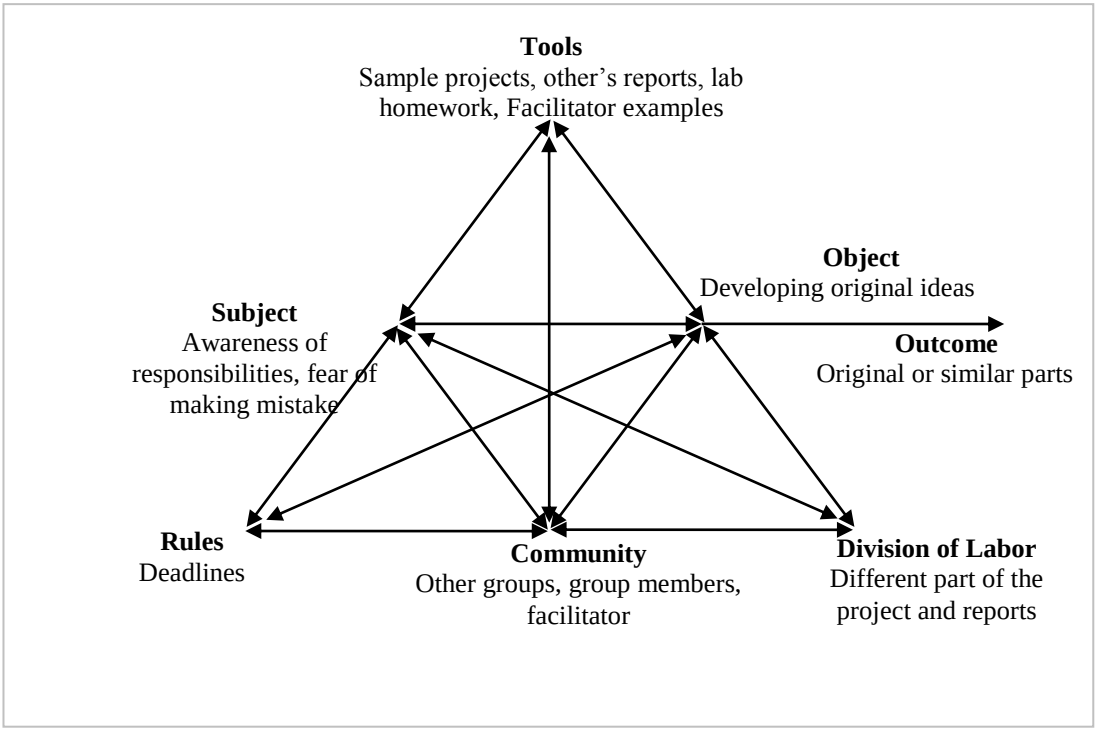



Figure 4.26 Influential dynamics on getting insight about the project

In several cases students took the lab homework as model in a part of their project. Among 13 first project groups, 5 of them used lab homework partially or entirely in the same structure and two of them used same graphics that they developed in their lab homework. This was not an ethical issue however; it reduced the originality of the projects.

In video project on the other hand there was not coding or new software, this eliminated the technical problems, but in this case videography knowledge influenced the flow of the videos.

### 4.7.3 Implementation of Target Group Expectations

Effective work with target group was very important in the course context. A specific target group had an important role on the work of project groups and get real life experience. Especially, when the target group teacher promised to use the projects in the class, NIDs were much more motivated to create a good quality of project.

**Effect of Community**

Communication with target group was different for each project team. In *Group 1-7, CS25* was contacted with her sister's teacher. She made several visits with her group members to teacher. They applied all the feedback given by teacher however in that case that ignored the

feedback of facilitator. For example, at the beginning, they allocated very small area to show actual content in their project; facilitator asked them to expand that area. They did not change that area. In group meeting at Week 9, they had expanded the area for content presentation. When facilitator asked them they said that the teachers want them to do that. In this group, target group had considerable effect when teacher was going to use the project in her class. Because of target group, *Group 1-7* changed their design much although technically it was feasible. They made their design as much as simple. As student from *Group 1-7* explained their problem by saying;

> *Oyun bulamadık, gerçi o bizim biraz target grubumuzla da alakalıydı. Eklemler vardı [projede] böyle, çocuklar çok küçük anlamıyorlar oyunları, biz de böyle sürekli basitleştirip yaptık oyunları böyle (CS25, Female, PI).*
>
> *We could not find a game, actually it was related with out target group. There are joint bones [in the project], the children were very young, they do not understand the games, we always simplified the games (CS25, Female, PI).*

**Effect of Community – the Tool**

In fact, the only thing challenging for Group 1-7 was not the level of target group bu also their technical skills were not enough to implement everything which was suitable for that age. On the other hand, they could design everything in accordance with the target group. In Group 1-7 even selecting colors of the project was painful. They become aware of the simplicity that a young age need. For example in *Group 1-7*, *CS25* get feedback from her sister who was at elementary school. In their storyboard they drew the real shape of the heart. However CS25 stated that her sister could not understand the shape of heart and found it incomprehensible. Therefore, the group changed their heart shape to the traditional cartoon heart shape. CS25 stated "*our target group could only understand in that way, therefore we will use the traditional one*". Thus, they had to use simple and familiar shapes to make young students understand the topic. Another student explained the expectation of their target group teacher as;

> *Yine analiz kısmında hocalarla görüşürken hoca şey dedi bize, kesinlikle öyle bir yere basılsın ordan açılsın olması. Ben basayım ileri ileri ileri geri geri yoksa ben de kullanamam. Basit olsun ya da bir iki tuş olsun, buna dikkat ettik (CS15, Female, PI).*
>
> *An analysis phase, while talking to teachers, the teacher said "it should not be something like click on something and it is opened in somewhere. I should click next, next, back back, otherwise I would not use it. It should be simple or there are two keys, we paid attention to that (CS15, Female, PI).*

This expectation, in fact made students' job easy. They have no requirement for complexity in their design. On the other hand, they had to reduce what they actually want to do. In

another example, target group teacher posed something difficult from the project group. At the beginning *Group 1-8* which is also prepared the project in accordance with the need of target group teacher was very motivated. On the other hand, teacher was even not willing to make a face to face meeting. In e-mail he sorted his expectations. However, facilitator and group members paid a visit to teacher to get in-depth information. In that meeting he wanted a project which can be used from the first to sixth grade of elementary school, which is almost impossible in a multimedia instruction. Group members convinced the teacher to make a project from grade three to five. In that meeting students stated their motivation to make a good project. However, except the first meeting they never contacted with target group, so the processes become dependent to the group members and the facilitators. Thus their used of fonts, layout and navigation buttons did not happen suitable for the target group much. The issues which were influential on implementation of target group expectation were represented in Figure 4.27.

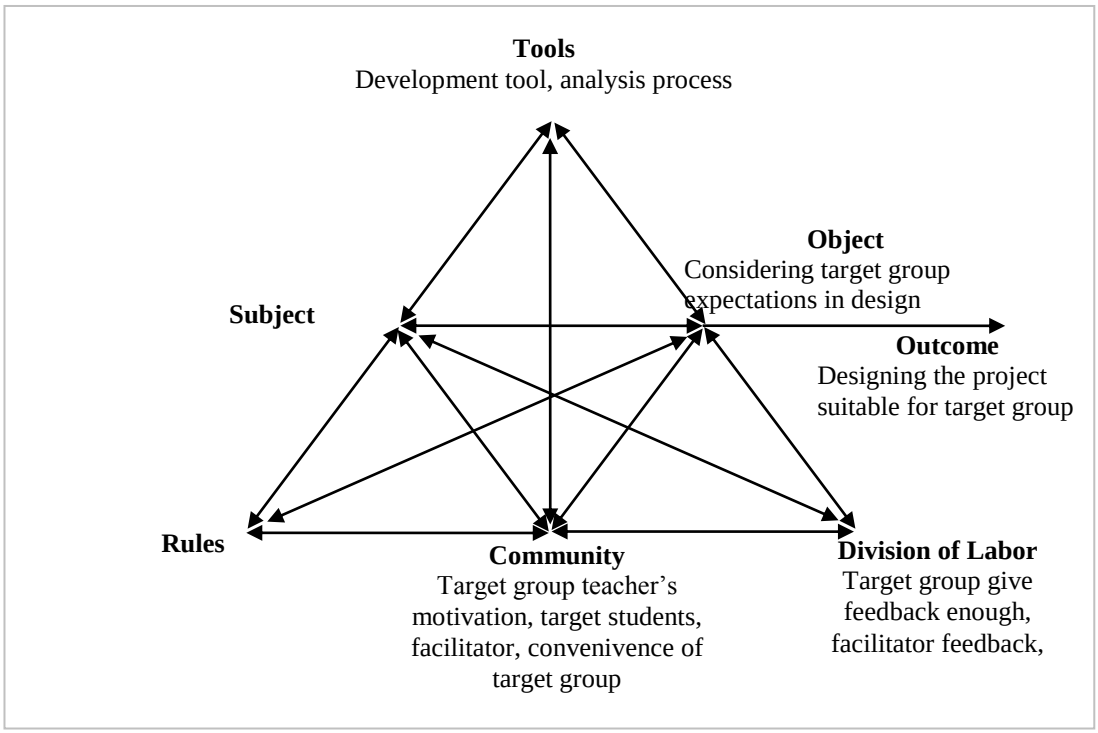



Figure 4.27 Influential dynamics on implementation of target group expectations

It was not implement all the expectations of target group because of the nature of the projects and development tool. Since target group is not much aware of the instructional

designer's skills and the nature of the projects, they might ask something difficult to apply. However, the expectations of target group might be moderated with the help of facilitators.

### 4.7.4 Visual Design and Graphic Design Process

In this context the visual appearance of the projects was very important issue. In the design and development phases, during the meetings, suitability of design to the target group was emphasized much.

**Effect of Community - Tool**

Although students did not synthesize the expectation of target group properly, with weekly meetings they developed a perspective to create a concise and effective screen design for their target group. In the projects NIDs thought on what kind of characters their target group would like especially. Then they created the stories of those characters. For example, as cartoon characters Group 1-11 used *Cedric*, Group 1-7 used *Ghost Casper* and Group 1-9 used *Sponge Bob*. Group 1-11 and Group 1-9 could apply a story and they consistently used the character. On the other hand in Group 1-7's project the character was only appeared at the beginning.

In drawing the visual components of the projects, especially females took role since. The females were the guarantee of the aesthetic appearance of the projects. Especially in Group 1-11, CS40 was very idealistic and determinant to create good graphics. She stated;

> *[dersteki] görsel tasarım çok hoşuma gitti… hatta şöyle tepkiler aldım, e biz yapıyoruz da hani sen her şeyi değiştiriyorsun, renkleri değiştiriyorsun, şekilleri değiştiriyorsun, biz niye yapıyoruz o zaman, … [Renkler] karakterimize uygun şeyler olsun istedim, hani soğuk renkler olmasın dedim capcanlı bir şeydi (CS40, Female, PI).*

> *I really liked the visual design [in the course] … even I get objectsions like 'we are making soimething, and you are always changing, you are changing the colors and the shapes, why do we do that then?'… I wanted colors which are suitable to our character, I thought it should not be cool colors, it was very lively (CS40, Female, PI).*

Her determinacy on creating appealing graphics was also effective on the project score..*CS40* was not only motivated to make good visual appearance, the also insisted others to develop good graphics. In one meeting she objected many issues that her group members did on the project, she was really careful about colors, size and proximity of objects and visibility of important issues. For example in one scene of them, Cedric was competing with another character in a quiz program. In the same scene *CS39* created many audience characters watching two characters. She objected the crowdedness of audience characters. Also there was a big blackboard to show the score of Cedric character. She again objected insisted that that big board cannot be used just to show the score. Then they decided to show

the scores in front of the competitors. She also objected some colors on the screen and after objecting many things, *CS39* said "*they are [target group] only kids, they will never understand* [it does not matter for them]",

then CS 40 answered "*the thing that you called kids are 12-13 year old!*". (*Group 1-11, Week 9*). At the end of the meeting group made their last decisions. And the screen was created as shown in Figure 4.28.

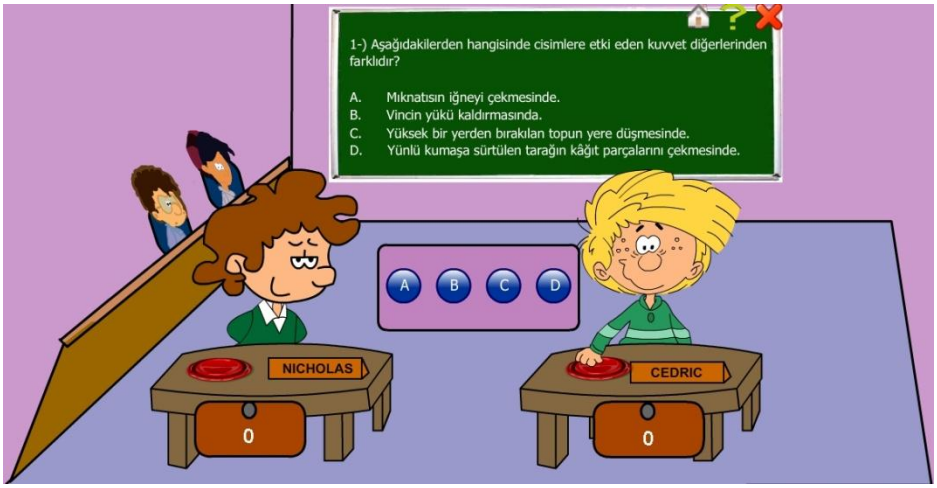



Figure 4.28 A quiz page of Group 1-11

*Group 1-11* was also only group who took the usability issues into consideration in the meetings. In other groups, group members did not interfere with other's work, or they had no effect on changing the things that others did. On the other hand, with the determination of *CS40*, other group members developed and improved their graphic design. In Group 1-8, *CS28* was also very skillful on visual design but she had no chance to lead other group members, she only drew what *CS30* asked her to do.

In Group 1-7, students had no skill of visual design but they tried to make their own graphics. Since their target group is very young, the simplicity of the graphics was not a problem. On the other hand, in some places they forgot about adding hints and clues about the functions of the buttons and graphics, which made the project difficult to be used by young students.

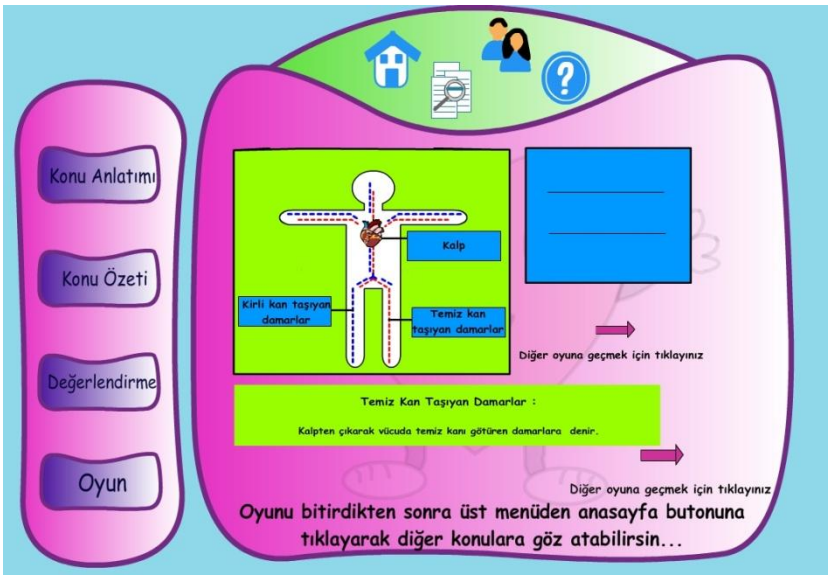



Figure 4.29 A lecture page of Group 1-7's project

**Effect of the Tool**

Development tool was an important issue; students had to allocate time to learn about it. Because of time limitation some groups like *Group 1-9* preferred to use available graphics like the pictures of sun, light resources, navigation button icons and Sponge Bob as the character of the project. Other than available still pictures they developed very simple animations to show the direction of light and its reflection on the mirror. They facilitated from the lab homework to make their test part. They used similar character face to show the feedback. In fact lab homework was used in many projects. They especially used the graphics that they developed in lab homework.

In the first lab assignments students were given some detailed graphics to be drawn. Most of them underestimate the graphical design. And the posed an excuse like "*we are not graphic designers*". Then in the labs students were given available visuals and functions and locating the visuals were left to students. Therefore, in quality of visual design, students' motivation and skills was very important to develop good graphics. In only design, almost all groups designed very attractive visual elements but in development some of them could not achieve them.

In fact in this short time the things that could make their projects simple but effective was to use good graphics. Designing something that was not easy to transfer to development tool was also important issue like being in *Group 1-10*. In addition to skills of the students, short-

time span for development was also effective in reducing the quality of visual design of project. Influential issues in design and development process are given in Figure 4.30.

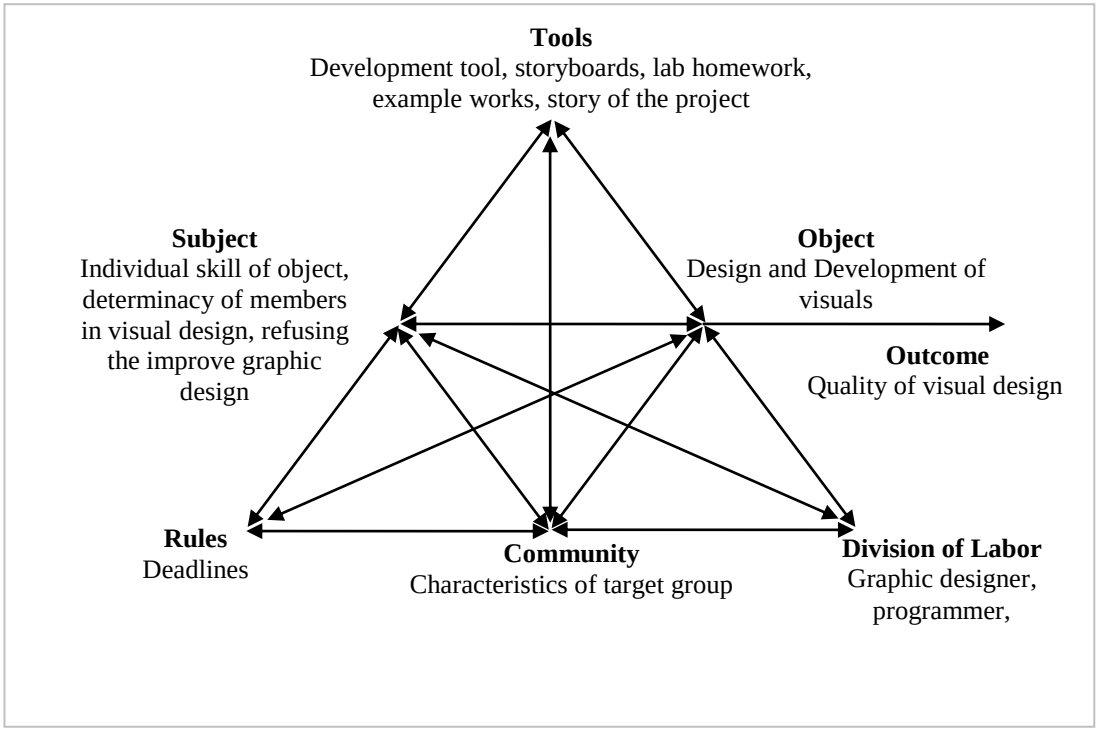



Figure 4.30 Influential dynamics on visual design of the first projects

### 4.7.5 Consistency Between Design and Development

One of the issues which affected the score of the projects was consistency between the designed and developed project. There were some issues causing inconsistency between them. First of all time limitation, lack of tool analysis and members' awareness about their skills played major role.

**Effect of Community - Division of Labor**

In division of labor, there were two issues. In some groups, one of the students was responsible to development of the entire project. Like in Group *1-10*, two female members worked in analysis and design stages, when they finished the design, *CS36* realized the impossibility of developing such a design. Then he did whatever he could do in the project. *CS37* explained this issue;

*Raporu [dizayn raporu] biz iki arkadaş yazdık, bir arkadaşımız hiç ilgilenmedi, o da tasarımı [geliştirme] ben yaparım dedi. Raporda yazdığımız şekilde olması mümkün olmadı o yüzden, o kendine göre yaptı (CS37, Female, PI).*

*We two friends had prepared the report [design report], one of our friends did not paid attention at all, he had already said that he would do the project design [development]. It was not possible to happen like we had written on the report, he did it as he wished (CS37, Female, PI).*

Because of lack of coordination between the group members, Group 1-10's project was one of the most inconsistent projects. To exemplify in Figure 4.31 and Figure 4.32, storyboard and a developed screen of the subtopic of "sublimation" are shown respectively.


Figure 4.31 A screen showed on storyboard of Group 1-10


Figure 4.32 A developed screen structure of Group 1-10

On the storyboard they used a character which was called as "*Engin*" and they made the entire story based on the daily life of this character. Two female members believed that CS36 could it easily. In their actual project on the other hand, they never used a character or a story. A female student who worked in another group was also disappointed with the work of a friend ın the group. She said;

> *Bazı birbirinden bağımsız kısımlar var, başı sonu birbirine uymuyor ... bir öğrenci gördüğünde muhakkak bu burdayken bu burda niye değişiyor niye aynı dizayn burda yok diyeceği bir şey oldu (CS19, Female, PI).*
>
> *There are some parts which are not consistent to each other, the beginning and end of the project was not consistent. Some parts happened such that when a student see it, he might say 'why this changes in there, why the same design is not available in there' (CS19, Female, PI).*

In another group both time limitation and members' irresponsibility caused change in design much as CS15 stated. She said;

> *Dizaynımız bence mükemmeldi, storyboardımızda her şey belliydi, ne yapacağımız çok açık belliydi, mesela feedbacklarımz çok güzeldi ama yetiştiremedim. Yani onun da işini yapmaya çalıştım bunun da işini yapmaya çalıştım, ve bunun sonucunda hiç feedback yoktu [projede] yani (CS15, Female, PI).*
>
> *I think out design was perfect, everything was determined on the sotryboard, the thing that we were going to do was specific, for example our feedback was very good but I could not finish all of them. I mean, I tried to finish others' job, and eventually, there was no feedback [on the project] (CS15, Female, PI).*

Most of the groups at the beginning stated that they would use sound in each piece of the projects. This was also caused the lack of willing people who could make voicing patiently like in Group 1-8. In design phase, facilitators always remind students of designing something possible to develop however students always trust themselves before starting the development. CS9 stated his situation in the first project by saying;

> *Oyun kısmını da 3 güne sıkıştırınca, bi de zaten facilitatorumuz da söylediydi ki zaten haklıydı ki siz bu oyunu bitiremezsiniz demişti, uzun bir oyundu çünkü. Tek kişi altından kalkmaya kalkarsa, zaten bitmeyeceği belliydi, zaten kırpmalar filan yapmıştık, azaltmalar sonucunda, en başta öğrencinin aktif olması durumu baya azaldı (CS9, Male, PI).*
>
> *When we rushed the game in 3 days, and our facilitator had alrealdy told us, he was right actually, 'you cannot finish this game' he said, because it was a long game. It was apparent that if unique on was responsible of it, he would not accomplish it. We already made some trims, after reduction, the state of activeness of the students reduced much (CS9, Male, PI).*

**Effect of the Tools**

The last issue with designed and developed project consistency was lack of tool analysis and awareness of the skills to design a feasible idea. The groups which made simple and applicable projects had no problem in development phase. With storyboarding their work become automatic. CS31 from Group 1-9 stated that since they did not prepared a storyboard which did not require any advance development skills. She said;

> *Story board oluşturulurken çok biz uçmadığımız için hepsini uyguladık yani, belki yapamayız diye. Hepimiz sonuçta çok fazla bilmiyorduk [Flash'ı] (CS15, Female, PI).*
>
> *While creating storyboard, since we did not exaggarate, we could apply everything, by thinking that may be we could not do it. We, in fact, did not know [about Flash] much (CS15, Female, PI).*

**Effect of the Rules**

Apart from problem in division of labor and skills of group members, time limitation was an effective factor in design – development consistency. In Group 1-7, they could not make their project like the story of Ghost Casper. Female member of the group stated;

> *Zaman çok az geldi, baya bir şey yetiştiremedik o yüzden, Casper'i ekleyemedik, o hala bizim içimizde bir dertti ve devam edemedik. Bir de aslında başta başka şeyler de düşünüyorduk, yapamadık, yetişmedi ama bu halde de iyi çalışıyor diye düşünüyoruz grup olarak (CS25, Female, PI)*
>
> *The time was very limited, we could not finish many things, we could not add the Casper, it is still a pain for us bur we could not continue. Also we were thinking some more things, but we could not do that, but it still works well in this state, think like that as group (CS25, Female, PI).*

In Group 1-7, one of the things that they wanted was to voicing each part of the instruction; however they only used songs for lecturing part.

Shortly division of labor, awareness of the tools and time limitations are important to make the design and end product consistent. In the second projects, there was no issue about consistency, since at least in recording video students were comfortable. They only cut some parts because of 5-minute time limitation. Among facilitator groups' this was not happened. However, in one case, Group 2-12, since students wanted to obey the storyboard and not exceed the 5 minutes, the video become so fast that learner had to stop some places. The issues influencing the consistency can be shown on the activity system like in Figure 4.33.

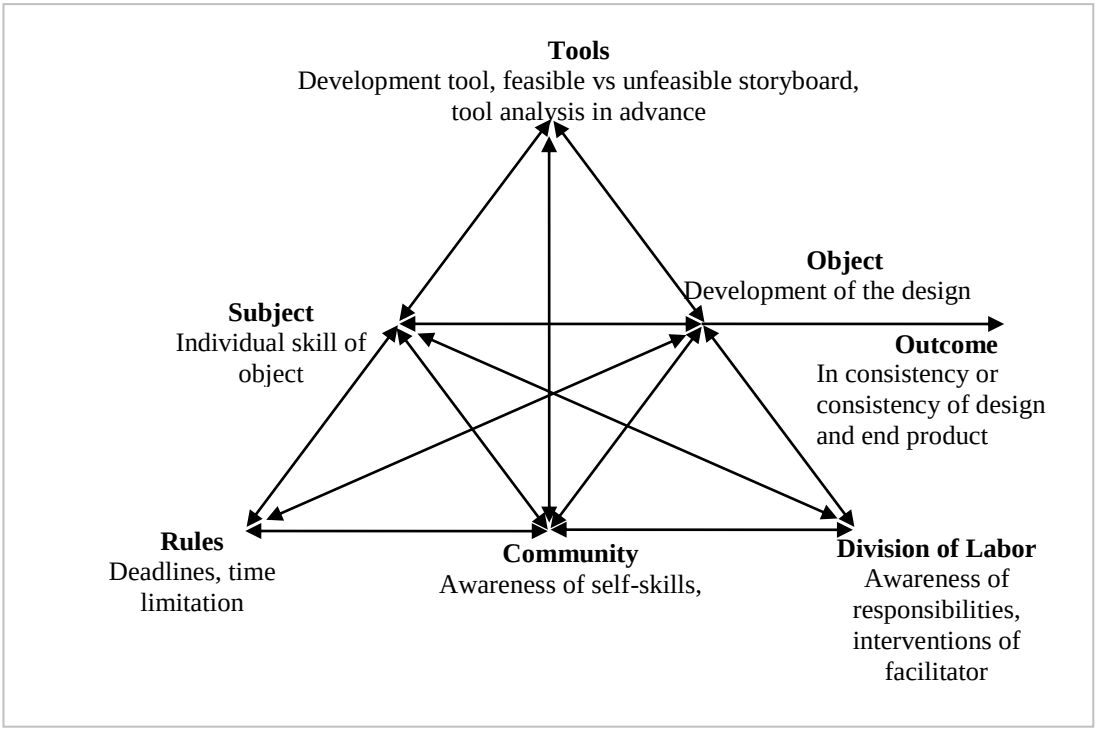



Figure 4.33 Influential dynamics on consistency of design and end product

### 4.7.6 Quality of Deliverables

Quality of deliverables can be assumed as the synthesis of information about target group, development of strategies for target groups and use required motivational and instructional strategies, and use the technology effectively. In this respect a coherent work among group members was very important issue as well as their academic and technical skills. Although students were grouped heterogeneously, not every group has really a good developer or designer member.

**Effect of Community – Division of Labor**

Having a good developer also is not warranty of development of good quality of projects for the groups. These two issues can be exemplified with *Group 1-7* and *Group 1-10*. In *Group 1-7* no one was good at technically. However academically they were encouraged and open to learn new things. They also give priority to instructional strategies in their projects. Asking their each process to facilitator showed how much they give importance to the processes. They asked feedback for every step of their work. Thus their academic skills provided advantage to them to learn new things in a short time. All group members were supportive to each other, after each deliverable they congratulate each other. Their good

interrelationship between group members, facilitator and target group provided successful and less stressful project development process.

In the two cases it can be seen that sometimes technical skills and academic skills of unique member do not guarantee the quality of project because of the group dynamics. Their motivation might reduce in a time if they remain minority in the group. With a 5 year experience *F2* stated similar case;

> *Her grupta mutlaka grubun diğer elemanlarını [çalışmaya] sürükleyecek teknik kapasitesi yüksek birinin olması aynı zamanda raporlama konusunda da .. gruptaki elemanları yönlendirecek birilerinin olması gerekli bence, çünkü böyle olmazsa bir şekilde o işte iki tane bacaktan teknik veya teorik kısımlardan birisi mutlaka aksıyor. Grup elemanlarının karakteristikleri grup başarısını çok etkiliyor (F2, Male, PI).*
>
> *In each group there should be someone who has technical skills to force the group members [work], at the same time, there should be someone who guide others in writing reports, unless providing this, certainly a either technical or theoretical part of this job halts. Characteristics of group members affect the success of the group (F2, Male, PI).*

Another of the facilitator also admitted that the student's skills and the time given for projects were influential issues on delivering quality of work. He argued;

> *Hem rapor yazıp hem ürünü ortaya koymaları bir problem çünkü bazı gruplar çok iyi rapor yazıyorlar ama çok kötü ürün ortaya koyuyorlar, bazı gruplar da çok iyi ürün ortaya koyuyorlar ama rapora çok fazla önem vermiyorlar. Zaten bence iki proje için de süreleri çok kısa en azından bir ürün ortaya koymak için gerekli zaman öğrencilere verilmiyor (F5, Male, PI).*
>
> *Writing reports while developing the product was a problem, because some groups write very nice repors but they exhibit very bad product, some groups on the other hand, exhibit very nice products but they do not much care about the reports. In fact, their time given for two project is very short, the time which is required to create a product is not given to students (F5, Male, PI).*

As he pointed out, some groups give importance to reporting while some of them focus on the product. This also an important issue that, the groups who worked on reports much have not as much time to develop their project. While students develop their reports, they should also start to working on the project to finish deliverables in time without any stress. Thus their work can be moderated.

**Effect of the Rules**

In quality of deliverables and projects, random grouping in the first project was one of the most effective issues in delivery of good product at least in perspectives of the students. For example CS19 stated;

*Projeyi hazırlarken baya zorlandık... zaten bir o [CS19] bir ben uğraşıyoruz, zaten diğer arkadaşlar [CS18 ve CS20] sağolsun (!) uğraşmadıkları için. Bu da birazcık da hocanın [grupları] belirlemiş olmasından kaynaklanıyor, grupları biz belirlemiş olsaydık daha güzel bir şey çıkarabilirdi ortaya, beklediğimizden daha düşük seviyeli bir proje ortaya çıkardık, ortaya yani görsel olarak idare ederdi ama içerik olarak daha güzel şeyler çıkabilirdi ortaya (CS19, Female, PI).*

*While developing the project, we had difficulty. Already only I and he [CS19] dealt with, since other friends [CS18 and CS20], thanks to them (!) they did not deal with it. This caused instructor's assignment of the groups, if we could make our groups, there might be more beautiful things might emerge. We created a project of which level is lower than our expectation, it was ok in terms of visual quality however in terms of content, better things might be created (CS19, Female, PI).*

Although not each group had trouble in the group, in some groups because of the academic and technical skills of the students, other group members bothered much. Their motivation decreased in some extent and some of them gave up working more than others, thus they did not apply everything in their mind while some of them kept working and tried their best. All these issues are given in Figure 4.34.

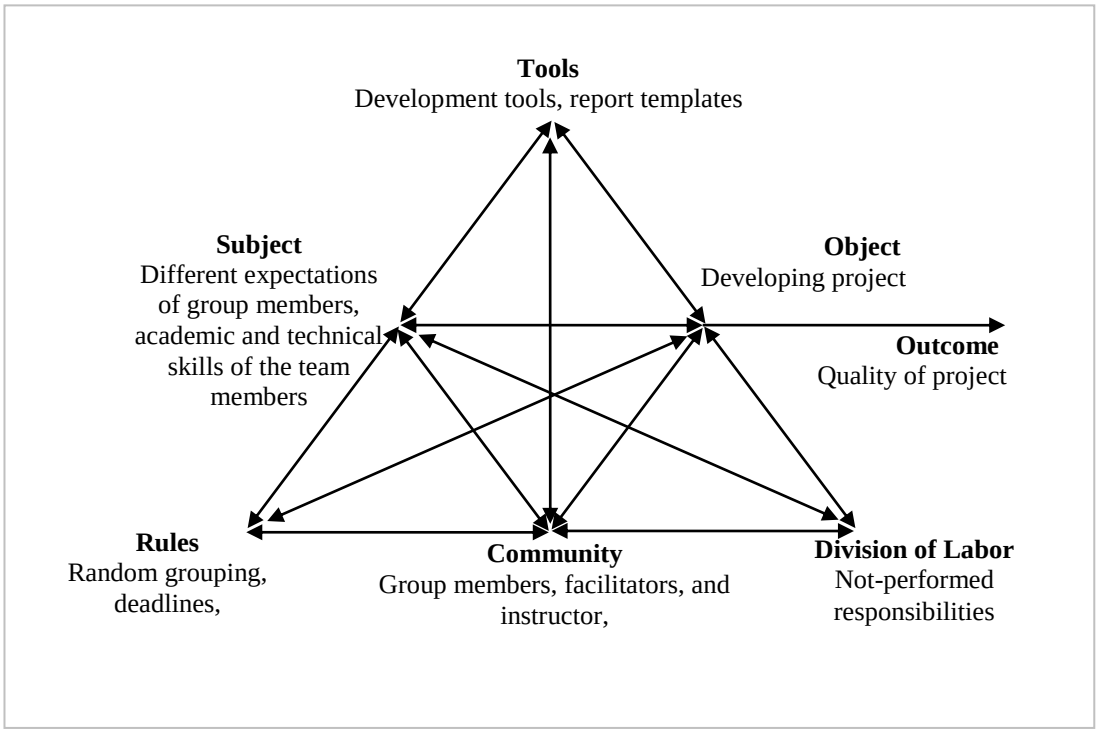



Figure 4.34 Influential dynamics on the quality of the projects

To conclude, time limitations and problems of randomly grouped students influenced the quality of the projects much. In this respect, some new strategies might be developed to strength the experience of students in randomly assigned groups.

### 4.7.7 Dealing with Technical Details

Lack of knowledge of development tool caused time loss much. This caused stress on the students. On the other hand, without practicing the tool many students could not accelerate on using the tool. Therefore, in the groups some members had to spend more effort than others to keep up with others.

**Effect of the Subject -Tool**

In *Group 1-11*, CS40 spent much more effort than other members; she expected others work as much as her. She complained about her group members much. However, when checking their work, there was no problem in the end product. She explained her work style by saying;

> *Flash bilmediğim için çok fazla efor sarf etmek zorunda kalıyordum çizimlerde, basit çizimlerde, onu oradan [çizgileri] birleştirip içine döküp boyamak gelmiyor da tek tek boyamak aklıma geliyor. Onu o şekilde [basit şekilde] yapabileceğimi önden kestiremiyorum (CS40, Female, PI).*

> *Since I did not know about the tool much, I had to spend more time in drawing, even in the simple drawings, it does not occur to me that combinin the lines and filling with paint, it occurs to me that painting it one by one with hand. I could not predict that I could do it like that [in a simple way] (CS40, Female, PI).*

This slow process did not cause any quality problem in the project but she was very stressful about their project because of the slow progress. Different experience of the tool caused problems in quality. The students who expected different quality of project were not pleased with the work of others and sometimes they did those parts again. In Group 11's case also CS40's insistency on good graphics caused much time loss. Although they were drawing frome sample pictures, since she wanted exactly same characters, they worked on graphics much more then other processes.

**Effect of the Tools – Rules – Division of Labor**

In another example, in *Group 1-11* of the first project group, the group had very short time to finish their project but *CS36,* who is the unique members working on development, spent much time to make something requiring advance programming. He could not manage it much in fact. He started to work on the test and game parts two weeks in advance of the submission. He sent 17 e-mails to facilitator to solve some problems related database. He could actually make same thing in much more simple ways but he preferred much more complex one. After finishing the test and game parts, they had no time for the lecturing part and he asked whether instructor gave any postpone. But it was not possible while instructor had already postponed the deadline two times. Then their project ended with a copy-paste lecture part and they got 0 point in that part. CS36 was also aware of this issue, he stated;

*Konu anlatımı içime sinmedi, tamamen farklı bir şeydi, ben sadece ondan hazırdan değiştirerek yaptım, üzerine yazıları koydum başka bir yerden de simulasyon vardı, onun üzerinde değişiklikler yaptım. Ama şimdi düşünüyorum da oyun çok güzeldi, [ama] düşünüyorum da çok uzatmışım kodları ama sıfırdan başlamıştım oyun yazmaya, daha kolay yapılabilirdi, zaman belki eklenebilirdi, başka güzel eklentiler yapılabilirdi (CS36, Male, PI).*

*"I was not satisfied woth the lecture part, it was completely different thing… I only made it by only changing an available one, I put the text on it, I get simulations from other places, I made changes on it. But not I think, the game was very good, [ but] I think I lengthen the codes much, but I started scripting the game from the rough, it was made much more easier, the time might have been added, some other nice additions might have been done" (CS36, Male, PI).*

As pointed out in two cases, working on unnecessary details cause time loss. This issue might be caused from students' lack of time management. Students had to consider their technical skills and difficulty of development tool to make a good time management. They might have considered the short deadlines of the project before starting complex ideas. The issues that cause time loss are shown in Figure 3.35.

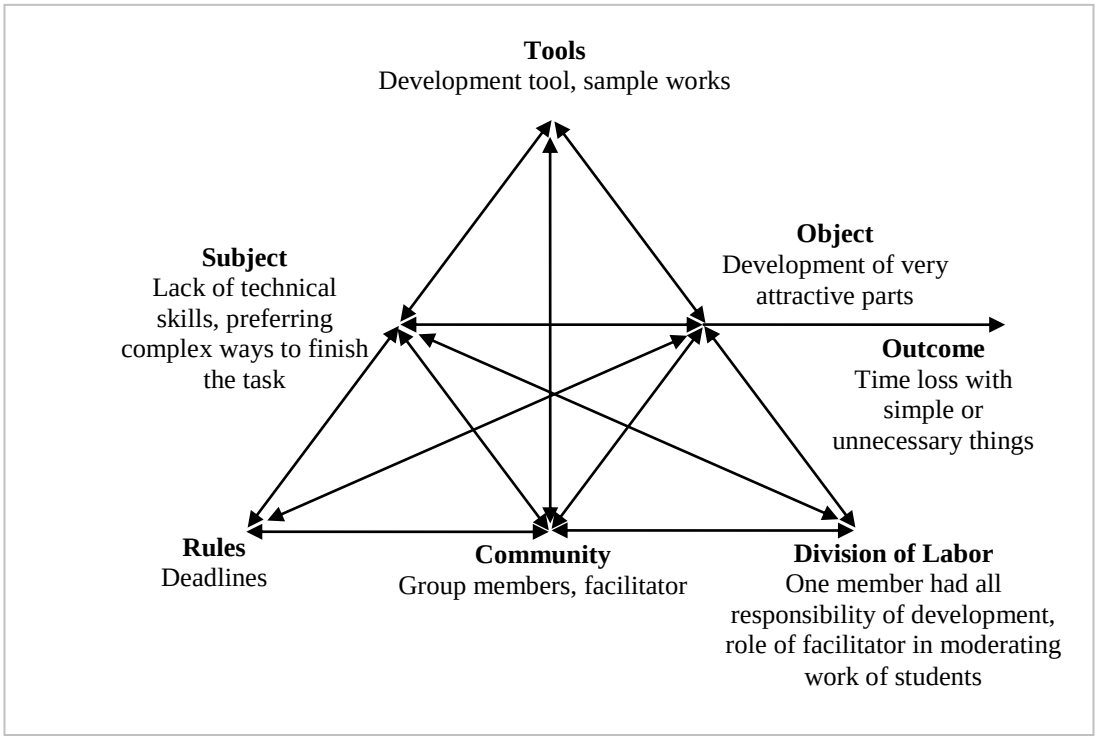



Figure 4.35 Influential dynamics on time management on project development

### 4.7.8 Comfortable Process in the Second Project

In the first multimedia project, they were challenged because they did not know how to report project steps and the development tools. In this phase they more take the target group interaction into consideration. When they come to video project they become very comfortable, because most of them thought video is an easy project to develop and they had report templates which they have already experienced. However, available templates were not exactly match with the nature of the second project, thus NIDs made some irrational or unnecessary connections between the reports and the project itself.

**Effect of the Tools**

The first project became the tool for the second project. If there would not be a second project it would not be possible to effect of the first one. In the second project students had no problem with finding target group, writing report, creating storyboard or developing the project. Having an experience from different groups and facilitators, students brought their experiences together in the second project. A student reported their second project progress as;

> *Analiz raporunda, ilkinde [ilk projede] mesela ne yapacağımızı bilmiyorduk, hatta contratı bile yaparken size geldik feedback aldık, onu bile yaparken zorlandık. Ama ikincisinde [ikinci projede] mesela kontratı 5 dakikada bitirdik, analiz raporu yine çok uzun sürmedi, bir kaç saatte hallettik analiz raporunu. Arkadaşlarımızın da zorlandığını sanmıyorum, needs analize context analize ne yazcaz onlar hiç engellemedi [sorun yaratmadı]. (CS27, Male, PI).*

> *In analysis report, in the first one [the first project] for example we did not know what to do, even while we were making the contract we came to you to get feedback, we had difficulty in doing that. However, in the second one [the second project] for example we finished the contract within 5 minutes, likely analysis report did not take much time, we were done in a few hours. I do not think that our friends have difficulty as well. What we would write on needs or context analysis did not cause any problem (CS27, Male, PI).*

A previous year student also mentined about relaxing in the second project by saying;

> *Video projesine geldiğimizde böyle bizde büyük bir rahatlama oldu, ... belki de Flash projesinde [sürece] çok alıştığımız için biraz rahat geldi onu bilemeyeceğim ama video projesi Flasha nazaran rahat geçti gibime geliyor (PS9, Male, PI).*

> *We we came to video project, we happened to very relaxed... may be because we get used to [the process] in Flash project, it was like more comfortable I am not sure, but video project went on more combortable than Flash project. (PS9, Male, PI).*

**Effect of Community**

In the second project for almost all project groups, all the members all group members became to know about what to do and thus they have very few mistakes. One of the NIDs

mentioned about the problems which caused lack of knowledge about the parts of reports in the first project and he added;

> *Şimdiki projemizde bu noktalarda bir sıkıntımız olmuyor, çünkü herkes kendi yaptığı noktada ne yapması gerektiğini biliyor. Hangi noktalarda hatalar çıkmış, nasıl düzeltilmiş ne tür cevaplar almış bunları zaten bildiği için, çok daha az hatalı bir sonuç çıkartıyor ortaya (CS10, Male, PI).*
>
> *In our new project we do not have any problem in these points because everyone know about what to do in their parts. Which parts were problematic, how they were revised, what kind of answers they took; since they already know about them, less mistakes are emerged (CS10, Male, PI).*

As CS10 pointed out, NIDs were comfortable to get information from the target group. Moreover reaching a target group was very easy in this project. They were also working with their close friends and their target populations were much more convenient. CS25 exemplified this easiness by saying;

> *İlk projede sadece bir tane öğretmenle görüşmüştük, aslında iki öğretmenle görüşmüştük ama ikinci öğretmen sonradan sorun çıkardı, çalışamadık onunda, dersaneden geliyordu galiba böyle ticari unsurlardan dolayı, video projemizde tek kişile sınırlı kalmadık, farklı kişilerin görüşlerini alalım diye, 4-5 kişiyle görüşme yaptık, değişik değişik gruplardan, işte trafik polisi, sigortacı filan… (CS25. Female, PI)*
>
> *In the first project we met only one teacher, in fact we met two teachers but the second teacher caused trouble and then we could not work with him, I think he was working at university entrance course, because of monetary issues, in the video project we did not stay limited with only one person, to take differen people's opinions, we conducted meeting with 4-5 people, from different target groups, let say traffic police, insurer (CS25. Female, PI)*

CS25 and her group were developing a project related "*preparing traffic inspection minutes*". Apart from finding a target group, also since the development of the product did not require advance programming skills designers did not have any technical problems. Moreover they enjoyed while recording the video.

NID were comfortable with working their group members in the second project too. They selected their close friends. In spite of many advantages of the second project, again not all the students had a successful progress. For example in one of the group that CS36, from Group 1-10 in the first project, formed their reports were not good which were averagely graded as 64. CS36 was one of the students who did not form his group in the second project. Therefore, instructor created two groups for the students who did not create a group by themselves. CS36 explained the start of his second project experience as;

*Herkes kendine bir grup seçti, en son beş altı kişi kaldı, hoca kalanları grup yaptı, ama çok iyi oldu, ilk işte raporu yazdık ilk defa ben rapor yazdım… biraz sıkıcı, neyse yazdık (CS36, Male, PI).*

*Everyone selected a group, lastly 5 or 6 students remained without a group, the instructor grouped those students, but it happened good, we wrote the report, it was the first time that I wrote a report… İt is some boring, anyways we wrote it (CS36, Male, PI).*

In the first project the female members of the group tolerated him because he promised the development of the project. In the second project with other male members he wrote report. Their reports were not good, but the material was good. In this sense, it can be easily seen that the students who did not pay attention to progresses did not have a comfortable second project experience.

In the second project students had comfortable process because of experience on reporting and roles in the group, having beloved friends in the group, knowing about the characteristics of group members. This was also recognized by the students. For example CS11 stated;

*Birinci proje için grubu çok da tatlıca olmayan arkadaşlar şimdi diğer arkadaşlarla grup, ve de çok daha iyi iş çıkaracaklar önceki projeye göre. O yüzden mesela not bakımından da düşünürsek ikinci proje biraz daha notları yükseltmiş olacaklar en azından bizim, biz rahat yapmış olacağız (CS11, Female, PI).*

*Our friends, who did not get along with group members in the first project, are now group with other friends and they will perform much better work. Thus, if we thing in terms of grades, they will raise their scores, at least us, we will make it comfortably (CS11, Female, PI).*

As recognized by the students, this comfort also provided increase in the average scores. For example average score of reports and the project in the first projects was 82.2 while in the second project it was 86.6. Average score of end products was 79.9 for the first project while in the second project average score of end products was 85.6.

**Effect of the Tools – Rules**

Although working conditions were much comfortable than the first project's work, they challenged with using report templates and applying all instructional strategies to the video project. They especially confused about how assessment and feedback strategies would be applied in the project. For example, in *Group 2-11* on the second groups *CS11* asked via e-mail about her confusion, she wrote;

*Approachta practice kısmı var, biz oraya ne yapıcaz tam olarak? videoda zaten biri instruction'ı yerine getirecek, ayrıca birine mi uygulatmamız gerekiyor anlayamadık. Bir de feedback kısmı var. Yine video da birisi yapacak. Videonun sonunda genel bir*

*tekrar olacak ve kaçınılması gereken seyler de belirtilecek. Bunlar feedback'e mi giriyor? Ya da feedback için ne yapmalıyız girmiyorsa?(CS11, e-mail, 27 Dec).*

*There is 'practice part' in approach, what we are going to write there exactly? There will be already someone who perform the instruction, beside it do we need to have someone apply it? We could not get it. Also, there is feedback part. Again someone will perform it. At the end of the video there will be a summary and the things that should be avoided will be specified. Do these things are assumed as feedback? Or if it is not feedback, what should we do as feedback? (CS11, e-mail, 27 Dec).*

After this e-mail she also sent another e-mail to ask whether one of their strategy could be assumed as non-example. In evaluation phase of their design they also wondered about how they could implement an evaluation. CS11 asked;

*Evaluation kısmı için insanlara tişört mü boyattırcaz da evaluation yapmıs olacağız, yoksa videoyumu izletcez manual ları da verip? ben tam anlamadım burayı(CS11, e-mail, 14 Jan).*

*In evaluation part, are we going to have people print t-shirt to make evaluation or are we going to have people watch the video with manuals? I could not get it (CS11, e-mail, 14 Jan).*

For motivational elements, they also asked

*Hocam major [motivasyonel] companents in satisfaction bolumune positive consequence bulamıyoruz yardımcı olabilirmisiniz. 'Video yu seyrettikten sonra kişi tişort üzerine baskı yapma işini bir hobi olarak düşünebilir boş zamanlarında. - video yu seyrettikten sonra kişi para kazanmak için bu işi yapabilir.' Bunlar positive consequence olabilir mi? (CS17, e-mail, 15 Jan).*

*Dear mentor, we could not find positive consequence in the satisfaction criteria of major [motivational] components, could you help us? After watching the video, people might consider t-shirt printing as a hobby. After watching the video people might start this job to make money'. Do these things can be assumed as positive consequence? (CS17, e-mail, 15 Jan).*

Motivational issues also caused some confusion in other groups, for example CS9 from Group 2-10 asked;

*Instructional approach ve major components'in ilk ikisini [group e-mail listesine] yükledim yeni haliyle. Lakin motivation components of the instructionda relevance kısmında kitlendim biraz. Bu yüzden HELP,F1,YARDIM☺(CS9, e-mail, 28 Dec).*

*I uploaded the first two of instructional approach and major components [to e-mail list]. However, I confused about the relevance criteria of motivational components of the instruction. Therefore, HELP, F1, YARDIM ☺(CS9, e-mail, 28 Dec).*

As seen on students questions, although students get experience on motivational and instructional strategies in concept teaching via multimedia project, they had difficulty use same strategies in the video project. This was mainly caused with the report templates which gave similar motivational and instructional strategies for different kind of instructional

materials. Another issue might be lack of experience on transferring similar strategies on different kind of instructional materials. And the last reason might be that students' need of examples to make sure that they are on the right way. In any case, students' efforts to add motivational and instructional strategies are much higher than the first projects. In the first projects, generally students could not use many of the strategies that they stated on their reports in fact. The issues influential on comfortable process are shown in Figure 4.36.

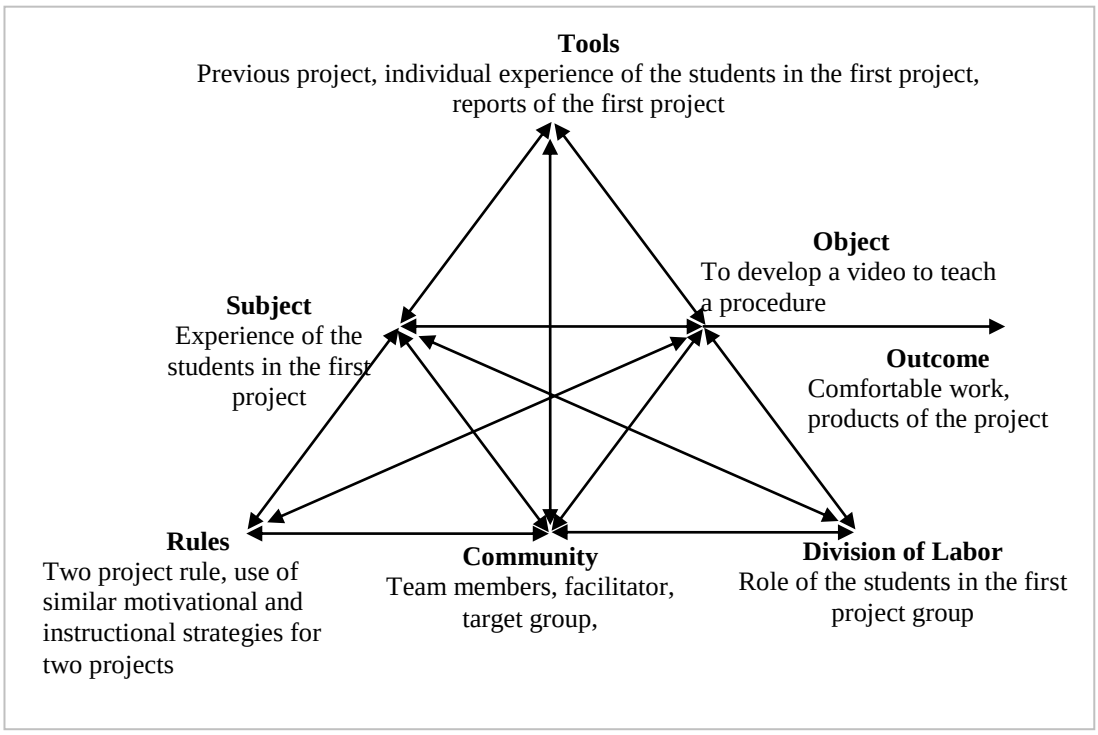



Figure 4.36 Influential dynamics on the second project

### 4.7.9 Submission of Deliverables and Deadlines

Short time span for each phase of design was most effective factor in finishing tasks properly. On the other hand lack of time management, encouragement of the facilitator to make NIDs submit their work before the deadline to get feedback are also important issues to deliver the projects in time. Except a few project groups who could get feedback from the facilitator, the project teams could finish their work shortly before the submission time.

**Effect of Community**

As mentioned before, Group 1-7 always took the feedback of facilitator before submitting it. In fact in their case, the motivation of finishing the tasks earlier than deadline was that, after

getting and applying the feedback, they could get higher score on that deliverable. This was a bit disadvantageous for the facilitator tough. After giving feedback students could object some points that facilitator reduced by saying "*but you did not state it in your feedback*". Therefore, there was a need for another strategy to give feedback on drafts.

Among other groups only Group 1-10 asked postpone and although facilitator posed that if they would not deliver the project on time, their score would be reduced. Even though this warning, Group 1-10 delivered their project one day later than the deadline. As mentioned in in this group main problem was dealing with unnecessary details and responsibility of unique person for the entire project. In other deliverables also they could only delivered at the last day. In this group, even CS35 wanted to start working earlier, since others did not regard her calls, but since at the beginning she tried to make others involve in progress, they lost time. At the end she started to work on reports alone but it was late to finish all work in a short time. At the end CS37 helped her but CS35 worked much more than her.

In Group 1-11, the case was similar but in that case CS40 insisted to work with others together. Thus they just come together shortly before the deadline and did whatever they could in the last day for the reports. Finishing tasks in time provided students submit proper tasks which could help for the next step. In the context since students prepared their work in rush, they did not have time to synthesize the processes and develop feasible ideas. Most of time they just focus on what the template was required without thinking about the next steps. Lack of plan for the next steps caused many changes in the projects or students had many troubles and spend much time to finish them like in *Group 1-10*.

**Effect of Community- Rules**

Being in rush to finish the tasks was not only caused from the students. Busy schedule of junior students and busy schedule of the course were also major factor being in rush. Most of time students had other courses' which match with delivery of two projects of the course. Moreover, there was very short time between the submissions. For example after the submission of design report, students had two weeks to finish, implement and evaluate the project and write the final report. Therefore, in development part especially was very busy for the students. A student stated his point of view about this issue by saying;

> *[dizayn] rapor[u] bittikten sonra projeye başlamamız bizi sıkıntıya soktu, en azından dizayn raporunda bile neler yapacağımızı çok büyük oranda belirlemeye başlamıştık. Orda bir şeyler oluşturmaya başlasaydık ya da biraz ilerleme kaydedebilseydik, bu kadar sıkıntı yaşamazdık (CS10, Male, PI).*

> *Starting project after the [design] report were done distressed us. At least we started to specify majority of what we would do in design report. If we started to create something in that phase or if we progressed some, we did not have so much trouble (CS10, Male, PI).*

As CS10 pointed out, students had trouble with developing the project after finishing the design part entirely. Unless students were asked to start to work on work with development tools, very few of them started to work on it. Although students were encouraged to start to design some graphics and layouts as early as possible, they posed excuse by saying that they are not ready to work on the tool. CS13 summarized this issue by saying;

> *Çok sıkışık[yoğun] olduğumuz bir dönemdi, kendimizi geliştirme şansı bulamadığımız için, orda bir sıkışıklık [stres] yaşadık, söylediklerimizi tam anlamıyla yerine getiremedik, biraz daha zamanımız olsaydı, belki çok daha güzel şeyler yapabilirdik (CS13, Male, PI).*

> *It was a very busy semester, since we could not have chance to improve ourselves, we had stress, we could not perform all the things that we proposed. If we had some more time, maybe we could do much prettier things (CS13, Male, PI).*

As seen in students' reactions main problem with finishing the deliverable in time influenced the deadlines and students' academic and technical skills much. The issues related submission of deliverables can be summarized in Figure 4.37.

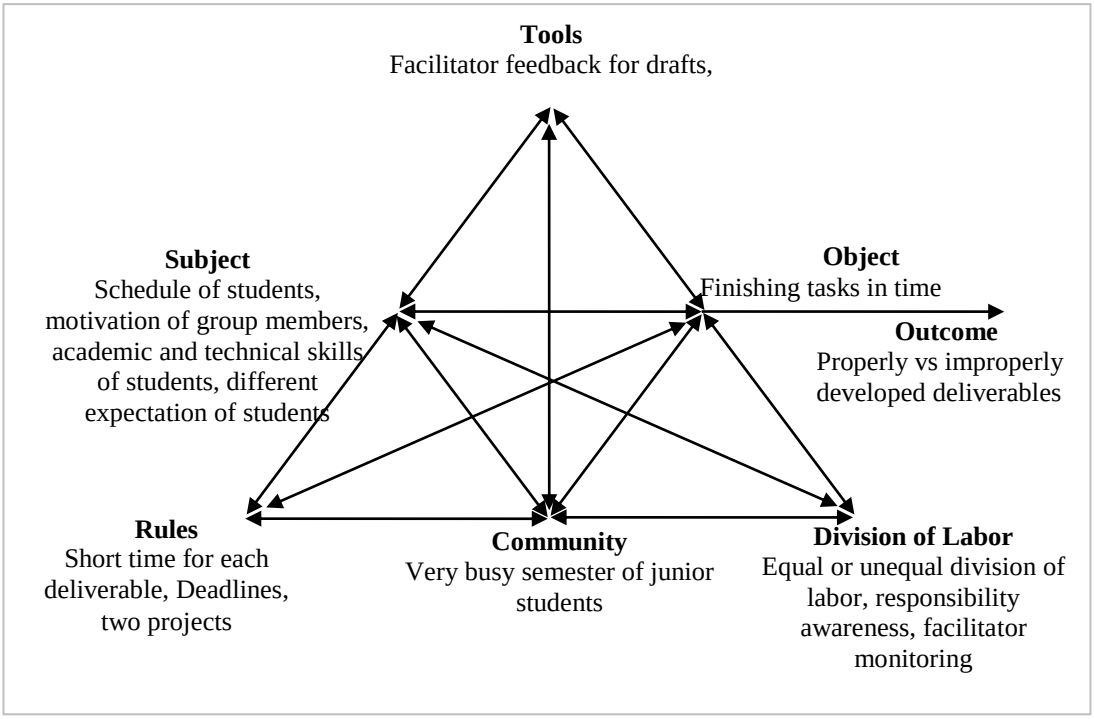



Figure 4.37 Influential dynamics on submission of projects

As seen in Figure 4.37 there is a tension deadlines and getting feedback from the facilitator before submission. In application of rules, community members' awareness of responsibilities and their expectation has an important role. Also facilitators might bring some more deadlines for smaller units of activities, like researcher tried to do for storyboards. On the other hand, no groups regarded this expectation of the facilitator and they did not bring their full storyboards before the design report's deadline. In this situation facilitator's methods are important to make students regard facilitators' expectation.

### 4.7.10 Ethical Work

Plagiarism of content, pictures and animations without any reference was important ethical issues which were encountered in the course. Students were actually supposed to be aware of many issues writing academically because in the *Week 2*, while talking about the report, CS28 from Group 1-8 asked whether they will use APA style for the reports. When the facilitator asked about how sho knew about it, she stated that they learnt in their English course. This might also meant that they knew about how they should make citation from other resources. However several ethical issues aroused during the projects.

**Effect of Community**

One of the problems was reaching a target group at the end, since most of the groups did not get any promise from the target group for an implementation they could not easily reach at the end. Therefore, it was crucial to talk about the processes of the project to the teachers to get permission from them for an implementation or at least an evaluation. In Group 1-7 since students contact with teacher continuously, they had chance to bring their project to her whenever they want. In other groups (Group 1-9, Group 1-10 and Group 1-11) the target group was not available for an evaluation. Thus, their evaluation parts did not seem a real one.

**Effect of the Rules**

Although there was no problem in reports in terms of plagiarism, they, like most of the groups, reported false information in evaluation part. This was mainly caused lack of time, motivation of the target group, students' communication with target group and knowing that it would not be recognized. In Group 1-8, in fact they sent their project to teacher and teacher thanked them via instructor. On the other hand he did not send any feedback about the project; he just stated that the implementation was very good and as CS30 voiced, he gave some feedback. On the other hand, they sent their project to the teacher after submitting the project and the final report to the facilitator. Thus, the things that wrote for evaluation part was not realized before writing that part. As mentioned in the first research questions, most of groups could not implement the evaluation phase because of lack of time and lack of access of the target group.

**Effect of the Tools**

Another ethical problem was encountered in lab homework and again time limitation was stated by students as main factor in making plagiarism. For example students which are actually motivated to learn new things stated;

> *Ödevler konusunda ben arkadaşlardan yardım aldım, mesela son bir ödev çok zordu, yaptım birazcık yetiştiremedim zaman olarak. Arkadaşlarımdan aldım o saat şeyini [zaman gostergesi], … tek başıma bulamadım hani yapamadım, olmadı anlamadım (CS15, Female, PI).*

> *I got help from the friends for the homework, for example the last homework was very difficult, I made it but I could not complete it in time. I got that clock thing [indicator of time].. I could not find it by myself, it did not happen, I could not get it (CS15, Female, PI).*

Although she was posing an excuse because she is aware of the situation of plagiarism, some students even were not aware of that they are making something wrong. For example, *CS9*

argued that he did all homework by himself and criticized other friends who did not do their homework seriously stated;

> *Convert [çalıştırılabilir dosyayı tasarım dosyasına dönüştürme] edebilirlerdi [ödevleri ciddiye almayanlar], … ben de convert ettim ama, mantığını anlama amaçlı kullandım, hani bilmediğim için kodları o amaçla kullandım, yeniden yaptım ama sonuçta. Yeniden yapmam bile, onun çizimini bile yeniden yapmam bile çok büyük avantaj sağladı bana (CS9, Male, PI)*

> *They [whom did not take homework seriously] could convert [converting executable file to development file], I also converted but to understand the logic, since I did not know that codes, for that reason, I did them again in the end. Even doing them again, even making their drawings again, provided great advantage for me (CS9, Male, PI).*

The student was not much aware that converting is plagiarism and already the aim of the homework interpreting the logic of it by just examining the executable file. As a conclusion even for the simple things, students preferred most convenient one most of time, they had no time for searching and spending hours to solve problem. Although one week time was enough for the students, since they had to submit reports frequently, their time became much more limited. The issues causing ethical problems were shown in Figure 4.38.

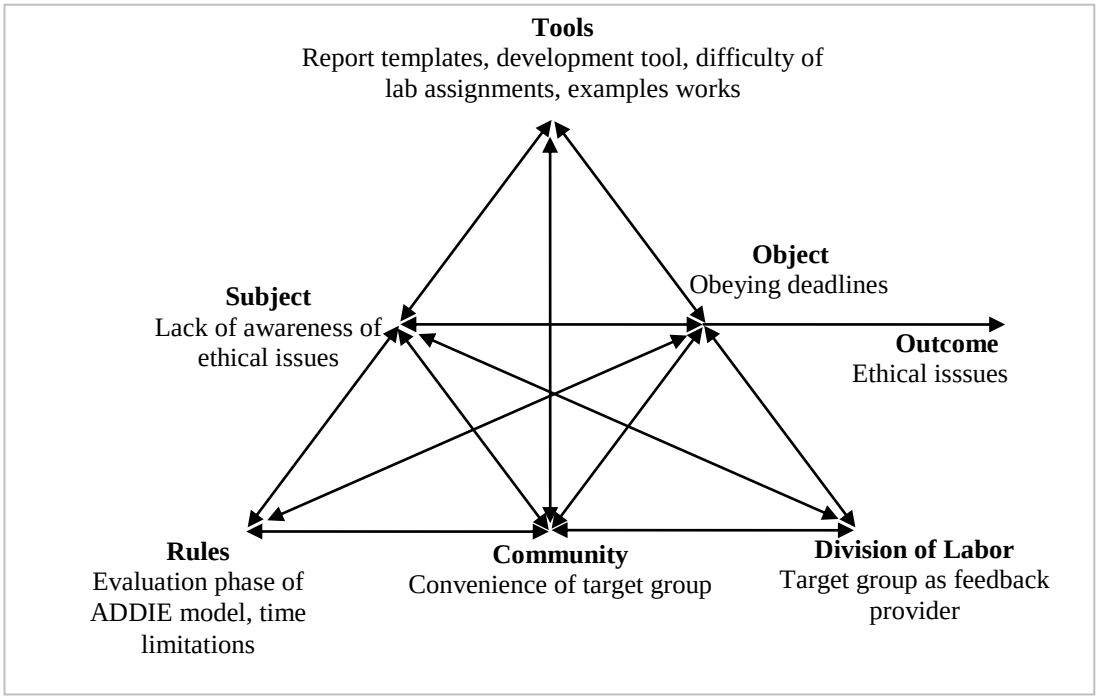



Figure 4.38 Influential dynamics on ethical work during the project

As shown in Figure 4.38, when the object was to finish the deliverables on time, ethical issues aroused because of time limitations, in evaluation phase of ADDIE because of inconvenient target group and difficult lab homeworks.

### 4.7.11 Summary of Research Question 2

In process of instructional design students started with developing ideas about their projects and they facilitated from examples, target group feedback and resources of the course. After designing their ideas mainly in development phase of the first project they had difficulty especially with deadlines. In the first project, working with target group was difficult. Since they were not experienced with collecting and synthesizing information most of them could not reflect what target group expected to their project. Development tool and lack of technically skilled group members caused difficulty of developing most of the design. The issues that influence processes of design and development negatively can be listed like below:

- Different motivation and expectations of group members
- Group problems because of the teams assigned by instructor
- Short deadlines
- Lack of effective monitoring of facilitator
- Inconvenient target group
- Target group's motivation to help project groups
- Unfeasible expectations of target group
- Lack of technical skills of group members
- Assigning one member to entire development
- Lack of awareness of technical skills
- Lack of examination of tools
- Lack of implementation of group rules
- Unfeasible design

- Need of concrete examples

and issues influencing the process positively can be listed as;

- Similar motivation of group members
- Convenient target group
- Target group which promised for implementation and evaluaton
- Background knowledge and experience of students related topic
- Having experience of the first project
- Working with beloved friends
- Examples of previous projects to get insight
- Taking continous feedback from facilitator
- Being experienced about tools

## 4.8 Research Question 3

What are the issues that might be combined in an activity system to provide the success of instructional design practice and products?

To answer this question, researcher provided the summary of the cases of four project groups.Therefore only current student's data were used (Fıgure 4.39).

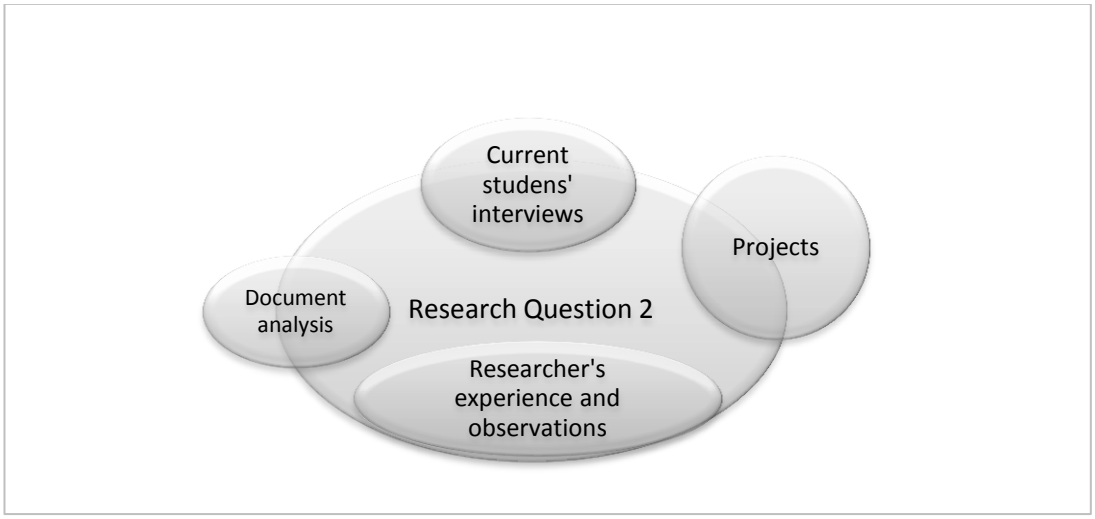



Figure 4.39 Data used to answer Research Question 3

Three of cases were selected from the first project groups since in the first projects group dynamics were very different. In the second process the processes and dynamics were similar; therefore one of the cases was selected in the second projects. After revealing the dynamics of the groups, researcher showed the influential issues on instructional design team's work. While categorizing the groups the researcher used "good", "moderate" and "poor" terms for both processes and the products. For the processes the researcher considered team work performance, communication with the facilitator and other stakeholders, use of communication tools, regarding meeting times, being encouraged to perform good work. For the products end product scores which is the average of three raters were taken as base.

### 4.8.1 Good Progress – Moderate Product: Case of Group 1-7

As a good progress Group 1-7 was selected because they had very good communıcation with facilitator, team members and target group. They get as much as feedback for their each step

and their reports were very clear and consistent as well. Their product was moderate because of some usability issues and some malfunctions in their project.

**Subject – Community**

For the first project, *Group 1-7* can be examined as a successful part of the community. At the beginning of the semester, they were really motivated to develop a good project and they were really fine with the group members. As a successful community they worked coordinately without major problems, followed the instructional design steps clearly and in detail, made design and development consistently, and used the time wisely. As mentioned before they developed a project for 4$^{th}$ grade of elementary school to teach the topic of "*Human Body System*". As target group they selected the classroom where *CS25's* sister studied. The teacher of her sister worked with them effectively.

At the end the project produces a product which is consistent with all the instructional design steps and the evaluation of the target group is in positive way. None of group members were good about programming. But they know to what extent they could use the program and they always consider what kind of things they could do or not. Therefore, they developed a simple idea in accordance with the target teacher's suggestions. The leader was CS25 but other members did not just wait CS25's calls to start any task. They all managed the group. Group 1-7's time management was very good. They always sent an e-mail to remember the tasks that should finish in that week. The leader's e-mail at the beginning of the semester shows how much they motivated to work with each other and work on the project. She says;

> *…, Öncelikle sizlerle aynı grupta olduğum için çok mutlu olduğumu tekrar söylemek istedim. Bir de ilk toplantımız sırasında konuştuklarımızı tekrar hatırlatmak istedim. Bayram tatili boyunca hepimizin evlerinde olması nedeniyle toplanamayacağız. Ama bu tatili boşa geçirmeden çalışırsak başarılı olacağımıza eminim.*
>
> *Toplantıda karar verdiğimiz ve yapmamız gerekenler: Meb müfredatına uygun bir konu bulmak, Konuya uygun ve anlaşılır bir senaryo oluşturmak, Konu anlatımında kullanacağımız orijinal bir karakter bulmak, Görüşmeye gidebileceğimiz okulları düşünmek, Action script çalışmak ve güzel bir kaynak bulunca gruba haber vermek*
>
> *Tatil boyunca hepimiz çalıştıklarımızı not alırsak dönünce en iyisini seçip karar verebiliriz (CS25, Female, Mail, 28$^{th}$ Sep)*
>
> *…, First of all, I would like to say again that I am very happy to be in the same group. Also I would like to remind you the things that we discussed at our first meeting. We will not meet because of holiday and we will be at our hometowns. But if we would not waste our time and work in the holiday, I am sure that we will be successful.*
>
> *The things that we should do and decided at the meeting are:Finding a suitable topic in MoE's curriculum, creating a suitable and clear scenario in accordance with the topic, finding an original character for narration part, thinking on the schools that we can go*

*[for target group], working on action script and letting others know if we find a good resource [about action script].*

*If we take notes about the things related the things that we worked on, we can choose the best one and work on it (CS25, Female, Mail, 28th Sep)*

During the project this kind of e-mails were received from different members and they stated their tasks clearly. They started very quickly and they were a bit worried since there was only 8 weeks to finish the project. Before each submission they always prepared a draft and get the feedback of the facilitator. This group was the unique groupwho could at least send a draft storyboard to be reviewed. Although they had to change something on their projects at the end, most of those changes were made in accordance with the target group feedback and very small piece was because of the technical issue.

**Object**

By presenting instruction about Human Body system, *Group 1-7* aimed "develop an effective instructional material which can be used in real class environment and to attend a competition which is related to educational software area" (Group 1-7, Contract). In their contracts their expectation from the project was high and among their goals there was attending an instructional design competition. This motivation made them start processes very early such that they started to prepare the animations on Flash before the analysis stage. Therefore, facilitator had to warn them to not go on the processes ahead of time. Facilitator also reminded them they are in an instructional design process which requires extensive analysis process.

Eventually, they prepared a project which addressed target group well. On the other hand, while they tried to make it as much as simple, some usability issues aroused. During their development, *Group 1-7* brought their product several times, to ask about some programing issues, to ask the harmony of the colors, suitability with target group and the content. In fact programming questions were very simple and thus producing their end product was not easy for them such a lack of experience. With this effort they got 86 points for the end product at the end of the semester although it got 59 in inter-rater evaluation.

The thing that was weak for their project was that, although they developed an original idea they could not make a proper story. They also developed a test part which was very similar with one of the lab homework. On the other hand their effort to make the content simple, using good narration was appreciated.

**Division of Labor**

The division of labor was made equally and all group members finished their work on time and even ahead of time. CS27 exemplified this by saying;

> *Toplu olarak oturup[işleri] yapsaydık, 3 kişi olduğunda biraz yavaş ilerler genelde, ama bizim grupta herkes kendi animasyonunu kendi halletti, [raporda] kendi kısmını kendi halletti. Onun için bir sorun çıkmadı ama genelde, böyle durumlarda yavaş ilerleme sorunu oluyor (CS13, Male, PI).*

> *If we would do [tasks] all together, when there are 3 people, it progress slowly generally, but in our group everybody made their own animations, their parts [in the reports]. Therefore, there was no problem but generally there is a problem of slow progress in those cases (CS13, Male, PI).*

Although CS27 stated that it all members did their parts themselves, most of time they come together to finish the tasks. The group was good at communication with facilitator. They always applied the feedback of facilitator. On the other hand this caused another problem. In their draft if the facilitator did not say anything about some parts they did not do more things about that part and in actual evaluation, if they lost any point they advocated themselves by saying that "*since you did not say anything about this place we did not make any change" (Week 5 and 7 observations).* In that situation facilitator explained that she only gave feedback for the things that seems wrong but she did not mention about what should be added more because, this would be unfairness for other groups who did not take any feedback before actual evaluation.

**Tools**

This group used communication tools well, both in communications with the facilitator and within the group. It was the unique group that could progress via e-mail or instant messaging. They were most active group which use e-mail list and ask questions. Their e-mails most of time were related minutes of their group meetings and weekly meetings with the facilitators. They easıly meet face to face but they also used Internet communication tools effectively. For example CS27 sent an e-mail to say that they finished their first report after meeting on messenger.

> *... Evet arkadaslar az onceki msn toplantimizdan sonra nihayet su raporu bitirdik. Hepimizin eline, emegine saglik. Yalniz ilk rapor icin bile bu kadar ugrastiysak gerisini dusunemiyorum bile:) Neyse 2. Raporda gorusmek uzere... (CS27, Male, Mail, 7th Nov)*

> *..., yes friends, at the MSN meeting a short time ago, eventually we finished the report, thank you, but if we strived so much just for the first report, I could not imagine for others : ) Anyways, see you on the 2nd report ... (CS27, Male, Mail, 7th Nov).*

As like CS27's e-mail, after each stage group members congratulated each other and presented their thanks. Thus one of the advantage of the group is that all group members were encourages and support each other. All group members did their jobs on time so no member spent more effort than others.

The thing that the group had challenge was using the development tool. Although they made almost all design, they could not make their project like a story. At beginning they had proposed to tell about Ghost Casper's story. At the beginning Ghost Casper was sad and wants a body, and it was told that if he worked the parts of the body it will win the parts of the body, thus at the end the Casper could get a real body. But they could not attach this scenario to their project. Additionally, although they always made formative evaluation, at the end they had problem with timing. They could not edit sound properly. Lastly, although they create content very suitable for early ages and made it very simple. This simplicity expectation reduced the interactivity of the project as well. Their project also had problems to guide the students. Although they get feedback for that problem, at the end they could not effectively apply it.

**Rules**

In their work policy they proposed that all members would come to meeting in time, work the task before the meetings, everyone should develop herself/himself about technical issues; all the minutes of each meeting should be posted via e-mail. They obeyed all these rules during the project. In each step even after the submitting a deliverable they send an e-mail to note that they submitted it. At the beginning, in their contracts they did not define any penalty for an undelivered commitment. When facilitator asked it CS25 explained it as "*we will not need penalty because we are so fine with working with each other*". However facilitator insisted about determining some penalties and Group 1-7 prepared it. As penalty they preferred reducing 5 point for any penalty situation.

**Outcomes**

As a result project of Group 1-7 were created very good project in a simple way but using good instructional and motivational strategies. Their project was including the colors that children like, and they added songs that might be very good motivation for 4th grade kids. All songs were sung by CS27 and their songs included the content of the project. The graphics were simple and all made by the members. On the other hand they applied a good instructional design process as expected in the course.

**Summary of Issues Influencing Progress and Product of *Group 1-7***

The issues influencing improving their progress are listed as;

- Good motivation of group members tow work with each other
- Selecting a convenient target group
- Effective workwith target group teacher
- Target teacher' promise to implement their project
- Wisely time use until the end of the project
- Behaving responsibly
- Getting continuous feedback from facilitator
- Planning the process well
- Using different communication tools effectively
- Examination of limitations of the tools
- Self awareness about using development tools
- Development of reasonable and feasible ideas about their project
- Getting feedback from students
- Giving priority to instructional and motivational strategies
- Giving importance to reporting, gave details in the reports
- Reporting all minutes of their progresses

At the end their project was evaluated as a moderate product because they could not develop all the design like using sound for all parts of instruction and transforming the Ghsot Casper to a human at the end of the instruction, and they had some usability problems. The influential factors in this issue were;

- Lack of application of simplicity expectation of target group
- Lack of time at the end

- Technical skills of members in terms of graphic design and actionscript

### 4.8.2 Moderate progress – good product: Case of Group 1-11

Group 1-11 was selected as moderate progress because of team problems. Their product on the other hand good in terms of having good graphics and good instructional strategies.

**Subject – Community**

Everything started good at the beginning for Group 1-11. The group had one female member (CS40) and two male members (CS39 and CS41). CS40 was very active students not only in the group but also she was continuing many hobbies. She had very good graphic design skills. Most silent one was CS41, he almost have never spoken in group meetings. CS39 was also motivated at the beginning but towards the mid part of the project his motivations seemed to reduce much. At the beginning *CS40* was happy with working two technically skilled friends, but in a while, she troubled with others' postpones. She stated her disappointment as;

> *CS39 ile aslında ilk defa bir grupta ilk defa bir aradaydık, aslında başta CS39'a güveniyordum, hani yaparım ederim, yaparız olucak lafları bana güven vermişti, ama olmadı (CS40, Female, PI).*
>
> *Fort he first time we were being a group with CS39, actually at the beginning I was trusting CS39, his words of 'I will do, we will do' was giving comfort to me, but it did not happen (CS40, Female, PI).*

The thing that made Group 1-11 moderate was the group problems. In fact there was no apparent problem but CS40's expectations were very high.

This group also did not worked with a target group properly. In analysis stage CS41 was going to meet with a teacher as he wrote in e-mail. On the other hand neither he provided any information from target group not they reported on their analysis report. Only *CS40* tried to contact with and analyze the target group. *CS40* had a many neighbors which have an elementary school child. She made very detailed learner analysis at the beginning. On the other hand they could not use the expectation of target group much but tried to look at the lenses of children. However, it was not possible to make formative evaluation since other group members never finished their parts before the deadlines. Towards the end, CS40 applied summative evaluation as she expressed in interview. On the other hand, it was a bit suspiciuous issue since they had kard times to finish the project before deadline. In the report, they also did not provide any evidence about the children that they contact with.

CS40, in questionnaire mentioned about many group problems which facilitator did not recognized. She emphasized in many place that a members should be the part of the work not the take all of the work. This was not only her experience in the course but her expectation at the beginning of the course. For example, in questionnaire for the question of how the quality of project can be provided, she answered;

> *Proje gruplarındaki elemanların kendilerini sürekli geliştirmeye açık olmaları yenilikleri kolaylıkla projelere uygulayabilecek yetenek ve bilgiye sahip olmaları [gerekir] (CS40, Questionnaire)*
>
> *Having skills and knowledge to be applied innovations in projects easily, being open to improve themselves constantly is required for project group members (CS40, Questionnaire)*

With this perspective CS40 always insistent on fair working and she wanted to trust the members. Thus she disappointed with the members who were not pay attention to the project and not much motivated to develop a different ideas for the project as much as her. In a time this issues led quarrels.

For the first two reports group members could manage working on e-mail list, however after design stage no group member used the group e-mail list although they could not meet face to face too. This might be caused the issues that they had in design part.Especially in decision making of the project they had many debates in group meetings. In that time, their personal relationship might have been ruined. After the design report submission, CS40 challenged to manage others and group problems continued until the end of the project.

**Object**

The group dealt with many unnecessary details. For example at the beginning they struggled with the selection of lecture part, whether it should be like a computer screen or a book. Then, after they selected to design as book sheets, they struggled to make sheets open like a real book sheet. They could not do that properly. And they did not make the sheets animated. These kind of unnecessary details cause much time loss for the group.

She had very colorful and attractive ideas, for example she explained their ideas as;

> *Hiç yazınsal bir örnek vermek istemiyoruz, tüm içerik görsel, işitsel ve animasyonlu olacak, tüm projeyi bir oyun gibi tasarlayacağız (CS40, Female, Week2).*
>
> *We will not give any text based example, all the content will be in visual, audial and animated, whole project will be look like a game (CS40, Female, Week2).*

CS40 proposed Cedric character for their project and the project was like a story of Cedric. She believed that both girls and boys will like it since it was a character at age of 8. She liked

to make decisions and apply them. In fact although at the beginning she liked working together and knowledge sharing, researcher observed that she do not accept most of ideas of others since she did not find them interesting or appealing. There was no problem between other two male members. They were working well but they were waiting until the deadlines. Since technical skills of CS40 were not as good as other members she had to wait for them and remind their tasks continuously. On the other hand she was very good at graphic design but she could not try programming the project since she did not believe that she could do. She explained the situation by saying;

> *12-13 yaşına hitap etmeye çalıştık ama karakterimiz 7-8 yaşında bir karakter yani, … mesela ben onda görsel tasarımın içinde bulunmaya çalıştım, bunun dışında zaten çok fazla kod bilmiyorum, yani beceremiyorum, aslında yapabilmeyi çok isterdim, çok da eğlendim, ama kod kısmı biraz beni ürküttü sonra çektim kendimi (CS40, Female, PI).*
>
> *We tried to address 12-13 years old, but our character was in age of 7-8. For example, I tried to be in part of visual design, expect this, I do not know about coding, I mean I could not manage it, actually I would love to do that, I really enjoyed it, but the coding part made me scared, I hesitated to do that (CS40, Female, PI).*

Although the group had decided to use Cedric character and its story in line with Cedric comics, they could not develop a clear idea towards the end of the project. In group meetings *CS40* was much more active than others and she always developed ideas in the meetings. Since she did not care others' ideas in a time other two male members preferred to stay silent. Her attitude was influenced others in negative way, she was also aware of this issue, she state;

> *Bütün Cedricler [grafikler] aynı görünmeliydi mesela ama olmadı hani hep böyle bir projenin parçaları değil de farklı projelerden derlenmiş gibi durdu. Bu beni rahatsız etti, hani ben eğer çok daha iyi biliyor olsaydım yani Flashı sanırım çok daha fazla müdahale ederdim projeye, daha fazla konuşan olmazdım,. Onlar çok hoşlanmadılar bundan ben çok müdahale ettim çünkü bilmediğim halde. Çok fazla yönlendirmeye çalıştım, bak bu güzel durmuyor, bu hani estetik değil, yeri güzel değil, boyutu güzel değil. Çok fazla müdahale ettiğim için biraz rahatsız oldular sanırım onlarda (CS40, Female, PI).*
>
> *All the [graphics of]Cedrics should seem similar for example, but it did not happen. It was not like a part of the project but was like rendered from different projects. This bothered me, if I knew about Flash well, I would intervene the project much, I would not be the one who spoke much. They did not like this, because I intervened much although I did not know. I tried to guide much 'look this does not look like good, it has no aesthetic, the place of its is not good, its size is not good'. Since I intervenet too much, I think I bothered them some (CS40, Female, PI).*

Although she was aware of that her attitude bothered them, she went on thinking very advance things, but those ideas were staying as idea.

**Division of Labor**

Division of labor was equal in the group. However, since CS40 was not good at technical issues she always had to wait others to combine the works. She was worked as graphic designer in the group while others created the animations and scripts. CS40 was good at leading other by continuous update and give some deadlines for the work. She could manage others at the beginning of the project and monitored others work. She also answered the questions of other friends. All script parts were made by CS39 and CS41.

**Tools**

Living location was one of the problems for this group. *CS39* was working at a part-time job and he did not want to come to school if it is not necessary. He wanted to perform some tasks via online. On the other hand *CS40* was insisting coming together and work by sharing knowledge. Especially she was very stressful about his relaxed attitude. She complained by saying;

> *'e şimdi ben [Ankara'da bir bölge]dan kalkıp nasıl geliyim, işte bir sürü zaman kaybı falan`hani MSN üzerinden, internet üzerinden bunu hallederiz` [CS39'un bu şekilde söylediğini söylüyor] (CS40, Female, PI)*

> *'How can I come from [a district in Ankara] right now, it is so much tome loss etc, we can manage it via MSN' [CS39 says]" (CS40, Female, PI).*

In fact online communication tools was suggested for the groups since the course requirements were a lot and students might not have finished everything by coming together. Some groups could accomplish this but *Group 1-11* could not do that because CS40's expectations. The thing that made her stressful that, she was not comfortable to work on development tool herself without help.

**Rules**

At the beginning they decide the rules of the group as being on time and meet regularly. However they could not apply these rules. They also defined a monetary charge for penalty but they could not do that. CS40 tried to make time management in the group but because of dominancy of others she could not manage all the processes.

They also had trouble to come to weekly meeting two times. In fact, two times they came to facilitator and said "*we have no progress this week, so could we just skip this meeting*". In fact weekly meeting was the rule but because of this kind of issues, facilitator accepted this to not cause more stress on them. However that two weeks cost lower report grades, since they did not ask about the requirements of design report and they did not get any feedback

for their drafts. All these issues reduce the quality of processes and cause the reduction in instructional design experience.

**Outcomes**

Because of the stated group problems and lack of concrete ideas on the project, in fact facilitator did not expect a good project. At the end but they submitted very good product with quality of graphics and story but it was not the exactly what CS40 imagined, she still was not satisfied with their product. On the other hand, when compared with other projects in the class it was one of the best projects. Even other facilitators stated that "*I have never seen such a project that uses the character effectively from the beginning to the end effectively*" *(F2, Personal communication).*

Facilitator was surprised with the end product because CS40 always stating or implying group problems in every occasion. *CS40* also did not hesitate to state group problems both in the meetings and in person to the facilitator. Therefore, the facilitator did not expect any consistency between the parts.

As a result of the progresses of Group 1-11 of the first project, male members could manage the last step of the project while CS40 worked on ID processes more than others. Although their products were good, the reports of them were not good. Their performance reduced gradually. Their report grades were representatively 86, 77 and 73 for analysis, design and final reports. This reduction was especially caused lack of details about the project and of application of facilitator feedback. Especially in the final report because of the lack of update of progresses and concrete evaluation results their report score was low. They end product get 83. On the other hand in inter-rater evaluation it get about 90 points.

**Summary of Issues Influencing Progress and Product**

The issues influencing the quality of progresses in Group 1-11 can be listed like below;

- High expectations of one of the group members
- Low motivation of dominant members
- Lack of programming skills of socially skilled member
- Lack of communication with target group towards the end
- Living different places

- One member working part-time, different schedules
- Lack of time management
- Losing too much time to develop an idea
- Dealing with too much details
- Lack of facilitator feedback on design report
- Not getting feedback continuously

The influential factors on their good products are

- Good technical skills of members
- Good graphic design skills
- Use of different instructional strategies

As a conclusion projects might be completed with success without good progresses of students. On the other hand, good product does not necessarily mean a good group work.

### 4.8.3 Poor Progress – Poor Product: Case of Group 1-10

Group 1-10 was poor in terms of progress because of team work problems, inconsistencies between the ID phases, lack of communication with a target group and facilitator. Their product was not fully original, they copied some of the parts from online resources directly, and there was lack of instructional or motivational strategies as well.

**Subject – Community**

For bad progress and bad product Group 1-10 of the first project can be given as example. This group's members were close friends in fact. Three of the members, *CS35, CS36, CS37* (withdrew) were staying at the dormitories in the campus and one of female member was staying another dorm outside of campus Being close friend prevent stating all the issues directly to each other. This made *CS35* most of time worked alone since she could not express her expectations much. Like other groups this group also started with many and advance ideas about their project. *CS35* was the leader with the votes of other members. This group met with two teachers at the beginning of their project. It was the first and last meeting with the target group.

**Object**

The objective of the group for their instruction was "to prepare a course material that represents an effective learning for the 7th grade students by using multimedia program, namely, Macromedia Flash. This material will be enjoyable, effective, including games, animations and experiments". With this purpose, this group also students always developed ideas but never noted them and they could not make their ideas concrete. They especially had trouble in the mid of the first project. CS36 decided to withdraw from the course. In fact the deadline had passed to do that but he left all work to the female members. Two members tried to go on their attractive and advance ideas although exactly they knew that they could not do that technically. This caused because of the deadline. The groups' storyboard was not ready until the deadline of submission of design report. At the last day of submission, two female members had no time to change their idea and create much more simple design. In fact, although during the project CS35 stated that they wrote the report with CS37, in personal interviews she stated that she wrote all the report herself. Design report was very complex therefore their score reduced in design report much. For example in analysis, both female students worked much and they got 90 points. Then in the design part they got 76 points in that report, and lastly. In the final report also since they did not work all together, they submitted something combination of analysis and design report without any update. The project was not consistent with the report and they got 60 from the final report.

Lack of content analysis and time they could not apply their storyboard in development. Also because of division of labor all responsibility on end product was remained to CS36. However, he needed help much at least for an available content. Therefore, in a short time they just tried to make a finished product without considering what they promised on their design report. CS36 explained the situation by saying;

> *Onlardan [CS35 ve CS37] soruları ve konu anlatımını istedim, onlar şey buldu içeriği filan, onlarla birlikte soru hazırlayacaktık ama konu anlatımı [soru hazırlamak için] çok dardı, yani ona göre soru bulamadık. Onlar da hazır sorular buldular bir yerlerden, cevapları ve yorumları da ayarladık, yorumları biz hazırladık. Onlar bana verdiler soruları, ben de test kısmını zaten textten çağırdığım [veritabanından] için hemen yapıştırıverdim. Bir de bir şey düşündüm ben, yani birşeyler farklı olsun, yani panel [yan panel] filan olsun, öğrenciler şeye [istedikleri sorulara] geçebilsin diye şeyler düşündü (CS36, Male, PI).*

> *I asked [CS35 and CS37] prepare the content and the questions, they found the content, we were goring to prepare the questions together however lecturing part was very narrow [to ask questions]. Then they found available questions from somewhere, we arranges the questions and comments, we ourselved prepared the comments. Then they gave the questions, since I had already prepared a database, I just copied and pasted. I also tought that something should be different, I mean there would be like a panel [vertical panel], the students should pass the questions they desired (CS36, Male, PI).*

As seen his explanation, he prepared a database to make update of questions easily and he developed a sliding panel which shows the question numbers. Students could pass any question by clicking on the number of the question. However, these two things took too much time and they were needless in fact. First of all the questions that they were supposed to develop was not much, therefore they did not need any database. Also for passing a desired question they could use a simple interface instead of sliding panel. Thus, these kinds of details caused much time loss for the group.

**Division of Labor**

Apart from technical and academically skills, personality of students was effective on the success. In the meetings for example CS36 always emphasized that he will not contribute on writing the reports. He did not talk to any target group people either. He took all programming and development part. Even in group meetings, CS36 never pay attention to issues related reports and he only talked about the project. Technical and academic skills of the students were different. Therefore, they preferred very clear cut division of labor. In

In the last stage students developed their projects and wrote their final reports. Although both material and report was written at the same time, Group 1-10's report was very different than the thing that they made on the material. And even more interestingly, although in analysis and design stage they mentioned that they will apply Reigeluth's concept classification approach, in the final report they wrote that they had used Carroll's minimalist approach. As mentioned in the first part minimalist approach was for procedure teaching. This showed that there was a huge gap in the group work. In fact the leader student (CS35) had many health problems and other group members also gave up to work together whenever CS35 gave up to work. In individual interview she mentioned this situation by saying;

> *Birisi [görevini] yapmıyordu ben yapmıyorum diyip çekiliyordu direk, ben mesela [işleri] tek başıma yapmak zorunda kaldım kaç kez, bir şey de diyemedim hani dedim ama yapamıyor mecburen yapmak zorundasın hani öğrenemiyorsa (CS35, Female, PI)*

> *Someone did not do his job for and he was withdrawing to do it by saying "I will not do that". For instance, I had to do those jobs by my own several times, I could say nothing, actually I said, but he did not do, compulsorily I had to do that if he could not learn to do that (CS35, Female, PI).*

Another group member of Group 1-10 also explained the situation by saying;

> *Final raporunu yazarken, hani daha projeyi yapmadan final raporunu yazmaya başladık, bir kopukluk oldu, ne yapacağımızı bilmeden rapor yazmak çok zor geldi açıkçası. Zaten bizim analiz raporumuz, dizayn raporumuz, final raporumuz böyle çelişiyor… (CS37, Female, PI).*

> *While writing the final report, actually, we started to write final report before developing the project, there was inconsistency, it was very difficult to write report without knowing what we would do. Actually, our analysis, design and final reports are contradicted (CS37, Female, PI).*

In fact, Group 1-10 always argued that they had very good friendship. That is why it was very difficult to set up a formal communication and a professional work style. If someone said "*I will not do this job*" another member tried to finish on behalf of that member.

**Tools**

Group 1-10, the things started well, CS35 was always giving update about process. She was using e-mail group well, however other group members did not pay attention to her questions or requests. Eventually her motivation decreased much and since she was not good at using development tool she did not contribute it except text based content development. Their project grades reduced gradually.

**Rules**

In the contract their expectations from all the members were coming all group meeting, completing all responsibilities and avoiding plagiarism. They could not apply those rules at all. Although all members were living in convenient places they could not come together except facilitator meetings *(CS35, Female, PI).* For plagiarism as mentioned before, although in reports there no issue, in the end product most of parts text based content and some animations were taken directly from the internet without any reference. This mainly caused lack of technical skills of the students who were academically skilled and lack of time since *CS36* spent most of development time for game and test parts which require advance programming knowledge.

**Outcomes**

Although CS36 was good at technical skills, since he postponed all the work, he could not manage to develop the entire project. First of all, one week before the submission of the project, he realized that he could not do the idea that they designed before, because he was good at programming but not graphic design. In their design they had proposed many attractive graphics. As a result, CS36 preferred took the content directly from Internet without synthesizing them. Although the CS35 and CS37 had capability to develop some visuals and animations they did not try to do that since they were already being tired of working on the reports. On the other hand, according to CS36 they at least created their test questions by copying from Internet and developing solutions for each questions. They also get visuals from Internet although they could have done them easily. Towards the deadline of submission of the project, CS36 was only focused on to develop a test and a game, they did

not have any attractive visuals but they required some advance programming. He asked many questions to facilitator to finish those two parts although he was warned in that they could not finish project if he deal with that advance things. As a result, most of places and introduction of the project was directly taken from Internet. Narrative and animations of lecture part was also copied from the Internet. Only two parts, game and test was developed by CS36. In general evaluation of their material they got 35 in inter-rater evaluation while in facilitator evaluation in that semester 60 out of 100.

**Summary of Issues Influencing Progress and Product**

In this group the main problem different skills of students and female members' lack of confidence of working on technical side. In their experience it is very difficult to say that they get idea of instructional design. They did not apply any instructional strategy in their product. They could not make any formative or summative evaluation.

The issues which reduce the quality of progresses in *Group 1-10* might be considered as;

- No effective leadership and project management
- Unique member responsibility on the entire end product
- Reduce of motivation with withdraw of a member
- Lack of use of communication tools
- Reduce of motivation of the most active member because of other members

The issues which causing poor product in *Group 1-10* might be listed;

- Lack of technical skills of active members
- Wrong division of labor
- Deadline, lack of time management
- Female members was not motivated to improve themselves
- Plagiarism
- Dealing with advance programming
- No re-examination of reports

- Refuse of development of the design
- Losing too much time to create a concrete idea
- Designing very advance things without tool analysis and self awareness
- Lack of knowledge sharing

### 4.8.4 Good Progress – Good Product: Case of Group 2-11

Group 2-11 was good in progress because they had very good team communication, communication with facilitator and target group. They developed idea at the beginning of the project and then they had very smooth process to develop it. Their product, consequently, was good in terms of including all motivational and instructional strategies and flow of the project.

**Subject - Community**

In procedure teaching project all groups had good progresses. However Group 2-11 was better than in product. CS11 and CS17 were close friends since the beginning of the program; CS3 on the other hand, was transferred from another university in that semester. CS3 had very good academic skills and it might have taken the attention of CS11 and CS17. CS17 was also very successful students while CS11 was an average. The researcher observed that CS17 was always compensating CS11's work since the close friendship.

**Object**

Group 2-11 developed a video to show how to make t-shirt printing. In their words their objective was "to illustrate the procedure of selected topic clearly and understandable to instruct target group by using camera and video editing software" (Group 2-11, Contract). They selected this topic since CS3 and CS11 was interested in t-shirt printing. At the beginning they only had difficulty to find a subject matter expert since as a rule of the class they had to find a subject matter expert. In some procedure project groups, group members behaved as subject matter expert, however in this group they had to find a subject matter expert because they did not know the procedure much. Then they could contact with a craft teacher to get information. Except finding a subject matter all other things were convenient for the group. They took the video at the department and get the video equipment from the instructor.

**Division of Labor**

In Group 2-11, division of labor was made such that all members worked in each part equally. This group, like other procedure project groups, used Google group and Google Docs to monitor their work. It was also easy for facilitator to check the status of all groups. Facilitator's role was also reduced in this situation, since they were experienced in the first project; they only contacted via e-mail with facilitator to take the feedback for a finished task and they get feedback for each task. They even get feedback for their completed video which is an occasion for video projects. On the other hand, sometimes, especially on the final report, they did not apply all the feedback.

**Tools**

The main challenge for all procedure project groups was to employ motivation, assessment and feedback strategies in the video. Therefore, in the meetings, especially CS11 asked many questions about these issues. Especially they could not imagine how they could assess the students on video material. Like all other groups, this group also solved this problem by adding some assessment questions on a manual which was given with the video. In fact there were other groups that could ask questions and give answer in the video.

Students had comfort of being experienced from the first project. Therefore, they did not ask many things about the reports. For example CS17 explained this issue;

> *Üçümüz de farklı gruplarla çalışmıştık, herkes kendi raporunu getirdi. Burda böyle yapmışız bunu buraya [bu projeye] nasıl dönüştürebiliriz, nasıl yapabiliriz, ve şimdi projemizi üretiyoruz (CS17, Male, PI).*

> *Three of us worked at different groupw, everyone brought their own report. 'We had done that there, how can we transfer it to here [this project], how can we do', and now we are producing our project (CS17, Male, PI).*

The comforts of smooth work, provided time save for the group. They could even make a rehearsal record before the actual one. In one of the meeting CS11 explained;

> *Geçen hafta deneme yaptık bir tane o gayet başarılı oldu. Ona göre zaten storyboardımızı oluşturuyoruz, şimdi burda bunu yaptık diye, şu an süreç iyi gidiyor (CS11, Group 2-11 of Second Project, Week 12).*

> *We made a trial record last week and it was very successful. We are creating our storyboard in accordance with that, like 'we did this in here', now the processes are going well (CS11, Group 2-11 of Second Project, Week 12).*

Their project was very clear and they applied almost all strategies that they mentioned in their design. One of the advantages of the group was that the video editing programs were not complex; therefore they did not have any difficulty after recording their project.

One of the advantages of Group 2-11 was the simplicity of the topic. In fact teaching procedure is not easy. On the video each detail should be showed, the instructions should be clear. Not all project topics allow it. For example, although all video project groups had a good processes, Group 2-12 of procedure project selected a topic which has many sub topics to be explained. By adding a summary of video their video became very quick and audience had to watch it several times to understand the processes which are similar to each other. In Group 1-10 of the second project on the other hand, they had to explain the game play of TABU, however in that case they could not show the game cards and game board properly, because of the quality of video. This made difficult to understand the rules of the game. Shortly selection of project topic was very important issue to create a clear procedure teaching project in this context. Group 2-11's topic was very linear and it was suitable to show each process on the video. They also used examples, non-examples very well.

**Rules**

There was little problem with both course rules and the rules that they defined. In fact their unique rule was related meeting several times in a week. They did not determine any penalty since they believed that it will not be needed although this is not a professional approach. In weekly meetings with facilitator on the other hand, CS3 did not come two times. However this did not cause any problem in working with her group, they had already happened to finish their work. In e-mail communication also, she did not asked any question to facilitator except to ask whether facilitator get her individual work.

Group 2-11 followed their instructional design properly and made an evaluation with the help of their six friends.

**Outcome**

In video project students submitted two different materials. One of was video and the other one a manual which each student individually prepared. Their grades were respectively 92, 94, 87.5 and 93 out of 100 for analysis report, design report, final report and the video material. As mentioned video projects provide students understand procedure teaching, video recording and editing, and acting skills as well as understanding ID processes. One of the things that made the second projects enjoyable was acting. Not only group members but also other class members became the actors on the videos. In Group 2-11 also those issues were mentioned in the final report. After evaluation of their material the things that they decided to change were;

> *Reorganize the scenes in terms of layout. To illustrate, we should change the camera's position in the scenes where presenting requirements of instruction.*

*Change the table because both the color of table on which we worked and t-shirt are white. Thanks to this adjustment, movements and the requirements will be seen more clearly.*

*Act as possible as more professionally. (for example instruction-teller should not look at directions except for the camera (Group 2-11, Final report)*

As seen in their statements, they could realize the issues to make their instruction more visible. They also realize some issues like acting in the video. In their video there are several people at the beginning who wondered about how a t-shirt printing could be made. CS3 explained the situation;

*Çok eğlenceliydi, benim odaya girmem ve diğer arkadaşların da tişörtümi görüp bana nereden aldığımı sormaları gerekiyor. Ama ilk denemede, odaya girdim, kimse benimle ilgilenmedi, herkes dalmış ☺. Birkaç kez arkadaşlardan biri kameraya filan baktı, sırtı dönük olmasına rağmen, bu yüzden bir sürü çekim yaptık, ama çok eğlenceliydi. (CS3, Personal communication)*

*It was very funny, I was supposed to enter the room, and other friends should have liked my t-shirt and ask about where I bought it. But in the first trial, I entered the room and others did not care about me, in several times, one of the friends look at the camera although they were already turn their back to the video, so we made many records, but it was very funny (CS3, Personal communication)*

As a conclusion, video projects much comfortable and enjoyable for the students in terms of the instructional design process and development of the product. They were also survived the comfort of working with their best friends and very convenient target group. All those things made the second project very smooth and even reduce the interaction and tensions between the dynamics of the system.

**Summary of Issues Influencing Progress and Product**

Like being in other project groups of the second project, students worked effectively with their good friends. The issues which provide good processes in Group 2-11 can be listed as;

- All motıvated group members
- Using time effectively
- All responsible group members
- Equal division of labor
- Getting continuous feedback from facilitator
- Planning the process well

- Using group e-mail tools effectively
- Getting feedback from peers
- Paying attention to feedback and assessment issues
- Being already experienced from the first project
- Having very convenient target group
- Being experienced in reporting

The issues which provide quality of product in Group 2-11 can be listed as;

- Using different instructional strategies
- Making continuous formative evaluation
- Lack of complexity of video editing tool
- Lack of complexity of project topic
- Making rehearsal for video recording

### 4.8.5 Contradictions and Overall Factors Affecting Activity

Contradictions appeared between dual relationships of activity theory components. Contradiction does not necessarily mean a problem in this context. In this system the main contradictions might be revealed via the difference of the nature of the two projects. First of all, in the first project there was rule of random assignment. Random grouping influenced community's work quality while it was a good practice of real work setting and coping with different style of people. There were many students who could have shown better performance if they could have worked with the friends normally they chose as group. When compare the three reports and materials of two projects there are improvement in procedure projects' grades not just because the experience of the first project but the groups did not deal with any group problems. For example in the first project the average of analysis, design, final reports and material was 81.8. The same students' average in the second projects was 88.4.

Because of the random grouping dynamics of the groups were tried to be heterogeneous but this heterogeneouty caused differences in motivations and expectations, and consequently

the efforts of the students. Motivated students and unmotivated students influence the group work differently. Thus, the "motivation" of student is a contradiction between subject – community – object. Another issue with random grouping is that they could not divide the tasks equally, even they could it most of time they could not apply it in practice. In the first project generally division of labor made as "developers" and "reporters" while in the second project all the group members worked in each part of the project. In the first project, sometimes, also developer students worked in reporting as much as others, but then they happened to work much more than others because others did not contribute development part.

Another contradiction happened between tool and subjects. At the beginning of multimedia development, students had high expectancies, at the end of the semester they understand limits of tools and limit of their time to expertise these tools they removed lots of parts of multimedia product. Tool was the most important issue influencing overall activity, it not only influenced the subject but also it influenced the division of labor and community. The students' experience of particular tools influenced students' roles in the community. Also community which includes facilitators and whole class had to know about the tools to finish the projects. In the second project on the other hand, the tool was not complex and students had not to use their graphic design or programming skills to create attractive projects.

There were several students who stated that two projects richened their experience however; with two projects they could not drill and practice the stages of instructional design stages properly because of the lack of time. The main contradictions can be showed on activity triangle like in Figure 4.41.

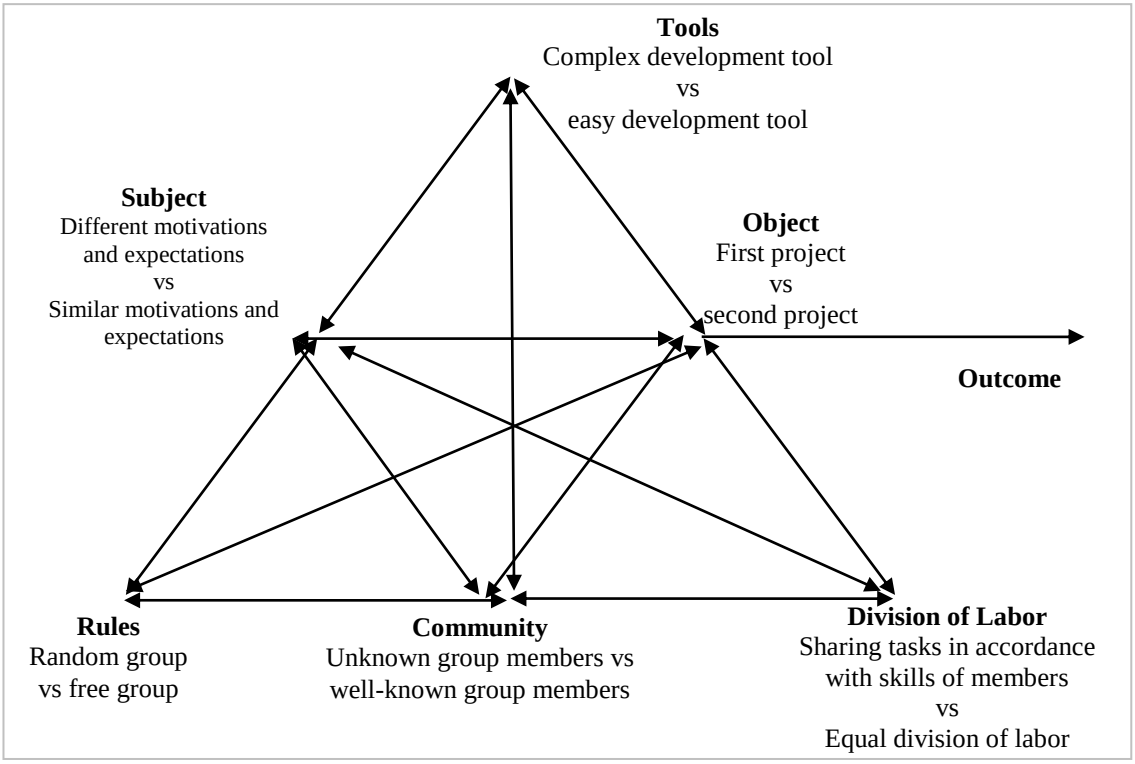



Figure 4.40 Main contradictions of the system

Thus the subject and rule – object triangle has several contradictions like having two projects in a semester, time limitation. In subject and rules – community – division of labor triangle random grouping was the main contradiction. In subject and tool – object triangle complexity of the development platform challenged the students. Self – motivation and self-confidence of students played big role in subject and community – division of labor and object parallelogram. All those contradictions had positive and negative influence on group working, project development and experience of students.

Finding target group was also an issue which was differently influenced the project.In the second project it was much easier to find a target group. On the other hand, in both cases, except a few examples, no groups could work effectively with target group. Especially in the second project, although they could make evaluation, implementation of their projects to a specific target group in a real setting was not possible while in the second project some groups had this chance. Therefore, it might not be assumed as a main contradiction between the two systems.

### 4.8.6 Combination of Dynamics to Provide Success in Processes

With the cases given as example strong and poor parts of the project teams were examined. Examination strong and poor aspects of cases can be listed like below;

**Subject**

- Motivated to work with other group members
- Knowing responsibilities responsible
- Good academic and technical skills (or being motivated to improve them)
- Good graphic design skills

**Community**

- In random grouping having no prejudice about working team members
- Living convenient places with all group members
- Schedule of group members should not much busier than others
- Having higher expectation as a group not as an individual (at least dominant members should have higher expectations
- Working with target group effectively
- Target teacher promised to implement their project
- Understanding the expectations of learners
- Taking continuous feedback from facilitator for each action and operation
- Planning the processes well
- Getting feedback from target group
- Selecting a convenient and trusted target group
- Combining target group expectation and facilitator expectations

**Object**

- Development of feasible ideas and design

- Being sure about that the project will be used in a real context
- Giving priority in instructional and motivational strategies more than attractive visual design
- Preventing loss of much time while developing an interesting idea in a short time project, keeping it simple
- Avoiding unnecessary details on the project
- Avoiding advance programming requirements

**Division of labor**

- Making equal division of labor rather than dividing ID phases into different members
- Understanding role of the leader and regarding the leader
- Making division of labor in accordance with the skill of the member

**Tools**

- Using different communication tools effectively
- Making an extensive tool analysis
- Know about the limitations and propertied of development tool well
- Understanding the importance of reporting
- Making reports properly
- Taking notes about progresses and updates
- Checking as many as sample works and understanding good and poor points
- Always examining old works, reports
- Being experienced from previous work
- Using a development tool which is not complex
- Selecting a topic which is not complex
- In video project making rehearsal

**Rules**

- Using time effectively
- Checking schedule continuously and take feedback from facilitator before submission
- Always planning the next actions and operations
- Aiming to finish the tasks before the deadline
- Managing time by means of leader and facilitator
- Considering ethical issues, avoiding plagiarism

Apart from observations, in interviews also students were asked about how their projects' quality might be improved. In perspectives of students the success factors are listed below;

- Working with well- known friends
- Being respectful to each member
- Time management
- Synergy between group members
- Giving importance to reporting
- Facilitator monitoring groups well
- Equal division of labor
- Being aware of responsibilities and responsible about tasks
- Know about development tool more
- More time, flexible schedule
- Working on one project during the semester
- Good skills of each member for different parts of the project
- Available content which was provided by instructor

As seen in the expectations of the students, generally group work based issues were emphasized. They also believed that good technical skills provide good projects. The dynamics which lead success in progress is not much different than the things that were observed by the researcher. Only difference, one student stated that an available content should be provided by instructors since they spent much time while deciding and developing the content.

# CHAPTER V

# DISCUSSION and CONCLUSION

The main aim of this study is to examine dynamics of an instructional design practice to improve the instructional design skills of novice instructional designers (NIDs). With this purposed many of the contextual factors were revealed to see the interrelations between them and their effect on the learning outcomes of the instructional design course and project development process. Examination of those contextual issues is helpful to develop ideas for instructional design education especially for undergraduate programs. In this part, first of all the results of the study will be examined to understand the context deeply with the help of literature. The researcher will also provide suggestions to improve the contextual issues influence the practices of NIDs.

## 5.1 Instructional Design Experience of NIDs

In terms of NIDs' ID experience, their ID process awareness and practices, real context experience, target group interaction, team work and project management, message design, content development, research and reporting skills, learning and using development software were examined. In the course, both ID and multimedia design experience was given. Novice instructional designers can show a better performance if they become conscious about the process that they practice instructional design (Jonassen & Murphy, 1999). In fact many of the students came to class being unaware of the processes. Then they became aware of some processes continuing step by step, however most of them challenged to elaborate the previous step to the next step. This result is exactly similar with the results revealed in Hardre, Ge and Thomas (2006) in which authors explored that novice instructional designers treated the phases of ID like very different parts while after getting experienced they started to look ID phases as holistic process (p. 81). Moreover they revealed that perception of responsibilities of instructional designers and metacognitive skills influence to expertise ID. Shortly, novice instructional designers should become aware of their responsibilities, their experiences, their skills, their weaknesses and strengths to grasp the ID processes well.

In practicing ID also NIDs had difficulty towards the end. They started with good analysis process, and design process was also complete. On the other hand, most of them could not practice formative and summative evaluation because of lack of time and lack of motivated target group. In fact, these issues are available in the real context. Holcomb et al. posed that instructional designers do not go through all the steps which was required in traditional ID model. Holcomb, Wedman and Tessmer (1996)'s study which researchers inquired 40 experienced instructional designers about their 77 instructional design projects, showed that instructional designers stated that in 95% of their work they thoroughly defined the objectives of the instruction and in 92% of them, they selected instructional strategies. On the other hand, in only 34% of the projects, they implemented a summative evaluation at the end of the implementation. Although the context might be different, in this study also there was problem of implementation of summative evaluation. In this context, one of the reasons was that there is not enough time to conduct an evaluation. On the other hand, in some groups although they got feedback from target group teacher, NIDs did not improve their project since the project was already graded.

Most of NIDs came to class knowing that they will make two projects and they would work as random groups in the first project. On the other hand, they were not aware of processes which they would go through while developing materials. Most of NIDs especially males focused on technical skills which provide potential of working in a company. Therefore, first of all, this unawareness of what ID is was the problem in the context. As pointed in several places, each student's awareness and perception on their experience was different in accordance with their expectations and motivations. The students who wanted to learn about development software disappointed because they wanted very intense practice of development tool, while some of them satisfied because they tended to improve themselves.

Motivations and expectations of students also caused perceive ID experience differently. While some of the students became aware of ID processes, some of them just see them as "*boring reporting process*" or some of them called it as "*deeply analysis and planning process*" by ignoring formative and summative evaluations. In fact, students became aware of "*project management process*" rather than ID processes. In other words, step by step processes were realized however, they neither could connect all phases consistently nor they practice each requirements of ID properly. To develop ID expertise of NIDs, they should be told about expected competencies clearly, thus they could "*develop realistic self-perceptions*" (Hardre, et el, 2006, p. 85).

As a second issue, as undergraduate students, they needed to assistance to conduct teamwork especially when they work with a friend which they have never worked together before. Teamwork is one of the most important skills for instructional designers. Although most of students implied that random grouping was beneficial to experience coping with different people and different styles, in practice they did not tend to solve problems in the group. Even though some students saw that the processes are like real company's work policies, in team working they could apply any real life strategies. This might be caused that in random groups; students did not want to deal with someone who they did not know well. Because of lack of sympathy between group members they might not want to tolerate others in some cases as well.

Instructional design project requires considerable time to make a wide sense analysis and design. In this course context for facilitators and students time was not enough to grasp all ID steps and apply them properly. On the other hand, since natures of two projects were different, it enrichened their experience. They worked with different facilitators, target groups, different tools and different team members. NIDs could make comparison between two experiences. It was accepted that the second project was much more comfortable not only because of previous experience but also working with bellowed friends. Moreover, video project required less technical skills than developing multimedia instruction.

Although in real life each person's role is different in this context NIDS were expected to work in each phase equally. NIDs had to develop their project by themselves. This issue caused several troubles. Firstly, technical skill requirement led NIDs think that their actual role is to develop most attractive and technically advance things. Secondly, since students had very short time to improve them technically, NIDs ignored most of ID processes. Lastly, it caused such a division of labor that technically skilled students focused on development and others focused on ID processes. In this context it is not possible to provide all real context issues like providing programmers who develop NIDs' designs. Besides, group members are not skilled programmers, reporters, animators and graphic designers at the same time. According to Goodyear (1997) for an efficient task sharing all instructional design team should have similar skills. Since this is not possible in an undergraduate course, at least NIDs should be asked to monitor others' work to get some experience from them. Again, they should be reminded of the importance of the processes of ID, more than the importance end product. In this case, the technical requirements might be reduced in some extent for this course. Thus, NIDs might pay attention to analysis and design processes more.

Working with a client was difficult in the course content. In fact this issue is a challenge in each instructional design project (Gibby, Quiros, Demps & Liu, 2002). Working with a target group was important issue, however, because of lack of monitoring of facilitators and instructor, most of project groups they could not work with target group properly. In this context also target group communication was not like in the real world. In real settings, target group brought their needs to instructional designer, specify all expectations. On the other hand, in this context project groups selected a topic at the beginning, and they tried to find a target group to get their opinions about the topic. Most of time, those target group people only helped students in analysis stage. Because of policies of the schools it was not easy to implement those projects in the classes. Moreover, because of lack of infrastructure, that target group teachers had no chance to implement the projects. Yet, most of them even did not consider those projects to implement in their class. Since NIDs were undergraduate students, teachers might not have regarded those projects as usable projects. For all these issues, instructors and facilitator might have played a key role in providing effective communication between target group and the students. With required permissions NIDs should be given chance to enter the schools and work with teachers. On the other hand, in this term, motivation of target group is also very important. In this case although target group teachers were very open to give information about their context, most of them did not consider implementing those projects. NIDs also could not set up a good connection with target group.

Although it was suggested that target group should be arranged by instructor, it might not be the exact solution. For instance, in the second project although target groups were very convenient, like being in the first project, NIDs could not conduct formative evaluations properly. Again lacks of time caused them both design and evaluate the instruction at the same time. Moreover, NIDs lack of background experience with working with a target group, prevent effective work with them. Since they were not aware of their further processes at the beginning, they did not get any promise from target group to implement their projects. Furthermore, for NIDs it is almost impossible to work with actual learners, most of time they could only contact with a teacher. Although the teachers might be assumed as knowledgeable about their students, still NIDs could not grasp what the learners really need to learn and how they want to learn. This problem is not much different than what happened in real project. Goodyear (1997) also points out this issue and he stated that most of time instructional designers could not reach target learners easily and their contact person do not understood what the learners need in fact.

Certainly very few groups could work with a target group effectively. On the other hand, in even that case they applied what the target group asked them even though their expectations sometimes reduce the effectiveness and quality of instruction. Lack of interaction with target group caused some challenge like developing a content which is most suitable for the target students and exploring misconceptions and characteristics of the target students. Thus, in instructional design team NIDs roles increased. According to Keppell (1999) instructional designers should work on as much as cases to improve the content development skill and accelerate the development of ideas for content production process. In his study which seek instructional designer and SME interaction, he also revealed that creation of knowledge maps were very helpful to understand the unfamiliar topics. In this case target group did not know what the NIDs projects would look like, therefore some of them tended to speak about their general technology needs instead of focusing on multimedia development. If instructors and facilitators would accompany NIDs in their target group visit this issue might have been solved.

According to Gibby et al (2002) an instructional designer should at least use Microsoft Word but they also know to use Macromedia [now Adobe] Director and Flash, Adobe Photoshop and Premier, Java and HTML. Gibby et al. believe that knowing to use those tools leads instructional designers create prototypes easily (pp. 214). In this context although students were very motivated to learn about development software, especially Macromedia Flash, they had no time to expertise it. Some of them also hesitated to develop some ideas by fearing of not applying them with their software experience while those who knew very little about software had difficulty in designing feasible ideas. In learning development tools, assignments were very crucial however because of lack of time, many of the NIDs (even the ones who are hardworkers) apply plagiarism. In this problem also the grade rule was very important because students who could not pass 9 points in lab assignments were going to fail in the entire course. With the anxiety of this issue many of the students did assignments without understand the logic behind of them. In fact, although the course was designed in a constructivist way, there was the dilemma of grading and the freedom of constructing the knowledge. Therefore, qualitative assessment methods most of time caused trouble between the assistants/facilitators and the students.

As Gibby et al (2002) pointed out in fact in real projects instructional designer role is separated from other roles in fact; especially in small companies, instructional designer have numeraous roles. Gibby et al summarize these roles as "*review others' work, find clients, write scripts for video and audio clips, write programming code, write technical documents,*

*create animation and graphics, work on character development, and train others*" (pp. 217). In this course also NIDs had many roles which need to be performed in a short time. Thus, it cannot be argued that they expertize their roles in that short time.

In project management NIDs could not apply a good leadership role in unexpected problems. Although they selected females as leaders since they believed their organization skills are good, in a time the roles changed and the member who is academically or technically dominant became the decision maker and leader of the projects. Especially in the first projects facilitators had to behave like project leader. Facilitators had to remind them to go target group, ask specific questions, draw a storyboard, and send their draft work although all schedule was given at the beginning of the course and in report templates all requirements were stated. After this reminds group leader's role was to bring group members together and share the work. In fact, this was a natural consequence of the course because students had no practical ID experience. They needed facilitator's guidance to start and finish the processes. Another issue, in the first project especially, NIDs did not select their team members, on the other hand after assignment of the groups, each team member tended to select their role. The groups who share all the work, on the other hand, expected all members start and finish the work at the same time. Lastly, leader students getting more responsibility and in an undergraduate context, with the concern of grading, students could not spend much time deal with making others work smoothly. The leader students developed different strategies which led them finish the work quickly and easily. Shortly, in each group project management was implemented in different way but commonly they focused on finishing deliverables in time.

It was not possible to give a project management skill in addition to many new learning situations in the course. However it should be emphasized that project management including communication, leadership, supervising skills should be one of the major parts of instructional design curriculum (van Rooij, 2010). With new curriculum of CEIT, project management became two semester course given to senior students. However it might be a bit late to offer this course after this kind of instructional design courses. Moreover, as a research assistant of those project management courses, again software development become dominant because all students focus on finishing their tasks in time while they are also busy with other commitments. Furthermore, it seems senior students still do not want to deal with analysis and planning processes. Recently, a senior student who is taking project management course complained about they spent too much time in planning phase and it made them lose much time. With this respect, one of the most important precautions might

be leading students understand the importanceof the pre-analyses and processes during the planning stages.

Generally speaking, this undergraduate course was not enough (and not expected) to provide expertise to NIDs, since very complex instructional design skills were tried to be given in a very short time. On the other hand, at least they could experience as many issues of ID. It can be suggested that their skills should be strengthening in further courses and practices. Another suggestion might be reducing the project numbers, providing a convenient target group and letting students reflect their experience in each phase of design. To evoke the awareness of ID progresses, reflections might be used to make them aware of each step that they go through (Rowland, 1993). At the end part of each report, NIDs reflection about the processes of ID and their reflections on their experience might be asked. During meetings, reflections of the NIDs might be inquired by facilitators. In this case misconception of NID might be removed just in time.

### 5.2 Instructional Design and Development Processes of NIDs

While designing computer based instruction, there were issues influencing their decision making, providing consistency between designed and developed product and quality. Shortly the issues influencing their projects' quality and outcomes were explored. Mainly NIDs lack of technical skills, lack of communication with target group and facilitators, lack of time and group problems influenced their quality of work. Quality of novices' products is an indicator that should be assessed to understand their awareness on instructional design (Dabbagh & Blijd, 2010).

According to Perez et al (1995), while experts spend more time on planning before design, novices start to think about details of instruction while working in design projects (p.322). In this study NIDs had many trouble to come up with developing a story for their instruction in the first project. West and Hannafin (2010) pointed out that in collaborative instructional design course; novice instructional designers developed most of the design ideas by means of the other community members in a studio setting. In this study on the other hand, collaborative idea generation provided attractive project ideas however, they also lost much time because of lack of collaboration except weekly facilitator meetings.

In instructional design and development process, working with a target group was very important to make decisions on the projects and to think with the lens of students. A specific target group which was arranged by instructor is one of the solutions. On the other hand still there are some issues preventing effective interaction between NIDs and teachers. First of

all, NIDs still could not synthesize the information received from target group teachers. Verstegen, Barnard and Pilot (2009) indicate that novice instructional designers could not represent the problem sufficiently and they might not have any explanation about their decisions in instructional design. In this study context this issue was happened most of the time. Apparently, they made learner analysis, they used instructional and motivational theories and approaches however, they did it just it was required in the templates.

As a second issue in working with target group is that they mostly tend to use available materials instead of waiting for ones to be developed. As Earle and Sheffield (1995) also point out, teachers have no time to contribute longitudinal process of material development. Lastly, NIDs had to focus on ID processes and to seek the instructional quality of the projects. On the other hand, teachers might only want instructional activities which bring a difference in their classes (Earle & Sheffield, 1995). In this context, similarly, the teachers considered "*it would be nice if a colorful and enjoyable supportive material would be developed*". In this case NIDs had to give most of decisions without getting feedback from target group.

In the course NIDs had to use specific instructional approaches and motivational strategies. Those strategies were provided in the report templates. Their main concern was to match some parts of their projects into the instructional approach's principles and motivational theory principles. Therefore, it cannot be argued that they considered on instructional strategies much. In line with this argument, in Perez, Johnson and Emery (1995)'s study, in which they compare expert and novice instructional designers, revealed that NIDs did not use any instructional design theory or instructional system development approach while designing their projects (p. 344). In this study if NIDs were not given specific approaches, probably they would not use any. In fact in this complex learning environment, it was very helpful for NIDs to not allocate time to find out suitable strategies, but it also did not help them explore different strategies which are suitable for their target group. In this sense graphical appearance, story and actual content was considered much, however in all project similar strategies were used. At the beginning an attractive animation, showing animations if it is suitable, asking questions and providing answer, giving examples and summary were main strategies which was used by NIDs, and already those strategies had to be used when considering report templates. In real context, Perez et al (1995)'s study showed that, experts consider which content is suitable, sequence of instruction, duration of instruction, instructional transaction and strategies and target group's familiarization with the content more than novices (p. 329). In this context without reports and supervision of facilitator

NIDs could not manage to consider all those issues. In the meetings, most of the time, NIDs focused on attention taking strategies and story of the project. When reporting on the other hand they exemplified all the instructional and motivational strategies since they had to do that.

Processes for development of the product was influenced from team work much. It can be easily argued that smooth relationship between team members lead a fair division of labor and culminated with a good project. Consistency between the design and the end product was provided when the team members bring their responsibilities equally. Also technical skills and tools analysis at the beginning provided this consistency.

### 5.3 Creating a Good Instructional Design Team

To provide a better experience to novice instructional designers the cases of the groups were important to see their processes. It might be very assertive to say that combination of all good aspects of the groups' lead better design and development practice. On the other hand, even they might not have very good team working, generally academically and technically skilled groups have superiority in success of the products. Motivation of group members to work others, working with a convenient and promised target group, communicating with facilitator in each occasion, fair division of labor might be counted as important issues to provide success for instructional design team in this course context. According to Strube, Thalemann, Wittstruck and Garg (2005) team members' different expectations and perspectives might cause some barriers and prevent the cooperation among them (p.193). Similarly in this study motivation of concluding the work with a good product influenced most of the dynamics. When all members have similar and higher expectations and motivations, they made more reasonable division of labor and did all responsibilities in time and in quality. Rummel and Spada (2005) pointed out that when dividing the roles reasonably individuals should be given enough time to work alone to show their domain knowledge. The insistence on working all together caused many personal problems in this study context. Interestingly, although NIDs could share the reports easily, most of time they wanted to work together in production time. In fact it was not an effective way of working because unless a good background knowledge it is very difficult to produce something at the moment they need to learn about it.

According to Rummel and Spada (2005) for a good team working, there are micro and macro level requirements. In macro level, the coordination which aims "*to specify the objectives of the work and reach a shared task alignment, to arrange the division of tasks*

*between the partners, to manage their temporal synchronization, and to establish a chronological order of activities*" (p. 206) should be provided. In this study a better work style could be negotiating on division of labor, explaining expectations for each role, individually performing the works and reviewing the work after completing all parts. However in this study in some cases NIDs could not make a fair division of labor, some of them insisted on working all together at the same time and some of them divided the roles but they did not review the end product. In micro level of good collaboration there are the issues like grounding, exchange of knowledge, and two way communications (Rummel & Spada, 2005). To achieve a common ground, team members should develop a mutual understanding and clear the misconceptions among the members. In this study again expectations and work styles of students influenced their decisions on the project. First of all not all ID team members understood the same thing with ID. All team members should have known about process, importance of working with target group, meeting with facilitators, using communication tools and taking notes about their progresses, etc. As a second issue knowledge exchange among team members was made sparingly. In fact personally good friends could share knowledge. However in the first project, team members, who are not personally close to each other, could not show an effective knowledge exchange. They most of time did not communicate except weekly facilitator meetings. Their division of labor prevented self-improvement of NIDs. Technically skilled members took part in development and they did not teach others about development tool. Similarly, the members who are responsible to communicate with target group did not share his insights gained from the target group. In interviews when NIDs were asked about communication with target group some of them answered by saying "*I was not responsible for that, another member interviewed them and write it to reports*". Therefore, it was not possible for NIDs to get similar experience from the projects. As a last issue of collaboration, two way communications was not provided well in this context. At the beginning some motivated members tried to share their reflections about processes, the ideas that came to their mind and questions to be answered. On the other hand, they could not get any response from other members most of the time. After a while e-mails reduced much because of lack of two way communications. In this situation the role of the facilitator might be asking other members to response the e-mails.

In the study context there was difference between the first and the second projects; formation of the ID teams, target group, nature of the products were different. In fact, in the first project all contextual issues are more suitable to get a real life experience. However, NIDs who are studying at junior class are not ready to manage working with a team which

composes of unknown classmates. Moreover, NIDs, in previous year, were provided subject matter experts who are studying at secondary mathematics education but again they could not work effectively because of different schedules and lack of use of communication tools. Strube et al (2005)'s study, researchers examined the communication in a web design project composing of customers, screen designer, IT expert and programmer. The researchers surprised with the lack of communication to share expertise or to make design decisions. Design team most of time communicated when a problem aroused, to discuss about deadlines or to ask information. This situation was explained with 5 years of team working expertise of web design team.

In the third research question the researcher tried to pose the dynamics which might have good effect on project development in ID course. In fact, there are many contextual issues which might change in accordance with the nature of the class. Therefore, it is not possible to pose a recipe which provides a good activity system. However, there are many precautions which might be taken by instructors and facilitators to improve the practice of NIDs.

### 5.4 Implications for Instructional Design Activities

In instructional design education many creative ideas might be founded from different disciplines like architecture, graphic design, engineering, interior design, media design and even medicine (Rowland et al, 1995, p. 224; Smith & Ragan, 1999). In these disciplines also the purpose is to optimize the design in accordance with the needs of clients. All of them require creative and aesthetic skills. For this reason, while structuring instructional design courses, the approaches that are used in those disciplines might be implemented. For example studio approach, which has been used many years in architecture, is being used in instructional design education (Reimer & Douglas, 2003; Clinton & Reiber, 2010). On the other hand, in Turkey, undergraduate CEIT classes are very crowded and instructional design courses are in limited times. Therefore, it is a bit difficult to implement this kind of approaches requiring time and places which are allocated for continuous design activity. On the other hand, creation of artifacts is more suitable and effective to give advance skills when the NIDs are exposure to real life situations while working with real target group (Rowland et al, 1995, p. 228). Besides, authentic and complex design problems might be posed to be solved by NIDs in instructional design education as well (Dabbagh & Blijd, 2010). Considering busy schedules of undergraduate programs and inadequate background of NIDs, in CEIT curriculum project based authentic approach provide a more suitable learning context. To improve the experience of NIDs in this kind of learning environments activities of the courses might be richened by considering the context of NIDs. First of all, different

instructional design models might be used or NIDs might be expected to develop their own models. However in undergraduate education, NIDs need much more guidance and they have limited time to go through different cycles of design. Rapid prototyping in which design and development is conducted concurrently might be helpful to create better quality products quickly (Tripp & Bichelmeyer, 1990). On the other hand, rapid prototyping do not provide an awareness of the processes of ID for NIDs (Verstegen, Barnard & Pilot, 2008). According to Verstegen et al (2008) the ID models which structure the processes clearly might be much more helpful in ID education. Therefore, ADDIE model might be assumed as a more suitable one especially for a basic instructional design course. With this idea, below, starting from analysis phase to evaluation phase of instructional design some suggestions will be presented for instructional design course keeping ADDIE model as guidance of NIDs processes. For each phase of ADDIE model activities, actions and operations will be suggested. The researcher selected to present more practical suggestions because she believed that in undergraduate ID design education there is need of more applicable procedures. Then, under AT components possible dynamics of a context which might be helpful to provide better experience and progress for NIDs will be mentioned.

### 5.4.1 Analysis and Planning Phase

Analysis and planning phase is the beginning of the project. First of all the students should know about what instructional design is. They should also know about processes that they will be going through. Although the product is important, NIDs should know the more important part are the processes that they go through in this course context. Lecture times are very important to give the awareness of the processes. In analysis and planning phase theoretical background knowledge should be provided with as much as activities like how to conduct an interview with a target group, how to analyze an interview, how to observe a school and students, how they could design in accordance with the design and how to evaluate analysis processes. According to Ozdilek and Robeck (2009), in analysis phase of ADDIE, instructional designers pay attention to learner analysis more than needs and context analysis (p. 2049). Similarly, in this study, NIDs take the learners into consideration much more than needs and context analysis. Ignoring needs analysis might be explained with NIDs perspective of '*in any case we will make this project, no need to inquire its importance*'. In the same way they also did not inquire any different instructional and motivation strategies. As pointed out most of time students filled the report templates without synthesizing their observations. Except learner analysis, they might not think that other issues would help them in designing the project. On the other hand, revealing the needs would help instructional designers specify clear objectives about their instruction. NIDs in this study although defined

objectives and goals of their instruction, those objectives were left in analysis report, they did not examine it in the further steps of their design. According to Smith and Ragan (1999) the most successful instructional designers (novice or experts) are the ones who could keep the main goals in their minds in all the instruction (p.4). Therefore, in the analysis phase facilitators had a major role in reminding NIDs about their objectives. To be able to utilize the goals and objectives of their instruction, the objectives must be clear and detailed enough.

Especially evaluation part of design should be emphasized. In study context because of the time limitation, evaluation phase was ignored. Also to make students elaborate instructional and motivational strategies different approaches might be presented. In this phase also NIDs should be provided as many examples of projects for different needs. Especially cases might be presented in theoretical part of the courses. Kinzie, Hrabe and Larsen (1998)'s study showed that NIDs find cases very helpful to get real life perspective, and analyze and synthesize their available knowledge of ID (p. 64). In this course also some students like the simple case which was given them to write analysis report parts. This kind of activities might be added to use different instructional and motivational approaches for different contexts.

It is not possible to control the context but the design might be done to accommodate the context (Tessmer & Richey, 1997, p. 88). Therefore, especially the design should focus on the learner which is the part of most varied part of the context. In this study, NIDs expectations and motivations in ID course was very different. Their perception about instructional design was also different. To give the idea of instructional design, firstly NIDs must be informed about the processes will be an important part of their projects. Guest speakers are helpful to give this perception. While arranging a guest speaker, they should be asked to present their analysis and design phases in their workplace. In guest speaker session, NIDs main questions were related the cost of the projects; the tools that were used in development, the time experts need to complete the projects, and how to become a part of a software company. In addition to answering students' questions, guest speaker also mentioned about reporting process and client – designer relationship. All those things were important for the analysis stage, however since NIDs were at the very beginning of the processes, they could not pay attention to processes mentioned by guest speaker. Therefore, the number of guest speakers should be increased and they should be invited in different phases of design. Moreover, if it is possible real work setting of educational software companies might be visited. In this context, with about 50 students it might be a bit

challenging but thinking that many of the companies located in the campus, students might be divided into groups and visit real companies to see the ID teams and their work style.

Analysis phase is the start of team work. For both random and free grouping, strong communication channels should be set up. Although face-to-face meetings are strongly suggested, this might cause no progress because each student waits for others to come together. Because of junior NIDs busy schedule and different living locations, online communication tools are life-saving part of team working. Facilitators should lead NIDs to use communication tools effectively. For example it should be compulsory to post each meeting minutes. Each time a different team member might be responsible to do that. Another issue is time management. NIDs most of time left the time management to the facilitators. Facilitators divided tasks into smaller units and they reminded NIDs responsibilities during the project development process.

Lastly, analysis process is the beginning of NIDs and target group teachers and students. In this phase instructor should assist NIDs to introduce themselves to target group teachers. Even if instructor could not arrange target group, instructor should contact with target group teacher who were found by NIDs to make them take this process seriously. Facilitator might facilitate the meeting of NIDs and target group. A checklist of actions and operations that might be strength the experience of NIDs in analysis stage is shown in Table 5.1.

Table 5.1 A potential checklist to be used in analysis and planning phase

| | |
|---|---|
| Groups are assigned | • Random grouping strategy was defined<br>• Random or free grouping was applied<br>• Group members met before facilitator meetings<br>• Facilitators and instructors decided activities in the lecture time<br>• Facilitators and instructors developed resources and templates for each operation of the course (instruments, report templates, contract templates, rules)<br>• If possible a school was arranged as a target group |
| Facilitator meetings | • Decisions about target group was made<br>• Facilitator arranged the target group or the team arranged<br>• Possible project topics were discussed<br>• Resources were suggested |
| Contract was signed | • Lab rules were stated<br>• Team working policies were defined<br>• Roles in the team was determined<br>• Ethical rules were stated<br>• Expectations of facilitators were stated<br>• Policies of target group collaboration were stated<br>• Communication channels and policies of use of them were stated<br>• Applicable penalties were defined<br>• Facilitator approval in weekly meeting was made |
| Meeting with target group | • A kick of meeting was conducted<br>• A contract was signed with target group for formative evaluations and implementations of the project<br>• A communication tool was specified<br>• Interview questions and observation schedules were prepared with facilitators<br>• Interview questions are related learners, context, content and needs<br>• Interviews and observations were conducted with facilitator<br>• A short report was prepared to summarize the findings<br>• Facilitator gave feedback to the findings |
| Examination of resources | • Resources to understand learner characteristics and content were examined<br>• Previous project examples were examined in the lecture hours<br>• Course web site presented report templates<br>• Resources related instructional and motivational strategies were examined<br>• Facilitator's resources suggestions were explored |
| Lecture hours | • Activities to synthesize analysis data were presented<br>• Importance of analysis was clarified<br>• Guest speaker was invited (Main topics are role of reporting, connection of the phases of ID, client – team communication and procedures, example projects) |
| Tool analysis | • Tool analysis was made during the lab hours and facilitator meetings<br>• Lab work was done |

Table 5.1 (continued)

| | |
|---|---|
| Definition of objectives | • All objectives and goals were defined clearly<br>• Objectives were shared with facilitator and target group<br>• Approval and feedback of facilitator and target group was taken |
| Analysis report | • Objectives, needs, learner, content and context analysis were summarized<br>• Target group meeting notes and resources were synthesized to reveal the framework of design<br>• Instructional and motivational strategies were selected<br>• Resources of content were clarified and main parts of the content was specified |
| Communication | • Each facilitator meeting notes were shared<br>• Each group meeting notes were shared<br>• All resources, contract and data were shared |
| Evaluation of analysis | • Analysis report is evaluated by facilitator and the feedback is given<br>• Revisions of analysis phase were noted and with all stakeholders |

### 5.4.2 Design Phase

In design phase NIDs had to use specific instructional and motivational strategies which were derived from instructional design theories. Yanchar et al (2010)'s study showed that NIDs do not want to use theory rigidly; they believed that a good design does not necessarily require the use of theory. In that study, NIDs believed that the templates to use the theories limits creative design process and prevents "*intuition and practical wisdom*" (p.54). On the other hand, in the same study, researchers out those theories provide creative and flexible problem solving and decision making process. In this study, NIDs only given specific theories and NIDs could not seek any other theories to be used. If there would be some more choices, it would lead more creative processes for NIDs. In fact, in this study the main problem with using the theories, which means using the principles of those theories in a correct way. They always needed an example of use of the principles. When they are given any example, they tended to use same thing in their design. This might be caused from the lack of grasping the theories and principles of them. To solve this problem, variety of examples of use of theories might be shown via available projects. Examples might be provided with an EPSS system.

Design phase is the actual decision making process where many ideas are posed. In both analysis and design phase NIDs need advice to conduct the processes (Verstegen et al, 2008). In this study NIDs always asked approval of facilitators for their ideas. In this

situation facilitators helped them to develop feasible ideas. In this study, NIDs sometimes lost much time to come up with a concrete idea. In this process facilitators might assist the development of ideas but this also limit the creativeness of NIDs. On the other hand facilitators should inquire NIDs in each meeting to understand the resources that they used and the data that they got. The examples should be examined by NIDs because to be successful instructional designers should be the "*voracious consumers of examples of instructional design materials*" (Smith & Ragan, 1999, p. 4). In fact the examples should be started to be examined at the beginning of analysis because NIDs should know what their end product will look like. Those examples might be shared with target group to show what kind of material they will be presented. In that case, target group might provide more concrete expectations and suggestions.

In design process NIDs need to know the connection between analysis and design processes. To achieve this instructor needs to explain each phase and their interrelationships generally before starting with details of phases (Verstegen et al, 2008). In this study context in fact the role of theoretical part was to provide a global level awareness about phases and their relationships. On the other hand this part was not mandatory and in facilitator meetings project groups generally focus on the processes which they were already working on. In fact in previous two instructional design courses NIDs were given the idea of what ADDIE is. Despite of this fact, during the multimedia design and development course they challenged to connect their former and further processes. Therefore, in weekly meetings there is a need of clarifications about the phases and their relationships. Besides, contracts which are signed at the beginning of the projects might be structured to show the master plan of the project. In most of the groups NIDs only specified analysis phase's steps but not further steps on the contracts. With the assistance of facilitators, all main activities, actions and operations might be specified on the contracts.

In design phase NIDs main processes were to make task analysis of the instruction, message design and storyboards. Smith and Ragan (1999) pose that successful instructional designers considers continuity, interest and wholeness by using metaphors, narratives and visual images in message design (pp. 4-5). Therefore, NIDs need to work on storyboards diligently to provide these message design conventions. Design phase might be divided into two parts such that in the first part NIDs provide theoretical background, descriptions and rationality of decisions, and the ways of delivery of the instruction, then in the second part they prepare storyboard. In that phase they could only make heuristic formative evaluations with the help of facilitators. In this study it seemed that NIDs tended to develop advance ideas which

might challenge them in development. Therefore, in analysis step a tool analysis should be mandatory.

NIDs should be able to look at different perspectives and consider the context of target group students. In this study, some of NIDs tried to look at the lens of target students, however generally their main concern was to developing as much as functional and attractive projects. In weekly meetings most of time students asked about how they could provide instructional strategy suggested in the report templates. In decision making for the projects most of time in weekly meetings, there was no clue about synthesis of target group's expectations. In this case NIDs needed much more guidance to use the data that they were collected at analysis phase. For a better guidance flow charts might be provided for the students. In the flow chart the questions that might be posed to be answered in decision making. A checklist of actions and operations that might be strength the experience of NIDs in design stage is shown in Table 5.2.

Table 5.2 A potential checklist to be used in design phase

| | |
|---|---|
| Lecture hours | • Connection between analysis and design process was pointed out<br>• Activities of task design and message design were presented<br>• Importance of design part and storyboarding was clarified<br>• Visual design issues was presented<br>• Content accuracy, instructional quality, visual/production quality, usability, and appropriateness of the objectives issues are clarified<br>• Examples of instructional and motivational strategies, feedback and assessment types were presented<br>• Guest speaker was invited to explain the implementation of design and storyboarding activities in real setting |
| Tool analysis | • Tool analysis was made during the lab hours and facilitator meetings<br>• Lab work was done |
| Decision making | • Objectives are considered in decision making<br>• Analysis report was examined<br>• Motivational and instructional strategies, assessment and feedback strategies were examined<br>• Motivational and instructional strategies, assessment and feedback strategies were decided with the guidance of facilitators<br>• The actual content was decided with the help of textbooks and the Internet resources<br>• Task analysis, sequence of instruction were made with the guidance of facilitators<br>• Target group's feedback was taken for the entire design decision |
| Design report | • Task analysis, sequence of instruction, motivational and instructional strategies, assessment and feedback strategies were defined<br>• Target group meeting notes and resources were synthesized to reveal the framework of design<br>• Instructional and motivational strategies were selected<br>• Resources of content were clarified and main parts of the content was specified<br>• The design report was delivered |
| Storyboarding - Message design | • Available programming and graphic design skills of team members were considered<br>• Available graphical and textual information was considered<br>• Sequence of instruction was taken as base<br>• Actual content was determined and narrated<br>• Instructional and motivational strategies were located in design<br>• Multimedia design criteria was applied for each screen<br>• All steps of instruction was drawn and shown on storyboard template<br>• The storyboard was examined with facilitator to decide its feasibility and consistency to the objectives<br>• Storyboard was shared with target group and a formative evaluation was conducted |

Table 5.2 (continued)

| | |
|---|---|
| Communication | • Each facilitator meeting notes were shared<br>• Each group meeting notes were shared<br>• Meeting times with target group was scheduled<br>• Group problems which could not be solved by the team was shared with facilitator<br>• Each role was monitored by the team members<br>• All roles was accomplished, if not it was stated to facilitator |
| Evaluation of design | • The entire design process is evaluated by facilitator and the feedback is given<br>• Revisions of design phase were noted and shared with all stakeholders |

### 5.4.3 Development Phase

In development phase NIDs transferred their storyboards to computer program. In the video project it also includes video recording stage. Although programming and graphic design is not the main role of instructional designers in real setting, in instructional design courses NIDs need to work in all the roles. On the other hand, complexity of development tools might cause NIDs to lose time and bother and consequently the quality of work might reduce. In this case simple way of material development might be provided. Thus, NIDs could have time to allocate for formative evaluation and revision of instruction.

In development phase NIDs worked on development tool intensively, therefore they could realize their deficiencies of using the tool. They also become aware of what kind of knowledge they need to know to develop the project. In development phase NIDs need someone knowledgeable to ask their questions. On the other hand in the course, these development times there are no lecture or lab hours. Although this provide extra time and NIDs are fine with this situation, if at least the lab hours are conducted, they may ask concrete questions related their projects. In available case some of the NIDs asked facilitators or other friends in person, or they search through the Internet. However, most of the time they chose to alter the design since they could not accomplish to develop it.

Development phase is also the time that NIDs create actual content. Most of time NIDs used available text based content. Most of them argued that they utilized TTKB resources and textbooks, however, most of the time they directly get it from the Internet. To prevent this kind of content development problems, all the raw content should be examined in weekly meetings. This kind of copy and paste content is also an ethical issue. In the current semester there was almost no plagiarism issue in the reports; however, in the projects many of them

used different Internet resources without citing them. A checklist of actions and operations that might be strength the experience of NIDs in development stage is shown in Table 5.3.

Table 5.3 A potential checklist to be used in development stage

| | |
|---|---|
| Development | • Storyboard was transferred to the computer via development tool<br>• Each team member worked coordinately on development |
| Communication | • Each facilitator meeting notes were shared<br>• Each group meeting notes were shared<br>• Meeting times with target group was scheduled<br>• Group problems which could not be solved by the team was shared with facilitator<br>• Unsolved development problems were shared with facilitators and get help from them<br>• Each role was monitored by the team members<br>• All roles was accomplished, if not it was stated to facilitator |
| Pre- evaluation of development | • The entire project is evaluated by facilitator and the feedback is given<br>• Revisions of development phase were noted and shared with all stakeholders<br>• Revised project was showed to target group to get feedback<br>• Objectives, content accuracy and visual design issues are evaluated<br>• Formative evaluation results were reported and delivered<br>• Revisions are implemented to the project and shared with all stakeholders |

### 5.4.4 Implementation and Evaluation Phase

In this course implementation and evaluation is an integrated project. In fact since NIDs products are not used in a real setting, their products might be assumed as prototypes. In the course also instructor emphasizes that NIDs are developing prototypes. Thus implementation and evaluation phase of their projects might be assumed as a formative evaluation of the product. In the study context NIDs could not implement a proper evaluation as well as based on target group. The main barrier was the time limitation for evaluation part. Since there were not time period between the deliverables of development and evaluation phases, NIDs could only spend their time for development. It can be said that development, implementation and evaluation phases are combined in this course context. For this reason after the development phase there should be some period for implementation and evaluation. After they submit their end products, facilitators should help NIDs to conduct a proper evaluation. In this phase either facilitators should be witness of the evaluation or NIDs should be asked an evidence to prove that they made an actual evaluation. For evaluations also some templates might be developed by instructors. In fact NIDs did not know how to asses "*content accuracy, instructional quality, visual/production quality, usability, and*

*appropriateness of the objectives*" indicated in final report template. Although facilitators presented explanations, NIDs did not have any experience to develop evaluation instruments to address those issues. For each issue an evaluation template should be provided or facilitator could help each project team to develop their evaluation templates. The questions should be developed under the supervision of facilitators.

Once NIDs are given time to evaluate their instruction, the problem might be collaborating with target group learners. Even NIDs are prepared to conduct a proper evaluation, it is difficult to reach target group for implementation and evaluation. Those who could reach target group students also could not make proper analysis of evaluation results. In the reports it can be easily seen that under the title of method of evaluation, NIDs listed many evaluation methods that they applied. On the other hand, their results are very narrow considering their methods and the questions that they asked to target group. Lastly, in revision part sometimes their revisions do not match with their evaluation results. Therefore, there is a considerable need of revision in evaluation part of ID in the course. The evaluation part also might be divided into four parts; preparation of evaluation instruments and methods, implementing evaluation and collecting data, analysis of the data and reporting the results, and lastly revision of the material. By dividing evaluation phase into several parts will prevent articulated evaluation. For each part facilitator should guide the students. Only one session meeting is not enough to give the entire idea of evaluation. Although report templates guide the students, they do not provide step by step process. Especially NIDs need an expert in analysis of the results. A checklist of actions and operations that might be strength the experience of NIDs in implementation and evaluation stage is shown in Table 5.4.

Table 5.4 A potential checklist to be used in implementation and evaluation phase

| | |
|---|---|
| Lecture hours | • Importance of evaluation was presented<br>• The questions to be asked to evaluate content accuracy, instructional quality, visual/production quality, usability, and appropriateness of the objectives were described and exemplified<br>• The methods of evaluation were presented |
| Preparation for implementation | • The methods were selected for evaluation<br>• The instruments to collect data for content accuracy, instructional quality, visual/production quality, usability, and appropriateness of the objectives were designed and developed with the guidance of facilitator<br>• A meeting with target group students was scheduled |
| Implementation | • The project was presented to target group<br>• Evaluation methods and instruments were implemented |
| Evaluation of development | • The entire project is evaluated by facilitator and the feedback is given<br>• Revisions of development phase were noted and shared with all stakeholders<br>• Revised project was showed to target group to get feedback<br>• content accuracy, instructional quality, visual/production quality, usability, and appropriateness of the objectives were evaluated with the instruments<br>• Summative evaluation results were reported and delivered<br>• Revisions are implemented to the project and shared with all stakeholders |
| Communication | • Each facilitator meeting notes were shared<br>• Each group meeting notes were shared<br>• Meeting times with target group was scheduled<br>• Group problems which could not be solved by the team was shared with facilitator<br>• Unsolved development problems were shared with facilitators and get help from them<br>• Each role was monitored by the team members<br>• All roles was accomplished, if not it was stated to facilitator |
| Assesment of NIDs | • Peer evaluations were held<br>• End products and other deliverables were evaluated with rubrics<br>• Facilitator observations were noted<br>• In class activities were evaluated |

## 5.5 Implications for Activity System Components

Under this title, observations of the researchers will be combined with suggestions for individual components of activity system. Certainly, there are interrelationships between the components. Therefore, for each component the suggestions might involve other components.

### 5.5.1 Subjects

Background of the subjects who are the actors of the activity might be improved in terms of teamwork skills, elimination of misconceptions and misbeliefs and communication skills.

**Teamwork**

NIDs' personal characteristics, pre-knowledge and experience are important contextual dynamics which affect team working and quality of outcomes. Their expectations from the course, technical and academic skills have an important effect on success of the team. Most of the time responsible team members are determined to finish the project successfully at the expense of working much more than others and even finish the entire project themselves. However this is not an expected work style in instructional design team. In fact the collaborative learning standards which were defined by the scholars are not applied in real team working in undergraduate programs (Colbeck, Campbell & Bjorklund, 2000). However, as Gillespie, Rosamond and Thomas (2006) pointed out faculty might support the groups to cope with group problems and keep the productivity. The course context was very suitable to support group working by means of facilitators, but team working problems could not be avoided and not all the problems solved. First of all the class were used to work with best friends for all the projects and they could not adopt working with different people easily. Therefore, previously taken courses were very important to provide team working skills.

**Misbeliefs**

There was a huge misbelief about instructional design at the beginning. Students match instructional design with screen design. This might be caused that they only saw the examples of the previous years and think that the only thing was to make something on the computer. Another reason might be that in Turkey still the meaning of instructional design is not recognized like being in USA. Most of CEIT graduates work as programmer in their profession and especially in online education companies. Thus, students might see themselves as programmer of educational projects. To prevent this point of view, from the beginning of the program NIDs mission of instructional design might be given.

**Communication**

NIDs worked with other stakeholders in project development for the first time in this course. To work with target group they needed many skills. Although being familiar, they were not good at analysis and synthesize of information taken from target group, working with different people, systematic project development, documenting (even some of them refuse to

write reports because of their poor English) and online communication. Therefore, some of those skills should be given in previous courses as much as possible.

### 5.5.2 Tools

NIDs especially had problem of working with templates and using development tool. Especially for the tangible tools there might be some improvement.

**Templates**

Reports were assumed as the main part of the course. NIDs saw the reports as a burden most of time. They are tended to do practical things in the project and this made them to ignore the processes. After writing the report of any phase they also did not check it in the further steps. Therefore, in weekly meetings NIDs previous reports should be available to be discussing on it. To create useful reports, NIDs have to give enough details. They should not be allowed to write very general learner, context and needs analyses. When the reports become available in each meeting, NIDs might be more careful about writing them. In the reports some unnecessary and repetitive parts might be excluded to not bother NIDs.

Without a storyboard, students only have ideas which are always changing in each meeting. Therefore, during the design process, NIDs should start sketching the visual appearance of screens. To provide this a grading policy might be applied. Grading is always a best reward for undergraduate students (Gillespie, Rosamond & Thomas, 2006). As seen in the course without grading NIDs did not tend to do something suggested by facilitators.

**Development tool**

NIDs need to know about the development tool even if they do not develop themselves. This is needed because as seen, NIDs tend to design unfeasible storyboards without tool analysis. On the other hand busy schedule of the course prevent learning and practicing the tool sufficiently. In this case reducing the project number to one might improve both ID skills and technical skills of NIDs. Especially in development phase NIDs need assistance in development tool, in this phase labs might continue to help NIDs for their project.

In addition to lack of time, NIDs lack of practice of tool is another issue preventing the knowledge about development tool. They tended to finish lab homework in a convenient way either getting from a friend or modifying the executable file of homework. Some of them tried their best and when they decided to they could not do it, they applied plagiarism. To prevent plagiarism lab homework started to be given as story boards. Thus two issues might be solved. The first one is that the NIDs, unless they get from each other, could not

convert the homework to the development file. As second issue, NIDs might learn how to create a detailed storyboard.

**Previous projects**

It seems that although NIDs got much experience in the first project and rather comfortable in the second project, students still had trouble to transfer motivational and instructional strategies to another kind of project. Therefore, novice instructional designers should be presented as many projects to become familiar with instructional and motivational issues. However, although examples are very important to see how the instructional strategies might be applied in multimedia courseware, in undergraduate programs they mostly because copying of the ideas directly. This problem might be solved careful examination of storyboards in the weekly meetings. Facilitator should always inquire the sources of the ideas.

**Project topic**

Project topics might be suggested by instructors. In fact although facilitators guide students to select a good project topic, most of time students select very convenient topics. This prevents them use critical thinking skills on the teaching strategies, routine and enrichment tactics since they could easily find many examples. Therefore, project topics might be updated in each year and more social science topics might be added. Apart from curriculum topics, other topics which influence the children might be added like some epidemics, new technologies, and global issues like global warming, natural disasters, and environmental pollution. These kinds of topics might be more applicable since teachers might also need some resources about them more than math and science topics.

**Communication tools**

Communication tools are one of the important parts of the course. Instructional design is highly dynamic process and NIDs have many questions to be answered. To share the questions and to get feedback for a completed work, online communication tools should be used more effectively.

### 5.5.3 Rules

For the rules working with different people, short deadlines and grading rules caused some problems.

**Assignment of the teams by the instructor**

Assignment of the teams by instructor is still a solution to make NIDs work with different people that they are not familiar. In grouping some more criteria might be employed to assign teams however heterogeneous teams are more likely to have some trouble because of different academic expectations. Loo (2003)'s study showed that in team working always one of the members is trouble maker, which is also similar finding revealed in this study. Therefore, even the best random grouping strategy does not solve the problems naturally. To solve the problems in the groups, the facilitators need to be more careful about groups. Another solution might be forming the teams after two weeks, instructors and assistants might observe the students in the labs and in the classrooms before creating the teams. Facilitators should not hesitate to ask problems whenever they feel something wrong with the teams.

**Short deadlines**

In the tools, it was argued that increase of the number of the projects might support the learning ID process better. On the other hand, to eliminate short deadlines and provide adaption among team members, only one project might be considered as a solution. Short period between deadlines is one of the problems causing friction among team members. According to Zwikael and Unger-Aviram (2010) the longer project times the better team development practice and project success. They also suggested that individual accomplishment in team work should be rewarded; the team members should be encouraged to meet frequently, the bonus rewards should be given for extra team success.

**Grading policy**

In this course although facilitator meetings and group meetings are mandatory, there was no penalty for who do not attend the meetings. Moreover their activeness in group meetings also rewarded. To strength the team working and attendance of meetings and activeness in the meetings should also be graded. Also attendance rule should be implemented for lecture times. Undergraduate NIDs tend to care instructor's request instead of facilitators. Attending lecture time might be helpful to bring team members together; the activities might be performed with team members. Shortly, instructors and facilitators should facilitate the team working with different kick off activities and practices.

In available course, NIDs had to collect at least 60% of the entire lab grade to pass the course. Although at the end this rule was not implemented, during the semester this made students very stressful. Some students came to ask withdraw when the labs were done, because they thought that they already failed because of their lab score. Instead of making

students stress out for their lab scores and lead them apply undesired solutions, instead of giving an available homework, they might be asked to submit a piece of their projects. Thus, lab homework might be individualized. Continuing the labs during the semester might also helpful because most of the students believed that when they become comfortable to work with the tool the first project finished, if there would be more time they might improve themselves.

**Contracts**

Lastly contracts should be given importance, and even in each meetings that contracts should be checked. Most of the time, NIDs leave the contracts with very general task definitions and policies. Therefore, each week those contracts might be updated with new needs. There should be parts that facilitator states his own expectations from the group members and NIDs state their expectations from the facilitator. NIDs should examine as many contracts to see the work policies and penalties. Facilitator might talk to them about possible problems that they might encounter. Unless facilitator's intervention, teams solve their problems rarely. Therefore, facilitator should build trust between her and the NIDs so that they could easily talk about the problems that they have.

### 5.5.4 Community

Community is a stable part of the activity system. It is not possible to manipulate the background of the community members. On the other hand for communication within the community some precautions might be taken.

**Facilitator – team – target group communication**

As mentioned in rules part, facilitator and teams should develop good relationships to be successful. In moderation of team working facilitators have important roles. In providing better communication between target group is also an important role of facilitators. Facilitators might accompany with NIDs in their target group visit to helps them asking questions and getting data. Availability of facilitator or instructor will lead target group teacher take the project seriously. Moreover, target group should be aware of the progresses and they should know about the project. Most of the time, NIDs do not clarify what they will actually perform in the project. Target group needs to know that NIDs will meet with them until the project is completed and evaluated. Some commitments should be taken from target group in that they will assist NIDs in formative evaluation too. Moreover, target group teachers might be added to online communication channel of NIDs, thus they will be informed continuously. In previous years working with a specific school's teachers was helpful, because all the teachers were aware of the projects. Moreover, NIDs were motivated

because they could easily contact with teachers. This kind of arrangement might be helpful because all the teams will work with similar target group students and NIDs might share their data received from the target group.

**Facilitator – facilitator communication**

In grading facilitators might work collaboratively. Although for each deliverables there are rubrics, each facilitator has different quality perception. Undergraduate NIDs had some complain about the different grading policies of facilitators. To prevent this argument, all facilitators might come together in evaluation of deliverables like being in the second project. On the other hand, after specifying a base score for each team's deliverable, facilitator might use his observations to modify the team or individual score in accordance with the team's performance. On the other hand, there should be policies to obtain performance scores too.

**Class members – team members**

There is a "*culture of CEIT students*", as some of the current and graduate students stated which means staying several nights at the department and finish the entire work in a few days. This is caused from their habit of working face to face. Since they do not have much time and labs are occupied at day time, they prefer to work at night at student labs. Working face to face might be effective however it also causes problems especially in effective team work and also push all the work in a few days. Different living location of problems and different schedules requires an effective online communication system. Communication tools are very important to solve team work or project related problems. Facilitators might take the initiative of communication and show how NIDs could progress via online communication.

### 5.5.5 Division of Labor

Style of division of labor has a considerable effect on project performance. Gender and background most of the time identifies the role. However, especially in learning ID process taking many different roles is an expected working style. To provide a fair and homogeneous division of labor some issues given below might be reconsidered.

**Clarification of the roles**

In division of labor the roles need to be clarified at the beginning. The role of facilitator, instructor, group members, and target might be listed on the project contracts. In the course one of the most important problems was the unfair division of labor among team members. Especially roles of females and males were separated. Academic and technical skills were

also played role in division of labor. In fact in ID teams the roles might be different, all the team members do not work at the same time for the same thing. However, in this context they need the experience of each role. Therefore, they were supposed to work in each phase equally.

**Gender issues**

Females' fear of programming should be eliminated. Although all the students had taken several programming classes, still most of them were not confident to work in programming. In fact, the programming required for their project was very simple. However females did not want to try it. Thus in most of the groups, females' role were communication with target group and reporting while males' role was developing the project. Also technically skilled team members worked on development much more than others. To prevent this kind of clear cut division of labor, knowledge exchange should be provided. Facilitators should encourage the team members who have difficulty in development part because unless all team members work on the development, the end product is shaped by the decisions of a unique member.

### 5.5.6 Object

To achieve the object of the activity system the objective of the course should be clarified at the beginning. Although it is stated on the course syllabus, NIDs do not tend to critically consider those objectives. Thus, again, the need of clarification which might be given by facilitators or instructor would be effective to think on them critically. NIDs need to know about they will be working in an authentic practice. The importance of each stakeholder, importance of the processes, quality measures of the end products and team work should be clarified. Unless clarifying the purpose of the course, NIDs had very different expectations and they might be disappointed.

## 5.6 Suggestions for Mentoring NIDs

In the study context facilitators was like a project manager of ID teams. On the other hand, they were supposed to only guide about instructional design processes and suggest some ways for design. Another role of facilitator might be asking NIDs reflect their learning and decision making process (Verstegen et al, 2009). On the other hand Verstegen et al (2009) suggest that facilitators should not involve in decision making process and they should be neutral in about instructional design teams' decisions. In this course context, facilitators had an important role in decision making because NIDs sometimes developed unfeasible ideas, they do not know the limits of development tools, do not know about instructional and

motivation theories and not know much about target learners. Unless guiding NIDs to make tool analysis, to know instructional theories and to get enough information from target learners, facilitator roles will remain as project manager. Moreover, since NIDs have problems in team working, they need more assistance from facilitators.

Templates are very important in novices' processes. Lanzilotti, Ardito, Costabile and De Angeli (2011) showed that qualities of evaluation of e-learning products are much better when novice evaluators use patterns (templates) instead of heuristic and think aloud evaluation techniques. They also pointed out that patterns eliminated the problem of evaluator's differences. In this study report templates, storyboard templates and rubrics had role of guide. On the other hand, they also limit NIDs inquiry of which aspect of their processes are important to be reported. Since they did not spend much effort while filling those templates (especially in reports) they could not consider most of their reports in their design. To prevent this, while mentoring students each of their decisions that they write on reports should be inquired by facilitators. Facilitators especially inquire "reasons of NIDs decisions" and "applicability NIDs decisions". After each phase of design, both facilitators and NIDs should turn back to the previous reports to check which parts of them were applied to the next step.

In instructional design courses EPSS (electronic performance support system) tools which provide continuous instructions to help decision making and digitizing the mental processes (Gery, 1991) might be developed to provide immediate help for NIDs. In the study that NIDs and experts used EPSS, Uduma and Morrison (2007) found out that although the quality of the products did not change, NIDs were very comfortable while they are designing. EPSS systems might be developed in accordance with the context and objectives of the courses. In the EPSS each question which comes from students might be collected and answered. Besides, this system should include as many as examples which assist NIDs to report learner, content, context, tool and needs analyses, instructional and motivational strategies. The EPSS should also record all developed ideas of NIDs and their collected data. As mentioned before one of the most important problem of NIDs (in fact problem that facilitators deal with) not to take note about their processes. According to Verstegen et al (2009) documentation allows "*to maintain consistency, to explain or defend design decisions, and to make it possible for somebody else to take over (when working in a team), and to be able to use all the information and arguments that are available (from present and past design processes)"* (p. 326). In ID process NIDs should be adapted to take notes throughout the project. This makes them forget about their previous thoughts and plans. A new EPSS might

record and present them whenever needed. With different communication tools EPSS might provide community of practice environment between target group, facilitators, instructor and NIDs. To sum up, the EPSS system might be structured as a diagram of ID processes. For each step all the actions and operations can be provided as checklists given in previous sections. Moreover, for each action and operation, strategies, methods, instructions, resources, templates and instruments might be provided. Besides, EPSS could provide spaces to took memos and facilitator feedback as a guide.

### 5.7 Suggestions for Assessment of NIDs

In the study context almost all student assessment was based on group work. Sometimes, if facilitators observed that some individual students spend more effort than others they might increase their scores or vice versa. However, almost all assessment of NIDs was based on the deliverables which are mainly reports, end product, and manuals. There was no evaluation of the competencies that NIDs gained. Therefore, there was need of evaluation of outcomes. In this respect ID activity might have been helpful to see the outcomes however it was not a mandatory activity and some students did not participate in the first or the second implementation of it. On the other hand only a paper based evaluation is not enough. First of all expected outcomes should be defined and activities of NIDs should be richened to observe the expected outcomes.

According to Klimczak and Wedman (1996) in ID project evaluation in addition to other stakeholders might evaluate the project. In this course as long as an effective collaboration with subject matter experts, target learners, teachers and even classmates, this kind of evaluation might be helpful. In the course although a peer evaluation was implemented, even the team members who had many complains about other members did not reduce others' points. This implies that NIDs are not ready to evaluate objectively. They did not want to be effective in the grade of their friends. Another issue, when Group 1-8 sent their projects to the target group teacher, he sent an e-mail to the course instructor and stated that the project was implemented successfully. On the other hand, when the instructor check the project he surprised because that project had many navigation problems and crowded screen layout. This implied that, target group did not also tend to reflect the real feelings about the projects. The teacher might think that the project group developed something free of charge. To be polite he might hide his real thoughts. In this case to get real feelings of stakeholders, face to face meetings with them might be helpful to see their actual reactions.

Fenwick (2001) argues that combination of several measurements will reveal the outcomes of a particular context. Contextual issues should also be considered in team working success to provide a fair assessment. As mentioned group problems influence hard worker students. Although the processes of a certain group are seen as lower level, an individual student in this group might work much to finish the project. In that case the division of labor should be observed by the facilitator and he might take the control of division of labor and evaluation of deliverables could be made differently for the students. In the study target group motivation, motivation of other team members, technical skills of team members, lack of time to make a complete ID process might be considered while evaluating the end products of ID teams.

As pointed out in the results, there were many skills that NIDs need to accomplish the goals of the ID course. On the other hand, lack of those skills caused students to fill those skills before accomplishing the course goals. To prevent this situation, faculty members need to communicate to state their outcome expectations from all the courses (Shaeiwitz, 1996). In the study of assessment of engineering student outcomes, Shaeiwitz (1998) concludes that using many assessment lead instructor know about his students much. This might provide more fair and objective assessment results.

Since instructional design education requires complex and authentic activities, it also requires extensive assessment methods (Bannan-Ritland, 2001). In this course there are many issues which might be considered for evaluation. Assessment of ID skills and learning outcomes of the course, assessment of ID products and other deliverables, assessment of team work performance and assessment of individuals should be combined to provide a complete assessment for ID course where the NIDs develop multimedia courseware. For example in this course requirement of technical skills influenced the processes and quality of end product much. Even a team shows a good performance during the semester, the end product might be lower quality. Therefore, this issue might be taken into consideration in evaluation of end product. Although one of the goal of the course was to let students use a computer based development tool, it should not as much important as other instructional design skills. As seen in Figure 5.1 the researcher proposed a combination of assessment include four components; assessment of ID skills, team performance, end products and deliverables and individual performance.

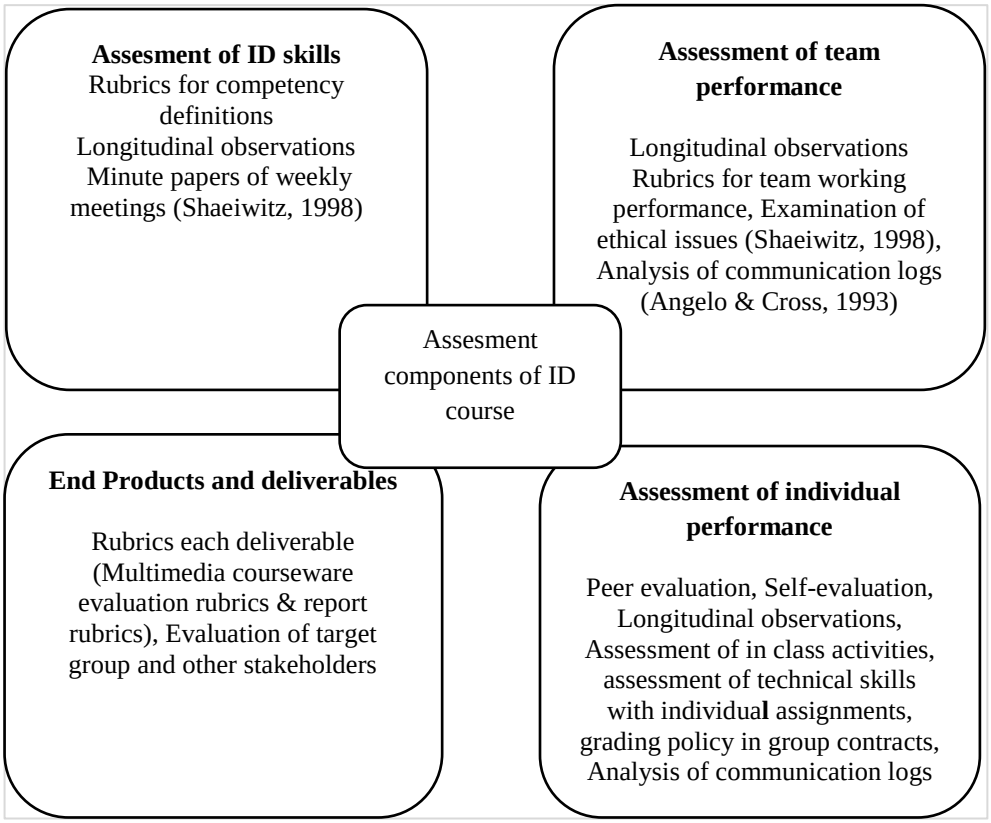



Figure 5.1 A potential assesment combination of ID courses

## 5.8 Practical Suggestion for ID Practice

This study aimed to find out contextual issues (combination of the junior students' context and the course context) which have effect on the experience of NIDs. The experience of NIDs was the inseperable part of their processes. Therefore, every single actions and operations during the ID process were important for improvement or stability of their ID competencies. The details about how a course (or practice) dynamic might be improved to provide better ID competencies and quality of the products were explained above. In this section, the important practical suggestions might be summarized under the categories of the department (curriculum), instructor (course designer) and facilitators like below.

**Practical suggestions for the department (curriculum –other courses);**

Since the first year of the program, students develop different cultures. For example, in the year of 2007 many of the students were working at a part time job job (some of them even full time jobs)while in the semester of 2008 almost no students were working at a part time job. In this issue, the culture of the cohort is very important. Team working habits,

plagiarism issues, personal problems between the students start at the beginning program. Awareness of the objectives of the program, the career opportunities should be given at the beginning of the program because many of the students come to the program thinking they will be equipped full of technical skills. The practical suggestions for the department and curriculum might be like below;

- Since the department is supposed to provide technical skills to the students, before taking the ID course the programming and graphic design skills might be given in a more serious way with more practice.

- Online communication tools are very important when the project teams have no time to work with face to face. Therefore the students should be motivated to use online communication tools.

- The students do not requlary check their e-mails (university accounts) and course web site. This habit should be provided since the beginning of the program.

- In a time the students developa perception of "the females cannot achieve technical things". This leads distinctive division of labor, and females just withdraw themselves from technical issues and left them to the males. In the same way, males leave the communication and writing roles to the females. This kind of division of labor prevents getting enough experience from the projects. All the students should be encouraged to improve themselves both in technical and social roles.

- Instructor's assignment of the teams caused several problems because since the beginning the students had fixed team members for each course. Some of the students stated that "*I had never talk to my team member before this team work*". Therefore, the students should be made familiar with working with different people to not have biases or high expectations from the team members.

- Plagiarism is a general issue for the department. The ethical consideration and awareness should be given and penalties should be applied. Many students make plagiarism just because they know that no one will recognize it. In the course especially in the lab homeworks, the students applied plagiarism. Therefore policies (like plagiarism detection programs, penalties) should be developed to prevent plagiarism.

**Practical suggestions for ID course designers;**

In course design the instructor should taken the available context and background experience of the students into consideration. The practical suggestions might be listed below;

- Awareness of the NIDs about ID processes, objectives of the practice, required processes and expected competencies might be provided at the beginning of the practice. Especially in undergraduate level this awareness should be increased with as many as guest speakers.

- Target group teachers, students and subject matter experts should be arranged by the instructor. Although this is difficult for the Turkish context, some permission might be got from MoE to enter the schools. Also target group teachers should be informed about expectations from them and their roles in the projects.

- To improve the quality of the products, target group should be asked to use the product at the end of the project. The quality is also improved with encouraging teams attend in a competency of instructional materials. There is already a traditional competency conducted by MoE.

- The students should be given the relevancy of each ID phase that they go through. Reflective activities should be increased to increase the awareness of ID phases.

- ID phases might be divided in smaller units and each unit should be monitored by the facilitators.

- An EPSS system might be developed to enable students check their past processes and get information about further processes as mentioned in the "mentoring NIDs" part.

- The development tools might be chosen between the ones that students had experience or simpler ones.

- Examples should be used in a reflective way and creative ideas should be encouraged. Unique and good example is not enough to show the good aspects of examples. Many examples should be given with their good and bad aspects. In idea development phase, students should not be allowed to be dependent to the templates and facilitator might encourage them to consider more and different types of tasks which are suitable for the target group to be included in projects.

- Policies for ethical issues should be developed and declared at the beginning of the semester. The policies should be implemented properly with the control of facilitators and instructor.

- Grading should be used in different situations like online communication, target group – team communication, activeness in the team meetings. Therefore, facilitator observation is very important.

- Assesment of NIDs might be structured by considering contextual issues and involving different stakeholders of the project as suggested in previous section.

**Practical suggestions for the facilitators;**

- The facilitators should develop a common way to give feedback and grading to provide fair experience and outcomes.

- Contracts of the teams should be created in a serious way. Especially in team working problems, the grading policy should be determined by the students. The contracts should be seriously implemented with the help of facilitators.

- Facilitator should support the teams in each phase of the design. Especially students need technical support in development phase. Facilitators should be knowledgeable about the development tools. In evaluation phase, facilitator might accompany with students to see how they ask their questions and implement the instruments.

- The communication tools should be used effectively and student monitoring should be made via different communication tools. After face to face meetings, students tend not to communicate with facilitator and they wait until the other week to take feedback for their deliverables. To prevent this, feedback must be given immediately with online tools.

- Facilitators should observe individual performance to monitor and improve team working. In problem situation, facilitator might intervene the problem by talking the students privately.

- In decision making process facilitators should scaffold the team to develop feasible ideas and some failure examples should be given by the facilitator. Especially, students should be asked to inquire their available skills and how they could develop the idea that they come up with.

- Constructive and informative feedback should be provided for each phase. Normally, in the course the feedback was given with rubrics and facilitators provided explanations about problems in the deliverable. On the other hand, many students believed that it was not enough to explain what was poor about the deliverable but how they could improve that part.

- Unmotivated or discouraged members should be encouraged to contribute team members. The frequency of face to face meetings with facilitator might be increased to adapt unmotivated members. Encouragement might be provided with telling about the outcomes of the projects. Besides, if lack of motivation is caused because of the personal problems with other members, division of labor might be made by the facilitator unless that problem is solved.

- In target group meetings facilitator might accompany with teams to increase the effectiveness of the communication between them. This will also lead teachers to take the meetings seriously and help NIDs in a more effective way. Besides, formal permissions might be taken from school administrators. Most of the time, teachers could not implement the projects because of administrative rules. Taking a formal permission will solve this problem and teachers might be more open to work with project teams.

## 5.9 Suggestions for Further Research

CEIT departments might have role of growing instructional designers. More practices should be inquired about how ID skills might be given to NIDs studying at CEIT departments. For the country, new competency definitions might be developed. Although still companies mostly employ instructional designers only in educational software projects, in future, like in other countries for performance improvement and in service training instructional designers might become important. In this respect, exploration of performance improvement and training needs of companies might be helpful to draw a framework for instructional design courses. In fact for Turkey, graduate of Faculty of Education are mainly seem as teacher candidates. CEIT has an advantage in this respect. It should be emphasized that CEIT students are both potential information technology teachers at elementary schools and potential instructional designers in educational projects. In the former one, their role is not so different than instructional designer. Information technology teachers should accompany with other branch teachers and help them in using technology in their courses and in showing the ways that they create technology enhanced effective teaching materials. Similarly in

different educational settings, CEIT graduates can work as project manager, system analyst, programmer, storyboard developer, evaluator etc. As the researcher observes in instructional designer job announcements CEIT graduates are also addressed. For example, in a job announcement, in which CEIT graduates were called, it was stated "*creating scenarios for various web based trainings, examination of content which come from subject matter experts, designing the instruction such that it can be taught at Internet environment, monitoring and evaluation of the development of instruction (controlling animations, interactions, games, interfaces and navigational features)*" (Adobe Academic Turkey, 2009).

Graduates of department of CEIT were involved in this study and they were inquired about the relationship between their ID experience coming from the program and their workplace performance. However, this inquiry is very limited since there is a long time between junior class times and real work setting times. Therefore, some other courses, seminars, in-service trainings might have also contributed their experience. Moreover, most of graduates had difficulty in remembering the activities in the class. Therefore, in further studies the skills which obtained from the program and the professional life must be differentiated (Larson, 2004).

Qualitative evaluation of NIDs should be considered seriously. Nowadays in undergraduate education quantitative measures are used more than qualitative ones. On the other hand, instructional design is a process driven field. Therefore, the processes should be observed to evaluate the students. Moreover, current needs of clients and context of the country should be considered in evaluation criteria. Further research might reveal clients' expectations from instructional designers and develop new objectives for instructional design programs and courses. In the light of those objectives new evaluation criteria might be developed to assess NIDs performance. In this study, the researcher proposed four types of evaluation; ID skills, ID products, group performance and individual performance. These types of evaluation might be increased for different contexts.

As seen in this study facilitator, as mentor of the processes, is an important part of the process. Novices need more guidance for their processes, and unless a strong relationship is set up between teams and the facilitator, the quality of processes cannot be accomplished. Therefore, the mentor – novice instructional designer relationship must be examined in the further studies to explore "*challenges and dilemmas*" between them and thus the policies which lead effective and productive relationship might be developed (Wang & Odell, 2007, p. 478). In real setting, instructional designers are expected to develop good communication with the team members, clients and all stakeholders. Therefore, target group – novice

instructional designer communication should also be inquired to improve NIDs communication skills.

As a last issue, the method used in this study might be improved and used in the further studies. Activity theory describes complex, tool mediated social environments; reveals key dynamics of the described reality; points out contradictions and shows a visual representation of interaction among the dynamics of the environment (Kaptelinin & Nardi, 2006). Activity theory provides a broad lens to investigate and simulate the dynamics of complex learning environments (Jonassen, 2000). In this respect, AT has been used in different stages of educational technology research like analysis of complex learning environments (Yamagata-Lynch & Smaldino, 2007; Mwanza, 2002), design and development of ICT tools (Mwanza & Engeström, 2005: Bellamy, 1996), exploring barriers and enablers in technology use (Lim & Chai, 2004, Blin & Munro, 2008), exploring and designing knowledge management (Gay & Hembrook, 2004; Baran & Cagiltay, 2006). Therefore, it can be argued that Activity Theory is an expandable framework and the contexts might be modeled on an activity framework. In line with this idea, Halloran, Rogers and Scaife's study (2002) suggests that further research might involve implementation of the scenarios and their assessment to see to which extent activity framework works as a predictive tool. This study will provide a description of a system by means of revealing interaction patterns between several factors where NIDs design multimedia by following an instructional design framework. Interaction patterns between the contextual issues will provide a big picture of the influential issues in the instructional design course. Thus, AT will also be assessed as a research tool. This might lead other studies to develop new models based on AT to evaluate the course outcomes and quality of the products.

### 5.10 Limitations of the Study

Limitations of the study were caused from the contextual bounds and these limitations influence the interpretation and generalization of the data. First of all, this study intensively influenced from the context, almost all the data and interpretations were limited with this case. However the method used was the important issue to conduct similar studies in different contexts. Researcher especially tested the method's usability in this kind of environments. Therefore, although the results were limited with this case, the method which was another important issue can be generalized.

Although the study's sample is large enough for a qualitative study, it is difficult to generalize results to each ID courses and CEIT departments. First of all, ID courses are given

with different strategies in different programs. As a second issue this study is based on the contextual factors influencing available NIDs' processes. Therefore, the results change in accordance with the context even a same course structure is implemented. First of all, in study context, there are four facilitators and this kind of assistance might not be provided in many other CEIT departments. Secondly, during the multimedia development process most of the resources were provided by the department and the instructor, such as video recording equipment, software and templates. Therefore, lack of this support might influence the results of the similar implementation. In this study, the target learners could not be provided by instructor and students have very limited communication with a target group. This limitation was assumed as a contextual factor influencing experience and lack of target group had a negative effect on the experience. However, with a proper target group – project team communication, this negative aspects might be eliminated.

In this study, although graduate students were involved into the study, it was not possible to say that their instructional design skills only came from this course. In fact they took some more instructional design courses and some of them have been already working part time job while studying at university. Therefore, it is not possible to argue that the outcomes which were mentioned by graduates reflect the outcomes of this course. On the other hand, some of skills mentioned by current NIDs and graduates can be matched and then it can be argued that NIDS gain outcomes mentioned by the graduates via this course.

Participants have some limitations, although they were supposed to know basic technical and pedagogical skills, some of them needed more to know. There were some students who withdrew the course and this also influenced some of the results for the groups. The general expectation of the course was all students finish their projects successfully. However, as said before since the focus is finding contextual issues which have effect on the projects and outcomes, the variety of the events richened the data and even failure was valuable data for the study.

One of the limitation is related the results of the study. The "outcome" which constitutes experiences and acquisitions of students were derived from their expressions and researcher observations. Therefore, these outcomes cannot be assumed the definite outcomes without long term observations of students in a real setting.

The last and the most important limitation are related with the researcher. Although she did inter-rater reliability of some of the data, she was alone to interpret a huge amount of the data. She also was alone while setting up relations between the dynamics of the activity

system. Therefore, the result of the study is highly dependent to researcher's interpretation skills and ability to finding connections among the dynamics of the context.

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## APPENDIX A.

## QUESTIONNAIRE FOR RANDOM GROUPING

| | Kesinlikle Katılmıyorum | Katılmıyorum | Kararsızım | Katılıyorum | Kesinlikle Katılıyorum |
|---|---|---|---|---|---|
| 1. Bir grup içinde çalıştığım zaman daha kaliteli işler yaparım | | | | | |
| 2. Bir grup içinde çalıştığım zaman işin fazla kısmını yapan olurum | | | | | |
| 3. Diğer öğrencilerle çalıştığım zaman bile kendi hızımda ilerleyebilirim | | | | | |
| 4. Bir grup içinde çalıştığım zaman kendi arkadaşlarım ile olmayı isterim | | | | | |
| 5. Diğer öğrencilerle çalıştığım zaman işin bitmesi daha uzun zaman alır | | | | | |
| 6. Grup arkadaşlarım benim görüşlerime saygı göstermezler | | | | | |
| 7. Diğer öğrencilerle çalıştığım zaman projeden daha fazla zevk alırım | | | | | |
| 8. Grup arkadaşlarımın anlamadığım şeyleri açıklayarak yardımcı olurlar | | | | | |
| 9. Grup üyeleri ile arkadaş olurum | | | | | |
| 10. Bir grup içinde çalıştığım zaman kendi görüşlerimi paylaşabilirim | | | | | |
| 11. Grup arkadaşlarım bana onlar kadar zeki olmadığımı hissettiriyor | | | | | |
| 12. Diğer öğrencilerle çalıştığımda projeyi anlamam daha kolay oluyor | | | | | |
| 13. Bir grup içindeyken çalışmalarım daha düzenli oluyor | | | | | |
| 14. Grup arkadaşlarım bir konuyu öğrenmem için yardım etmekten hoşlanırlar | | | | | |
| 15. Grup arkadaşlarım çok çalışmasalar bile iyi sonuç alırlar | | | | | |
| 16. Grup ile çalıştığım zaman iş yükü genellikle daha az olur | | | | | |
| 17. Grup içinde olup bitenlerin bir parçasıymışım gibi hissederim. | | | | | |
| 18. Grup içinde genellikle kararları veren bir kişidir | | | | | |
| 19. Herkes ödevini tamamlamadığı sürece işi bitiremeyiz | | | | | |
| 20. Grup içindeyken düşüncelerimi ifade etmede zorlanırım | | | | | |
| 21. Grup notunun adil olmadığını düşünüyorum. | | | | | |
| 22. Grup arkadaşlarımın proje sürecinde gerekenler öğrendiklerinden emin olmaya çalışırım | | | | | |
| 23. Kendi notum grubumuzun ne kadar şey öğrendiğine bağlıdır | | | | | |
| 24. Grup üyeleri ile sınıf dışında bir araya gelmek zor oluyor | | | | | |
| 25. Benden farklı öğrencilerle çalışmayı öğreniyorum | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| 26. Grup arkadaşlarım hislerimi önemsemiyor | | | | | |
| 27. Birlikte çalışmakla görevlendirildiğim grup üyelerinden hoşlanmıyorum | | | | | |
| 28. Diğer grup üyelerine çalışmanın çoğunu yapmaları için izin veririm | | | | | |
| 29. Grup arkadaşlarımı iyi tanırım | | | | | |
| 30. Grupla çalışmanın zaman kaybı olduğunu hissediyorum | | | | | |
| 31. Bir grup içinde çalıştığım zaman hak ettiğim notu alırım | | | | | |
| 32. Grup arkadaşlarım beni sevmezler | | | | | |
| 33. Benim kadar zeki olmayan öğrencilerle çalışmaya mecbur oluyorum | | | | | |
| 34. Grup içinde çalışırken, görüşlerimi açıklamak için fırsat oluyor | | | | | |
| 35. Grup üyeleri ile çalıştığım zaman iş eşit olarak bölüştürülür | | | | | |
| 36. Herkes katılmadıkça ödevi tamamlayamayız | | | | | |
| 37. Diğer öğrencilerle çalıştığım zaman notum artar | | | | | |
| 38. Grup arkadaşlarıma en iyi olduğum alanda yardım ederim | | | | | |
| 39. Grup arkadaşlarım en iyi iş yapanın kim olduğunu görmek için yarışırlar | | | | | |
| 40. Grup üyeleri ile çalıştığım zaman proje daha ilginç gelir | | | | | |
| 41. Grupla çalıştığım zaman çalışma alışkanlıklarım gelişiyor | | | | | |
| 42. Yapılan işi öğrenmeleri için grup üyelerine yardım etmekten hoşlanırım | | | | | |
| 43. Bazı grup üyeleri yapacakları işi unuturlar | | | | | |
| 44. Grup üyelerimin iyi not alıp almadıklarını önemsemem | | | | | |
| 45. Grubumun işi zamanında yapması benim için önemlidir | | | | | |
| 46. Sevmediğim kişilerle birlikte çalışmaya mecbur bırakılıyorum | | | | | |
| 47. Diğer öğrencilerle çalışınca daha fazla şey öğreniyorum | | | | | |
| 48.Diğerleriyle çalışınca projeyi bitirmek daha az vakit alıyor | | | | | |
| 49. Grup üyelerine bir şeyler öğretirken aynı zamanda ben de öğreniyorum | | | | | |
| 50. Grup üyeleri yapılacak işi anlamadıklarında hayal kırıklığına uğruyorum | | | | | |
| 51. Grup ile çalıştığımda, hak ettiğim notu alırım | | | | | |
| 52. Eğer başarılı olacaksak, herkesin görüşlerine ihtiyaç duyarız | | | | | |
| 53. Grup üyeleri ile çalıştığımız zaman, farklı konuları konuşarak çok vakit harcıyoruz | | | | | |
| 54. Birlikte çalışacağım insanları kendim seçmeyi tercih ederim. | | | | | |
| 55. Cinsiyetiniz | Bayan [ ]<br>Bay [ ] | | | | |
| 56. Şu anki GPA | | | | | |
| 58. Geçen yılki ortalama GPA | | | | | |
| 59. Bu dönem beklediğiniz avaraj GPA dereceniz | | | | | |
| 60. Proje sırasında birlikte çalışmak üzere bir öğretmen ya da okul ile iletişim kurma imkanınız var mı? | | | | | |

Grup çalışmalarında ne gibi sorumluluklar ve roller üstlenmek isterdiniz ? (programlama, raporlama, iletişim, liderlik, görsel dizayn)

Flash Uygulamaları geliştirmede kendinizi nasıl puanlarsınız ?

| | **1** | **2** | **3** | **4** | **5** |
|---|---|---|---|---|---|
| ActionScript | | | | | |
| Görsel tasarım | | | | | |
| Animasyon | | | | | |

## APPENDIX B.

## INTERVIEW QUESTIONS FOR CURRENT and FORMER STUDENTS

### Introduction

Öncelikle bu görüşmeye katıldığın için teşekkür ederim. Geçen dönem beraber proje geliştirmiştik, bu sayde birçok deneyim edindiniz. Ben de bu konuda sizin öğretim tasarımı konuları, takım çalışması, çoklu ortam geliştirme aracı gibi deneyimlerinizi, yaşadığınız problemleri ve önerilerinizi hakkında konuşmak istiyorum. Önerileriniz dersin gelecek dönemlerde gelişmesini sağlayacaktır. Bu nedenle samimi cevaplarınız beni çok mutlu edecektir. Siz de sormak istediğiniz bir şey varsa sorabilirsiniz.

Görüşmeyi kaydedeceğim, eğer görüşmenin belli kısımlarını silmek isterseniz silebiliriz. Görüşme yaklaşık 1 saat sürecektir. Eğer herhangi bir sorunu yoksa başlayabilir miyim?

1. Daha önceki öğretim tasarımı derslerinizde ne tür projeler geliştirdiniz
    a. Grupla çalıştınız mı:
2. Size asistanlık sağlandı mı, sağlanan asistanlık için neler düşünüyorsunuz, çalışmanızı nasıl etkiledi? Projenizin gidişatını nasıl etkiledi?
3. Öğretim tasarımı derslerinde ne tür bilgi ve beceriler kazandığını düşünüyorsun?
    a. Öğretim tasarımı ile ilgili ne tür kazanımlarınız oldu, neler öğrendiniz.
4. Bu neler yaptığınızı hatırlıyor musun?
    a. Ne tür görevleriniz olmuştu?
        i. Neden bu rolü seçiyordunuz?
    b. Analiz kısmında neler yaptınız (hedef kitle bulma, raporlama, analiz türleri)
    c. Tasarım ve Geliştirme kısmında neler yaptınız? (storyboard)
    d. Değerlendirme kısmında neler öğrendiniz? (hedef kitleye erişim)
5. Dersteki tüm süreçleri düşünürsen (ders saatleri, lab saatleri, toplantılar, takım çalışması, material geliştirme süreci), bu derste öğretim tasarımının teorisinin ötesinde neler öğrendiniz?
6. Proje geliştirme sürecinde ne gibi sorumluluklar üstlendiniz?
    a. İş bölümünü bu şekilde yapmanızın bir nedeni var mıydı?
7. Proje geliştirme araçları ile ilgili herhangi bir sorun yaşadınız mı?
    a. Bu sorunlar nelerdi?
    b. Bunların üstesinden nasıl geldiniz?
    c. Geliştirme aracı ile ilgili herhangi bir sorun nedeniyle projenizde değişiklikler yapmak durumunda kaldınız mı?
        i. Bunlar ne tür değişikliklerdi?
8. Derste takım çalışması ile ilgili görüşleriniz nelerdir?

    a. Takım çalışmasının ne tür avantaj ve dezavantajlarını gördünüz?
9. Takım çalışması ile ilgili herhangi bir problem yaşadınız mı?
    a. Bunlar ne tür problemlerdi?
    b. Bu problemleri nasıl çözdünüz?
    c. Takım çalışmasında iyi bir işbirliği ve projenin kalitesinin sağlanabilmesi için ne tür kurallar koyulmasını önerirsiniz?
    d. Genel olarak takım üyelerinden beklentileriniz nelerdir?
10. Takım koçuyla haftalık yaptığınız görüşmelerin size ne tür avantaj ve dezavantajları oldu?
    a. Sizce bu görüşmeler gerekli mi?
        i. Neden?
11. Sizce ders süresince en yararını gördüğünüz aktiviteler nelerdi?
    a. Size ne tür faydalar sağladı?
12. Derste gerekli olmadığını düşündüğünüz aktiviteler nelerdi?
    a. Neden bu şekilde düşünüyorsunuz?
13. Eğer bu dersin öğretim elemanı siz olsaydınız, dersin daha iyi bir öğretim tasarımı deneyimi sağlaması için ne tür değişiklikler yapardınız?

Katılımınız için teşekkür ederim, herhangi bir sorunuz var mı?

## APPENDIX C.

## INTERVIEW QUESTIONS FOR GRADUATE STUDENTS

### Giriş

Öncelikle, bu görüşmeye katıldığınız için teşekkür ederiz. Daha önce sizinle 323 dersinde birlikteydik ve bu derslerde grup çalışması yaparak projeler geliştirmiştiniz. Ben de sizinle öğretim tasarımı, grup çalışması ve kullanılan araç ve yazılımlarla ilgili neler öğrendiğine dair deneyim, problem ya da önerilerinizi öğrenmek istiyorum. Önerileriniz, gelecek dönemlerde bu tür öğretim tasarımı derslerinin güncellenmesi ve geliştirilmesine ön ayak olacaktır. Bu nedenle sorularımızı samimi bir şekilde cevaplamanızı rica ediyorum. Tabii ki siz de ne zaman isterseniz bana soru sorabilirsiniz.

Tüm görüşmeyi kaydedeceğim izniniz olursa, eğer istemediğiniz kısımlar olursa onları silebiliriz, Görüşme yaklaşık 1 saat sürecektir, Eğer bir sorunuz yoksa başlayabiliriz.

### Görüşme Soruları

1. Ne zaman mezun oldunuz?
2. Şimdiye kadar neler yaptınız (mezun olmadan önce de yaptığınız işler varsa onlardan da bahsedebilirsiniz)
    a. Şu anda ne işle uğraşıyorsunuz,
3. Yaptığınız işi tanımlar mısınız, neler bekleniyor sizden?
4. Şimdiye kadar öğretim tasarımı ile ilgili derslerde ne tür materyaller geliştirdiniz? Dersler nasıl işleniyordu?
5. Size asistanlık sağlandı mı, sağlanan asistanlık için neler düşünüyorsunuz, çalışmanızı nasıl etkiledi? Projenizin gidişatını nasıl etkiledi?
6. Öğretim tasarımı derslerinde ne tür bilgi ve beceriler kazandığını düşünüyorsun?
    a. Öğretim tasarımı ile ilgili ne tür kazanımlarınız oldu, neler öğrendiniz.
7. 323 için düşünürsek, bu iki derste neler yaptınız hatırlıyor musun?
    a. Ne tür görevleriniz olmuştu?
        i. Neden bu rolü seçiyordunuz?
    b. Analiz kısmında neler yaptınız?
    c. Tasarım - Geliştirme kısmında neler yaptınız?
    d. Değerlendirme kısmında neler yaptınız?
    e. Tüm süreçte yaşadığınız problemler var mıydı?
        i. Kullanılan araçlar
            1. ne tür sorunlar olmuştu
            2. nasıl çözmüştünüz
        ii. Grup problemleri
            1. ne tür sorunlar olmuştu
            2. nasıl çözmüştünüz
            3. grupla çalışmanın avantajları nelerdi?

a. Dezavantajı var mıydı?
4. Sence iyi bir grup çalışması olabilmesi için neler gerekir.

8. Şu anda gerçek işinde grupla işler yapıyor musunuz
   i. Sizce derslerdekinden farkı nedir?
   ii. İyi bir ekip çalışması için gerekli olan nelerdir?
   iii. Grup üyelerinden beklentilerin nelerdir
      1. eskiden nasıldı
      2. şimdi nasıl
9. Gerçek işinizde projenin düzgün gidip gitmediğini kim kontrol ediyor
   1. derslerde sağlanan koçluk hakkında neler düşünüyorsun
      a. yararlı mı, gerekli mi
      b. sağlanan destek kişiden kişiye değişiyor mu?
      c. Sence projenin kalitesini nasıl etkiliyor
      d. etkili bir koçluk yapmak için neler yapılmalı sence
10. Sorunlar nedeniyle projede değişiklik yapmak durumunda kaldığınız olmuş muydu? Nasıl çözümler üretmiştiniz?
    i. Kendi çalışma stiliniz
    ii. Sizce iyi bir proje ortaya koyabilmek için gereken unsurlar nedir?
11. Sonuç olarak bu iki derste neler kazandığınızı düşünüyorsunuz?
    i. İşinize yansıyor mu burada öğrendikleriniz
    ii. İşinizin hangi kısımlarında en fazla yardım sağlıyor
12. Bu ders sürecinde en yararlı gördüğünüz husus nedir?
    i. Dersle ilgili gereksiz ya da eksik olduğunu düşündüğünüz hususlar nedir
13. Bu dersin öğretim elemanı sen olsaydın, nasıl bir ders tasarlardın öğrencilerin öğretim tasarımını daha iyi içselleştirebilmeleri için?

Katılımınız için teşekkürler, sizin bir sorunuz var mı?

## APPENDIX D.

## INTERVIEW QUESTIONS FOR FACILITATORS

### Giriş

Öncelikle, bu görüşmeye katıldığınız için teşekkür ederim. Uzun zamandır 323 derslerinde proje danışmanı olarak bulunuyorsunuz. Ben de sizinle öğretim tasarımı, grup çalışması ve kullanılan araç ve yazılımlarla ilgili neler öğrencilerin ne tür problemler yaşadıklarını, sizin ne tür problemlerle karşılaştığınızı ve bu konular ile ilgili önerilerinizi öğrenmek istiyorum. Önerileriniz, gelecek dönemlerde bu tür öğretim tasarımı derslerinin güncellenmesi ve geliştirilmesine ön ayak olacaktır. Bu nedenle sorularımızı samimi bir şekilde cevaplamanızı rica ediyorum. Tabii ki siz de ne zaman isterseniz bana soru sorabilirsiniz.

Tüm görüşmeyi kaydedeceğim izniniz olursa, eğer istemediğiniz kısımlar olursa onları silebiliriz, Görüşme yaklaşık 1 saat sürecektir, Eğer bir sorunuz yoksa başlayabiliriz.

1) Ne kadar süredir 323 derslerinde koçluk yapıyorsunuz
2) Her dönemde ortalama kaç grupla çalıştınız
3) Ders için başka rolleriniz var mıydı, nelerdi
4) Genel olarak grup çalışmalarındaki rolünüz nedir
    a. Danışman olarak rolleriniz
    b. Ders laboratuar asistanı olarak görevleriniz
    c. Notlayıcı olarak görevler
5) Grup çalışmaları üzerindeki etkinizi nasıl görüyorsunuz?
    a. Siz nasıl geri dönütler veriyorsunuz
    b. Geri dönütleriniz nasıl uygulanıyor
6) Grup çalışmalarında genellikle gördüğünüz problemler nelerdir
    a. Bu sorunları çözmede neler yapıyorsunuz
7) Projelerle ilgili genel problemler nelerdir?
    a. Proje problemlerini nasıl çözmeye çalışıyorsunuz gruplarda?
8) Sizce iyi bir grup çalışması olabilmesi için neler gerekiyor?
9) İyi bir proje ortaya çıkması için neler gerekiyor?
10) İyi bir koçluk için neler gerekir sizce?
11) Dersle ilgili genel sıkıntılar nelerdir?
12) Öğretim tasarımı derslerinde yaptığınız bu görevin size ne tür kazanımlar sağladığını düşünüyorsunuz?

## APPENDIX E.

## QUESTIONNAIRE of INSTRUCTIONAL DESIGN COURSE EXPERIENCE

İsim: .....

***1.*** Daha önce ne tür öğretim materyalleri tasarladınız?

---

***2.*** Bu öğretim materyallerini tasarlarken belirli bir öğretim tasarım sistemi kullandınız mı?

---

***3.*** Kullandığınız öğretim tasarım modelleri nelerdi?

---

***4.*** Öğretim tasarımı denildiğinde aklınıza gelen anahtar kelimeler nelerdir?

---

***5.*** Öğretim materyali tasarımı için bir öğretim tasarım modeli izlemek gerekir mi? Neden?

---

***6.*** Öğretim materyali geliştirirken grupla çalışmak avantaj mı yoksa dezavantaj mı? Hangisini tercih ederdiniz? Neden?

---

***7.*** Grup oluştururken neler dikkat edersiniz, grup üyelerini belirlerken kriterleriniz nelerdir?

---

***8.*** Grupla çalışırken ne tür roller almayı seversiniz? Neden?

---

***9.*** Proje tabanlı öğretim materyali geliştirme derslerinde neler öğrenmeyi umarsınız?

---

***10.*** Bölümde şu zamana kadar öğretim tasarımı adına ne tür beceriler kazandığınızı düşünüyorsunuz?

---

***11.*** Dersler dışında alanınızla ilgili olarak kendinizi geliştirmek adına neler yapıyorsunuz?

---

***12.*** Siz en çok hangi tür öğretim materyalleri geliştirmekten hoşlanıyorsunuz? Neden?

---

***13.*** Siz öğretmenlik hayatınızda öğrencilerinizi motive etmek için hangi tür öğretim materyallerini tercih edersiniz?

---

***14.*** Herhangi bir ders için öğretim materyali geliştirirken hangi unsurları göz önüne alırsınız?

---

***15.*** Sizce projelerde geliştirilen öğretim materyalinin kalitesinin arttırılması için hangi unsurlar önemlidir?

---

***16.*** Öğretim materyal tasarım derslerinde daha fazla deneyim kazanmak için derse ne gibi etkinlikler eklenebilir?

---

***17.*** Kullanılabilirlik denildiğinde aklınıza neler geliyor, hiç kullanılabilirlik testi uyguladınız mı?

---

Verilen ifadelere göre *lütfen* kendinizi puanlandırın*ız*...

| **Beceri** | **Puan** | | | | |
|---|---|---|---|---|---|
| | *1* | *2* | *3* | *4* | *5* |
| Başkaları ile iletişim becerisi | | | | | |
| Takım çalışmalarında işbirlikli çalışabilme | | | | | |
| Organizasyon becerisi | | | | | |
| Proje yönetimi | | | | | |
| Başka kültür ve çeşitli gruplarla etkileşim becerisi | | | | | |
| Öğretebilme becerisi | | | | | |
| Başkalarına danışmanlık yapabilme ve destek olma becerisi | | | | | |
| Bir araştırmayı yürütebilme ve raporlama becerisi | | | | | |
| Pedagoji Bilgisi | | | | | |
| Veritabanı kullanma becerisi | | | | | |
| Resim işleme araçlarının kullanımı | | | | | |
| Ses ve video düzenlemesi yapabilme | | | | | |
| Multimedya geliştirme programlarının kullanımı | | | | | |
| Web programlama ve script yazma | | | | | |
| Donanım bilgisi | | | | | |
| Öğretim tasarım süreçleri hakkındaki bilgi | | | | | |
| Teknolojinin derse entegre edilmesi | | | | | |
| Teknolojik kaynakların öğretim için etkili kullanımı | | | | | |
| Öğretim araçlarının kalitelerini değerlendirme becerisi | | | | | |
| Danışmanlık nezaretinde çalışabilme becerisi | | | | | |
| İçerik geliştirme | | | | | |
| Kullanılabilirlik ile ilgili beceriler | | | | | |
| Öğretim materyali geliştirebilme | | | | | |
| Storyboard geliştirme | | | | | |

## APPENDIX F.

## INSTRUCTIONAL DESIGN ACTIVITY

**Rolün**
AkaMedya yaklaşık 10 yıldır müşterilerinin beklentileri doğrultusunda eğitsel materyaller geliştiren bir şirkettir ve siz AkaMedya'da öğretim tasarımı danışmanı olarak yer almaktasınız. Şirket, Milli Eğitim Bakanlığı'nın talebi doğrultusunda ilköğretim ikinci kademedeki öğrenciler için ders sonrası kullanmalarını Fen Bilgisi ve Matematik konularında tekrar etmelerini sağlayacak web tabanlı etkileşimli eğitim projesi üzerinde çalışılmaktadır. Milli Eğitim Bakanlığı proje için gerekli gözlem ve planın yapılması, pilot çalışmaların yapılarak projenin geliştirilmesi ve uygulanması için AkaMedya Şirketine birkaç ilköğretim okulunu seçme şansı vermektedir.

**İlköğretim Okulları**
Türkiye'de İlköğretim okullarının bilgisayar donanımları hız ve kalite bakımından çeşitlilik göstermekle birlikte çoğunlukla yönetimin belirlediği çerçevede İnternet bağlantısı bulunmaktadır. Öte yandan Batı şehirlerindeki öğrencilerin büyük kısmının evinde de bilgisayar ve İnternet imkanı varken, Doğu şehirlerinde bu oran oldukça düşüktür. Öğrencilerin bilgisayar kullanma alışkanlıkları da farklılık göstermekte, erkek ve kız öğrencilerin beklentileri değişmektedir. Öğrencilerin sözel ve sayısal derslerdeki bilgi seviyeleri okullara göre değişmektedir. Öğretmenlerin yeni teknolojilere olan ilgileri de farklılık göstermektedir.

**Problem**
Çok farklı altyapı, öğrenci ve öğretmen özelilerine sahip olan okullar için de en uygununu pilot okul olarak seçmek ve eğitsel web sitesini geliştirilmesi için gereken adımları uygulamak. Tüm bunları yaparken şirketin ekonomik ve insan gücü kaynaklarını verimli kullanmak, ülkedeki tüm okullara hitap edebilecek yazılımı geliştirmek için MEB ile uyumlu şekilde çalışmak.

**Sizden beklenenler**
AkaMedya şirketi öncelikle etkileşimli eğitsel web tabanlı ortamın geliştirilmesine yönelik tüm dizayn adımlarını uygulayıp bir rapor hazırlamak, geliştirilmek üzere ilgili birime sunmak, ve projeyi geliştirildikten sonraki çalışmaları tamamlayarak projeyi zamanında Milli Eğitim Bakanlığına göndermek durumundadır. Sizden beklenen ise tüm proje aşamalarını planlayıp, süreçleri takip etmek, sonuçları değerlendirerek gereken dönütleri rapor halinde vermektir.

**Bu durumda;**

1. Pilot uygulamalar için nasıl bir okul ve sınıf seçersiniz?
2. Öğretim tasarımcısı olarak süreç boyunca ne gibi görevleriniz olacaktır?
3. Proje ekibinde ne tür görevler için personele ihtiyaç duyarsınız?
4. Projenin başından sonuna kadar geçen zamanda, hangi adımları izlersiniz? Temel aşamalarınız nelerdir? Öğretim Tasarım modelini çizerek gösteriniz.
5. Projenin planlanması aşamasında nasıl bir ön çalışma yürütürüsünüz?
6. Ne tür analizler yapar ve hangi soruları sorarsınız?
7. Hazırladığınız projede senaryo ne olur.
8. Hazırladığınız projede öğrenci motivasyonunu sağlamak için neler yaparsınız?
9. Tüm süreçte ne tür değerlendirmeler yaparsınız?

## APPENDIX G.

## LAB REFLECTION QUESTIONS

**1.** Is there adequate motivation in instruction? What kind of motivational strategies were used in the project? If you were how you would provide motivation in this project?

**2.** Is content satisfactory to give whole unit? What strategies were used to give content?

**3.** What about flow of the content, is it satisfactory?

**4.** What can you say about navigational issues? Are they easy for elementary students? What kind of problems are there as you see?

**5.** Are there any problems in visual design? What are they?

**6.** Could this instruction achieve objectives? How?

**7.** In what ways interactivity is provided? Are they adequate?

**8.** How does this multimedia project can be used in curriculum?

**9.** If you develop this project which comics' character would you use to motivate your target group? Why?

**10.** If you design this project what changes would you do? Why?

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| | |
|---|---|
| 2004 - Present | PhD Student, Department of Computer Education and Instructional Technology, Middle East Technical University (METU), Ankara |
| 2009 – 2010 | Visiting Scholar, Curriculum and Instruction, Iowa State University Host Professor Dr Ana Paula Correia |
| 2003 – 2004 | English Preparation School, Middle East Technical University (METU), Ankara |
| 1999 – 2003 | BS, Computer Education, Gazi University, Ankara |

### WORK EXPERIENCE

| | |
|---|---|
| 2004 - Present | Research Assistant, Department of Computer Education and Instructional Technology Middle East Technical University (METU), Ankara |
| Jan'09 – Dec'09 | Visiting Scholar, Curriculum and Instruction, Iowa State University, Host Professor Dr Ana Paula Correia |
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**FOREIGN LANGUAGES**

Advance English

**PUBLICATIONS**

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**Karakus, T.,** Adiyaman, Z., Askun, C. Baran, B. Bayir, G., Demirel, F. and others (2006). What People in Turkey Think About E-Learning? Their Awareness and Preferences, International Open and Distance Learning (IODL) Symposium Proceedings, pp. 585-598.

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Kursun, E., **Karakus, T**. (2005). Uzaktan Eğitimde Akıllı Sınıf Uygulamaları: ODTÜ Akıllı Sınıf Örneği, 5. Uluslararası Eğitim Teknolojileri Konferansı, Sakarya, Türkiye, 21-23 Eylül 2005.

Uzun, E., **Karakus, T**., Kursun, E., & Karaaslan H. (2007). Öğrenci Gözüyle Aşırma (İntihal): Neden Ve Çözüm Önerileri. Akademik Bilisim 2007 Konferansi, 31 Ocak-2 Şubat 2007, Kütahya, Türkiye.

Tüzün, H., Yılmaz, M., **Karakus, T.,** İnal, Y. ve Kızılkaya, G. (2006). Bilgisayar Oyunlarinin Öğrencilerin Öğrenme ve Motivasyonuna Olan Etkileri, Akademik Bilişim 2006 Konferansı, 9-11 Şubat 2006, Denizli, Türkiye.

**Seminars**

**Cagiltay, K. & Karakus, T. (2010).** Taşınabilir Göz İzleme Cihazı, Modelleme ve Simülasyon Araştırma ve Uygulama Merkezi 2010 Altyapı Tanıtım Seminerleri, ODTÜ - TSK MODSIMMER, December 10, 2010, Ankara: Turkey.

**Karakus, T.** (2010). Uçuş Simülatörlerinin Eğitmen Konsol Yazılımları için Kullanıcı Arayüzü Klavuzu Geliştirilmesi, Türkiye'de Uçuş Eğitim Simülatörü Sektörünün Mevcut Durumu ve Hedefleri Çalıştayı, Savunma Sanayii Müsteşarlığı, November 26, 2010, Ankara: Turkey.

Shah, K., Correia, A.P. & **Karakus, T.** (2009). *Alternative Technology Exploratorium: Efforts to bring main stream gaming into teacher education, Iowa State University Curriculum and Instruction, September 2009, Ames, Iowa, USA*

**Karakus, T.** , Inal, Y. & Cagiltay, K. (2008). Introduction of SimGE (Simulations and Games in Education) Research Group and Its Activities. Invited panel at the Second National Student Convention of Computer Education and Instructional Technology, May 2008, Bahcesehir University, Istanbul, Turkey

**Workshops**

Near East University, Faculty of Education, Nicosia, North Cyprus, December 17, 2010.

Cagiltay, K., Kursun, E. & Karakus, T. (2010). Workshop: **Using Computer Games in Education**, 4th International Computer & Instructional Technologies Symposium, Konya, Turkey, 24-26 September, 2010

Cagiltay, K., Karakus, T., Kursun, E. (2010). ENGAGE Game Based Learning. Full Day workshop to be delivered at Middle East Technical University, Faculty of Education, Ankara, Turkey, February 26, 2010

Correia, A.P., Baran, E., Desmiraslan, Y., **Karakus, T**., Shah, K. & Yusop, F. (2009). Web 2.0 Technologies for Virtual Collaboration: How to Design and Support Successful Learning Experiences? Half-day workshop to be delivered at the *Association for Educational Communications and Technology 2009 Convention*, Louisville, KY, October 27-31, 2009.

**HOBBIES**

Amigurumi (knitting toys), painting, writing blog