THE LIVED EXPERIENCE OF ELEMENTARY SCHOOL TEACHERS
IMPLEMENTING LEARNING OBJECT BASED INSTRUCTION: A
PHENOMENOLOGICAL STUDY

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ABSTRACT

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Access to technology and availability of it for today's classrooms provides teachers the ability to modify their teaching content by updating and making small changes in their lesson plans to facilitate learning, to motivate students, and to increase their achievement. This qualitative phenomenological study explored attitudes, perceptions, and lived experiences of nine elementary school teachers about learning objects and its implementation into their educational environment. The main purpose of this study was to investigate (a) teachers' perceptions, as instructional leaders of the school, (b) teacher definitions and applications of learning object based instruction, and (c) opportunities and problems of the implementation process. For this study, data was collected using (a) semi structured interviews, (b) field observation reports, and (c) photos and data were analyzed using Giorgi's (1997) method of descriptive phenomenology under four stages: data coding, developing themes, organizing codes and themes, and describing findings. Findings of the study showed that while almost all of the teachers have a positive attitude and impression towards learning object and learning object-based instruction, they indicate a few difficulties for teachers and students in implementation of learning objects, such as time, workload, and training. The results also indicated that most of the teachers did not have a clear understanding of the term "learning object" as it is stated in the literature. Teachers identified heavy curriculum, quality of learning objects, classroom physical environment, and lack of in-service training and technical support as obstacles and administrative support, peer support, and positive outlook as opportunities while the implementing the approach.

Keywords: Learning Objects, Learning Object Repositories, Teacher Education, Elementary-based Learning Object Repository (ELOR)

ÖZ

ÖĞRENME NESNELERİNE DAYALI BIR EĞİTİM MODELİ UYGULAYAN İLKÖĞRETİM ÖĞRETMENLERİNİN GERÇEK DENEYİMLERİ: FENOMONOLOJİK BİR ÇALIŞMA

Arslan, Kürşat
Doktora, Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü
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Günümüz okullarında teknolojiye erişim ve onun sınıflarda yaygın kullanımı, öğretmelerin ders planlarında yapacakları küçük değişiklikler ve güncellemelerle, öğrencilerin ihtiyaçları karşılamak, basari ve motivasyonlarını artırmak için, öğrenme içeriklerini kolayca düzenlemelerine imkân sağlamaktadır. Bu nitel fenomonolojik çalışma öğrenme nesneleri ve onun uygulanması konusunda dokuz ilköğretim öğretmeninin tutum, algı ve deneyimlerini araştırmıştır. Çalışmanın esas amaçları (a) okulların eğitici liderleri olarak öğretmenlerin öğrenme nesnelerine karşı algılarını, (b) , öğrenme nesnelerine dayalı bir eğitimde öğretmenlerin nesneleri ilişkin tanım ve uygulamalarını ve (c) bu süreçte karşılaşılan problem ve fırsatları araştırmaktır. Bu çalışma için veriler (a) yarı yapılandırılmış görüşmeler, (b) alan gözlem raporları ve (c) fotoğraflar kullanılarak toplanmıştır ve veriler dört aşama altında (verilerin kodlaması, temaların geliştirilmesi, temalar ve kodların oluşturulması ve bulguların açıklanması) Giorgi'nun (1997) tanımlayıcı fenomenoloji metodu kullanılarak analiz edilmiştir. Çalışmanın sonuçları göstermiştir ki öğretmenlerin neredeyse tamamı öğrenme nesneleri ve bu nesnelere dayalı eğitim konusunda olumlu bir tutuma sahip olmalarına rağmen, öğrenme nesnelerinin uygulanmasında kendileri ve öğrencileri acısından örneğin zaman, is yükü ve profesyonel eğitim gibi çeşitleri zorlukları ifade etmişlerdir. Bulgular ayrıca öğretmenlerin birçoğunun "öğrenme nesnesi" terimi hakkında literatürde yer aldığı gibi açık bir bilgiye sahip olmadıklarını göstermiştir. Öğretmenler ağır müfredatı, öğrenme nesnelerinin kalitesini, sınıfların fiziksel ortamını, teknik destek ve hizmet içi eğitimdeki eksiklikleri bu yaklaşımın uygulanmasında birer problem olarak görürken, okul yönetiminden ve is arkadaşlarından gelen destek ve algılanan fayda açısından ise birer fırsat olarak değerlendirmektedirler.

Anahtar kelimeler: Öğrenme nesnesi, Öğrenme nesnesi Ambarı, Öğretmen eğitimi, ilköğretime dayalı öğrenme nesnesi ambarı (ELOR)

To my family,
To Mom and Dad, my heroes
And to my wife, my best friend and love

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CHAPTER 1

INTRODUCTION

1.1 Introduction

"A learning object is any digital resource that can be reused to support learning" (Wiley, 2002, p.6).

Availability and accessibility of technology in today's classrooms help teachers to efficiently and effectively modify their lesson content by updating and making some small changes in their existing lesson plans and learning materials to meet the students' needs and to motivate them. To achieve this, a new instructional technology, called as digital learning object, has been introduced by Wayne Hodgins (Polsani, 2003) to be used or reused for teaching and learning. According to McGreal (2004) learning object concept is relatively new in educational area therefore there are many terms and definitions available in the literature to describe LOs.

Institute of Electrical and Electronics Engineers (IEEE) is the first institution to attempt to define a learning object as "any entity, digital or non-digital, which can be used, re-used or referenced during technology supported learning". Wiley (2000, p.6), on the other hand, indicated this definition as very broad one to be meaningful and defined it as "any digital resource that can be reused to support learning". This definition is used in the scope of this study to describe a learning object. Many different forms of the learning objects (LOs) are available on the internet such as a photo, video, lecture, multimedia presentation, simulation, game, website, or even an entire course. The granular structure of a learning object makes it possible to vary greatly according to educational aims. There are also some specifications and standards that allow users to gain some key advantages of learning object, such as interoperability and reusability by different applications and in different learning environments. Learning objects may be stored in the educational digital libraries, called as learning object repositories, and served over the internet to many individuals (potential users) by central systems for sharing, searching, locating , and reusing (Sherwood, 2003; Yacavelli, 2004).

Today, teachers use technology to reach different teaching and learning tools with different instructional techniques in order to form effective learning settings. In different formats, LOs can be used to motivate, to present, to demonstrate, to explain, and to illustrate to learning experiences and objectives. However, as stated by Robleyer (2006, p13), "technology itself provides only the raw materials for enhanced educational

strategies. Now we know that everything depends on how teachers plan for and use these powerful devices". Those digital learning objects may help teachers create more active and appropriate student-centered instructional environments, and encourage student-oriented individual and group learning; however teachers' decisions about "what, when, how, and if" they teach learning object, play a very important role to integrate these learning objects into their educational settings.

The current qualitative research study includes detailed exploration of elementary school teacher's perception and their lived experiences of learning objects to reveal their understanding, attitudes, and usage of learning object and learning object repositories they have used in their daily instruction. The prejudices of teachers about advantages and disadvantages of learning objects and how they may serve as barriers or enablers for learning may be revealed in detail by exploring teachers' experiences. Chapter 1 begins with a discussion of literature as related to learning objects, learning object repositories, statement of the problem, purpose, and significance and nature of this study. After that, research questions and their theoretical background follow. Definitions, assumptions, limitations, and delimitation then conclude Chapter 1.

1.2   Background of the Problem

Today, educational policy specialists, administrators, teachers or even students are trying to increase the use of technology in the classrooms (Compton & Harwood, 2003). The effect of technology on education has been analyzed in the literature extensively. For example, the results of a Kulik's (1994) large-scale meta-analysis and Sivin-Kachala's (1998) review of the research, involving more than 700 different studies, showed that technology affects the learning process positively in three different ways: achievement scores of students, teacher and student attitudes towards technology, and experiences of how teachers integrate technology into the curriculum (Baker, Gearhart, & Herman, 1994; Kozma, 2003; Kulik, 1994; Kulik & Kulik, 1991). According to the International Society for Technology in Education (ISTE), technology can be used as a tool to change outdated educational systems, improve student performance, and to develop skills for 21st century work, communications, learning, and life (ISTE, 2007). In addition, ISTE indicated that educational technology plays a very important role by developing teacher productivity, creativity, responsibility, and some skills such as communicating, collaborating, analyzing and solving problems. In this information age, teachers use constructivist based, learner-centered educational systems, such as meaningful learning (Jonessan, 2000), active learning (Nielsen, 1993), and collaborative learning (Andersan & Kanuka, 1997). Therefore, technology has the potential to change the teaching experiences by allowing teachers to use a variety of strategies and activities that are generally more student-centered, active or interactive, and relevant (Lim, 2003).

In this study, background of the problem related to use of the learning object in learning and teaching is based on two main hypothesis which are teachers do not use learning objects effectively and efficiently and design of learning object repository negatively affects teachers' attitudes towards learning object.

As a small part of the technology-supported learning environment, digital learning objects are generally defined as teaching and learning resources (MsGreal, 2004). These small units give users, teachers and students the chance of being used alone, assembled together, rearranged, and/or reassembled to minimize the potential negative effects of past experience of teachers (reusability, accessibility, ease of use) and to improve student learning (active, interactive, adaptive, multimedia, reducing cognitive load) (Heins & Himes, 2002). Wiley (2000) pointed out that learning objects, compared to other learning technologies are easily accessible, suitably priced, and easy to learn and use via the internet. On the other hand, although overall effect of the learning objects on instruction is uniformly positive, these resources have not used by classroom teachers in a more effective way in order to be integrated the resources into the educational area (Bradley & Boyle, 2004; Looser, 2007). There are different reasons in the literature why teachers haven't used the learning object frequently in their lessons. The first one is the perceptions of teacher towards learning object based instruction and social- cultural attitudes towards collaboration and sharing of learning objects (Littlejohn, 2005). Parrish (2004) indicated that teachers see these learning materials more difficult and less effective than using their own.

The second reason, stated by Koper (2003) in a study, is some practical difficulties teachers face while sourcing, adapting, collecting and sequencing the learning objects (Swaim & Swaim, 1999). McCormick et al. (2004) pointed out that learning object revision time has a negative effect on teachers' attitudes towards LOs because most of the teachers spent, on average, about one hour on revising a learning object. In addition, since there are a lot of online instructional resources available to educators for free, locating appropriate learning objects for a specific subject can be difficult and time consuming process for teachers (Hart & Albrecht, 2004; Alfano & Hendersen, 2006).

The third reason is the quality of learning objects. As stated by MacLeod (2005), in order to encourage teachers and learners to use the learning objects, high quality and properly metatagged learning objects can be a sufficient number and accessible online. The last one is the technical skills of teachers. Metros (2005, p.8) point out that most of the teachers do not have "…the pedagogical background, the technical skill, or the desire to sidetrack their scholarship and devote themselves to time-consuming instructional technology project development".

One of the ways to make learning objects accessible for teachers, students, or others is to develop digital libraries, Learning Objects Repositories (LORs) as described in the literature. The repositories have the potential to enhance the learning process at different levels. However, because of such issues as interface usability or the complexity of creating reusable and adaptable learning objects, they have not been used as effectively as possible by school teachers (Greer & Thomas, 2004). Usability difficulties associated with LORs include, for example, screen design, interactivity, content, and navigation (Najjar, Ternier, & Duval, 2004; Caris, 2004; Lovin, & Branch, 2003; Rowand, 2000; Roberston, 1999; Voorbij, 1999).
Rowand (2000) found that while almost 99 percent of a sample of school teachers had access in their schools to computers or the internet, most teachers used LORs or the internet to in a limited degree because of inconsistent and disorganized screen designs.

Another issue related to LORs is disorientation (Dillon, 2000). Defining structures for the storage of information becomes more complex as information increases. Thus, finding appropriate learning objects can be more difficult (Gustavsson et al. 2004). A study conducted by Fitzgrald et al. (2003) investigated educators' perspective about the usability of Gateway to Education Material (GEM) allowing users to quickly search for educational resources, such as lesson plan and curriculum units. Results indicated that many users, approximately 90%, were not successful in finding learning objects on their first attempt. In this study, novice teachers reported that the interface of site appeared confusing and complicated because of higher information density and redundant data. Similar results about the effect of the interface design on the performance of users or students have been reported by Ceaparu et al (2004).

In spite of these problematic issues, Porter et al. (2000) concluded that for creating effective and cost efficient learning objects, repositories are a very important and a missing element that makes content related resources widely accessible to institutions and teachers (Arms, 2000). Hansen (2006) conducted a study to evaluate LORs as

instructional resources and media distribution systems. The findings showed that most teachers were quite positive about the repository because of its effect on enhancing the quality of learning (Bradley & Boyle, 2005; Downes, 2000), saving preparation time for teachers (Downes, 2000; Murphy, 2003; Carmel & Cheney Mann, 2003; Hicks et al., 2004), enhancing student independent study (Acker et al. 2003; Oakes, 2002), being less expensive (Arms, 2000; Cassel et al., 2003), and increasing use of multimedia for learning (Hicks, Potter, Snider, & Holmes, 2004).

1.3   Statement of the Problem

Learning objects, stored in repositories, have drawn much attention from educators because these resources are easily accessible, relatively easy to use due to their limited size and focus, interactivity, graphical components, and adaptability (Kay, 2007). Looser (2009) indicated that the overall effect of learning objects on teachers and students is uniformly positive (Bradley & Boyle, 2004). However, these resources have often been used by classroom teachers without directions for more effective and efficient use or integration. Teachers also encounter some difficulties in their classes when attempting to source, adapt, aggregate and sequence learning objects (Koper, 2003). A second issue relates to usability problems of LOs and LORs, as discussed by Rowand (2000), Lingaard (1994), and Dillon (2000). Also, Powell (2007) pointed out that many factors affect teachers' technology usage. Backer (1994) defined several categories on teachers' technology usage, including school and classroom environment, resource availability and support, teachers' background and experiences, and teachers' perceptions of technology.

This extensive review of the literature about LOs and LORs indicates the critical importance of the teacher as the final authority about how, when, what, and if, to use learning objects for enhancing learning and the uses of reusable resources for teaching. In this phenomenological study, elementary teacher perceptions and lived experiences regarding learning object-based instruction, and the applicability of it to an elementary school in Duzce, was explored. Data generated from this study should help guide Turkish administrative leaders and others about the uses of various resources in their classrooms, and may provide insight regarding the support and/or motivation teachers need to incorporate learning objects into their curriculum by analyzing usage of learning objects, advantage and disadvantage of implementing learning object-based instruction into their educational environment, and the role of teachers as an educational leader in this process.

1.4   Purpose of the Study

The purpose of this qualitative phenomenological study is to more fully understand the perceptions and lived experiences of elementary education teachers through the implementation of learning object-based instruction. The aim of this research is to define themes related to teacher perception and lived experiences while conducting the instruction based on digital learning objects. The positive and negative sides of this process and explanations about how and why teachers may or may not use learning objects during the lessons are explored in light of emergent themes. Themes and related codes that arise from the interviews may provide insight for teachers or administrators into the process of learning object based instruction.. A phenomenological approach is

used to understand the meaning of a particular phenomenon, and it includes an examination of the experience in order to obtain a comprehensive description for a structural analysis that describes the essence of the experience (Van Kaam, 1969).

1.5   Significance of the Study

The study of learning objects is an element of the adaptive or individualized instruction for the more effective design of courses. This type of instruction is more accessible than traditional classroom activities, more appropriate for different types of learning style and levels, and useful for complementing teaching and learning (Hudak, 2007). According to Parrish (2004), to accomplish implementation of learning objects in an efficient and efficient way within the educational environment, the skill of teachers, the knowledge of instructor, and the ability of students are also key components. To examine these key components, the phenomenological study approach was the most effective to reveal perceived pros and cons of learning object based instruction based on teachers' perceptions and lived experiences.

Although there is a significant body of research literature on learning objects from different perspectives, such as the definitions and meanings of LO (Wiley, 2004), repositories (Najjar, Ternier, & Duval, 2004; Caris, 2004; Lovin, & Branch, 2003), design and development of LOs (MacDonald et al., 2004), metadata standards (Downes, 2004), evaluation (Kay & Knaack, 2007), and creation of LOs (Jessup Stephanie, 2007), little research has been done on teachers' personal understanding of learning object and their integration into the Turkish elementary school classrooms. In these classrooms, teachers act as both subject matter expert and instructional designer. Therefore, this study examined in details the skills, knowledge, and perceptions of the teachers who implement learning object-based instruction. The study focused on the teachers' own perspectives when they use learning objects, to better understand their successes and failures, and to provide views, themes and constructs, which may contribute to the literature of learning objects in education, may provide school administrators with valuable information regarding obstacles and enablers of this approach, may provide some valuable information for curriculum developers on how to design learning materials, and finally may help other elementary classroom teachers to plan more effective learning activities based on these digital learning elements.

1.6   Significance of the Study of the Learning Object Repository

For this study, a learning object repository was developed by researcher. In order to document the experiences and perceptions of teachers who implement learning object based instruction, an Elementary Based Learning Object Repository (ELOR) was designed to upload, download, and locate all LOs that teachers used during the training session of the study. The ELOR was designed with attention to interface usability issues, such as screen design, navigation, and principles of cognitive load theory (Arslan & Yildirim, 2011). Following recommendations by Rowand (2000) and Gustavsson et al. (2004), consistent and well organized screen design was used in the development of the ELOR. The design and development process of the ELOR was explained in more detail in the method chapter.

1.7   Research Questions and Interview Questions

In this type of qualitative study, the exploration of themes related to the phenomenon being studied is the main concern and the research questions help guide researchers in the collection and analysis of the data. Law (2004) indicates that determining the particular research questions in phenomenological studies is a highly complex process needed to gain clarity of the focus and purpose of the study. Lived experiences of teacher conducting learning object based instruction and their perceptions about learning objects was analyzed and described in light of the following research questions.

The central focus of this study is analysis and description of teachers' perceptions and their lived experiences of utilizing learning objects in their lesson activity. Such factors as internal, conscious, and cognitive/effective experiences (Moran & Embre, 2004) of participants are investigated. What teachers think and feel about their own experiences with a learning object and learning object repository is the main concern in this study. The study focuses on four aspects of experiences of teachers; (a) teachers' self perception as a learning object creator, (b) teacher application of learning object-based instruction, (c) teacher selection of learning object, and (d) teacher experiences of obstacles and opportunities in using learning objects.

These research questions were used to guide this phenomenological study:

Main Research Question:	How do teachers describe their lived experience regarding their usage of learning objects from a repository in an elementary school class?
Research Question 1:	How do teachers perceive their role in their class as a teacher who uses and develops learning objects?
Research Question 2:	How do teachers implement learning object-based instruction in their daily instruction?
Research Question 3:	How do teachers define learning objects and learning object based-instruction through an implementation process?
Research Question 4:	What are the obstacles and opportunities for learning object-based instruction that affect teacher performance and instruction implementation?

1.7.1   Research Question One

The rationale for the first research question is to provide the experiences of participants as an educational leader when conducting learning object-based instruction in the classrooms. Teachers have decided what resources and strategies are used and they would have some expectations about how students will learn by using relevant tools such as learning objects (Bratina, Hayes, & Blumsack, 2002; Akpinar & Simsek, 2007). Information about teacher roles and responsibilities, and the boundaries within which they work, may provide a valuable within which to interpret further issues that follow.

Table 1-1 Research Question One in Comparison to Interview Questions

Research Question	Interview Questions

How do teachers perceive their role in their class as a teacher who uses and develops learning objects?	1. Have you tried to create a learning object with the help of the computer?
	
	If yes,
	  a) Can you tell me something more about it?
	  b) Could you please give me examples of your thinking about this topic?
	  c) What it means to create learning object?
	  d) How does it differ from creating those learning by (with) hand?
	  e) Did you share them with your friends?
	
	If No,
	  a) Why?
	  b) What it means to create learning object?
	
	2. Did this process make any difference in your thinking after you have used learning objects?
	  • Potential benefit?
	  • Do you do it always, or only under some condition?
	
	3. Are you planning to use or create the learning objects related with your profession when needed?
	  If yes,
	  • Why?
	  • Which properties of learning objects you have used impress you?
	    i. *Reusability?*
	    ii. *Interactivity?*
	    iii. *Interoperability?*
	    iv. *Granularity?*
	
	  If no,
	  • Why?
	  • Do you think creating a learning object is difficult?
	  • Do you think you need so much time and effort to create a learning object?
	  • Do you think learning object did not meet your expectations? (time, effort, and quality)
	  • Dou you think the problem related with not using learning objects in your classrooms is because of the learning object or repository?

1.7.2   Research Question Two

The goal of the second research question is to understand all decision-making process (Wiley, 2004; Sharabi, 2009) that guides a teacher's implementation of learning object-based instruction. Nash (2005) identified tools and strategies, critical parts of learning object-based instruction. These are "learning objective, desired learner outcomes (performative and measurable), range of content and learner level, and instructional strategies" (p.225). This study explores some of those tools and strategies about teacher knowledge and understanding of this instruction approach and it may help address school leadership about teacher knowledge of learning object based instruction and its practical application in their classroom environment.

Table 1-2 Research Question Two in Comparison to Interview Questions

Research Question	Interview Questions
How do teachers implement learning object-based instruction in their daily instruction?	4. How you describe your 40 minutes lesson from start to finish? • *In aspect of learning materials you used* • *In aspect of classroom environment?* • *In aspect of activities?* • *In aspect of seating style?*

1.7.3   Research Question Three

The rationale behind the third research question includes an in-depth understanding of teachers of learning objects and using them in learning objects-based instruction. What a learning object mean to teachers is explored in terms of different processes, such as, searching, selecting, and implementing. According to Brusilovsky and Vassileva (2003), selection criteria of learning object for teachers, for example, depend on a set of teaching and learning rules according to cognitive style or learning preferences (Stash & De Bra, 2004). Despite the fact that most rules are based on the teachers' domain of expertise, the actual selection of learning objects in practice by teachers is not defined by well clarified and commonly accepted rules (Knolmayer 2003). Related themes and codes associated with teacher understanding of how to implement learning object-based instruction may help illuminate teacher preferences and practice.

Table 1-3 Research Question Three in Comparison to Interview Questions

Research Question	Interview Questions
How do teachers define learning objects and learning object based-instruction through an implementation process?	5. How can you define a learning object according to your experiences? 6. How can you define learning object repositories according to your experiences? • What are the positive and negative aspects of using a LOR?

1.7.4   Research Question Four

The rationale behind the fourth research question is to reveal potential problems and opportunities of caring out learning object based instruction. Clark and Rossett (2002) indicates that using learning object in educational area bring two advantages; reducing the cost and recycling of learning object. On the other hand, in the literature many disadvantages have been discussed by the researchers in terms of different categories, such as theoretical problems (definition, metadata standards), usability problems (locating and reusing) or design problems (quality, time, design, and development) (Ducket & Nelson, 2007; Perry, 2004). According to Wiley (2003) teachers are affected directly or indirectly by each of the problems when using these learning materials in their classrooms. Identifying potential benefits and troubles may help teachers develop a set of rules for effective learning object implementation by considering teachers' perceptions and lived experiences.

Table 1-4 Research Question Three in Comparison to Interview Questions

Research Question	Interview Questions

What are the obstacles and opportunities for learning object-based instruction that affect teacher performance and instruction implementation?	7. What are the results of using learning objects in your classroom when thinking this process in all of the aspects?
	• In aspect of classroom environment?
	  o Physical space
	  o Classroom culture
	• In aspect of lesson productivity?
	  o Content
	  o Material
	• In aspect of lesson planning?
	• In aspect of students' achievement?
	• In aspect of students' motivation?
	• In aspect of students' behavior toward technology?
	• In terms of school administrators' attitude?
	• Anything you want to add about what it make this process difficult or easy to use learning objects during a lesson or while planning a lesson?

1.8   Definitions of Terms

The following terms related with learning object-based instruction are used for this research study.

ATLAS.ti is a qualitative data analysis software enabling easily to code large amounts of text, graphic, audio and video data. This software was used to analyze data collected for this study.

Digital learning object is the one of terms used to describe learning object in the literature. There has been no general definition for the concept of a digital learning object, frequently used as a synonym for a content object (ADL, 2003), educational object (Ilich, 1971), learning object (Hodgins, 2004), or information object (Wiley, 1999; Wieseler, 1999). A digital learning object within the scope of this study is defined as "any digital resource that can be reused to support learning" (Wiley, 2000, p. 7).

A *Learning Objects Repository* (LOR) is the centralized system that organizes a large number of learning objects and facilitates access to them (Neven & Duval, 2002). Differences among LOs and their metadata properties may result in the design and construction of different respositories. However, most recent repositories have been developed with the same metadata standards or with common community needs. There are different types of LORs, such as relational database or a digital library LOs (Bannan-Ritland, Dabbagh & Murph, 2002). In this study, LOR refers to a digital library of LOs.

Learning strategies are the plans, method, or steps prepared by teachers to assist more effective learning (Zook, 2001)

Scaffolding is learner assistance from a more advanced knowledge source that builds on what learners already know to help them reach a higher level of learning (Roblyer, 2006, p. 43).
The *Elementary-based Learning Object Repository* (ELOR) Online is a cognitive-based user interface LOR created by this researcher for this study. The ELOR contains related texts, graphics, animations, and applications about elementary education.

Metadata is information about content, or, "data about data" (according to a typical definition), which makes possible the storage and retrieval of data from a database (Beck, 2003). Lrcan Dempsey et al., formally defined metadata as "… [a] data associated with objects that relieves their potential users of having full advance knowing of their existence or characteristics".

Metatags are hypertext markup language (HTML) tags that define different information such as copyright information, searchable keywords, subjects and formatting description of LOs (Beck, 2003).

Elementary Teachers are teachers in the Turkish educational system who teach any grade from first through fifth.

Traditional elementary classroom settings refer to the physical classroom environment, not an online school or an e-school, for students in grades one through five.

1.9   Assumptions

In this phenomenological study, some assumptions were made about the concept of personal feelings, perceptions, and lived experiences of elementary school teachers. According to the focus of this phenomenological study, four research questions were

asked of the participants so as to understand the meanings and causes of their experiences implementing learning object based instruction (Creswell, 2007; Van Manen, 2002). One assumption was that teachers who participated in the current study expressed their feelings, perceptions, and lived experiences honestly and forthrightly. The second assumption was that the participants in the study are teachers who represent a reasonable sample of elementary school teachers in Duzce and who teach students in similar schools, even those in different fields, such as classroom teacher, science and technology, and computer application. The third assumption was that subjects would enable the researcher to analyze or examine in detail their learning object based instruction. The final assumption concerns researcher's bias. In phenomenological research, the bracketing method (epoche) was used to eliminate, or at least minimize, researcher bias. The concept of bracketing is a fundamental principle of phenomenology, and it refers to the suspension of a researcher's presuppositions, suppositions, and bias about the phenomenon under study. Although a number of steps in the bracketing process were applied, to effectively eliminate researcher bias, even if some bias were to remain, it was assumed that bias was fully eliminated.

1.10 Scope

The scope of this qualitative, phenomenological study spanned the examination of feelings, perceptions, and lived experiences of elementary school teachers who implemented learning object based instruction for students in grades one through five in Turkey elementary schools. The study included nine participants from different schools within the same area, Duzce. The experience level of the teachers ranged from two to 16 years and their experience level with regard to learning object and repositories included at least two years. Four research questions were asked of teachers to determine their perceptions and lived experiences using learning object based instruction. For data collection, semi-structured interviews, observation reports, and photos were used, and the data were analyzed with an Atlas.ti tool to reveal codes, themes, and patterns.

1.11 Limitations

In this current study, three limitations are noted. First, number of the participants is small. However phenomenological studies aim to gather in-depth data on a phenomena and to explore subjective nature of an experience by the in-depth analysis of semi-structured interview, sample size is often at or below than 10 participants (Morse, 1994). For this study sample size is 9. A second limitation was potential impact of training on teachers' perceptions and lived experiences. However, in order to eliminate/minimize the effect of training on participants' perceptions and lived experiences, they were asked to define the meaning of training of learning object and repositories and their experiences with it (Morse, 1994). The last limitation concerns uncertainty in the specific interview process. Data saturation technique was used until little, new information was revealed about the phenomena as a result of data analysis (Morse, 1994).

1.12 Summary

In this chapter, an introduction and definition of a learning object and learning object based introduction was introduced and discussed. Learning object as a small piece of learning content was expanded to reveal related parts of this process for successful understanding and implementation and why teachers need to know the learning objects and to adopt the process. A discussion of the learning object in terms of theory and practice, statistical and research background information on using of learning objects, and enablers and obstacles elementary education teachers encounter during learning object based instruction were stated in the background and statement of the problem. The study's focus was discussed in the section of purpose of the study to clarify aim of the study in detail. The significance of the study emphasizing the need to explore elementary teachers' personal understanding was discussed in the different aspect of learning object and repositories --teachers' perspective, leadership role of the teacher, and learning object repository. The research questions were used for clarity of the main problems of the study and the rationale behind asking each of the questions. The second chapter includes an in-depth analysis of some aspects of learning object and learning object based instruction.

CHAPTER 2

LITERATURE REVIEW

The purpose of this qualitative phenomenological study is to explore perceptions and lived experiences of elementary education teachers conducting learner object based instruction in their classrooms. The problem is that although the overall effect of learning objects on teachers and students is positive (Looser, 2009; MsGreal, 2004; Bradley & Boyle, 2004; Heins & Himes, 2002), these resources do not be used effectively by teachers because of no efficient suggestions or information giving to find more effective way to integrate the resources into the educational environment (Looser, 2009).

In this chapter, the literature review for this objective and problem, the most relevant to the purpose of the study, is summarized. First of all, review begins an overview of learning objects (LOs) and learning objects repositories (LORs) along with examples, definitions, and usage in classrooms. The review then focuses on characteristics, advantages, and disadvantages of LOs and LORs in implementing learning objects approach. At the same time, technical aspects of learning objects, such as interoperability, metadata, search and retrieval process of using repositories, or components and attributes of LO, is defined. The review process includes relevant peer review journals, articles, books/chapters, dissertation and thesis, and other resources in the subject area. The process begins with some books by experts in the field of learning objects and learning object based instruction, while some of them are borrowed, others are purchased. Then, the articles is selected from ProQuest and EBSCOhost databases by using some key words, such as "learning object", "learning object and instruction", "leadership and learning object" and "repositories".

2.1 Learning Object

2.1.1 Emergence of Learning Object

Today, technology-based instruction is being used in order to contribute learning process and gain effective learning environment (Kulik, 1994; Sivin-Kachala, 1998), however, as stated by Robinson and Anderson (20003), its high initial costs is a very critical concern to individuals and organizations in the educational area. On the other hand, as stated by Downes (2000) the organizations and educational institutions are currently trying to develop some learning models including pictures, animations, multimedia presentation, website, or entire course or lessons, which is a very expensive and time consuming process. To reduce the costs and to save time, the concept of the learning objects, as a main focus of educational concern, is introduced from computer science filed and integrated into the field of education and training (Jacopson, 2002; Rennie & Robin, 2004). According to Wiley (2002) learning objects is a form of the computer based instruction connected with the Object-Oriented paradigm in computer programming. The basic principle of objects orientation is the creation of components (called as objects) that can be used or moved in different contexts. Similar to this, Wiley indicates that instructional designers can create small instructional components that may be reused again and again in different learning tasks. These components, according to its types, generally can be quite small when considered entire course.

2.1.2 Definition of Learning Object

Learning objects, as a new technological concept, may cause some confusion to the researchers in the literature. Polsani (2003), for example, pointed out that the term, learning object, is firstly used and popularized by Wayne Hodgins, and because the concept is relatively new, different organizations and research groups define learning objects from their point of view (McGreal, 2004). Wilhelm (2005) states that in the literature, many different terms are used by educators and trainers to define a learning object, such as, instructional object, educational object, knowledge object, intelligent object or data object. Together with these term confusion in the literature, there is also no a general definition accepted to the all research area (Shank, 2003).

Wiley (2002b, p.6) defines a learning object as "any digital resource that can be reused to support learning". According to Wiley (2000) the most significant characteristic of a learning object is the reusability in multiple contexts, which is "the fundamental idea behind learning objects: instructional designers can build small (relative to the size of an entire course) instructional components that can be reused a number of times in different learning contexts". (p.3)

This is one of the accepted definitions in the learning object terminology. As mentioned earlier, there are many different definitions of a learning object, some of them are similar in terms of their scope and some are quite different. Following are some of the definitions, widely accepted ones in the literature.

The IEEE Learning Technology Standard Committee (2001, 2002), for example, defines the learning objects as "any entity, digital or non-digital, which can be used, re-used or

referenced during technology supported learning" (p.5). On the other hand, some researchers claim that this definition is too broad to be meaningful (Shank, 2005; Merrill, 2002; Wiley, 2000) because according to this definition, non-digital materials, such as printed documents, photographs, tapes, diagrams, and maps, can be a learning object, however a learning object, as Wiley (2002)'s definition states, has a digital nature.

Downes (2003), as a parallel view to the IEEE, gives an example of tissue paper to indicate that anything and everything can be used as a resource to support learning so they can be seen or considered as a learning object. He added that there is no reason to prevent ourselves from defining rules on what is (or is not) learning object in educational area.

Cisco Systems, as another example of the group defining learning object, is one of the important leaders in the field of network technology area and learning objects. Cisco believe that the definition of learning object should be chosen based on some criteria, including needs, hierarchy, instructional approach, audience, and delivery media (Cisco, 2003) and define a learning object as a small, self-contained, and reusable entity that can be used independently or collectively into a larger content (Millar, 2004). Many of the researchers, who are accepted as a leader in their field, have different opinions to define a learning object therefore according to Shank, to use a "working definition" of learning object is very important because all existing learning objects can be used, located, and utilized in this way. He defined learning objects as a "digital piece of learning material that addresses a clearly identifiable topic or learning outcome and has the potential to be reused in different contexts" (cited in Weller et al., 2003).

In order to better understand and define different aspect regarding learning object, Table 2-1 provides a clear summary of the terms and their scope in defining a learning object (McGreeal, 2004). In the first row of the table, the scope of the definition is categorized under three titles; anything non-digital, anything digital, anything specific for a learning environment. Second row indicates the terms interchangeable used with learning object and the researcher who popularized the term in the literature. The third row induces a few examples of the learning objects in the category listed in the first row.

Table 2-1 Learning Object Terminology

Scope in the definition	Anything non-digital	Anything digital	Anything specific for a learning environment

Terms and Researcher	• Component
	  ○ Merril, 1983
	
	• Asset
	  ○ Wiley, 2000
	
	• Learning Resources
	  ○ Downes, 2003
		• Information Object
		  ○ Wiley, 1999
		
		• Content Object
		  ○ Slosser, 2001
		
		• Educational Object
		  ○ Friesen, 2001
		
		• Learning Object
		  ○ Jacobsen, 2001
			• Sharable Content Object (SCO)
			  ○ ADL, 2003
			
			• Reusable Learning Object (RLO)
			  ○ Cisco System, 2001

Example	• Text books, tissue paper, maps, …	• text file, image, video, audio, animation, slide, worksheet, diagram, html file, …	• Course materials, and any digital resources with metadata tags

Wiley (2003) definition is used as a definition of a learning object in the scope of the current phenomenological study; "A learning Object is any digital resource that can be reused to support learning".

2.1.3 Characteristics of Learning Object
As learning object has become popular in educational area, individuals and organizations have attempted to define the characteristics of Learning Objects (Robinson & Anderson, 2002). In order to distinguish between learning objects types, they can be classified according to certain characteristics (Wiley, 2000). In the literature, many characteristics of learning objects are available, however, accessibility, interoperability, reusability, durability, and granularity are five key attributes that is commonly accepted by researchers in the literature (Smith, 2004; Wiley, 2002).

Accessibility is an important characteristic of a learning object because instructional components are often accessed from one remote location and delivered many other

locations (McGreal & Roberts, 2003). Properly tagged a learning object and metadata standards support accessibility of the learning material.

Interoperability is another component of this learning object approach. According to McGreal & Roberts (2003), instructional components can be used in a one location with one set of tools or platform and similar to this; same components can be used in a different location with different set of tools and platforms. Therefore, while creating learning object, to use an acceptable modal is very important factor. Metadata and learning object standards provide an interoperability of learning objects.

Reusability is the most important feature of learning object because of learning object approach that is generally based on the reusability issues. Reusability is defined as a process of using a material in multiple contexts (McGreal & Roberts, 2003). According to Longmire (2000, p.1), "If material is designed to be used in multiple contexts, it can be reused much more easily than material that has to be rewritten for each new context". Similar to this, Parrish indicated that if learning objects are reusable, that is, one material used in one courses or in one place can be used in different course or in different place, they may provide the possibility of updating or modifying existing materials. At this point Tompsett stated that creating new materials as reusable learning object allows comparison with other models of development but does not demonstrate reuse (cited Boyle et al., 2003; Lam et al., 2004). To overcome this issue, repositories of reusable learning objects must be support re-configurability (Tompsett, 2005) so it can be possible to see a reusable learning object integrated into a substantial part of a course and used many different instructional environments again and again.

Durability operates instructional components when base technology changes, without redesign or re-coding (McGreal & Roberts, 2003). Both educators and learners are well aware of the acceleration of technology changes and create a learning object that allow easy updates and re-publication would make extend the durability of the learning object (Learning Object Authoring Zone Networks (LOAZ), 2004)

Granularity, as the last attribute, refers to how rigorously we choose to break down and store our learning objects (Learning Object Authoring Zone Networks (LOAZ), 2004). A course based on the learning objects (Wilhelm, 2005) or the unit of a learning object can consist of a program, a course, a module, a lesson, a segment, or a raw object. Generally a finer level of granularity will promote reusability, by allowing for use in multiple contexts. Of course, a greater number of smaller objects requires more cataloguing and therefore increases the costs associated with manageability.

2.2   Advantages of Learning Objects in Instruction

Today, many learning object repositories are available over the internet for the potential users. These resources is making LOs accessible for the all teachers and learning age groups in different areas; including K-12, higher education, and continuing education. According to Clark and Rossett (2002), as discussed in detail in characteristics of learning object section, there are three main reasons to have these learning materials in educational

environment—Reduce (financial advantage), Repurpose (instructional advantage), and Recycle (financial advantage).

Reduce refers to developing learning materials as LOs in order to separate them into manageable contents and sizes. Clark and Rossett (2002) indicate that learning object approach can be successfully applied when these resources are recycled for new uses. With the reducing and recycling of LOs, the category of financial advantages of LOs can be explained. In this category, time saving, cost affectivity, and increasing faculty productivity are the benefits of LOs in implementing the resources into the educational content (Sallas & Ellis, 2006; Mason et al., 2005).

Repurpose is to be used LOs for different purposes in different contexts. With this term, the category of instructional advantages of LOs can be listed as just-in-time learning (Oakes, 2002; Mason et al., 2005), personalized education (Acker et al., 2003; Oakes, 2002; Seimens, 2003), higher quality educational materials (Bradley & Boyle, 2005; Downes, 2000), and timeliness and diversity in educational content (Christiansen & Anderson, 2004). The relationship between characteristics of LOs and the advantages related to it is illustrated below in Figure 2-1.

Reduce & Recycle

Financial Advantages

• Time Saving
• Cost Affectivity
• Increasing faculty productivity

Repurpose

Instructional Advantages

• Just-in-time learning
• Personalized education
• Higher quality educational materials
• Timeliness of content
• Diversity in content
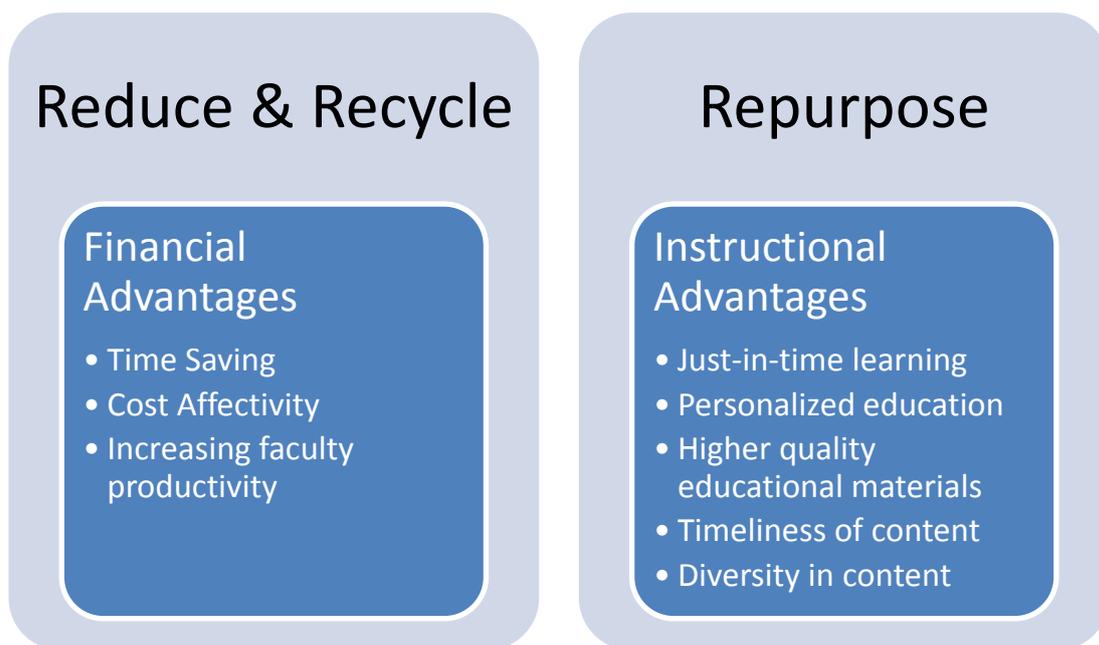
Figure 2-1 Advantages of LOs in Instruction

2.3   Disadvantages of Learning Objects in Instruction

As shown in Figure 2, there are a few disadvantages to LOs in using these learning materials in education. The disadvantages can be analyzed under three main categories -- theoretical challenges (definition and metadata standards) (Friesen, 2003), usability challenges (locating and reusing) (Rowand, 2000; Lingaard, 1994; Dillon, 2000), design challenges (quality, time, design and development) (Ducket & Nelson, 2007; Perry,

2004). Wiley (2003) indicates that teachers are directly affected by each of these disadvantages when using LOs and LORs (Parrish, 2004).
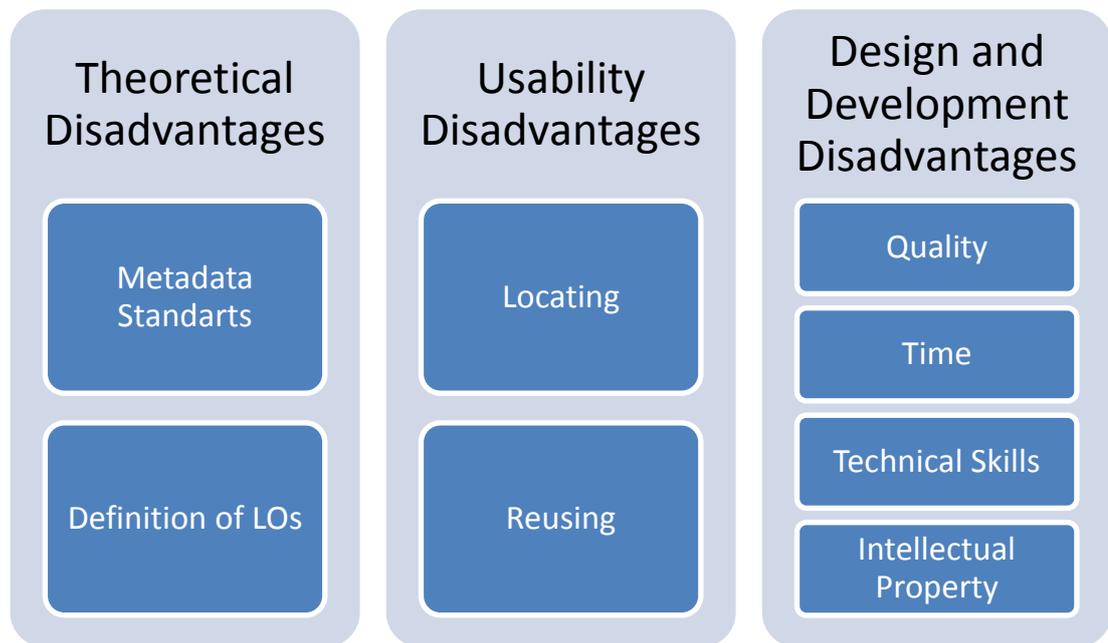
Figure 2-2 Disadvantages of LOs in Instruction

2.3.1   Design and Development Disadvantages
Because the challenges encountered in designing and developing a learning object are much more than the other disadvantages of LO and the critical part of the process of learning object based instruction, teachers generally prefers to use existing learning objects instead of creating a new learning material (Arslan & Yildirim, 2011). And also, design and development of a LO means that teachers act as a developer role in addition to being a content professional. Quality and time are other two important elements for teachers in designing and developing a learning object.

2.3.1.1   Quality
One of the challenges in designing and developing a LO is to create high quality instructional materials. Teachers may not be motivated to implement LOs into their lessons if a LO is not created in adequate quality. MacLeod (2005, p.6) points out that "there must be a sufficient number of high-quality, properly metatagged learning objects easily accessible online in order to encourage teachers and learners to return again and again to these repositories". On the other hand, even if teachers have self-motivated to create high quality learning materials for their lessons or online assessments, they are faced a few challenges related with time and talents (technical skills) (Levine & Sun, 2002; Jones & Jhonson-Yale, 2005). The Wisconsin Online Resource Center Interactive Learning Objects (Wisc-Online, 2005) has published a set of quality criteria in creating a LO for instructional reasons. The general quality of LO standards are presented in Table 2-2 below.

Table 2-2 Quality Learning Object Standards (Wisc-Online, 2005, p.11)

Standards
• Contains a clear and relevant purpose
• Reflects a specified learning preference including visual, auditory, or kinesthetic
• Supports competency at the appropriate level
• Helps learners understand the concept being presented
• Is to be applied to courses in different subject areas
• Is able to be applied to different programs of study
• Can be grouped into larger collections of content including traditional course structures
• Requires interaction on the part of the learner with the learning materials
• Is independent of textbook chapters and other external sources
• Contains all information and materials needed by learners to complete the activity
• Is easy to use and modify
• Applies appropriate principles of good practice
• Applies the appropriate learning principles

With the standardization in developing a learning object, today, a lot of learning object repositories have used a peer review process to make sure that a LO is enough in quality when uploaded it in a LOR (Arslan & Yildirim, 2011; Hanley,& Zweier, 2003). Arslan and Yildirim, for example, implemented a learning object selection process into ELOR (Elementary Based Learning Object Repository), as listed in Table 2-3, to ensure a high quality LO. Although the quality standards and the LO selection list as a peer review process has been applied by developer of LOs and LORs, Powell (2007) indicates that for teachers the quality of LO is still a "hot" topic which should have been worked on.

Table 2-3 Learning Object Selection Criteria list in ELOR (Arslan & Yildirim, 2011)

Criteria List
• Is the object appropriate for the elementary level
• Is the quality of the objects in terms of language and image high (i.e., there are no language errors, and the interface of the objects is easy to use and is readable)
• Does the object fit the description in the metadata section in ELOR
• Does the object require rarely used applications to work
• Is the size of the object within acceptable limits (i.e., less than or equal to 5 megabytes)
• Does the object work independently in different platforms

2.3.1.2   Time

Teachers prefer to use LO because of the its manageable structure (the ability of being adaptive, generative, and scalable) so that they may separate a LO into constituent parts and then place them together in a different content in order to get the most appropriate LO for their lesson plan. This can be a time consuming process. Because teachers have

some limits in terms of time (Swaim & Swaim, 1999), most of the teachers thought that instead of using LOs, using prepackaged books, non-digital learning materials or some electronic materials from the lesson book publisher are much more easer and time-saving for them (Caris, 2004; McCormick et al., 2004).

Another issue related with the time is the revision period. In a study conducted by McCormick et al. (2004), revision times have a negative effect on teachers' attitudes toward LOs. The study indicated that more than 30% of the teachers spent time over the 30 minutes when revising a learning object, therefore they thought that using a LO is a waste of time.

2.3.1.3   Technical Skills

When designing and developing a LO, the second role of the teacher appear –creator, developer. Therefore, teachers need to know their technical skills in software use and in development of multimedia content. In this process, they should be very comfortable with using a number of software technologies including web-page design and development, graphic design, and use of the templates for metadata and SCROM standards. Those standardization technologies are used to create a common platform to the repositories for improving usage of LOs in terms of reusability, accessibility, interoperability, and granularity (McGreal & Roberts, 2003; Longmire, 2000; Wilhelm, 2005). On the other hand, Metros (2005) point out that most of the teachers do not have "…the pedagogical background, the technical skill, or the desire to sidetrack their scholarship and devote themselves to time-consuming instructional technology project development" (p.8).

2.3.1.4   Intellectual Property

Another issue regarding developing and using learning objects in classroom environment is to protect the intellectual property rights (IPRs). Sharing of the instructional content is not a norm (Parrish, 2004). Metros et al. (2004) point out that educational institutions are not willing to upload LOs to a repository freely accessible over the internet, instead they prefer to keep those learning and teaching materials for only their needs. In addition, they thought that in repositories there are not enough good quality learning objects to encourage teachers to visit and to use them. One of the reasons teachers do not develop and share a LO is the lack of reward system that support teachers who develop quality learning objects for sharing those materials with protecting their intellectual property in the system (Metros, 2005). According to Donohue and Howe-Stegler (2005), teachers, as a designer and developer of a LO, want to know whether they will preserve the control of their intellectual property over the materials they developed, "if they make them available online and if they get another appointment, can they take their work with them" (p.20), therefore until intellectual property issues are resolved, teachers do not get additional financial resources to create high quality learning objects to share with other potential users and to provide LOs to free educational repositories (Wiley, 2004).

2.3.2   *Theoretical Disadvantages*

The theoretical challenges in the use of LOs in instruction based on the "working" definition of learning object and "right" the metadata standards of a learning object (Polsani, 2003; McGreal, 2004). The concept of learning object is relatively new in the

educational area since organizations and research groups use different definitions and metadata standards according to their point of views (Polsani, 2004).

2.3.2.1   Definition of LO

The concepts of the learning object in the literature is relatively new since organizations and research groups in the field of education use different definitions according to their point of view. The IEEE (2002), for example, defines LO as "any entity, digital or non-digital, which can be used, re-used or referenced during technology supported learning". On the other hand, Sosteric and Hesemeier (2002) indicates that LO is "a digital file (image, movie, etc.) intended to be used for pedagogical purposes, which includes, either internally or via association, suggestions on the appropriate context within which to utilize the object". The difference of being digital or non-digital in the definition of LO is only one of disagreements taking place in the literature. Wiley (2002) indicates an widely accepted definition in all areas is essential for the reusability because based on the acceptable definition of LO, the other standards of a learning material, such as metadata, copyright or design and development, can be developed and improved.

2.3.2.2   Metadata Standards

In the literature, there is still an ongoing argument on the metadata standards about how much information is needed for describing a learning object (McGreal & Roberts, 2003; Wiley, 2003). Hatala et al. (2002) point out that when entering data about a learning object, using much more information is important for the exact description of the learning object. On the other hand, time can be a barrier if much more tags (data about data) are used in a metadata schema because of the requirement of filling out all the fields in the storing the LOs in the database. Moreover, Peig et al. (2001) indicates that in the future new metadata schemes in the field of education can be generated so creator of the applications should also be aware of these emerging schemes. Another issue related to metadata is the number of the metadata schemas in educational area and it is still growing because every researcher or company is developing a different set based on their needs and goals.

2.3.3   Usability Disadvantages

To search reusable learning objects, teachers generally prefer to use well known learning object repositories, such as Multimedia Educational Resources for Learning and Online Teaching (MERLOT, 1997), the Gateway to Educational Materials (GEM, 1997) or discipline based repositories or forums, such as iLumina (Natinal Science Foundation), Fenci (Turkish Science and Mathematics Education) (Arslan, Yildirim, 2011). In the literature, there are two different definitions of LORs in terms of managing learning objects. One of them is repositories that are "…the systems created to house and manage digital resources. They exist primarily facilitate discovery of existing resources, and to enable their sharing and reuse" (Alfano and Hendersen, 2006, p.17). The other one, however, is the referatories that are the system including only metadata information of learning objects which are stored and managed at the different sites on the internet (Alfano and Hendersen, 2006). Because of the huge online instructional resources available to educators for free on internet (Hart & Albrecht, 2004), locating and reusing is staying as two important issues under usability disadvantages of LOs in instruction.

2.3.3.1 Locating

According to Alfano and Hendersen (2006), locating appropriate learning object for a specific subject is time consuming process for educators. Insufficient metadata tagging, user interface design issues, such as screen design, navigation, and the small number of quality learning objects in some disciplines are the main reasons for the time consuming problem in using LOs (Stelmaszewska & Blandford, 2002; Alfano & Hendersen, 2006; Rowand, 2000; Gustavsson et al. 2004).

2.3.3.2 Reusing

The other challenge after locating suitable learning object is to download and reuse the material. Today, there are still a lot of learning objects created before SCROM or other commonly used standards and do not have metadata tags so interoperability (McGreal & Roberts, 2003) between different resources can be a very challenging issue in reusability of LOs in a different location with different set of tools or platforms. Other challenge in reusing LOs is absence of the any existing copyright that covers the learning materials (Bornfreund, 2008;).

2.4 Learning Object Repository

Learning Object Repository (LOR) is a digital environment including learning objects, which is used to be searched, located, reused, and shared learning objects in order to make these learning components accessible for the teachers, students, and other potential users (Sherwood, 2003). The main purpose of the LORs is to create an environment in which users can share their LOs in order to be delivered over the internet and accessed by many users. Boskic (2003) indicates that this environment is based on a database technology for storing learning objects, however also it is an architecture to encourage different users groups (e.g., teachers, learners, instructional designers) to discover, exchange, and reuse of those resources.

In general, all LOR stores both learning object and the metadata tags of that object, however there are two ways of storing a learning object in a web portal over the internet. One of them is, as the most commonly method, to store physically the object file in the server with the appropriate metadata tags –repository. The second way is to store only metadata tags and the links of the learning object hosted and managed any other webpage in the Web –referitory (Alfano and Hendersen, 2006). On the other hand, today popular search engines, such as Google, Yahoo, or Yandex, can be seen as an alternative way in cataloguing of any type of web resources, with this approach the entire internet may act as a repository providing "on the fly" searches and locating of LO.

There are many initiatives for creating certain standards for the learning object repository, however five of them are very popular in the field of education; Shareable Content Object Reference Model (SCROM), Multimedia Educational Resources for Learning and Online Teaching (MERLOT), Campus Alberta Repository of Educational Object (CAREO) and HEC, Alliance of Remote Instructional Authoring and Distribution Networks for Europe (ARIADNE), CISCO and WebCT. Among those initiatives, SCROM will be analyzed in detail in the next section.

One of the many benefits of a LOR is to prepare teachers (or users) to better understand the contexts and to implement these learning resources into their teaching strategies in order to meet their students with current educational norms. Another one is to make these educational contents accessible for the potential users, such as intuitions, teachers, or students (Arms, 2000). According to Carmel and Cheney (2003), a learning object repository may also help teachers to improve their curriculum with existing learning objects, especially in elementary level.

2.4.1   Metadata

The most important element of a LOR is metatags. These "little data" provides all necessary descriptive information about a learning object to be searched in a learning object repository and to be reused more easily. The main aim of developing these standards is to increase finding, managing, using, reusing, and sharing of the learning object, however as a recent attempt, the standards has been also wanted to use a communication tool in different repositories over the web (Leslie et. al, 2004). According to Lrcan Dempsey et al. (p.x), a formal definition of metadata is "…data associated with the object that relieves their potential users of having full advance knowledge of their existence and characteristics". Metadata can be seen as barcode number on the food packages whose purpose is to describe a resource or object characteristics and its objective. This barcode includes structural, descriptive, contextual, and administrative data of a digital document by using specified keywords for each pre-defined element (White, 2005). The digital document can be anything digital to make it available for the potential users, such as a document, a video or audio, multimedia content, or power point presentations if it is physically available on the Web.

There are many metadata standards and schemas, however two of them are popularly used in educational industry to facilitate locating, referencing, searching, and accessing, and updating of learning elements, Dublin Core Metadata Initiative (DCMI) and Learning Object Metadata (LOM) Standard. DCMI is an open organization "dedicated to promoting the widespread adoption of interoperable metadata standards and developing specialized metadata vocabularies for describing resources that enable more intelligent information discovery systems" (DCMI, 2012). The Dublin Core element set's last version includes 17 elements. A brief description of the 17 elements and their definitions are provided in Table 2-4.

Table 2-4 Dublin Core Metadata Element Set (DCMI, 2013, p.1)

ID	Element Name	Definition
1	Title	A name given to resource
2	Creator	An entity primarily responsible for making the content of the resource
3	Subject	The topic of the content of the resource
4	Description	An account of the content of the resource
5	Publisher	An entity responsible for making the resource available
6	Contributor	An entity responsible for making contributions to the content of the resource
7	Publisher	An entity responsible for making the resource

Table continued

ID	Element Name	Definition
		available
8	Contributor	An entity responsible for making contributions to the content of the resource
9	Date	A date associated with an event in the life cycle of the resource
10	Type	The nature or genre of the content of the resource.
11	Format	The physical or digital manifestation of the resource
12	Identifier	An unambiguous reference to the resource within a given context.
13	Source	A Reference to a resource from which the present resource is derived.
14	Language	A language of the intellectual content of the resource.
15	Relation	A reference to a related resource.
16	Coverage	The extent or scope of the content of the resource.
17	Rights	Information about rights held in and over the resource.

DCMI standards, however, are not specifically developed for educational purposes even if recently working on standardization of Educational Level elements. The IEEE Learning Technologies Standards Committee (IEEE LTSC) provided a new Learning Object Metadata (LOM) specification as metadata standard aimed for defining educational content and specifically learning objects. This new data modal is based on the XML technology and defines a "hierarchical base schema for learning objects". In this modal, there are nine categories and more than 70 metadata elements to describe a learning object. Nine categories and description are presented in the following table (Table 2-5).

Table 2-5 Nine Categories of LOM (LTSC, 2002, pp.10-42)

Category Name	Definition
General	To describe the learning object as a whole; Includes 10 elements
Life cycle	To describe the history and current state of the learning object; Includes 6 elements
Meta-metadata	To describe the information about the metadata record of learning object; Includes 9 elements
Technical	To describe the technical requirements and characteristics; Includes 12 elements
Educational	To describe the instructional and pedagogical characteristics; Includes 11 elements
Rights	To Describe the intellectual property rights and conditions of use; Includes 3 elements
Relation	To describe the relationship between the learning object and other resources (learning objects); Includes 6 elements

Table continued

Category Name	Definition
Annotation	To describe the comments and related information about the learning object; Includes 6 elements
Classification	To describe the classification system to which the learning object belongs; Includes 8 elements

2.4.2   SCROM

Sharable Content Object Reference Modal (SCROM), as one of the popular open standards for the structure of the learning object, Version 1.2 indicates that "the department of Defense and the White House Office of Science and Technology Police launched the Advanced Distributed Learning initiative in November 1997. The purpose of the ADL initiative is to ensure access to high-quality education training and decision aiding "mentoring" materials that can be tailored to individual learner's needs and made available whenever and wherever they are required" (ADL, 2001, p.6). These standards is commonly used to develop a modal for the Learning Management System (LMS) and the learning objects created under the standards can be accessed and, on demand, delivered to the learners anytime and anywhere under the control of the LMSs.

2.4.3   Use of Learning Object Repositories in Elementary Level

Duncan (2002) defined elementary educators' usage of learning object repository under five categories in order to elevate their teaching and learning experiences: locate, browse, preview, borrow, and publish.

- Locate: locating refers to searching and browsing of LO. This is the most used method to reach a learning object in a LOR. Using keywords or text of elements itself are two ways of searching. In recently, images also can be used as a searching technique in some repositories. As it is mentioned in the section of metadata, if a learning object is properly tagged with keywords and metadata, it enables users to find it easily. (Duncan, 2002; Cebeci, 2003)

- Browse: browsing represents using a few strategies to explore through categories and to see the content of each category. Browse strategy can be helpful for the users if a repository includes more than 7,000 learning objects. Dewey Decimal Classification System or the Library of Congress are commonly used classification categories in grouping learning objects, however subject specific categories may also be used in some subjects. (Duncan, 2002)

- Preview: previewing refers to verifying that whether or not the learning object found in the repository serves its defined purpose taking place in the metadata. Some repositories give users to make comment on a learning object so it can be used as an alternative approach to preview a learning object from previous users' comments.(Duncan, 2002)

- Borrow: borrowing represents the option of downloading the learning object after previewing it. (Duncan, 2002; Cebeci, 2003)

- And publish: publish indicates uploading a learning object into the repository. Many learning object repositories have an option for registered users to

contribute learning materials to the repository. This is the most common way to increase number of learning objects in a repository after administrative review. On the other, the rights and permissions over the learning object uploaded to the repository is one of the ongoing problematic issues on the usage of learning objects (Neven & Duval, 2002; Duncan, 2002; Cebeci, 2003).

2.4.4   *Advantages of Learning Objects Repositories*

Many learning object repositories are available over the internet and accessible to teachers, students, and potential users. Those repositories can be grouped under eight categories in terms of types of LORs: proprietary, open, commercial, non-commercial, peer reviewed, non- peer reviewed, free content, and non-free content. The list of most commonly known or referenced repositories in the literature can be found in Appendix E. MERLOT, CAREO, and ARIADNE are the repository and referitories that are well known in the area of learning object and learning object repository throughout the worldwide. For nationwide, AtaNesA is the first repository including more than 9000 learning objects in different format, such as, documents, presentations, flash animation, videos and different subjects, such as, chemistry, physics, biology, mathematics, instructional technologies (ATANESA, 2012).

Advantages of the free repositories generally based on the number of the learning objects stored in the repository and being free and open to all potential users. MERLOT, for example, is free and open resource to everyone and provides a huge collection of references of more than 39.000 peer reviewed learning materials. Another advantage of such kinds of the repositories is to provide users to make a comment and get feedback on the learning objects from the users. Recognition and credits for the learning object users uploaded to the repository is another advantage increasing usage of learning objects and repositories. According to Neven and Duval (2002), peer reviewing is one of very useful properties of the repositories since it provides an option to evaluate the quality of a learning material even if it is a time consuming process and it requires some kinds of management skills.

For non-free repositories, in addition to the advantages for the free repositories listed above, use of intellectual property right (IPR) is the most important advantage for the users. On the other hand, Parrish (2004) indicates that despite of intellectual property is very important for the users gaining payment for the learning objects and valuable for e-learning community, the prices for the learning materials are still at a high cost for the students and organization. Another advantage for the non-free resources is to find the learning object that is specifically developed or build for the users' requirements and needs (Neven & Duval, 2002). Copyright is seen as another advantage providing to make money for the users for developing and sharing of LOs. However, copyright and its uses are still an ongoing discussion since both developers and users of LO do not have enough information about a "working understanding" of copyright law and the shift of copyright paradigm in the online environment (Bornfreund, 2008; Smith, 2004). The following table presents a summary of advantages of learning object repositories (Table 2-6).

Table 2-6 Advantages of the repositories

Advantages
• For Free Repositories
○ Open to everyone
○ Huge number of learning objects in LOR
○ Making comment and getting feedback
○ Recognition and credits for learning objects
○ Peer reviewing
○ Intellectual property right not protected
○ Non Free
○ Use of intellectual property right
○ Finding learning objects specifically developed to users' needs
○ Creator royalties
○ Layered design

2.4.5   Disadvantages of Learning Objects Repositories

For free repositories, there are several disadvantages for the popular and commonly used repositories available over the internet. Intellectual Property Rights (IPR), as one of the important issues in improving learning objects usage, is not generally protected for free repositories. Campbell (2003) stated the importance of the IPR in learning object economy by saying "As learning object repositories proliferate and the reuse of learning objects across communities of practice and international boundaries become more common and widespread, the necessity to formally address digital rights management issues is likely to become more urgent and pressing". According to Casey (2006), it is very important to integrate IPR information into the metadata of learning objects in order to improve technical and educational aspects of reusing learning materials. Table 2-7 provides a presentation of disadvantages of learning objects repositories.

Another disadvantage of the repositories is interface design. McGrenere et al (2002) conducted a study on the effects of interface design on users' satisfaction. Results of the study of the study indicated that majority of the participants preferred to use layered interface. Gustavsson and Torgersson (2005) stated that users, especially for novice users, using non-layered interface experienced difficulty when navigate throughout the interface because of lots of information in the repositories.

Another one is irrelevant objects taking place in the repository. Some free repositories may contain materials that can be not directly related to the learning or teaching content or that can be related to the specifically to a region in which repository managed, such as specific documents to Turkey or any other countries in which repositories are developed. Quality of learning objects as another disadvantage in some repositories may be very poor quality since they do not implement a peer review process for the objects accepted for publishing. MacLeod (2005) indicated that in order to increase use of the learning objects among teachers and learners and to use the repositories regularly, repositories should include learning objects that high quality and properly metatagged.

Table 2-7 Disadvantages of the repositories

Disadvantages
• For Free Repositories
o IPR not protected
o Interface Design
o Containing non-relevant things
o Layered Design
o Quality of LO

2.5 Summary

The concept of learning object was firstly used by Wayne Hodgins in 1994 and the origin of this approach lies Object-Oriented Programming (OOP) which is a paradigm from computer science (Wagner, 2002). The basic principle in this approach is to use and re-use an object in different contexts. Similar to this, Wiley (2002) indicates that instructional designers can create small instructional components that may be reused again and again in different learning tasks. There are many different terms and definitions available in the literature (Wilhelm, 2005), however the most common and well known was made by Wiley (2002b, p.6) as "any digital resource that can be reused to support learning". This definition is also used in the scope of this study.

As similar to the definition, many characteristic of learning object are listed by the researchers, however accessibility, interoperability, reusability, durability, and granularity are five key attributes that is commonly accepted by researchers in the literature (Smith, 2004; Wiley, 2002). Each of these properties is very important, on the other hand, since reusability is the core idea of learning object, Longmire (2000) stated that "If material is designed to be used in multiple contexts, it can be reused much more easily than material that has to be rewritten for each new context". Material can only be a "learning object" if that material can be reused in multiple contexts (Tompsett, 2005).

Learning Objects can only be accessible for users if they stored in a digital environment, Learning Object Repository, and appropriate tags, metadata. Repositories includes learning objects, which is used to be searched, located, reused, and shared them in order to make these learning components accessible for the teachers, students, and other potential users (Sherwood, 2003). Metadata is usually defined as data about data. These "little data" provides all necessary information about a learning object to be searched in a learning object repository and to be reused more easily. In order to standardize metadata, Dublin Core Metadata Initiative (DCMI) and Learning Object Metadata (LOM), well-known and mostly preferred, created metadata schemes for a learning object.

The advantages and disadvantages of Learning Object and repositories has been analyzed many times by the researchers, such as, such as the definitions and meanings of LO (Wiley, 2004), repositories (Najjar, Ternier, & Duval, 2004; Caris, 2004; Lovin, &

Branch, 2003), design and development of LOs (MacDonald et al., 2004), metadata standards (Downes, 2004), evaluation (Kay & Knaack, 2007), and creation of LOs (Jessup Stephanie, 2007). And very recently, there is an increased interest in researching effectiveness of learning objects in K-12 learning environments (Kay, 2012; Kay & Knaack, 2005; Lopez-Morteo & Lopez, 2007; Türel & Gürol, 2011). On theother hand, no research has been done on teachers' personal understanding of learning object and their integration into the Turkish elementary school classrooms. In these classrooms, teachers act as both subject matter expert and instructional designer. Therefore, this study examined in details the skills, knowledge, and perceptions of the teachers who implement learning object-based instruction. This study would contribute the literature by investigating teachers lived experiences to reveal (a) teachers' self-perception as a learning object creator and instructional leaders of the school, (b) teachers' personal applications of learning object-based instruction, (c) teachers' definitions of learning object, and (d) obstacles and opportunities in using learning objects.

CHAPTER 3

METHOD

The purpose of this qualitative phenomenological study is to explore the process of implementing learning object based instruction to the teaching environment through the lived experiences of elementary school teachers. This qualitative research was conducted to describe in detail elementary education teachers' feelings and perceptions by revealing related themes, codes, and pattern obtained from three different data collection instruments (semi-structured interview, observation, and documents) for better understanding the potential advantages and disadvantages of this approach and explanations on why teachers use or not use learning objects during the lessons. This study based on Giorgi's method of descriptive phenomenology, as described by Langdridge (2007).

The chapter begins with a brief introduction to the qualitative research and phenomenology, and discussion of why it is appropriate for this study. The next section is the research design, including discussion of the participants, informed consent, data collection, and data collection instruments. The last section of this chapter includes data analysis including data coding, developing themes, and organizing codes and themes. Researcher's role and validity and reliability are also presented in the last section.

3.1   Introduction to Qualitative Research

While quantitative research is generally based on determining, predicting, or testing specific causal relationships based on certain variables, qualitative research allows the researcher to explore in detail the nature of <u>a priori</u> unknown variables by collecting deep information from the perspective and experiences of participants on how they understand or perceive the world in which they live (Creswell, 2005). According to Bernard (1995), one of the main advantages of qualitative methods is the use of unstructured or semi-structured open-ended questions. This questioning method evokes information from the participants' own words, rather than forcing them to choose from defined, fixed responses. Instruments appropriate for this mode of data collection in quantitative research include questionnaires, surveys, and structured observations. A second advantage is the flexibility of direction based upon initial participants' responses. For example, a researcher may then probe for further information with such question types as "if", "why", or "how". Many different models of qualitative research are available for a researcher. Ethnography, case study, grounded research theory, narrative, and phenomenology are examples that are more commonly used (Creswell, 2005, 2007; Moustakes, 1994). The research model selected for this study is phenomenology.

3.2   Introduction to Phenomenology

According to Moran and Mooney (2002) although the true origins of phenomenology, defined in the literature as descriptive psychology, can be traced to Hengel, Vandenberg (1997, p.11) indicates that Edmund Husserl is the "fountainhead of phenomenology in the twentieth century" which Martin Heidegger and his followers then developed further. Husserl pointed out that in order to understand human experience, philosophy needed a different approach emphasizing individual subjectivity and discovering the essence of multiple experiences (Creswell, 1998; Moustakes, 1994; van Manen, 1990). The name of this philosophical method, according to Husserl, is "phenomenology", the science of pure "phenomena" (Eagleton, 1983, p.55).

According to van Manen (1990, p.9), phenomenology "differs from almost every other science in that it attempts to gain insightful descriptions of the way we experienced the world pre-reflectively, without taxonomizing, classifying, or abstracting it". The aim of phenomenology is a "return to thing themselves" (Moustakes, 1994; Langdridge, 2007). In practice, this results in; (l) a focus on people's perceptions and feelings (lived experiences) on a particular phenomenon, (2) analysis to reveal themes, codes, and patterns of the phenomenon, and (3) the presentation of findings describing the essence of the phenomenon and its individual meaning(s) (Langdridge, 2007). Phenomenological research uses rich and vivid descriptions of people's perceptions for insight and understanding about the phenomenon. Also in phenomenology, presuppositions or pre-understanding, judgments, and bias are to be withheld by the researcher so as to preserve his "observer" status, and not interfere with the descriptions of the lived experiences of people within their own life-world. Furthermore, phenomenology provides the researcher an opportunity for "intersubjective knowing" of lived experiences, and selecting a topic to describe the meaning, structure, and essence of a particular phenomenon from the view point of participant (Moustakas, 1994, p. 101).

3.3   Appropriateness of Phenomenology

This type of qualitative inquiry, phenomenology, was selected for this study because the goal of this research is to understand a particular phenomena, that is, the lived experiences of elementary school teachers conducting learning object based instruction. Other research methodologies in qualitative inquiry, such as grounded theory, ethnography, and case study, are used to examine and understand experiences. However, they do not focus on exploring lived experienced of participants with rich descriptions from the perspectives of the participants who experience the phenomenon. For example, according to McDuffie and Scruggs (2008), grounded theory is based on (1) explanation a phenomenon to discover why it occurs and (2) the development of a theory that is supported by the research findings so the grounded theory approach is not appropriate for this study because of its goal to create an explanatory theoryfor the phenomena. The second methodology in qualitative research is ethnographic, the goal of which is to become a part of a culture or group to acquire as rich a description as possible from the group that is being studied. However, ethnography is inappropriate for the study being examined because the phenomenon is not only focused on a particular culture or group. Case study, as another qualitative design, focuses on all dynamics of a situation -- context, process, and outcomes. Corcoran, Walker, and Wals (2004) indicated that case study does not focus on the lived experiences and the main aim of the case study is to investigate specific cases and to improve practices by gaining vivid descriptions and providing feedback. Case study is not appropriate for the study because providing feedback is not the focus of this study. As a result, grounded theory, ethnography, and case study research models do not mainly focus on the lived experiences of individuals on a specific phenomenon, therefore phenomenology has been selected as a basis for the current study.

For this study, the phenomenological approach provides the researcher some flexibility to gain in-depth information about the perceptions and lived experiences of elementary teachers, to avoid bias, presuppositions, and judgments, and to have potential to add new codes, themes, and patterns revealed from interview, observation, and document data (Creswell, 2005). In this study, the researcher collects data from participant teachers who participate in field observations and the interview process, and provide information about lived experiences regarding learning objects usage in their classrooms. Therefore, phenomenological research seemed the most appropriate design for this study (Leedy & Ormrod, 2005; Creswell, 2005; Creswell, 2008).

3.4   Context of the Study

Participants were accessed through the help of an elementary school teacher working in the school of Arabaci in Duzce, western Turkey. Following the approval from METU, the potential participants were selected after meeting with their school principal. This school was selected because the teachers were volunteer to participate this study and conducting a lesson based on the learning objects. Considering that Turkish educational ministry has conducting a project aiming to provide e-content for teachers and students, and teachers' leadership role has a vision of technological uses for creating student-centered learning environment, researcher chose to investigate teacher personal understanding of learning

object and its implementation. After the research permissions was gained from Duzce ministry of education, researcher visited school to introduce himself and the study to the participants and school principal. A training session was organized by the researcher to all participants in order to inform the concept of learning object and repository, such as what is a learning object or learning object repository. For this purpose a learning object repository was developed by researcher and different types of learning object was added into that repository as an example. Contact information including cell phone number and e-mail address was given to the participants if they have any question about the study after the training. This initial meeting was done in an effort to give some brief information about the learning object and repository, and to make a comfortable relationship between participants and researcher. All data collection instruments were face-to-face interviews, field observation research, and photos.

3.5   Participants

Because a sampling procedure in qualitative research is generally flexible – that is there are no clear guidelines on selection criteria for sample (Morse, 1991), it may sometimes create some problems for the researcher. According to Kitson et al. (1994), interpretation of research findings and replication of the study in qualitative method depends on explaining or describing sample strategies in adequate detail. The researcher for this study used purposeful sampling as described by Patton (1990); "The logic and power of purposeful sampling lies in selecting information-rich cases for study in depth. Information-rich cases are those from which one can learn a great deal about issues of central importance to the purpose of the research, thus the term purposeful sampling" (p.169). In addition, according to Patton (1990), all types of sampling strategies in qualitative approach can be seen as "purposeful sampling" because all cases are selected purposefully to fit the study.

The participants for this study consists of elementary education teachers who had/have experience with learning object based instruction from different perspectives, who teach grades from one to eight, and who volunteer to participate in this study. In this case, snowball sampling (a subset of purposeful sampling) is used by asking teachers who met this criterion (teachers who had experiences with learning object-based instruction), to participate the study. This type of sampling, also known as chain referral sampling, begins with asking "information rich key informants" to nominate other people who could be asked to give their perceptions and belief about the study topic (Patton, 1990, p.176). Snowball sampling is generally used to reach the target population that is not easily accessible to a researcher. Sample size in snowball sampling, as stated by Morse (1994), generally is difficult to predict beforehand, however it is often at or below 10 participants. On the other hand, Auerbach and Silverstein (2003) stated that the sample size of participants can be increased until the data becomes saturated. Data saturation would occur when little new information is added the study by the addition of each new participant.

This study consists of 9 elementary school teachers, all of whom have had at least three years of teaching experience, and who are familiar with the concept of learning objects

and learning object-based education. Of these participants, six were female and three were male. The participants involved in the study are from three different schools in Duzce in Turkey. The teachers are from five different fields, four from classroom teacher, two from science and technology, one from computer application, one from Turkish education, and one from guidance counselor. Additional demographic information regarding the 9 teachers is provided in Table 3-1.

Table 3-1 Demographic Information of the Participants

Demographics	Number of participants
Gender	
Male	3
Female	6
Teach another grade, school, subject	
Yes	7
No	2
Number of years of Teaching Experience	
0-2.5 years	2
3-6.5 years	3
7-10.5 years	2
11-15.5 years	1
16+ years	1
Number of years in current position	
0-2.5 years	2
3-6.5 years	4
7-10.5 years	2
11-15.5 years	1
16+ years	-
Subject of Teachers	
Classroom Teacher	4
Science and Technology	2
Computer Application	1
Turkish Education	1
Guidance Counselor	1

Nickname was used for the participants to ethically protect and to mask the real names in data analysis and presenting findings. These nicknames were DZC1, DZC2, DZC3, DZC4, DZC5, DZC6, DZC7, DZC8, and DZC9. Each participant profile was given in Appendix E in order to present as complete reflection of each participant's consciousness (Seidman, 1998) as possible.

3.6   Informed Consent

All of the teachers participating in this study were given an informed consent form (see Appendix F) with information about the study. According to Shank (2006), an informed consent for the researcher provides explanations of ethical considerations such as an element of force, over-reaching, or other forms of constraint or coercion. The informed consent includes the name of the study, the purpose of the study, what is expected of participants, expected risk and benefits of attending the study, and the name and contact information of researcher. In addition, the form gives information about the interview process.

3.7   Data Collection

Data collection methods of phenomenological research include in-depth interviews (structured, semi-structured, and unstructured), observations, and documents (Creswell, 2007; Moustakes, 1994; Lupton, 1996). The most common method used in phenomenological design to collect data is the interview (Donalek, 2005). However, because the focus of data collection process is on understanding the phenomena from the interviewee's point of view, and gaining as much as possible rich and detailed answers that have the potential to reveal related themes and codes for the phenomena being studied, two types of interview method are generally used in phenomenological studies -- semi-structured and unstructured interviews. Although both of these offer some potential to discover people's experience, Langdridge (2007) indicates that the unstructured interview is sometimes very difficult for a researcher in terms of managing the process and collecting good-quality data. Observation and documents are two other important data collection tools in phenomenological studies (Moustakes, 1994). Close observation method, sometimes called as participant observation, is commonly used for phenomenological data collection. A goal of this form of observation is for the researcher to participate in the participants' lifeworld for direct access to the experience for better understanding and describing it.

For this study, data was collected by using multiple methods of data collection, including the semi-structured interview, field observation reports, and photos. Each of the interviews is digitally recorded and transcribed verbatim (i.e., all information gained from the interview is recorded word by word, exactly as stated), and then saved into computer text files. The data files are then uploaded into ATLAS.ti, a software analysis program for qualitative data that generates themes, codes, and qualitative data statistics (see Appendix B). These files were sent to the participants of the study via e-mail for verification of the transcriptions with the interview verification form (see Appendix G), and if necessary, provides for additional comments. The verified interview data was examined again to guard against inadvertent errors and then saved in password protected computer files.

A field observation report is the second data collection tool for this study. Langdridge (2007) pointed out that although this method of data collection has not been used more in qualitative studies, if observation is carried out well, it can give the researcher an insight into the participants' experience about related situations. An observation form (see Appendix A) is used to guide the researcher to exactly what aspects of the classroom

environment should be recorded, such as teacher' behaviors and teacher-student and student-student interactions.

In addition to this data collection instruments, Elementary Based Learning Object Repository (ELOR) was developed by researcher and used for this study (see Appendix F). The objective was to build a workable prototype in order to use in training session of the study and to inform teachers the concept of learning object and the repository while they are already know and use these resources without named it. The details of ELOR will be explained in the next chapter.

The participants of this study were also given an informed consent form addressing the objective of the study, interview process, and an explanation of their guaranteed rights (see Appendix F).

3.7.1   *Semi-Structured Interviews*

The most common interview type used in phenomenology and fundamental to many qualitative researches is the semi-structured interviews (Creswell, 1998; Langdridge, 2007). The main purpose of the use of the interviews for gathering data is to "engage in dialogue with participants to elicit their description and perceptions of themselves and their understandings [of the phenomena being studied]" (Brott, 2002, p.166). Patton (1990) indicates that there can be many methods for creating an interview that is consistent and reliable. When defining the best approach for the interview, the researcher should take into consideration a few factors, such as, the phenomena being studied, the interviewee's needs, and background and personal style of the researcher (Patton, 1990). Patton (1987) identified 10 questioning techniques/guidelines for effective interview:

1. Ask clear questions (Patton, 1987, p.123)
2. Ask single questions (Patton, 1987, p.123)
3. Ask truly open-ended questions (Patton, 1987, p.122-3)
4. Ask experience/behavior questions before opinion/feeling questions (Patton, 1987, p.115)
5. Sequence the questions (Cohen & Manion, 1994, p.277)
6. Probe & follow-up questions (Patton, 1987, p.125-6)
7. Avoid leading questions (Patton, 1987, p.128)
8. Establish personal rapport (Patton, 1987, p.127)
9. Encourage a free rein but maintain control (Patton, 1987, p.143)
10. Practice interviewing (Patton, 1987, p.143)

These guidelines were used in this study while developing the semi-structured interview questions. According to the main research questions, a set of test interview questions was prepared in order to determine whether or not the questions were understandable to potential participants (see Appendix B). Interview questions require reliability, and so their construction may need several rounds of revision (Neuman, 2006; Patton,1990; Kvale, 1996) in terms of double barreled, leading, and double negative, as stated by Patton (1987). Double barreled, for example, is one question form, it means asking two different questions in one that may have different meanings. Leading is other question form that a researcher may use during interview. It means encouraging the participants to

answer a question in a way desired by the researcher. Double negative is a form that means using two kinds of negative in the same sentence. In the case of misunderstanding the questions from the participants, a probing questioning technique (Patton, 1987) was used during the interview to clarify, give further explanations focus on the question. For example, "can you be more specific", "anything else", and "please, tell me more" are some ways for eliciting more detailed information from participants about a specific research question. After constructing and testing the interview questions, they were sent to an expert in qualitative research to ensure that the questions were clear and consistent.

Validity of interview questions was assessed with a pilot study that included two of the teachers previously selected for this study. The purpose of the pilot study was to determine whether or not the teachers understood potentially confusing concept and terms, such as learning object, reusability, learning object-based instruction, etc. In addition, the time of the interview was recorded in the pilot study to inform teachers in informed consent. The teachers in the pilot study commented on each of the interview questions and they suggested some changes. For example one of the participant stated that some opening languages can be added, such as, "how", "what is it about", and "tell me more about". Questions including technical terms, such as, learning object, repository, and metadata can be taken off from each interview question, which is another suggestion by participants. According to their suggestions, the interview guide was modified and sent to the expert again to check that the questions are clear and consistent (see Appendix B). In expert review process, two reviewers independently critiqued interview questions. Some interview questions were revised and a few new questions with prompts were added to the interview script. First and second versions of the interview script can be found in Appendix B- Appendix D.

For the analysis of the interviews, Atlas.ti, a qualitative data analysis program, was used. In data analysis section, it is explained in detail hot to analyze data in this descriptive phenomenological study. Figure 3-1**Error! Reference source not found.** shows one of the interviews with the codes, which was coded in Atlas.ti.
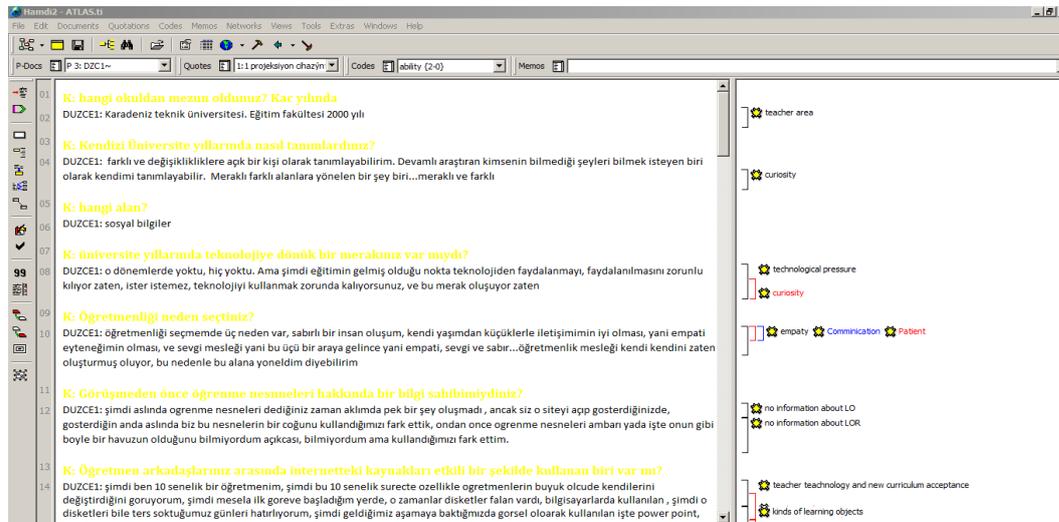
Figure 3-1 Atlas.ti Interface with a Coded Interview

3.7.2   Field Observation Report

The purpose of the observation guide is to describe teachers' behavior and teacher-student interactions during a lesson based on learning objects. Two observation sessions were conducted with teachers to analyze how to use the learning objects and the repository. During and after the teacher training, a number of questions related to the main research questions of the study were asked. As examples, some of the questions used as a guideline for the observation follow: how do teachers transfer their information to the educational environment, what kinds of problems do teachers encounter during the application, what kinds of strategy do teachers use, and how do students react to this kind of learning experience. The observation form structure can be found in Appendix A.

Data obtained from the filed observation were analyzed by using Atlas.ti program and Figure 3-2 shows one of the field observation reports with the codes.
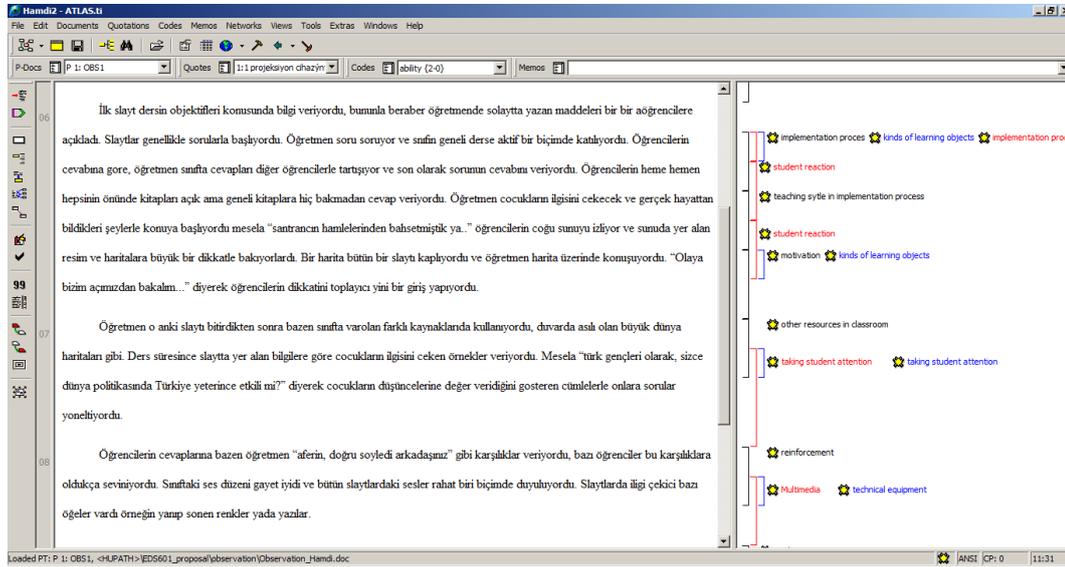
Figure 3-2 Atlas.ti Interface with a Coded Field Observation Report

3.7.3   Photographs

Photographs were also used to collect qualitative data from the participants in order to illustrate some aspect of the phenomenon. According to Denzin (2001, p.26), "the meanings of lived experiences are inscribed and made visible in these performances [photographs]." Each of the photographs and their explanations were digitized and analyzed with the Atlas.ti software (Graham, et al. 2002). A total of 16 photographs were examined for the identification of the specific aspect of the phenomenon, such as, classroom environment and culture, teacher/student interaction, and technical equipment. One of the photos taken from one of the classrooms with the codes is shown in Figure 3-3.
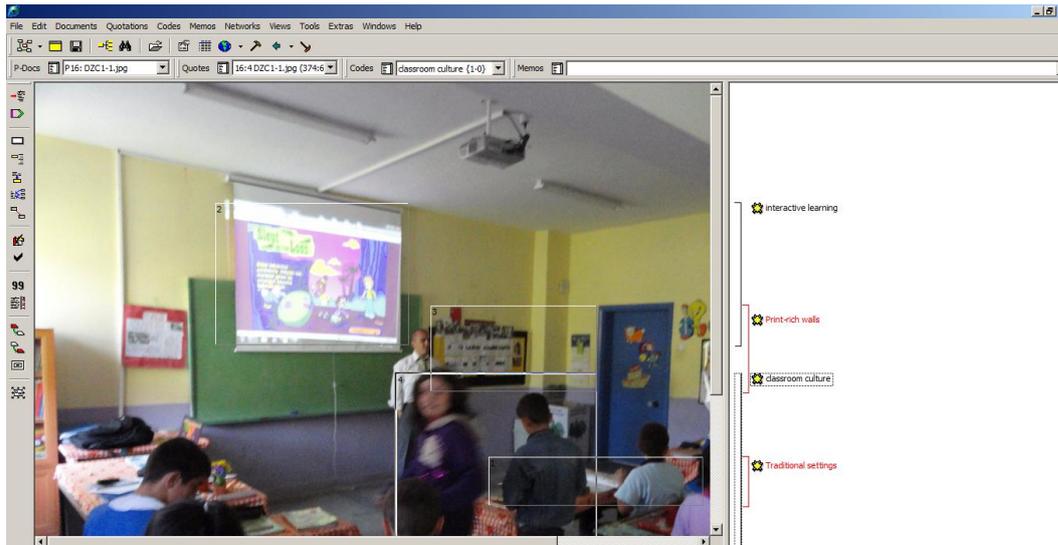
Figure 3-3 Atlas.ti Interface with a Coded Photos

3.7.4   Elementary-Based Learning Object Repository - ELOR

For this study, a learning object repository, named as ELOR, was developed by researcher to document first experiences and perceptions of elementary teachers with a learning object and learning object repository and to introduce the technical concepts on training sessions of the study. This repository was specifically developed to explain some technical concept of the study, such as, learning object, repository, and metadata. The working prototype can be accessed at www.ilknesne.com. The prototype contains content with metadata, meaning that the repository does not store links for learning objects. Instead, it stores all the learning objects and information by which the learning objects may be retrieved. Teachers may search for desired learning objects by different fields such as "keywords", "title", "description", "date", and also more complicated elements like, "object type" and "level of difficulty". The prototype we have developed serves only elementary school teachers, and it concentrates on subjects such as mathematics and science. ELOR is also designed to share learning objects with other institutions using CanCore's standards, a basic outline on how to create learning object metadata (LOM) (Friesen, 2005).

ELOR, based on ASP technology, has a web-based only interface and displays only in the Turkish language. The repository has different capabilities for unregistered and registered users. The registration process is very simple and is available only for elementary teachers. Fig. 2 indicates the homepage of ELOR in Turkish for non-registered and registered users. Caws (2005) found in a study that when students evaluate a learning object repository, they prefer a cleaner interface, with fewer elements. Thus, this repository is developed under the principles of cognitive load theory. According to this theory, there are different types of memory; sensory memory, working memory, and long-term memory (Sweller et al., 1988). The theory indicates that learning occurs in working memory, with limitations. To minimize the limitations, some learning techniques are used to decrease negative impact on repository use. The repository is designed in light of (1) the split attention effect in which irrelevant text and graphics are minimized, (2) the

redundancy effect in which redundant sources is decreased as much as possible, and (3) the modality effect.
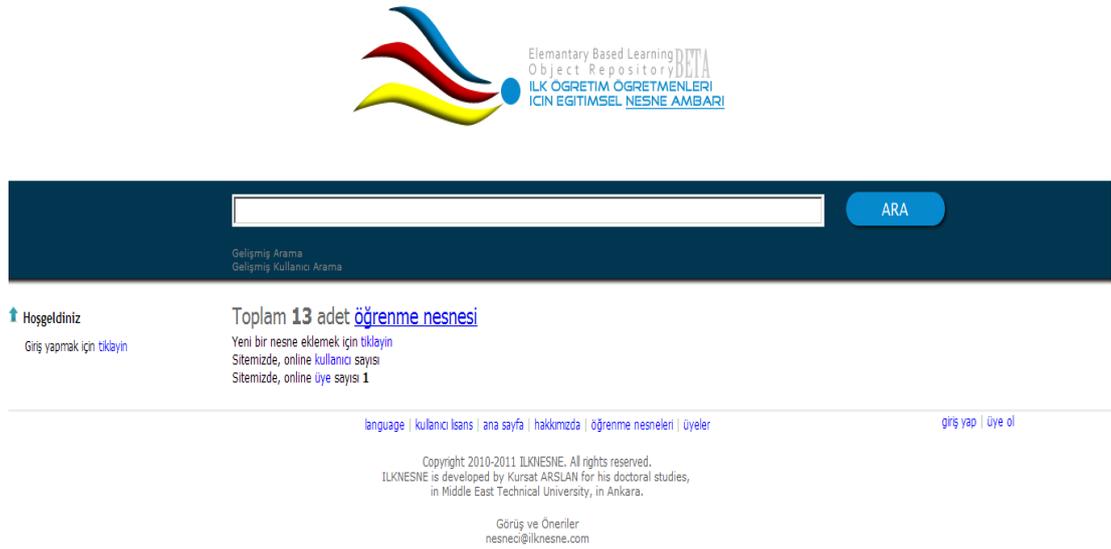
Figure 3-4 ELOR Home Page

3.8   Data Analysis

Data analysis in phenomenological research can be conducted differently according to phenomenological approaches (Moustakas, 1994; Langdridge, 2007). According to Langdridge (2007), there are three basic approaches when analyzing data in a phenomenological research: descriptive phenomenology, hermeneutic phenomenology and template analysis, and critical narrative analysis. For the current study, the descriptive analysis method was selected.

Every phenomenological design consists of four important features for phenomenological analysis — (1) intentionality, neoma, and neosis, (2) epoche, (3) phenomenological reduction, and (4) imaginative variation. *Intentionality* involves being conscious or aware of the world around us (real or imaginary, actual or nonexistent). Intentionality is important in phenomenology because Husserl (1982, cited by Moustakas, 1994) believed that in order to fully understand an experience, we must know how we are conscious of something. Intentionality in phenomenology is not used in everyday life, such as intending to go the movies, or to do something specific. Instead, it is understood as an a priori desire, that cannot be ignored. *Neoma* and *neosis* are other two important terms in understanding the role of intentionality in phenomenology because Husserl argues that "all experience is the experience of something" with the correlation between neoma and neosis. Neoma refers to the thing "that is experienced" and neosis refers the way "it is experienced" (Moustakes 1994, p.71, Langdridge, 2007, p.15). *Epoche*, sometimes called as bracketing, is the process referring to the suspension of a researcher's presuppositions,

suppositions, and bias about the phenomenon that being studied. *Phenomenological reduction* is the continuous process of epoche and includes three important elements, which are description, horizontalization, and verification for "…continually returning to the essence of the experience in order to derive the inner structure or meaning in and out of itself" (Merriam et al., p. 94). *Imaginative variation* refers to the description of meaning from the experience (Moustakes, 1994, Langdridge, 2007). These essential steps for analyzing data in phenomenological studies will be explained in detail in chapter 4.

Two types of phenomenological approaches are generally used in the research literature including descriptive (eidetic) phenomenology and interpretive (hermeneutic) phenomenology. The main concern of descriptive phenomenology is to describe a phenomenon rather than to explain it. In contrast, according to Creswell (2009, p.59), "Hermeneutic phenomenology is not only a description, it is also seen as an interpretive process in which the researcher makes an interpretation of meaning of lived experiences." The focus in hermeneutic phenomenology is less on description of data and more on interpretation. Langdridge (2007) also indicated that descriptive phenomenology is very popular in applied research, especially in nursing and education. The data analysis of this study is based on **Giorgi's (1997) method of descriptive phenomenology, as described by Langdridge** (2007), because the goal is to fully understand and describe the perceptions and lived experiences of elementary education teachers implementing learning object-based instruction. The methods of analysis used in this study include descriptions of feeling and perceptions of the teachers through intentionality, epoche, phenomenological reduction, imaginative variation, and synthesis of meaning in order to reveal overall patterns, relationships, themes, and codes. Figure 3-5 represents step by step actions in the analysis process of the study.
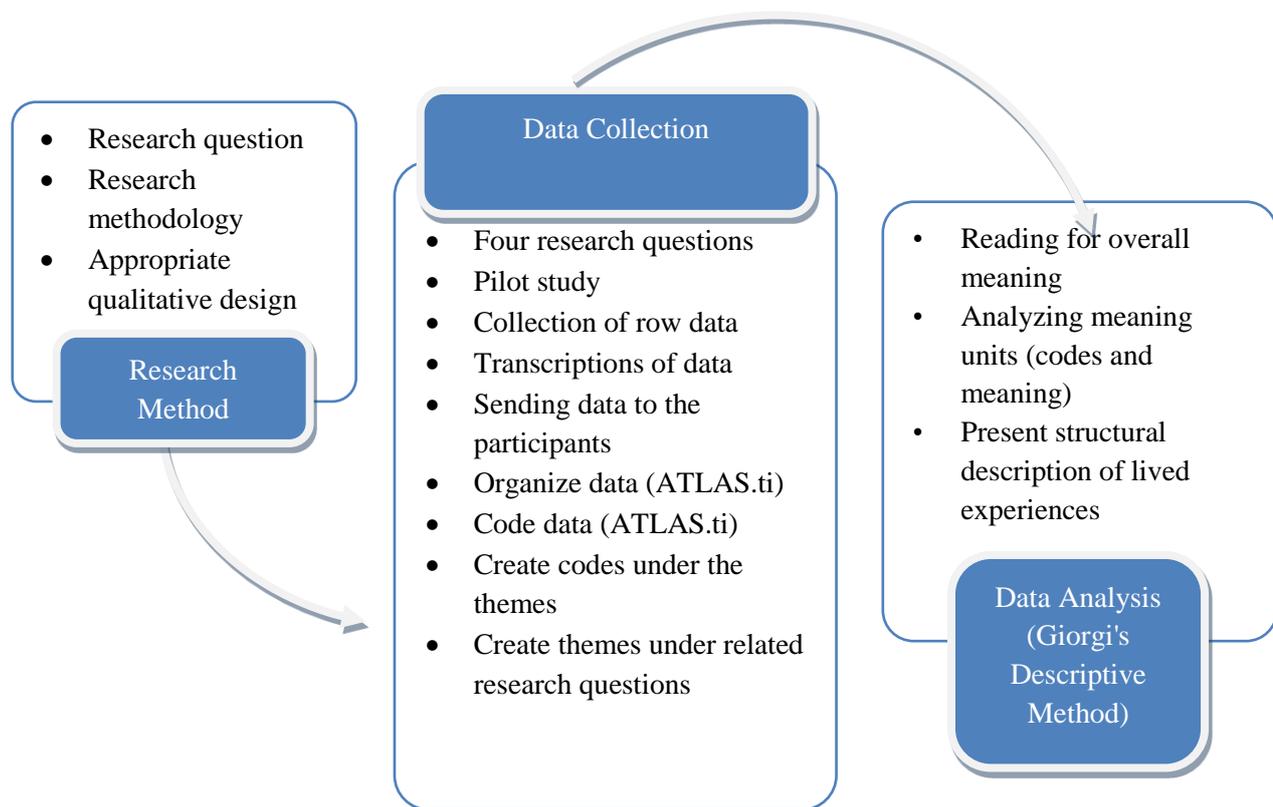
Figure 3-5 Research Method, Data Collection, and Data Analysis

In the present study, content analysis of the Giorgi's (1997) method of descriptive phenomenology was conducted under the following stages, stated by Yildirim and Simsek (2008):

1. Data coding
2. Developing themes
3. Organizing codes and themes
4. Describing findings

Detailed discussions of each of the stages are as follows:

3.8.1 *Data Coding*

Data coding is the first step of the analysis to identify pattern and themes within the data being investigated, which is defined by Auerbach and Silverstein (2003) as a "move from raw text to research concerns in small steps, each step building on previous one" (p.35) and Creswell (2007) defined coding process as "an inductive process of narrowing data into a few themes" (p.266). In this study coding process began with recording interviews with audiotape device and the records were then transcribed verbatim into a computer text file. All documents were read first and reviewed multiple times in order to get the essence of the underlying meanings of the phenomenon. Then, all of the files uploaded into the ATLAS.ti, qualitative data analysis software, to prepare the data for analysis. ATLAS.ti is one of the qualitative data analysis tools used to manage, organize, and analyze data for particular statistical information, such as the number of codes and references in the interviews (Shank, 2006). The aim of using ATLAS.ti software is to

avoid a time consuming process of coding interview data, to count the number of references, and to create systematic codes for themes to simplify a more complicated analysis. Johnston (2006) indicated that using qualitative data analysis software, such as ATALS.ti, helps the researcher to find common codes and themes more easily and code data for different formats, such as text, photography, video and audio of unlimited length. Figure 3-6 below shows the ATLAS.ti interface with a coded interview.
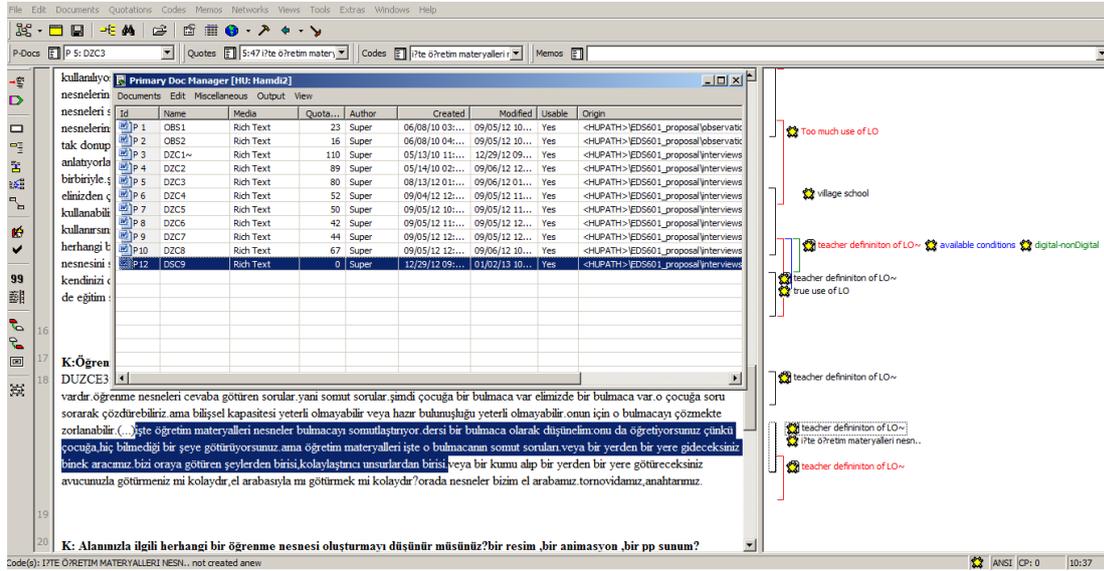
Figure 3-6 ATLAS.ti interface

3.8.2   Developing Themes

Themes are the general propositions revealed from rich descriptions of experiences of participants. Taylor and Bogdan (1998) suggest the following steps when working on data and developing themes: (1) Look for words and phrases, (2) analyze similarities between codes and themes, (3) develop generalizations, and (4) read literature. In order to develop appropriate themes from emerging codes, researcher firstly analyzed literature to synthesize potential themes that can be relevant to the study and then all the codes emerged from interviews were exported to MS office document to categorize codes and generate themes and sub-themes for each research question. Finally, the result of the pilot study, the field observation reports, and photographs were analyzed to confirm emerging themes from the study and added new themes if needed. Table 3-2 represents an example of the developing themes and sub-themes according to the phenomenon.

Table 3-2 Overview of an example when developing themes and sub-themes

Sub-Themes	Themes	Phenomenon
…	Instructional Strategies	

Table continued

Sub-Themes	Themes	Phenomenon
Selection of content Searching of learning object Selection of learning object Revising of learning object Implementation of LO	Implementation Process	Implementation of learning object
…	Teacher differentiation in Implementation	
…	…	

3.8.3 Organizing codes and themes

To organize codes, emerging themes was used. Researcher first attempted to find common features of codes and then grouped them according to their relation under the themes. Themes were organized based on the research questions to illustrate how the phenomenon is experienced by teachers in their learning environment (see Appendix H). Finally, emerging themes and categories were taken back to the original descriptions of the participants to confirm them and to control for inconsistencies, which were also used for the validity of the study.

3.9   Researcher's Role

In qualitative research, the researcher act as a primary instrument of the research (Patton, 1999; Yildirim & Simsek, 2008) and active participant in data collection and analysis (Cresweell, 1998). According to Cresweell (1998), this participation may have an effect on the meaning and context of the phenomenon being studied. Therefore, the central focus in all phenomenological studies is on attempting to remove presumptions, knowledge, biases, and ideas about the phenomenon under study (Giorgi, 1997; Moustakes, 1994), known as reflectivity in qualitative studies (Rennie, 1995).

In this study, the role of the researcher can be explained under two stages. One of them is Epoche. Patton (1990) indicates that "the first step in phenomenological analysis is that of Epoche". Langdridge (2007) describes epoche as a process by which "we attempt to abstain from our presuppositions, those preconceived ideas we might have about things we are investigating" (p.17). To achieve epoche, researcher must put aside his perceptions, judgments, and knowledge throughout data collection and analysis (Patton, 1990; Moustakes, 1994; Giorgi, 1997).   Second role of the researcher is to indicate or reveal any potential bias for the validity of the study if the phenomenon is somehow related to the researcher, which is also called "backyard research". To minimize potential threats of backyard research, (a) data triangulation (Lincoln & Guba, 1985), (b) member checking (Lincoln & Guba, 1985), (c) peer debriefing (Lincoln & Guba, 1985; Creswell, 2007), (d) noting and reflecting possible biases (Creswell, 2007), (e) providing rich and

thick description of research context (Lincoln & Guba, 1985), (f) ensuring that teachers understood that their participation to the research would not have any effect on their school conditions and professional life, was used.

3.10 Trustworthiness

Reliability and validity define the value of the research, and generally focus on measurements and predictions of the study in quantitative research (Landridge, 2007; Moustakes, 1994). Morse at al. (2002) point out that this process determines the rigor of the study and recommends that reliability and validity analysis can be applied to all research methods. On the other hand, some researchers, such as Lincoln and Guba (1985), assert that these terms are not appropriate for qualitative research, so alternative terms have developed for reliability and validity, such as trustworthiness, rigorousness, or quality. For this study, trustworthiness substitutes for validity and reliability. Under the general banner of trustworthiness, credibility, transferability, dependability, and conformability was addressed to ensure trustworthiness of findings (Yildirim & Simsek, 2008; Lincoln and Guba, 1985; Moustakes, 1994; McLeod, 2001). Polkinghorne (1989) defines a list of five guidelines for the validity of the phenomenological research to be answered by researcher:

- Did the interviewer influence the contents of the subjects' descriptions in such a way that the descriptions do not truly reflect the subjects' actual experience?
- Is the transcription accurate and does it convey the meaning of the oral presentation in the interview?
- In the analysis of the transcriptions were there conclusions other than those offered by the researcher that could have been derived? Has the researcher identified these alternatives and demonstrated why they are less probable than the one decided on?
- Is it possible to go from the general Structural description to the transcriptions and to account for the specific contents and connections in the Original examples ot the experience?
- Is the structural description situation-specific or does it hold in general tor the experience in other situations? (p.208)

In order to address to the guidelines above, researcher used credibility, transferability, dependability, and conformability throughout the data collection and data analysis.

3.10.1 Credibility: Internal Validity

Creswell (2007) suggests that credibility is used to ensure accuracy of research findings from the perspective of participants in the research. Member checking, peer debriefing and triangulation, suggested by Creswell (2007), are three important strategies that can be used to confirm credibility in any phenomenological study. For this study member checking was used as an internal check of the research and it can be defined as a technique to establish to the validity of an account. It gives participants some opportunity to correct errors, to change incorrect interpretations, to volunteer additional information to finalize the data, and to check preliminary findings to confirm that they reflect their

experiences or feelings. In this study, all transcribed data was sent to the participants to check and revise the accuracy of the findings and interpretations.

Lincoln and Guba (1985, p.308) described peer review, or famously peer debriefing, as "a process of exposing oneself to a disinterested peer in a manner paralleling an analytical session and for the purpose of exploring aspects of the inquiry that might otherwise remain only implicit within the inquirer's mind". In this process, the researcher became of his position toward data and analysis by asking hard questions about method and meaning (Lincoln & Guba, 1985).

Triangulation, the last technique to provide credibility in this study, refers to the combination of several data sources (Patton, 2002). In this study, the researcher used three types of data collection techniques to verify data -- semi-structured interview and field observation report and photos (Lincoln & Guba, 1985).

3.10.2 Transferability: External Validity

Transferability in qualitative research is the equivalent of the traditional term of generalizability or validity in quantitative research (Lincoln & Guba, 1985). It defines the extent to which results of the research can be generalized or transferred to other settings. As stated by Lincoln and Guba (1985), it is not possible for a researcher to generally identify the transferability of findings. Instead, the readers must decide whether or not the results of the study are transferable to any particular setting. In order to enhance transferability, the researcher provided rich and thick descriptions of research context and process to enable the readers to judge whether or not the findings of the study are transferable.

3.10.3 Dependability: Reliability

In quantitative research dependability is an alternative term of reliability, based on assumptions of repeatability (Lincoln & Guba, 1985). An external auditor, as suggested by Lincoln and Guba (1985), is one of the strategies to ensure the dependability or consistency of the results of study. The external auditor is different from a peer reviewer. The external auditor is new to the research and can help the researcher to ensure that data, findings, and conclusions are consistent through the use of Giorgi's method of descriptive phenomenology (Creswell, 1998).

3.10.4 Conformability: Objectivity

Conformability is the parallel term of objectivity in quantitative research (Lincoln & Guba, 1985). Objectivity refers to the potential influence of researcher on the results of the study. On the other hand, conformability in qualitative research is the extent to which the results of the study could be confirmed and corroborated by others. A number of strategies can be used to enhance conformability. One of them is the documentation of all research decisions and procedures for checking and rechecking data in every part of the study (Creswell & Miller, 2000). In addition, member-checking method is also used to ensure that data, interpretations, and results of the interviews represent participants' own experiences.

3.11 Summary

The focus of the current phenomenological the study was to explore elementary education teachers' perceptions and feeling regarding learning object and learning object based instruction by studying the lived experiences of teachers. This chapter provided a detailed discussion of methodology including participants, data collection, data analysis, and trustworthiness of the study. The data was collected through face-to-face, semi-structured interviews, field observation reports, and photographs. Semi-structured, open-ended interview questions were used to "engage in dialogue with participants to elicit their description and perceptions of themselves and their understandings [of the phenomena being studied]" (Brott, 2002, p.166). Interviews were recorded, transcribed verbatimly, and analyzed by the qualitative data analysis software (ATLAS.ti) to identify emerging codes and themes for developing meaningful and relevant conclusions from qualitative data (Ballard & Bates, 2008). Data were analyzed using Giorgi's (1997) method of descriptive phenomenology under four stages: data coding, developing themes, organizing codes and themes, and describing findings. Chapter 4 provides a detailed analysis and presentation of the results for the current study.

CHAPTER 4

RESULTS

4.1 Results of the Pilot Study

In order to verify the face validity of the interview questions, a pilot study was conducted with four teachers who had been previously selected only for the pilot study. The aim of the pilot study was to identify any potentially confusing concepts, terms, and questions. The participants of pilot study were asked nine interview questions including prompt questions to determine the quality and clarity of each. In addition to the eight questions, every participant was asked "Is this question clear for you? Is there anything you want to add, omit, or change?" The duration of the interview was also recorded to provide the approximate time used for interviews with the main-study participants.

Teachers in the pilot study commented on each of the interview questions and suggested some changes. Using their suggestions, several changes were made based on the pilot study, including omitting a few questions, reordering the questions for clarity, rewording questions to elaborate on different concepts, and rewriting some questions to obtain simpler questions and improve comprehension. Removal of questions was one of the most important changes of the pilot study because some participants said that some questions were repeated. . To reduce redundancy identified in the questions of pilot study, certain questions were combined and a few were added to improve clarity.

4.2 Participants

As mentioned in Chapter 3, nine elementary education teachers voluntarily participated in the current phenomenological study. Among the teachers, four were classroom teachers, two were science and technology teachers, one was a computer application teacher, one was a Turkish education teacher, and one was a guidance counselor.

4.3 Data Collection Procedure

The data collection process for this study included semi-structured, open-ended interview questions, observation reports including field and interview observation, and photographs to gain a neutral and unbiased understanding of the phenomena of using learning object-based instruction modal by describing perceptions and lived experiences of elementary school teachers (Langdridge, 2007). Semi-structured interview questions were the main data collection instruments for this study. In addition, field observation reports were used to obtain insight into the participants' experiences in related situations (Langdridge,

2007). Data were also collected using photographs of the observed situations. Photographs were taken with the permission of the teachers who participated in the study. Teachers were asked to sign "informed consent" forms in order to participate in the study and to inform teachers about objectives of the study, the interview process, the teacher's rights, and that usage of the documents would be limited to academic publications (Moustakes, 1994).

Nine teachers participated in this study and responded to a semi-structured interview protocol including seven questions and many prompts. Steen and Roberts (2011) pointed out that "The length of a phenomenological interview is guided by the process of saturation, i.e. when the narratives become repetitive and no new data is revealed." Data saturation procedure determined the number of participants in the current study (Auerbach and Silverstein, 2003; Steen and Roberts, 2011). The average duration of the interviews for the face-to-face interview in which no incentive or prize is provided should not exceed 25 minutes (AMSRS). The interview length for this study ranged from 20 to 25 minutes and all the interviews were conducted during a three-month period, from April 2010 to June 2010. Figure 4-1 provides a representation of the timeline of the events in data collection phase for this study, including interviews, observations, and photos.
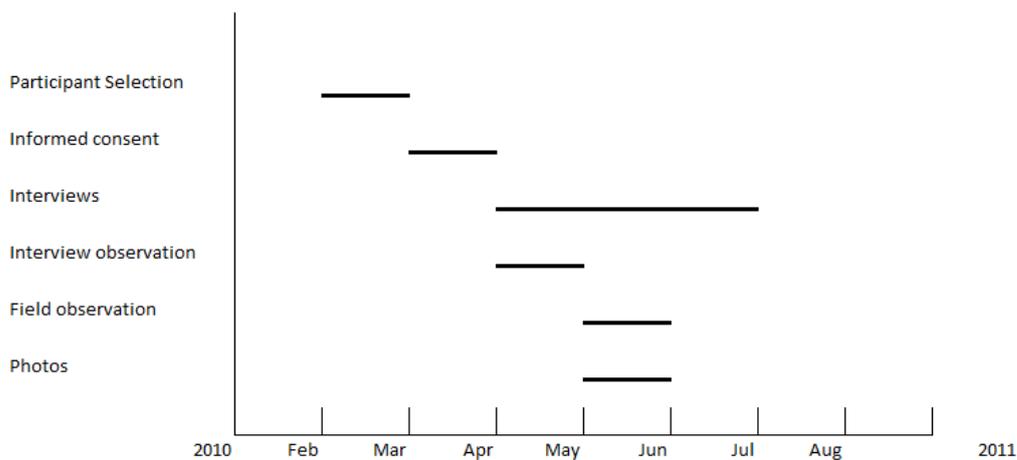
Figure 4-1 Data Collection Timeline

Before any interview questions were asked, an informed consent form was given to the teachers to inform them regarding the study objective, interview process, and an explanation of their guaranteed rights, and also to obtain their personal information, such as phone numbers and email addresses. After these forms were signed, an interview time was set up by calling each of the participants and making sure that teachers understood the importance and the confidential nature of the interviews. Interviews began with asking background questions including the teacher's name, address, phone number, title, and length of time they had been working as a teacher in that school. The seven interview questions with the multiple prompts followed.

Prior to the data analysis, transcripts of interviews were sent to the participants via email for verification. Teachers were asked to make any necessary changes and provide additional comments. Each of the participants replied with an email attachment including a signed interview verification form (see Appendix D) declaring their acceptance and verification of the transcript. Additional information regarding the data collection in the study is given in Table 4-1.

Table 4-1 Data collection instruments

Data Collection Tool	Number of items
• Semi-structured Interview	9
• Observation report	
o During the interview (interview observation)	2
o During the lesson (field observation)	7
• Photographs	
o Before the lesson	10
o During the lesson	6

4.4   Data Analysis Procedure

"The phenomenological method should be descriptive because the phenomenological researcher wants to avoid any kind of premature analysis or explanatory constructs." (Giorgi. 1985, P. 47) Data analysis in this phenomenological study included five essential processes: epoche, getting a sense of the whole, phenomenological reduction, imaginative variation, and synthesis of meaning (Giorgi, 1997; Moustakes, 1994). In order to protect the anonymity of participants and to maintain the confidentiality of data, the researcher personally transcribed all interviews and used code names as D1, D2, D3, D4, D5, D6, D7, D8, and D9 to identify participant data. For this study, Giorgi's method of descriptive phenomenology was used to guide the researcher, as discussed in a previous chapter. Each of these essential processes is described as follows:

4.4.1   Step one: Epoche
The first step in data analysis of the study was the epoche. This requires the researcher to set aside his or her all previously acquired knowledge, biases, presuppositions, and suppositions about the phenomenon (Giorgi, 1997; Moustakes, 1994). According to Giorgi (1997), this does not mean removing of all past experience and knowledge. Instead it is only suspension of the past knowledge so that previous information does not affect the phenomenon being studied. Moustakes (1994) describes epoche from his point of view during the epoche process as follows:

> The Epoche process inclines me toward receptiveness. I am more readily able to meet something or someone and to listen and hear whatever is being presented without coloring the other's communication with my own habits of thinking feeling, and seeing, removing the usual ways of labeling or judging or comparing.

I am ready to perceive and know a phenomenon from its appearance and presence (p.89).

Beginning with the epoche, the researcher did not include his own knowledge and experiences of the phenomenon and listened very carefully to the words of the teachers by consciously removing his own prejudgments and keeping his internal dialogue silent. During the data analysis, this bracketing process was continued by the researcher limiting his conscious ability and his expectations, and staying close and true to the teachers' original descriptions or ideas.

4.4.2 Step two: Getting a global sense of whole
After epoche, the researcher started the second step by reading descriptions of interviews. Entire transcriptions of each of the participants were read first and reviewed multiple times in order to perceive the essence of the underlying meanings of the phenomenon. This reading step is based on the gestalt phenomenological perspective emphasizing that every statement of the description is "…related to each other and that one cannot understand the relationships among the parts unless one goes through the entire description at least once" (Giorgi, 1989, p. 48). According to Giorgi (1997), the first reading and continuous reviewing are the key to preparing the process for the next step.

4.4.3 Step three: Phenomenological Reduction
Phenomenological reduction was the third step of the analysis. This is the contiuing s process of epoche and includes description, horizontalization, and verification for "…continually returning to the essence of the experience in order to derive the inner structure or meaning in and out of itself" (Merriam et al., p. 94). Giorgi (1997, p.238) stated that "…phenomenological reduction is a methodological device invented by Husserl in order to help make research findings more precise". In phenomenological reduction researchers set aside data and then every statement of this bracketed description of phenomenon is seen as having equal value. Below, an example of a horizontalizing, phenomenological reduction is given to demonstrate the data analysis process for a single brief description or definition of a learning object. R refers to the researcher and D1 is one of the teachers participating in the study.

> Example: Transcription
> R: Which properties of learning objects you have used impress you?
> D1:   First of all, it is visual and digital, and you can use a learning object again and again, however sometimes I have attended some seminars. They use projection and show us something with no pictures, sound, and animation. There is no attractive thing in the presentation, just like a book. I mean when preparing a presentation there are a lot of thing we will have to consider, it should not be so many text and so many pictures. There should be a balance. Texts in the presentation should consist of short and concise information. Because of that I am criticizing all the presentations used in the seminars. To me, presentations should be attractive for the students and to do that I am using less texts more

animation and video. My students like them a lot and I am getting happy just seeing that.

After bracketing content from the description above, each statement of the description of the experience was treated as having an equal value and belonging to the experience.

Example: Horizonalizing of the description
1. First of all, it is visual and digital,
2. and you can use a learning object again and again that is really important,
3. however sometimes I have attended some seminars.
4. They use projection and show us something with no pictures, sound, and animation.
5. There is no attractive thing in the presentation, just like a book.
6. I mean when preparing a presentation there are a lot of thing we will have to consider,
7. it should not be so many text and so many pictures, there should be a balance.
8. Texts in the presentation should consist of short and concise information.
9. Because of that I am criticizing all the presentations used in the seminars.
10. To me, presentations should be attractive for the students and to do that I am using less texts more animation and video.
11. My students like them a lot and I am getting happy just seeing that

After horizontalizing, the statements irrelevant to the topic or question, and those observations that are repetitive and overlapping were deleted, "…leaving only the horizons (the textual meaning and invariant constituents of the phenomenon)" (Moustakes, 1994, p.97). The invariant constituents of the experience are listed below:

Example: Removing irrelevant statements
1. It is visual and digital
2. You can use a learning object again and again that is really important
3. It should not be so many text and so many pictures, there should be a balance
4. To me, presentations should be attractive for the students and to do that I am using less texts more animation and video

After verification of the invariant constituents, they are then clustered into themes as below:

Example: Themes of the invariant constituents
1. Visual
   - It is visual and digital,
2. Reusability
   - You can use a learning object again and again that is really important,
3. Quality
   - It should not be so many text and so many pictures. There should be a balance.

4. Enjoyable
   - To me, presentations should be attractive for the students and should include entertaining elemenets, so to accoplish it I am using less texts more animation and video.

After the meaning of the description is thematically clustered and the themes are developed, a coherent textual description of the teacher's experience and its meaning using the teacher's own words is created.

Example: Textual description

Visual, Reusability, Quality, and Enjoyable are some of the properties of a learning object according to the teachers' lived experience. D1's comment about the reusability is "You can use a learning object again and again that is really important", which illustrates D1's feeling regarding the importance of using a material in multiple contents at multiple times.

4.4.4   Step four: Imaginative Variation

The next step in data analysis was the imaginative variation (or imaginative free variation). It is "…the process of approaching the phenomenon being experienced from different perspectives by imaginatively varying features of the phenomenon" (p.19). This step was used to create possibilities and identify potentialities. During phenomenological reduction, imaginative variation was used to determine what was (what was not) truly essential to the meaning of the experience. This is accomplished by removing individual constituents from the structure to decide whether the phenomena would collapse, or not. According to Giorgi (2003), imaginative variation is also used to transform the description (in daily language) of the participants on the phenomenon into the "toward psychologically heightened revelation" (p. 253). Participant D1, for example, talked about being "like a Carsamba bazaar" when explaining feelings regarding the learning objects in the internet, the researcher used his imagination to understand the feelings and generate an appropriate term for it.

4.4.5   Step five: Synthesis of meaning

The final step was the synthesis of meaning units. After identifying the essential meaning units, the researcher organized them to describe the structure of the experience of elementary teachers. Each interview was synthesized individually to obtain the essential structure of the experience of each participant. As a final part this process, all the meaning units that emerged from each interview were synthesized into central themes under related research questions. The following diagram (Figure 4.1) presents the flow of the data analysis of this phenomenological study as an example of the process mentioned above.
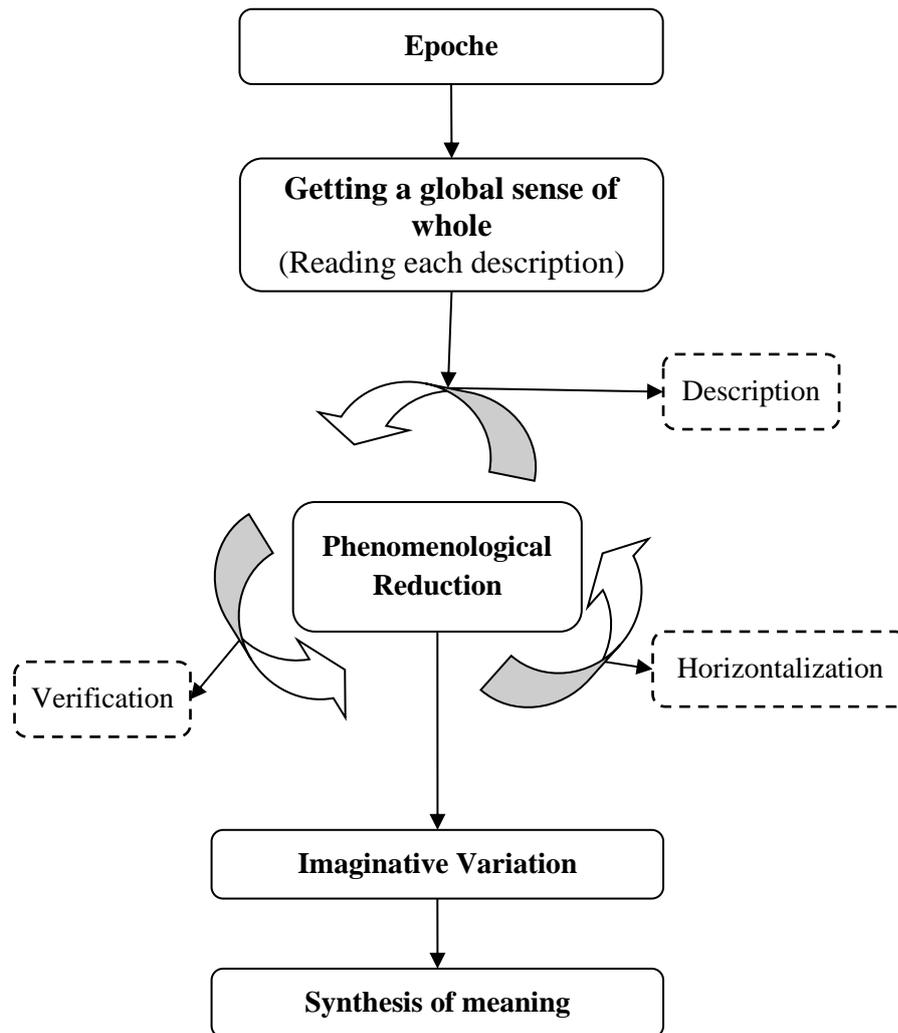
Figure 4-2 Flow chart of data analysis

At the conclusion of the data analysis to describe elementary teachers' perception regarding learning object based instruction, 30 themes and sub-themes and 116 codes emerged. They are discussed in detail in the following section.

4.5 Research Questions and Themes

4.5.1 Research Question One
The first research question was "*How do teachers perceive their role in their class as a teacher who uses and develops learning objects?*" This question aims to identify the experiences of teachers as instructional leaders when adopting learning object-based instruction in the classroom. According to Akpinar and Simsek, (2007), teachers are the only responsible person in the classrooms who can decide what resources and strategies are to be used, and how the students can learn by using these tools with relevant activities (Bratina, Hayes, & Blumsack, 2002). Because teachers have the responsibility to define their job descriptions and to set their boundaries about whether or not to use digital

resources in classes it may be reasonable and helpful to explore a teacher's educational risks related to learning objects in their classrooms.

Under this research question four themes developed from reference codes were formed: *teachers use of the repository, teacher use of the multiple learning objects, purposeful implementation, classroom environment,* and *classroom environment.* Table 4-2 indicates a summary of the number of references in the interviews for each theme.

Table 4-2 Themes for the First Research Question

Themes	Number of references
Teacher use of the repository	41
Teacher use of the multiple learning objects	52
Purposeful implementation	11
Classroom environment	3

4.5.2   Research Question Two

The second research question was "*How do teachers implement learning object-based instruction in their daily instruction?*" This questions was asked to better understand the decision-making process (Wiley, 2004; Sharabi, 2009) when teachers carry out the implementation of learning object-based instruction. Nash (2005) indicated that instructional strategies, when conducting a learning object-based instruction, should be consistent with these online materials in order to select the most suitable learning objects for the student. To reveal the practices of teachers who implement a lesson integrating the learning objects from the repositories or other potential resources, it may be helpful to define the most appropriate instructional strategy to be used with learning objects.

Three themes under the four research questions were developed from the reference codes and titled as; *instructional strategies*, *implementation process*, and *teacher differentiation in implementation*. Table 4-3 provides a presentation of themes and number of references for each theme.

Table 4-3 Themes for the Second Research Question

Themes	Number of references
Instructional strategies	9
Implementation Process	58
Teacher differentiation in implementation	21

4.5.3   Research Question Three

The third research question, *"How do teachers define learning objects and learning object based-instruction through an implementation process?"*, was asked to determine the teacher's understanding of the learning object and learning object-based instruction approach. What a learning object means to teachers was explored in order to reveal their personal definitions which could be related to their educational background, course area, or attitudes toward these learning materials or the technology used to integrate them into the instructional environment. In the literature of learning objects, there is still an ongoing discussion on the definition of a learning object and its scope (Wiley, 2000; Wilhelm, 2005; Shank, 2003; Downes, 2003), and no general definition has yet been accepted by the majority of researchers (Shank, 2003). This research question may therefore be helpful in revealing a "working" definition of learning object from the teachers' own perspectives and (or) their actual experiences of this phenomena.

Teacher education, teacher definition, properties of learning object, creating a learning object, created learning objects, perceived benefit, and teacher reaction were the themes revealed under the third research question. Table 4-4 displays themes related to the research question and number of references for each theme.

Table 4-4 Themes for the Third Research Question

Themes	Number of references
Teacher Education	38
Teacher Definition	41
Properties of learning object	47
Creating a learning object	26
Created learning objects	14
Perceived Benefit	43
Teacher Reaction	51

4.5.4   Research Question Four

The fourth research question was "*What are the obstacles and opportunities for learning object-based instruction that affect teacher performance and instruction implementation?"* The purpose of this research question was to reveal potential problems and opportunities available from conducting learning object based instruction. According to Clark and Rossett (2002) learning object usage in education has two main advantages: reducing cost and the reuse of learning objects. On the other hand, Dillon (2000) indicates that teachers do not use these resources effectively due to the lack of sufficient information and suggestions for the integration of such resources into the educational arena. Theoretical (definition, metadata standards), usability (locating and reusing), and design problems (quality, time, design, and development) are other issues that affect directly or indirectly teachers' opinions and attitudes toward these learning materials (Wiley, 2003). Identifying potential benefits and difficulties teachers could encounter during the implementation process may help them develop a set of rules for more effective learning object implementation and usage in their classes.

Two themes were developed under this research question: *Opportunities* and *Problems*. Table 4-5 presents themes and number of references participants made about obstacles and enablers of learning object based instruction throughout the interviews.

Table 4-5 Themes for the Fourth Research Question

Themes	Number of references
Opportunities	69
Problems	80

4.6   Results

4.6.1   Research Question One: How do teachers perceive their role in their class as a teacher who uses and develops learning objects?

The first research question contained four themes: teacher use of the repository, teacher use of the multiple learning objects, purposeful implementation, and classroom environment.

4.6.1.1   Teacher use of the repository

The rationale for the first theme was to reveal advantages and disadvantages of the repository and kinds of the repositories teachers use to select learning objects. In this topic, participants' responses were formed from five sub-themes. Five codes regarding the advantages of an LOR emerged: variety of LO, variety of LOR, communication tool, locating a LO, and easily accessible. There were three codes regarding disadvantages of LOR: subscription, quality of LO, and links surfing. Four codes emerged under the quality of LO in a LOR: very simple object, good quality, poor quality, and prefer to create own object. There were four codes revealed from the kinds of LOR. Table 4-6 provides a detail presentation of sub-themes and codes under each of the sub-themes concerning teacher use of the repository.

Table 4-6 Teacher use of the repository in learning object based instruction

Sub-Themes and Codes	Number of participants	Number of references
Advantages		
• Variety of LO	6	7
• Variety of LOR	4	5
• Communication Tool	1	2
• Easily locating LO	1	2
• Easily accessible	3	3
Disadvantages		
• Subscription	2	2
• Quality of LO	7	13
• Links surfing	2	3

Table continued

Sub-Themes and Codes	Number of participants	Number of references
Quality of LO		
• Very simple	4	6
• Good quality	2	3
• Poor quality	3	4
Kinds of LOR		
• Forums	3	4
• Web portals	8	17
• Search engines	4	5
• Blog	1	1

Advantages. The objective for the first sub-theme was to discover the positive aspects of the LOR from teachers' point of view. Some of the participants stated several advantages of LOR which affected usage and implementation: (a) variety of LO, (b) variety of LOR, (c) communication tools, (d) easily locating LO, and (f) easily accessible. Most of teachers (almost 80 percent of the participants) thought that the main advantage of a LOR was that it contains many different kinds of learning objects within one place. Participant 4 explained:

> *There are a lot of options, I mean; there are different students in our classes and they learn in different ways. If a student did not understand a topic, you can use different tool [a learning object], so if a power point presentation did not work, you can use video or any of many possibilities available in the repositories (DZC4 – 6:48).*

Participant 5 said that "we have a lot of alternatives available that can fit your needs. Sometimes you can reach much more than you need" (DZC5 – 7:28). On the other hand, Participant 5 added "generally, I can find many things I am looking for, however sometimes I could not, especially related to my subject area, so I think it is not enough" (DZC5 – 7:50).

Four participants (almost 40 percent) described variety of LOR as one of the advantages of using a learning object repository. Participant 3 stated that "I can find different learning objects on a topic by using web portals on a specific field, search engines, and forums" (DZC – 5:33). "We are using forums as a learning object repository. There are forums available specifically for classroom teachers in elementary level. In addition there are web sites and blogs" (DZC – 8:5), participant 6 added. Three participants saw having an easily accessible object repository as an advantage as Participant 3 stated "Today learning objects and a learning object repository can be obtained very easily. There is nothing you could not reach to. You need to take time on it. That is all!" (DZC3 – 5:55). One participant said that LOR can be seen as a communication tool between teachers to share their ideas about a learning object. Participant 1 describes communication tool as "it [learning object repository] makes many things easier for teachers in terms of sharing

ideas to other teachers on a learning object, I mean you can access experiences through a learning object that they already used in their classes…" (DZC1 – 3:65)

Disadvantages. The main objective of this sub-theme was to reveal the problems teachers encounter through usage of a learning object repository. Only three properties of LOR were considered as disadvantages for participants: (a) subscription, (b) quality of LO, and (c) links surfing. In general, each participant has positive attitudes and belief toward the use of learning object repository, however almost all of the participants (90 percent) stated that the most important disadvantages of LOR is the quality of LO. Participant 3 stated "Available learning objects did not fit my expectations, for example there are power point presentations but they are not different than our books. You can see them as a book including big pictures; students have the book so they do not need much more" (DZC3 – 5:56). Participant 7 added that "no pictures, no sound, no animation. Text [in a learning object] does not include short and concise information. That is not a learning object. " (DZC7 – 9:42) while Participant 8 believed in creating one's own learning material by saying:

> I do not think available learning objects are best fit to my needs in terms of quality and content. I mean if we create a learning object by ourselves, it will be more reliable at least. Since you know what you need and which examples you need to give the students when conducting the lesson, you can prepare it very carefully. (DZC8 – 10:48)

In addition, Participant 3 said that "I do not think that learning objects available over the internet are high enough quality, I think some are even very poor quality" (DZC3 – 5:60). Two of the participants thought that subscription fees are one of the negative effects on usage of these resources. While Participant 4 criticized subscription by saying "Some of web sites I used want subscription so I think that is the missing [negative] thing" (DCZ4 – 6:14), Participant 7 said that "…one of them [repositories] I used is not free, there is a monthly subscription payment, however the presentations in that site are really very good" (DZC7 – 9:10). Two participants discussed spending a lot of time on link surfing within repositories and web pages.

Quality of LO. The objective of the third sub-theme of Quality of LO was to provide insight into teachers' experiences regarding how to define the quality of learning objects they used during a lesson. Three groups emerged from participants' comments on the quality of LO: (a) very simple, (b) good quality, and (c) poor quality. Almost all of the teachers participating in the study criticized the quality of learning objects with frustration. Four participants (almost 50% percent) thought that the quality and usefulness of LO is inadequate and defined them as "very simple". Participant 2 stated, "It is not so difficult for me to prepare a power point presentation, you can do it in a few steps just using copy and paste. These are the objects we found through the internet." (DZC2 – 4:51) and Participant 6 said, "The learning objects we get from the repositories do not meet my needs and expectations so because of that I generally prefer to create my own learning objects" (DZC6 – 8:6). Participant 8 added that "some power point presentations can be really very simple so if I want to use a resource [a learning object] from the web for my lesson, I research it a lot more." (DZC8 – 10:17) Three participants found learning

objects to be of poor quality while only two participants thought the online resources are good enough quality to use them in their lessons.

Kinds of LOR. The objective for the fourth sub-theme of kinds of learning object repositories was to ascertain what kinds of learning object repository teachers use to gain learning objects and which repository combinations teachers prefer as a part of learning object based instruction. Teachers reported that repositories include (a) forums, (b) web portals, (c) search engines, and (d) blogs. Three participants said they prefer to use forums as a repository to find learning object to fit their needs. Participant 6 stated it by saying "We are using forums as a learning object repository; actually there are some forums that are only available for us, advisory teacher" (DZC6 – 8:5). Participant 7 added that "I can find different types of the learning objects by using search engines and forums" (DZC7 – 9:11). Almost all of the participants discussed using web sites as the main resources to find learning objects. Participant 3 said, "There is a web site for the classroom teachers, named as sinifogretmeniyiz.biz, you can find a lot of power point presentations when you enter the site" (DZC3 – 5:72), and Participant 1 discussed using a combination of different repositories by saying "…generally I am using search engines and we have a site belonging to us, there are lots of things within the site, such as maps, images, quizzes, games, concept maps, and many others…" (DZC1 – 3:11). Three participants stated search engines as a primary search tool for their learning object repository. One participant only mentioned blogs for searching learning objects by saying "I am getting much more benefit from bloggers' sites…"

4.6.1.2   Teacher Use of Multiple Learning Objects

The rationale for the second theme under the first research question was to define what kind of learning material teachers prefer for their lessons. Participants stated 9 different types of learning objects: (a) power point presentations, (b) videos, (c) excel, (d) games, (e) movies, (f) cartoons, (g) animations, (h) simulations, and (i) printed documents. The most common learning object type preferred by 8 participants (100 percent) was power point presentations as participants stated "I am generally using power points because there are a lot of materials that are already created [in this format]", and "…primarily [power point] slides…". On the other hand, as mentioned in the quality of LO theme, some of the participants mentioned the low quality of learning objects especially in power point presentations. Animation was the second most popular learning object type being used by 5 participants, one of whom stated that "I prefer to use animations because they draw students' attention much more". Table 4-7 shows the variety of learning objects preferred by participants, the number of participants mentioning each learning object during interview, and the number of references.

Table 4-7 Type of the learning object used by Participants

Learning Objects	Number of participants	Number of references
Power point presentation	9	21
Concept map	1	2
Video	3	6
Excel	2	2

Table continued

Learning Objects	Number of participants	Number of references
Game	2	4
cartoon	2	2
animation	5	8
Simulation	2	3
Printed documents	1	2

4.6.1.3   Purposeful Implementation

This theme was aimed to reveal teachers' preferences about how often they integrate learning objects into their lessons. Participants' responses are categorized into three categories: (a) always, (b) mostly, and (c) irregularly. One participant said that "I am always using power point presentations; actually my lessons are based on these objects". Five participants stated that learning objects are used when the subject or curriculum is appropriate to use these materials in the lessons. Participant 2, for example, said "it is not useful for every subject" (DZC2 – 4:33) and "it is not possible to use learning objects for every subject, students, for example, do not want to go with presentations for some subjects, instead they want me to use traditional instruction" (DZC2 – 4:34). Three participants defined their use of the learning objects as irregularly. One participant stated "…as I said, maybe it [not using learning objects regularly] is related to my course area, or maybe it is my fault. I am not using them as much as I want" (DZC3 – 4:11). Table 4-8 presents teachers' preferences regarding purposeful implementation and number of participants and references.

Table 4-8 Purposeful Implementation

Purposeful Implementation	Number of participants	Number of references
Always	1	1
Mostly	5	6
Irregularly	3	3

4.6.1.4   Classroom Environment

The rationale behind the third theme was to learn how the classroom environment is designed or redesigned by school teachers to conduct a learning object based instruction. According to participants' responses and field observation reports, three categories are described and observed: (a) traditional settings with computers, (b) nontraditional settings with computers, and (c) computer lab. Five participants (almost 50 percent) were observed to use traditional settings with computer and projection system including machine and screen. Three participants reported that a non-traditional classroom environment is sometimes more appropriate for this type of the lessons. One participant said "Traditional classes are, I think, not good for this type of the instruction. I mean we need to think to create much freer environment for our students…" Table 4-9 provides a summary of three physical conditions participants stated about learning object based instruction.

Table 4-9 Classroom Physical Environment

Classroom Environment	Number of participants	Percentage of Participants
Traditional settings with computers	5	55%
Non-traditional settings with computers	3	35%
Computer lab	1	10%

4.6.2   Research Question Two: How do teachers implement learning object-based instruction in their daily instruction?

The second research question contained four themes: instructional strategies, implementation process, teacher differentiation in implementation, and student new role.

4.6.2.1   Instructional Strategies

The rationale for the first theme was to devise instructional strategies for the implementation and deployment of learning objects by teachers in ways that facilitate learning. Nash (2005) indicates that instructional strategies, learner level, learning objectives, desired learning outcomes, and the range of the content should be taken into consideration before using a learning object.   Five instructional strategies and activities were defined by teachers: (a) class discussion, (b) interactive learning, (c) scaffolding, (d) problem solving, and (e) constructivist learning. Seven participants (almost 80 percent) said that their instructional process includes class discussion. Participant 7 explains the learning process:

> *...First of all, I am asking a crucial question in order to take students' attention to the lesson, everyone (is wondering) wants to know the answer to the question, I am not telling them the solution, then I am conducting my lesson while they are listening to me carefully. After finishing the lesson subject, during the rest of the lesson period, I am using class discussion method with power point presentation including related questions to the topic (including questions and answers) (DZC7 – 9:6)*

Participant 8 describes the process:

> *...if I use power point presentations, I am always starting my lesson with oral presentations and... then I am referring them [power point presentations] in some specific points during the lesson ...and using some examples from the presentations. ...I mean, instead of writing an example, we can see much more from them. I am then finishing my lesson with question and answer method...(DZC8 – 10:3)*

One participant uses interactive learning activities in lessons for the students as a second method. Two participants stated that they use scaffolding, one participant uses problem solving, and one participant uses constructivist learning as a primary instructional strategy. Four participants discussed using blended learning as the learning method when integrating learning objects into the lessons. Table 4-11 provides the instructional process that participants used in their lessons and the number of references participants made during the interviews.

Table 4-10 Instructional Strategies and Activities Used by Participants

Strategies and activities	Number of participants	Number of References
Class discussion	7	9
Interactive Learning	1	1
Scaffolding	2	2
Problem Solving	1	1
Constructivist learning	1	1

4.6.2.2   Implementation Process

The rationale for the second theme was to uncover the implementation steps of the learning object based instruction. The following implementation steps as sub-themes were defined in the use of learning objects in the lesson: (1) selection of content, (2) searching of LO, (3) selection of LO, (4) revising of LO, and (5) implementation. Four codes emerged regarding the mechanism for the searching of learning objects: web portals, search engines, forums, and blog. There were three codes regarding the selection of learning objects: taking students' attention, student level, and learning outcomes. For the revising of learning objects four codes were created: no changes, adding/removing slides, making some changes, and removing irrelevant things. The following table provides a summary of sub-themes and codes about implementation process of learning object based instruction (Table 4-11).

Table 4-11 Steps of Implementation Process

Sub-Themes and Codes	Number of participants	Number of references
(1) Selection of Content	9	11
(2) Searching of LO		
• Web portals	3	4
• Search Engines	8	17

Table continued

Sub-Themes and Codes	Number of participants	Number of references
• Forums	4	5
• Blog	1	1
(3) Selection of LO		
• Be attractive	8	13
• Be appropriate for student level	5	7
• Be appropriate for lesson outcomes	5	6
• Humor	1	1
(4) Revising of LO		
• No changes	1	1
• Adding/Removing slides	6	9
• Removing irrelevant things	1	2
(5) Implementation of LO		
• Based on technological equipment	9	15
• Based on availability of LO	4	7
• Based on availability of time	3	3
• Based on knowledge and skills	4	5

Selection of Content. The objective for the first sub-theme was to learn the first step of participants' implementation process of learning objects. All participants expressed content selection as the first step in the process. Participant 3 said:

> …at the subjects students cannot learn easily, especially at some subjects in mathematics and science… I mean if you teach them with just using traditional method [based on speaking], students cannot understand…at this point learning objects do come into consideration…" (DZC3 – 5:3).

And Participant 4 said that learning objects are included to the lesson "according to the lesson subject" (DZC4 – 6:2). About content selection, Participant 3 stated that "It [using a learning object in the lesson] is based on lesson's subject and course. For example, I am not using regularly learning objects in Turkish lesson. I am generally using traditional method in that lessons, however in Mathematic I am using them a lot."

Searching of Learning Objects. The objective for the second sub-theme was to learn teachers' searching methods as the second step in the implementation. Searching styles reported by participants include (a) forums, (b) web portal, (c) search engines, and (d) blog. The result of the sub-theme is not explained here because the same sub-theme was also stated for the first research question under the theme of kinds of learning object repositories.

Selection of Learning Objects. The objective of third sub-theme was to learn which criteria participants used for determining whether or not a learning object is appropriate for their lesson activities. Participants defined four criteria for the selection of learning

object: (a) be attractive, (b) be appropriate for student level, (c) be appropriate for the course outcomes, (d) be funny. Eight participants (almost 95 percent) stated that capturing students' attention was a critical characteristic for selecting a LO for the students. Participant 6 said:

> *I definitely use visual media [in my slides], you can put a cartoon or a picture that takes students' attention, but I am specifically taking advantages of cartoons. They includes some jokes and also it help student talk a lot than others (DZC6 – 8:11)*

In addition Participant 7 said, "the visual elements in the slides is drawing students' attention much more, so I am even not telling them 'be quiet' so they are listening to me very carefully" (DZC7 – 9:14). Participant 1 added that "it is very important to start a lesson with the intriguing learning objects…"

Four participants judged the level of student is of primary importance in selecting a learning object. Participant 3 said, "…The first thing I am considering while searching a learning object is the level of students…" and Participant 5 added "Students' level is also important". Five participants also stated that course outcomes were the first thing they were looking for in the process of selection, including "I am generally selecting learning objects appropriate for the lesson outcomes" and "I am using learning objects according to lesson objectives". Humor was the one of the selection criteria stated by one participant "…especially they should be funny…"

Revising of Learning Objects. The objective of the third sub-theme was to learn how teachers revise a learning object that they want to use in their learning environment. Three types of revising were described by participants: (1) no changes, (2) adding/removing slides, and (c) removing irrelevant things. Only one participant expressed using a learning object without any changes. Most of the participants (almost 60 percent) said that revision of learning object includes adding and removing slides in the PowerPoint presentations. Participant 7, for example, said "I am spending less time since I found the presentations that is already created by others and ready to use in my lessons, just I am watching it and shortening a few things to set it 40 minutes". Participant 6 added "there are lots of learning objects that I found over the internet and outlined it and then added slides". One participant stated revision process started with taking off irrelevant things from the presentations.

Implementation of Learning Objects: The objective of the fifth sub-theme was to learn about the various conditions under which teachers implement learning objects in their educational settings. The implementation conditions stated by participants were as follows: (a) based on technological equipment, (b) based on availability of learning object, (c) based on availability of time, and (d) based on knowledge and skills. All of the participants stated that the variety of the technological resources available in the school environment affect their implementation of learning objects. Participant 2 said, "Eventually, my school have these facilities, I have projection device and computer". Participant 3 explained this by saying:

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...Of course it [use of learning objects] is related to the technical facilities. In order to use these [learning objects], a projection equipment should be in your classroom. I know it is not a simple thing to have them. Projection device and a computer should be. You need to have a laptop to bring it to the classroom, or a computer should be in the classrooms so that you can benefit from them...I had all these last year and used a lot, however I do not have these year. (DZC3 – 5:6)

Four participants discussed the learning objects available over the internet as a factor affecting implementation process as participants stated, "The learning objects we get from the repositories does not meet my needs and expectations so I generally prefer to create my own learning objects or I am using my traditional teaching method", and "I do not think power point presentations are not quality enough or even poor quality". Three participants saw time availability as a barrier for the implementation of learning objects. Participant 8 said, "There are times I need to use at some points. If I take time to prepare something nice, I believe that it will be very helpful for me", and Participant 3 said, "you can create power point presentations, but it, of course, takes your time".

Like other participants who reported knowledge and skills are critical factors for implementing resources in the learning area, participant 3 stated "sometimes I want to use animations or something interesting for students, however I could not find them. We are not in a position that we can create such kinds of learning object. I do not think no teachers can do that". And participant 8 said "…that is really taking my attention and I could not present them [some learning objects over the internet] in front of the students, such as small-caps errors, and common grammatical problems".

4.6.2.3   Teacher Differentiation in implementation

The aim of the third theme was to identify participants' perceptions of their reasons for implementing learning object based instruction in their daily instruction. Participants differentiated their instruction in six ways to meet the needs of their students: (a) changing teaching style, (b) motivating students, (c) giving more choice to students, (d) adjusting difficulty, and (e) giving more time to students. Table 4-12 presents the number and references of participants helping students by differentiating instruction to facilitate learning. Five participants (almost 50 percent) stated that when they integrate learning objects to their lessons, they generally change their teaching styles to help students learn more and understand better. Participant 1 said, "Information is now something that cannot be followed, and it is not possible to memorize everything because it is growing like a snowball so we are trying to teach students to learn the ways to access the information, such as how to use library, how to use internet" and added that "…as a result we did not think we can teach our students with games, animations, and cartoons, however we are doing all of these today". Participant 2 explained changing teaching style by saying "…I mean if I tell them for two hours, they do not understand well, but when they see there [in the presentations], they learn better or at least remember easily". Participant 3 discussed changing teaching style with learning objects in a different way that is "with these small learning materials teachers have recently changed his/her teaching styles, however teachers should not become addicted to using learning objects in the lessons. The objects is not the objective, instead it is only a tool".

Motivating students, the most referenced data participants (almost 80 percent) highlighted during the interviews, is the main purpose for which teachers use learning objects. Participant 1, for example, said

> *If students do not have curiosity, they do not learn. It is very important to start a lesson with an intriguing learning object. I mean it should attract students' attention. It can be a question or something else, however it should definitely be something taking attention of students because they motivate them. (DZC1 – 3:44)*

Another participant indicated

> *As I said before, it is very important for students in terms of motivation. They are motivating students much more and helping students to participate to the lessons because they are attracting the attention of students and this is the same for everyone. Before to start something, it should take your attention first and this is especially important for elementary school students. (DZC3 – 5:20)*

Three participants (35 percent) stated that using learning objects in their daily practice creates more choices for the students by increasing the variety of media in the learning objects. Participant 7 stated, "I am using presentations because they includes texts, pictures, animations, and sometimes sounds. They are more useful in completing the some of the weaknesses of the books". Two participants stated that they have much more time to deal with students in different activities.

Table 4-12 Participant Applications of Learning Object Based Instruction.

Teachers' Applications	Number of participants	Number of References
Motivating students	7	9
Changing teaching style	5	11
Giving more choices to students	3	3
Adjusting difficulty	2	3
Giving more time to students	2	3

4.6.3   Research Question Three: How do teachers define a learning object and learning object based-instruction through the implementation process?

The third research questions contained seven themes: teacher education, teacher definition, properties of learning objects, creating a learning object, created learning object, perceived benefit, and teacher reaction.

4.6.3.1   Teacher Education

The purpose of the first theme was to understand the effect of past experiences and teacher area on the subject of learning object based instruction. Four factors emerged from participants' responses: (a) teacher area, (b) teacher education, (c) past experiences, and (d) adaptation. Table 4-13 indicates factors affecting learning object usage based on participants' responses. All nine participants stated that they generally decide according

to their subject area whether or not they use a learning object in their lessons. Some of the participants, for example, included participant 8 who said, "It is said that it [using a learning object] is not so effective in our subject area, I suppose it uses especially in numerical lessons", participant 5 who said "…it is based on the course subject", participant 5 who said "I am teaching with animations, simulations, and again power point presentations in my science lessons", and participant 2 who said "it depends on the subject of the course". Three participants said that their educational background and personal willingness to use learning objects plays an important role through the comments like "we graduated from university without knowing anything about internet, we generally use printed documents", and "I am using because I read from my college lessons that it should be used and because I know it". Six participants indicated past experiences in understanding learning objects and learning object based instruction by saying "we made them a lot in the college courses so I know from there and prepare power point presentations for myself" and "I had some information about power point presentations and flash animations because of the college courses".

Table 4-13 Teacher Education Effect on Learning Object Based Instruction

Teacher Education	Number of participants	Number of References
Teacher area	9	11
Teacher education	3	5
Past experiences	6	13

4.6.3.2   Teacher Definitions

The second theme was aimed to describe how participants understand and define learning objects in their daily instruction. Six definitions reported by participants are as follows: (a) an object digital or non-digital, (b) an object retaining of knowledge, (c) a guiding tool, (d) a facilitator tool, (e) a motivational tool, (d) a helper for teachers. Table 4-14 shows a brief summary of number and reference of the participants and combination of the definitions stated by participants.

Table 4-14 Teacher Definitions of Learning Object

Definitions	Participants	Number of participants	Number of References
An object digital or non-digital	DZC1; DZC3; DZC4; DZC6; DZC8;	5	5
An object retaining of knowledge	DZC3; DZC4; DZC5; DZC6	4	8
A guiding tool	DZC1;	1	2
A facilitator tool	DZC2; DZC3; DZC6; DZC8	4	5
A motivational tool	DZC8; DZC9; DZC1	3	3
A helper for teachers	DZC7; DZC8	2	2

The theme of Teacher definition developed from the participants' responses to the interview question 3 *how can you define a learning object according to your*

experiences? All participants responded to this question, while five participants (almost 50 percent) expressed uncertainty about the definition of a learning object by saying "when you say learning object, I have not had a lot in my hand" and "I do not have any idea about what is a learning object before". Five participants viewed learning objects as having both digital and non-digital properties and stated this as follows:

> *Now we have something like this: for example, I do not have a large library in my house and also the library of the school is not enough for students. It is not always possible to find a book of any poet and show the students. Instead, I can show them the cover of all of the books from internet or presentations. they retain easily in this way, however sometimes to view the book itself, I mean to touch and analyze it, can be more useful for them than just seeing from the internet. (DZC8 – 10:49)*

4.6.3.3   Properties of Learning Object

The properties of learning objects are important to ensure standards and a standardization process for the end users (Bryden, 2003). The purpose of the theme of properties of learning object was to unveil attributes of the learning objects from the interviews of participants. The properties of a learning object that participants described are categorized under eight headings: (a) objectivity, (b) granularity, (c) developable, (d) reusability, (e) enjoyable, and (f) easy to remember. The most commonly given response about the property of a learning object by participants (8) was objectivity: "presentations can help [students] objectify intangible concepts" and "it objectifies and facilitates learning". The least stated property of a learning object was being developable and enjoyable by two participants. Table 4-15 displays the references and number of participants and a distribution of properties of learning objects.

Table 4-15 Attributes of Learning Object Discussed by Participants

Properties	Number of participants	Number of References
Objectivity	8	11
Granularity	4	5
Developable	2	13
Reusability	6	7
enjoyable	2	5
easy to remember	5	5

4.6.3.4   Creating Learning Object

The purpose of the fourth sub theme was to uncover participants' feeling about the process of creating a learning object. As stated by participants during the interviews, the development process of creating learning objects was not easy or simple. Participants emphasized five aspects that describe how participants think or feel when developing a learning object: (a) taking time, (b) difficult, (c) special education, (d) in-service training, and (e) easy. Table 4-16 provides the number of participants creating learning objects and number of references indicating the number of how many times participants discussed this code throughout the interview. The large number of the responses was about two

themes, one of them was the amount of work (almost 60 percent) participants stated in creating or using a learning object in their instructional design. About the theme of taking time, participant 2 indicated "I think it is not difficult but it is taking time and the more you have time the more beautiful the thing that is created" (DZC7 – 9:1). Another participant highlighted his experiences in creating learning object by saying "in my opinion, to prepare a power point presentation is taking a bit time. Colors, effects, or setting slides transitions, all of them is taking time. Preparing presentation is taking two or three hours" (DZC6 – 8:39).

A second theme participants commonly stated was special education. Six teachers indicated that the needs of special education or training should be considered when developing a learning object. For example participant 5 expressed "…but we saw that there are friends creating power point presentations with animations, however I am not in a position and I need to take a different education for that." (DZC5 – 7:49). Three participants also indicated a request for practical training on creating and using learning objects in such a way for easier integration into the learning environment. While three of the participants saw this process as difficult, two teachers indicated the creation of a learning object according to their needs was easy.

Table 4-16 Participants' Opinions on Creating Learning Object

Creating a learning object	Number of participants	Number of References
Taking Time	6	9
Difficult	3	3
Special Education	5	6
In service Training	3	6
Easy	2	2

4.6.3.5   Created Learning Objects

The purpose of the fifth sub-theme was to understand the types of learning objects that teachers create in their daily instruction. Participants indicated two types of learning materials: (a) power point presentations, and (b) video. The following table displays three learning objects stated by teachers with number of participants and references (Table 4-17). Almost all of the teachers created power point presentations as learning objects for a specific topic. For example, "…I created a presentation for the science and technology course." (DZC5 – 7:36) and "I prepared presentations about mathematics" (DZC8 – 10:45). Only one participant stated trying to create learning objects in the form of video: "…for example, I have videos and I am using them. I am taking camera the places I go to, and then showed them [students]. It is attracting their attention much better" (DZC4 – 6:39). One participant also told about creating concept maps as learning objects.

Table 4-17 Learning Objects Created by Participants

Learning Object	Number of participants	Number of References
Power point presentation	7	13
Video	1	1
Concept map	1	1

4.6.3.6   Perceived Benefit

The purpose of the sixth sub theme was to reveal the extent to which participants perceived learning objects and learning object-based instruction as a positive tool or approach for their students and their teaching styles. Participants discussed several benefits of using and implementing them into the lessons: (a) interesting and enjoyable, (b) Increase class participation, (c) peer cooperation, (d) achievement, and (e) easily accessible. Table 4-18 provides a presentation of five benefits of using and conducting learning objects teachers stated.

Table 4-18 Perceived Benefits of Learning Objects

Benefits	Number of participants
Interesting and enjoyable	5
Increase class participation	2
Peer cooperation	3
The support for achievement and motivation interactivity	9
Easily accessible	4

Five participants stated that using learning objects in their classrooms provide them an enjoyable environment throughout the lesson. Participant 4, for example, said "they [learning objects] are very important for my lesson and if I did something very right and appropriate to my objectives, especially when getting feedback, I like it a lot" (DZC4 – 6:33) and another participant added that "I am getting to enjoy doing this [conducting lesson based on learning objects]" (DZC6 – 8:21).

All of the participants, as mentioned earlier in research question one and two, said that using learning objects helps motivate students to learn more and to learn more easily, to promote student achievement, and to improve the interactive learning environment. About achievement, participant 6 indicated "I think in line with my observations it affects students' achievement positively" (DZC6 – 8:32). Participant 1 discussed interactivity by saying "students are doing on their own these games, some animations, and such kind of fun things like these, they are just at the center of the event therefore they are getting both to enjoy and to learn, so it is very difficult to forget it, and so such kinds of activities are very helpful" (DZC1 – 3:106).

Other issues that participants discussed regarding perceived benefits are increasing class participation during the lecture, cooperation among teachers by sharing learning objects

and discussing them, and easy accessibility of learning objects within many repositories over the internet.

4.6.3.7   Teacher Reaction

The purpose of the seventh sub theme was to reveal the reaction of teachers to learning objects and student reactions from the teachers' point of view. Participants' responses were categorized under two sub-themes: teacher reaction and student reaction. There was only one code for the teacher reaction: positive, while four codes were emerged for the student reaction teacher stated: (a) always positive, (b) sometimes, (c) needed change, and (d) based on subject. The following table presents sub-themes and codes on teacher and student reaction (Table 4-19).

Table 4-19 Teacher Reaction on Learning Object

Sub-Themes and Codes	Number of participants	Number of references
Teacher Reaction		
• Positive	9	21
Student Reaction		
• Always Positive	6	12
• Sometimes	2	5
• Needed change	3	3
• Based on Subject	1	1

Teacher Reaction. All of the teachers perceived learning objects and their use as positive by saying "very good thing is emerging when you combine fun and learning" (DZC1 – 3:85), "they are very good activities for us" (DZC2 – 3:86), and "I am using those because of having a positive effect on students and facilitating their learning" (DZC8 – 10:13).

Student Reaction. The objective for the second sub theme was to learn about student reaction to the learning objects from the teachers' point of view. Participants' reported student reactions to lessons based on learning objects. These included: (a) always positive, (b) sometimes, (c) needed change, and (d) based on subject. Seven participants (almost 70 percent) stated students' reactions to the learning objects as positive. Participant 2 commented:

> *In my opinion, they thought that learning objects provide to learn by enjoying, or learning objects has the potential to make a boring course enjoyable for them. They are generally asking to me 'let's watch [presentations]' they are always behaving like this. I believed that they like too… (DZC2 – 4:100)*

In addition, participant 6 indicated "they are sometimes being in apposition that they cannot do anything without technology" (DZC4 – 6:47) and participant 5 said "they are asking to watch presentations" (DZC5 – 7:16). According to participant 6, students

definitely like lessons with learning objects, but only if "…they are attractive" (DZC6 – 8:35).

Two participants said that using learning objects can sometimes be boring for students if they use them for every lesson. Participant 1, for example said:

> *While conducting a lesson based on the learning objects, maybe we could not noticed that however there sometimes have been some critiques from our students, such as 'teacher! Do not use any book?' or 'we always watch like this'. I think children [students] sometimes want to see something different because of conducting lessons in the same way or with the same objects, even if how much you visualize the lessons and content or how much they provide easefulness for us (DZC1 – 3:79)*

According to three participants, there is always a need to change their teaching method from traditional to computer based and vice versa so as to keep students active and to create a learning environment that is changing periodically. Participant 2 said:

> *Actually, it is very different; you could not use everything for every lesson. You have to change it. For example when the projection device arrived for the first time, and when we watched it for the first time, everything was taking their attention. They aren't now so you have to use very different methods. Sometimes I stop using computer in my lessons for a while.(DZC4 – 6:19)*

One participant also indicated subject of the lesson as one of the criteria defining students' reaction to the lessons based on learning objects.

4.6.4 Research Question Four: What are the obstacles and opportunities for learning object-based instruction that affect teacher performance and instruction implementation?

The fourth research questions contained two themes: opportunities and problems.

4.6.4.1 Opportunities

The rationale for the first theme was to reveal potential enablers helping teachers use learning objects in their lessons. The theme contains three sub-themes: administration support, peer support, and positive outlook. The findings of each sub-theme were presented in detail under the same titles. Table 4-20 provides a presentation of sub-themes and codes regarding opportunities affecting implementation and using of learning object.

Table 4-20 Opportunities Participants stated

Sub-Themes and Codes	Number of participants	Number of references
Administrative support		
• Promoting approach	9	9
• Controlling teacher	3	4
• On-going support	2	2
Peer Support		
• Peer acceptance/pressure	6	6
• Peer contribution	5	8

Table continued

Sub-Themes and Codes	Number of participants	Number of references
• Peer cooperation	3	5
Positive outlook		
• Benefits	9	25
• Feasible	5	13

Administrative Support. The objective for the first sub-theme was to examine the educational leadership role of the principal in facilitation of learning object based instruction and activities. The support from administration for implementation and adaptation of learning object based instruction are defined by participants as (a) promoting approach, (b) controlling teacher, and (c) on-going support. All participants emphasized that school administrators actively support the approach and activities by expecting teachers to use learning objects, and administrators facilitate access to the necessary technological equipment they need for instruction, as participant 4 stated, "they support much and frankly they are endeavoring to help teachers to use them [technological equipment and learning objects]" (DZC4 – 6:29) and participant 8 said "the School administration support especially on this topic". Three participants reported teacher accountability as a form of administrative control over the use of technological equipment and learning objects through classroom observation, lesson planning, and monthly meetings. Participant 3 said, "They want to see you using these technology in the lessons" (DZC3 – 5:15). About classroom observation, participant 1 stated, "the thing the principal want to see in your lesson plans is the visually" (DZC1 – 3:4) about the lesson planning. On-going support was the last theme participants highlighted about administrative support. All participants indicated that their administration has supported teachers in terms of technology equipment and teacher assistants for implementing learning objects into their lesson activities.

Peer Support. The objective for the second sub-theme was to better understand the effect of other teachers' working at the same school or on the same subject, on the successful implementation of learning object-based instruction. Peer supports were categorized under three sub-themes according to participants' responses: (a) peer acceptance/pressure, (b) peer contribution, and (c) peer cooperation. Six participants discussed other teachers' knowledge and perceptions on using and creating learning objects as an important factor defining their attitudes towards these learning materials. Participant 1, for example, said, "I see that almost all of teachers, especially new graduated teachers, are using this software [to create a learning object]" (DZC1 – 3:56), and added that "you can be seen as old fashioned among teachers" if you do not use them. Participant 2 said "All of the teacher I know benefit from internet".

Peer contribution was the second theme and five participants emphasized the importance of sharing learning objects among teachers to increase their use. Participant 1 indicated

positive aspect of the process by saying "teachers are creating objects on their own and sending them to the repositories. Actually, it is growing like this and increasing variety of learning objects" (DZC1 – 3:59). Participant 6' comment on peer support was "we are sharing our power point presentations within the forums" (DZC6 – 8:7). On the other hand, some of the participants, including participant 8 and 4, said that they do not share their learning materials in online environments, such as repositories or forums, because of not finding a reliable place for storage, and also because they felt possessive about learning objects into which they invested much time and effort. Three participants also discussed the cooperation of teachers and other professionals on the same subject as a positive factor helping teachers to use learning objects in their lessons.

Positive outlook. The objective for the theme of positive outlook was to identify all aspects of learning object-based instruction in terms of teachers' perceptions, thoughts, and attitudes and to observe the positive view as opportunities for using learning objects. All participants made positive comments on using learning objects in their classrooms in terms of course area, different level, and time. Participant 4 stated, "I am using power point presentations according to the subject of the lessons" (DZC4 – 6:2) about using learning object based on the subject of the course, and Participant 1 said, "I think there are much more time for the relationship between student and teachers" (DZC3 – 3:33) about time flexibility of using learning object. Participant 3 discussed the benefits of learning object for the level of students by saying:

> The attention level of the students in elementary level is between 5 and 10 minutes, for example for a lesson taking 40 minutes the level of students can only be 5-10 minutes. Maximum 10 minutes, do not exceed this time limit. If you always use traditional method throughout the lesson, the last 30 minutes of the lesson goes without doing anything (DZC3 – 5:21)

Table 4-21 illustrates the benefits of learning objects under three categories stated by teachers, number of participants, and number of references. Five participants indicated that it is feasible for them to implement learning object based instruction.

Table 4-21 Teacher Perceived Benefits on Positive Outlook

Positive Comments	Number of participants	Number of References
Course area	7	13
Different Level	4	10
Time	2	2

4.6.4.2   Problems

The rationale for the second theme under the fourth research question was to learn about what instructional barriers, if any, prevent participants from using and implementing learning objects in the teachers' learning environment. The theme includes five sub-themes: (a) lesson planning problems, (b) design problems, (c) repetition problems, (d) classroom environmental problems, and (e) educational problems Table 4-22 summarizes

contributions participants made to the understanding of learning object based instruction, and percentages made to each problem.

Table 4-22 Problems Stated by Participants

Sub-Themes and Codes	Number of participants	Number of references
Lesson planning problems		
• Heavy curriculum	4	8
• Increased lesson duration	5	9
• Increased lesson preparation time	7	13
Design Problems		
• Irrelevant objects	3	3
• Too much text	2	2
• Too simple	2	2
• Grammatical errors	1	1
Repetition Problems		
• Losing attention of students	3	5
• Addiction to using LO	2	3
• Shifting from tool to object	2	6
Classroom environmental problems		
• Large class size	3	4
• Sound problem	1	1
• Lack of tools and resources	2	3
Educational Problems		
• In-service training	6	8
• Old experiences	2	4
• Lack of technical support	2	3

Lesson planning problems. The objective of the first sub-theme was to gain insight regarding difficulties teachers encounter during the process of implementing learning objects. Three major difficulties were stated by participants while planning a lesson based on learning objects: (a) heavy curriculum, (b) increased lesson duration, and (c) increased lesson preparation time. Four participants implicated the national curriculum as an obstacle when trying to plan for a learning object based lesson. Participant 3 stated

> *Okay. Students learn in a very good way, learn easily, and learn in a comfortable way; however you do not have enough time to finish the curriculum in time because curriculum is very heavy in our educational system. There are lots of things for students to do. In addition to them, if you totally integrate these learning materials to the lessons, you are presenting a power point presentation during the class and you see that there are a lot of things to do according to curriculum. (DZC3 – 5:43)*

Participant 8 mentioned curriculum by saying "I am using certain numbers for a lesson during one semester because of the heavy curriculum" (DZC8 – 10:35).

Another lesson planning obstacle participants stated during the interviews was lesson duration. Five of the participants stated time as an issue when using learning objects during a lesson. Participant 2 said, "if I use learning object, I can complete a lesson in two lessons." (DZC2 – 4:77) and participant 3 said, "Learning objects in a lesson slow a lesson down" (DZC3 – 5:51). In addition participant 5 indicated that learning objects are not preferred for some lessons because "I have to be fast for some lessons so presentations are taking time during the lessons…" (DZC5 – 7:5).

Seven teachers (almost 80 percent) described lesson preparation time as a barrier to implementing learning object based instruction, and participant 6 said, "You have to take time to do it, you need to do seriously a lot of things for it, as a result it is a process taking time"

Design problems. The objective of the second sub theme was to reveal issues of the design of learning objects that teachers used in their teaching and learning process. Participants defined four problems about the quality of learning objects: (a) irrelevant objects, (b) too much text, (c) too simple, and (d) grammatical errors. Three participants see irrelevant things, such as texts, images or objects, in learning materials as a disadvantage of learning object based instruction. Two participants explained that there are lots of learning objects containing too many looping animations, details, and texts, and that it can be very difficult to use them in their lessons. Participant 2 said that "it should not be used too many texts in presentations because students do not like reading when looking at the presentation. Instead in my opinion, it should be preferred images and animations" (DZC – 4:49). Two participants also indicated that the learning objects they find over the internet or repositories are mostly very simple. Participant 8, for example said, "Some power point presentations can be really very simple so if I want to use a resource [a learning object] from web for my lesson, I research it a lot more" (DZC8 – 10:18) One participant also mentioned grammatical problems in the content of learning objects.

Repetition Problems. The objective of the third sub-theme was to state "true" use of learning objects. This theme emerged from the participants' responses to the question of which factors have a negative impact on implementing these digital resources into the educational environment. Participants discussed three issues related to the excessive use of learning objects: (a) losing attention of students, (b) addiction to using learning objects, and (c) shifting from tool to objects. Three participants reported that using learning objects in lesson again and again can be sometimes boring for students and teachers. One participant said:

> *I also saw that when I was presenting a presentation in front of the whole class, they expressed that 'we do not understand from the presentations, we mean what is this we do not understand this, please teach us as it is' (DZC2 – 4:35)*

Another participant said "sometimes we are getting some complaints from the students while teaching with a projection" (DZC1 – 3:114).

Participant 3 observed:

> *Teachers should not become dependent on a learning object in a lesson. He/she bring the object to the lesson and leaning object is there a tool, not a purpose. If you use it as a purpose, students can have some questions in their head. Students construct knowledge on their own with the help of these learning materials (DZC3 – 5:39)*

One participant also mentioned a shift from using the learning object as a tool for teaching to using it for a purpose.

Classroom Environmental Problems. The objective of the third sub-theme was to learn which issues, if any, arise from physical problems in the classrooms. Participants identified two barriers that prevent successful implementation of learning object: (a) classroom size, (b) sound problem, and (c) lack of available tools and resources. Three participants stated large class sizes as an important obstacle to integrating learning objects into the learning environment, and participant 7 described the difficulty of using learning objects in such classrooms because of "…teaching mathematics in two class together" (DZC5 – 7:5). Participant 7 said, "I think there is only one missing thing, smart blackboard. It would be great if I have it in my classroom. I have everything in my classrooms except it" (DZC7 – 9:35). Participant 8 added "actually we have certain number of smart blackboards, however they have not set up yet." (DZC8 – 10:43). One participant requested a good quality sound system in the classroom by saying "Sound is very important for some presentations, but I have encountered some students' complaint, especially seating at the back of the class, about hearing problems when teaching a lesson with a presentation" (DZC8 – 34:34).

Educational Problems. The objective of the fourth sub-theme was to reveal obstacles related to teacher education and their past experiences regarding learning object based instruction. Three dimensions of teacher education were reported by participants: (a) in-service training, (b) old experiences, (c) and lack of technical support. Six participants (almost 60 percent) indicated the importance of in-service or practical training for implementing learning objects into the educational environment in a successful way. Participant 2 stated "as I said earlier, I could not prepare little animations. Maybe there can be some special educations to do it" (DZC2 – 4:92). Participant 3 discussed the need for in-service training by saying "there are even smart blackboard in the village school as well, I think it is essential to get an education taking three or four months to use it because it seems difficult" (DZC3 - 5:10). Two participants said that their old experiences negatively affect their implementation process by saying "Before these internet applications was not started to use in the school, we apply what we saw from the professors in the college and we have an educational approach just like they have, therefore we sometimes feel comfortable in this way" (DZC1 – 3:53). Two participants also discussed the need for practical assistance in case of having difficulty in using learning object. Participant 2 underlined the need of the assistance by saying "there is teacher trainer [in my school] but I do not think they know…".

4.7   Results and Conclusions

Elementary teachers' perceptions and lived experiences of learning object-based instruction was analyzed and new themes, codes, and patterns emerged from interviews regarding the feeling, experience, and perceptions of elementary school teachers on learning object based instruction from the transcribed data. The ATLAS.ti qualitative data analysis software program was used to code data and to organize themes under each research question.   Sixteen themes and eighteen sub-themes were developed from interviews for each research question that shapes the understanding of teacher of learning object based instruction. Figure 4-3 represents an organized presentation of all research questions, themes, and sub-themes.

Research Question One:
How do teachers describe their lived experience regarding usage of learning objects from a repository in an elementary school class?

Themes:
- Teacher use of the repository
- Teacher use of multiple learning objects
- Purposeful Implementation
- Classroom Environment

4 sub-themes

Research Question Two:
What instructional strategies do teachers use to conduct learning object-based instruction?

4 sub-themes

Themes:
- instructional strategies
- implementation process
- teacher differentiation in implementation

Research Question Three:
How do teachers define learning objects and learning object based-instruction through implementation process?

Themes:
- Teacher education
- Teacher definition
- Properties of learning objects
- Creating a learning object
- Created learning object
- Perceived benefit
- Teacher reaction

2 sub-themes

Research Question Four:
What are the obstacles and opportunities of learning object-based instruction affecting teacher performance and implementation?

Themes:
- Opportunities
- Problems

8 sub-themes

Figure 4-3 Data Organization Scheme

4.8   Summary

The purpose of this phenomenological study was to explore perceptions and lived experiences of teachers of learning object based instruction. Nine elementary teachers from three different schools in Duzce participated in the current study and responded to seven semi-structured interview questions regarding their feelings, ideas, attitudes, perceptions, and experiences with learning objects and learning object-based instruction. This chapter included a detailed description of data analysis procedures with five stages, in addition to the results of the pilot study, participant selection procedure, and data collection procedures. The next chapter provides conclusions and implementations, and recommendations according to the findings of research data and the literature related to the subject of the study.

CHAPTER 4

5. DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

The primary purpose of this study is to discover how well elementary school teachers understand the learning object concept, how effectively they implement them into their educational environment to overcome some educational barriers in order to enhance learning, and to identify which opportunities and problems occur when teachers implement a learning object approach in their instructional planning and practice. Nine teachers in three different schools in Duzce, western Turkey, participated in this qualitative phenomenological study with responses to seven interview questions. The main research question and sub-questions are as follows:

- How do teachers describe their lived experience regarding their usage of learning objects from a repository in an elementary school class?
  1. How do teachers perceive their role in their class as a teacher who uses and develops learning objects?
  2. What instructional strategies do teachers use to conduct learning object-based instruction?
  3. How do teachers define learning objects and learning object based-instruction through an implementation process?
  4. What are the obstacles and opportunities for learning object-based instruction that affect teacher performance and instruction implementation?

Face-to-face, semi-structured interviews were conducted with each teacher, in which they shared their personal experiences and perceptions of the learning object-based instruction approach. Participants' responses were first transcribed and then uploaded into ATLAS.ti program for sorting and organization of raw data. Based on the results of analyses, several themes and sub-themes emerged for each research question. For the first research question, four themes emerged: teacher use of multiple learning objects, purposeful implementation, and classroom environment. The second research question concerned three themes, implementation process: instructional strategies, teacher differentiation in implementation. For the third research question, seven themes emerged: teacher education, teacher definition, properties of learning objects, creating a learning object, created learning object, perceived benefit, and teacher reaction. There were two themes, opportunities and problems for the fourth research question.

5.1 The Interpretation of Findings

The findings of this study were based on the analyses of responses to seven interview questions asked of nine elementary school teachers. The responses to each interview question for each participant were analyzed individually and then compared to other responses for further analysis.

For the first research question, the researcher wanted to discover experiences of teachers as an instructional leader through advantages and disadvantages of the learning object repository teachers use to find learning objects, purposeful implementation, and classroom environment. The major results showed that the most frequently reported advantage of repositories was the variety of learning objects. Even though the teachers believed that there are a very large number of resources on the internet available for their needs, they thought that the quality of learning objects in the repositories is very poor.

The second research question was designed to reveal the implementation process of learning object-based instruction in terms of instructional strategies, the steps for implementing learning objects, and each teacher's implementation style. Overall results indicate that class discussion was the most appropriate instructional strategy participants used to facilitate learning, and maximize the effectiveness of learning. In addition, results showed that teachers implemented learning objects into the learning environment in five steps: (1) selection of content, (2) searching of LO, (3) selection of LO, (4) revising of LO, and (5) implementation. Moreover, teachers said that motivating students was the main implementation reason for using learning objects in their lessons.

The third research question was designed to reveal what teachers understand about learning objects and the learning object-based instruction approach. Results showed that teachers' subject area play an important role in affecting the teacher's decisions on whether or not to use learning objects in their lessons. Results also helped to clarify teachers' lack of a clear understanding of the learning object concept, approach, its main characteristics, and use. Furthermore, according to teachers, the excessive amount of work involved in developing a learning object and the need for special instruction on their design and development were identified as major barriers to creating learning objects for lesson activities.

The aim of the fourth research question was to understand existing obstacles and enablers for conducting learning object based instruction. Teachers identified heavy curriculum, quality of learning objects, classroom physical environment, lack of in-service training, and inadequate technical support as obstacles they encountered in the implementation process. Administrative support, peer support, and positive outlook were identified as enablers for teachers during implementation of the learning object approach.

5.2 Discussion and Conclusion

5.2.1 Research Question 1
The first research question included themes of teacher use of the repository, teacher use of multiple learning objects, purposeful implementation, and classroom environment.

Teachers exhibited generally positive attitudes towards learning objects and repositories, and they emphasized the benefits of the repositories and learning objects for student achievement and motivation regardless of practical problems in the use of the repository and uneven quality of the learning objects in the repositories.

Teacher use of the repository related to learning object based instruction was analyzed under four sub-themes: Advantages, disadvantages, quality of learning objects, kinds of learning object repositories.

Teachers noted positive experiences regarding advantages of the repositories. Their attitudes towards using learning object repositories were quite positive because of the growing number of learning objects in LORs and their easy accessibility. Teachers believed that the most important advantages of LORs were the inclusion of a very large collection of peer-reviewed learning objects and mechanisms for their retrieval. Although Neven and Duval (2002) indicated peer-reviewing as a very important process for the repositories that helps to ensure the quality of learning objects in the repository, most teachers did not specifically mention to the importance of peer-reviewed or non-peer-reviewed materials. On the other hand, Benkler (2005) emphasized that the using a peer-reviewed process can be expensive and time consuming therefore for many repositories, international or national, such a process is not used. Results also indicated that the extensive variety of LORs on the internet was another most important advantage of the repositories (Arms, 2000; Cassel et al., 2003). Participants also stated that repositories are mostly free and open resources to them, which is another advantage of the repositories.

In addition, participants emphasized that learning object repositories also help them to communicate with other teachers on the content of learning objects by asking questions and sharing ideas. In the literature, there are several studies supporting the idea of using the learning object repository as communication and interaction tools among elementary educators (Fenrich, 2001; Marcus, 2001). According to Marcus (2001), interface design plays an important role for improving communication through screen design, menus, dialogs, forums, and comments.

Teachers were also asked what negative conditions exist that discourage teachers to use the repositories. Variation in the quality of learning objects was the most cited disadvantage. Results showed that teachers generally prefer to not implement LOs into their lesson activities because of the lack of quality of LOs. MacLeod (2005) indicated "there must be a sufficient number of high-quality, properly metatagged learning objects easily accessible online in order to encourage teachers and learners to return again and again to these repositories" (p. 6). In order to verify LO quality, an examination and analysis of learning objects in terms of quality and pedagogical value can be used by applying a peer review process (Pushpagiri & Rahman, 2002; Neven and Duval, 2002). Yacovelli (2004) defined three properties of LO to ensure quality: current, cost-free, and combination of simple, intermediate and advanced information on a specific subject. Subscription was also mentioned by teachers as another disadvantage of LORs. A study conducted by Fitzgerald et al. (2003) indicated that most of the teachers complained about the cost of learning objects. Parrish (2004) indicates that use of intellectual property

(IP) is important for creators in order to gain payment for the learning objects; however, the process of utilizing intellectual property for these learning materials is still costly for teachers, students, and organization.

Participants stated that learning object quality is a determining factor for teachers who want to use LORs. Results showed that most of the teachers find many LOs too simple or of poor quality. Wiley (2003) indicated that the usage of a learning object repository by teachers is directly related to the quality of learning objects in the repository. While the Wisconsin Online Resource Center for Interactive Learning Objects has developed certain standards to increase the quality of LOs and many LORs by using a peer review process (Wisc-Online, 2005; Pushpagiri & Rahman, 2002; Neven and Duval, 2002), it seems that the subpar quality of many learning objects for elementary school teachers remains a barrier to their effective use.

Two types of digital learning material libraries, repository and referitory, have been discussed in the literature according to the way in which resources or metadata link of the resources are stored (Alfano and Hendersen, 2006). Repository refers to a system in which both the resource and its metadata are stored. Referitory, however, refers to the databases that make resources available digitally by storing only metadata and link of the resource (Alfano and Hendersen, 2006; Downes, 2004). Results indicated that teachers preferred to use four digital learning resources as a repository to locate learning objects: forums, repositories, search engines, and blog. Using repositories based on a specific subject was the most common method for teachers to find sources of learning materials, such as sinifogretmeniyiz.biz, slaytizle.com, and edebiyatogretmeni.net. The second most commonly used method for locating learning objects is using search engines, such as Google, Yahoo, or Yandex. Like the referitory, these search engines index many types of data.

According to Churchill (2006), based on the definitions of learning object from the literature (Wiley, 2000; Wiley & Edwards, 2002; McGreal, 2004; Merrill, 2000), six types of learning objects emerged: presentation, practice, simulation, conceptual models, information and contextual representation objects. Presentation objects are designed with a purpose to give direct instruction to the learners and/or to transmit subject matter to achieve a specific learning objective (Churchill, 2006). Results showed that teachers more often selected PowerPoint presentations and animations as two main types of learning objects for their lessons. PowerPoint presentations can be seen as another form of the presentation object, therefore it seems that teachers generally prefer to use presentation object for their lesson activities more than other types of learning objects.

Bannan-Ritland et al. (2000) stated that users, whether novices or experts, deploy learning objects in their daily instruction on an as needed basis to meet their students' learning needs. Most of the teachers, six participants, reported using learning objects in their educational environment when they need it and defined it as "mostly", and also stated that learning object based instruction is implemented into their lesson plans according to the subject, students' needs, and students' level. They also discussed time as one of main factors affecting the frequency of learning object usage.

Regarding how to design or redesign their classroom environment when conducting a lesson based on learning object, most of the participants indicated a traditional seating arrangement with one computer and projection device. A few teachers also designed their classrooms with non-traditional seating arrangements because they believe that non-traditional seating is much more appropriate for this type of learning method. Turel and Gurol (2011) pointed out that for effective implementation of learning objects, the physical environment is crucial in terms of light, sound system, seating, position of projection screen, ergonomics of chairs and tables, and angle of sight.

5.2.2   Research Question 2
The second research question included themes of instructional strategies, implementation process, teacher differentiation in implementation, and the student's new role. Most teachers prefer to use a class discussion method as an instructional strategy for implementing learning objects into lessons. During the implementation process, teachers discussed the following steps from beginning to the end: defining content, searching of LO, selection of LO, revising of LO, and implementation. Participants also differentiated their learning object-based instruction in different ways to meet student needs. Motivating students was the most common reason for teachers to differentiate instruction.

Parrish (2004) notes that various types of learning theories and instructional strategies may be applied to digital learning objects and the learning object approach because of their granular nature and reusable structure. In addition, according to Nash (2005) instructional strategies that teachers used in the classrooms should also be taken into consideration before their integration into lessons. Results showed that a large majority of the teachers (80 percent of participants) preferred to use class discussion to promote higher order thinking skills among students when they conduct a lesson based on a variety of learning objects. Teachers also stated interactive learning, scaffolding, problem solving, and constructivist learning as instructional strategies or activities they used in a lesson based on digital learning objects. Dong and Agogino (2001) also suggested the use of a constructivist model of learning to meet the needs of students and teachers in a learning environment based on resources of a digital library.

The implementation process refers to rules teachers used to put learning objects into practice. According to Karampiperis and Sampson (2004), learning object implementation and selection is based on some teaching and learning rules according to learners' cognitive styles and preferences. Nash (2005) stated that there are three rules that determine the selection of learning objects: being understandable (clear), providing stimulation and avoiding boredom (challenging), and minimizing the chance of failure (achievable). Teachers identified five steps to engage learning objects in the instruction: defining content, searching of LO, selection of LO, revising of LO, and implementation. All teachers expressed importance of the lesson content in using learning objects. They stated that for some subjects such as mathematics and science, it is essential to use learning objects to decrease the difficulty level of the content for the students. The second step stated by teachers was the searching for learning objects. Teachers indicated forums, web portals, search engines, and blogs as resources available for searching appropriate learning objects according to the content of the lesson. The selection of a learning object

was defined by the teachers as the third step in implementation. Results showed that the effectiveness in motivating students and focusing their attention on the lesson was the most important feature of learning objects that teachers took into consideration while selecting a learning object for a lesson. The next step was revising a learning object. Results indicated that most teachers, seven participants, revise learning objects by adding or removing slides in PowerPoint presentations. The last step in the implementation process teachers stated was implementation. Results showed that all teachers stated that the availability of appropriate technology in their classrooms as the main criterion affecting their implementation of learning objects in this process.

Teachers were also asked how they differentiate and arrive at reasons for implementing learning object based instruction in their daily teaching. Almost all of the teachers specified that they use the learning objects to motivate their students and adjust the difficulty level of the lessons content for the students. Those teachers also emphasized changing teaching style, giving more choice to students, and devoting time to them as other reasons to implement learning objects. Koper (2003) noted that teachers already know and apply an instruction based on learning objects without identifying it as such. However, Koper (2003) indicated that for the successful implementation of learning objects requires clear directions and explanations for their more effective and efficient use and integration. As a consequence, with these explanations, teachers can overcome some difficulties they encounter while sourcing, adapting, collecting and sequencing learning objects.

5.2.3 Research Question 3

The third research question included themes of teacher education, teacher definition, properties of learning objects, creating a learning object, created learning object, perceived benefit, and teacher reaction. Teachers' subject area was the first main factor affecting their decision on whether or not to use learning object in their lesson. All participants emphasized that there was a direct relationship between their subject area and their usage of learning objects. Although many participants stated the lack of training about learning object based instruction and their uncertainty about the nature of learning objects, and how to create them, all the teachers highlighted benefits of learning objects for their students in terms of motivation, guidance, and the quick review of a previous concept. Teachers also stated objectivity as the most commonly cited property of learning objects and thought that learning objects help their students to objectify intangible concepts. About creating a learning object, almost all of the teachers emphasized a need for more time and special education to create learning objects as they need to.

Results showed that teacher area and teacher education as related to learning object usage play key roles for implementing learning object based education. Six participants also mentioned the effect of their past experiences in using learning object materials in their lessons. According to Tomlinson (2005), standard professional development and professional development are different from each other, as professional development includes "reflective, informed, applied, collaborative and supportive training". Some participants also highlighted the amount and quality of the in-service training they received on the use of these digital resources in their lesson activities. In addition, results

also revealed an interest in more training, specifically focused on developmental skills, and practical applications.

As for definitions of the learning object provided by participants, results revealed the extent to which teachers understand concept of learning object and its instruction approach. Results indicated that most of the teachers do not have a clear understanding of the methodology of the learning object concept or learning object based instruction. Two participants said that they did not know anything about learning objects or learning object-based instruction and could not define it literally. Most teachers stated that a learning object means an object that can be digital or non-digital to facilitate learning by guiding, motivating, and also helping students objectify intangible concepts. This definition is similar with the IEEE one, which is "a learning object any entity, digital or non-digital, which can be used, re-used or referenced during technology supported learning", however according to Wiley (2000), this definition is too broad by including non-digital materials, and he defined it as "any digital resource that can be reused to support learning". Another definition given by teachers was that a learning object is a helper tool for them because of decreasing lesson preparation time and reusing it in different lessons or contents (McCormick & Li, 2006; Recker, et al., 2006).

About the properties of the learning object from participants' point of view, almost all participants (eight teachers) perceived objectivity as the most important characteristic of the learning object. They thought that learning objects help students to more easily understand a concept that is intangible and not easy to apply in a classroom environment. Another property of learning objects according to the majority of the teachers was reusability. They thought that one of the attractive features of a learning object is the ability to reuse it in different lessons or in different groups of students. Reusability is the core idea of the learning object approach and it refers to a process of using a digital material in multiple contexts (McGreal & Roberts, 2003; Parrish, 2004; Boyle et al., 2003). Some researchers prefer to use the term "reusable learning object" instead of "learning object". According to Parrish (2004), if a learning object is reusable, that material used in one course or in one place can be used in different courses or in different places, and also they may have an option for updating or modifying existing materials., However, teachers defined reusability as being able to use material in different years for different students, not in different contexts.

While trying to create a learning object for their lesson activities, most teachers noted the excessive amount of work involved in developing a learning object. A few teachers also mentioned about the need or special instruction needed for developing a learning object. Others indicated the importance of in-service training, and difficulties in creating these learning materials. Moisay et al. (2006) examined factors affecting the development of learning objects, and his results showed that the amount of work and lack of the skills are barriers. Missing in a generally accepted definition and some usability difficulties of repositories are other obstacles, such as screen design and navigation.

Teachers were also asked what kinds of learning object they create for their lessons to support student learning. Results indicated that almost all of the participants (eight

teachers) developed only PowerPoint presentations on a specific topic at least one time during a semester. Video, concept maps, and other materials were also created by teachers as learning object to support their student learning.

While teachers noted the difficulty of creating a learning object, and while they have uncertainty about the concept of learning objects and its characteristics, all participants saw learning objects as beneficial. Teachers indicated that learning objects help them in different ways; motivating their students to learn more easily, supporting them to improve their achievement, and providing them with an interactive learning environment. According to Kay and Knaack (2005, 2007), students and teachers benefit from learning objects in terms of enhancing their learning and motivating them during the lesson. An experimental study conducted by Cakiogku (2010) indicated that learning objects used in some activities result in a statistically significant positive effect on student achievement scores (Kay, 2012). Similarly, Türel and Gürol (2011) found that learning objects provided an instructional environment that supports students' motivation and retention. A few teachers also stated that learning objects have the potential to increase class participation during the lecture, and to provide a collaboration environment for teachers by the sharing and discussing of learning objects because of their easy accessibility over the internet. Ilomaki et al. (2006) stated that learning objects can be used as exploration tools, information resources, and objects of discussion. Wiley (2000) also pointed out that if learning objects are compared to other learning technologies, they are easily accessible, suitably priced, and easy to learn and use via the internet.

In addition to these perceived benefits, teachers' were asked for their reactions to the learning object approach. Consistent with finding by other researchers (e.g., Downes, 2000; Bradley & Boyle, 2005; Akpınar & Simsek, 2007; Baki & Çakıroğlu, 2010; Kay & Knaack, 2007b; Turel & Gurol, 2011), teachers thought that learning objects are very helpful for their students by supporting them in different ways, such as providing a brief introduction to the lesson, allowing them on their own to investigate learning objects in the activity, and facilitating class discussion with learning object. In addition, one of the participants also indicated that learning objects help their students by combining fun and learning because learning objects increase student interest, and capture student attention (Allen, 2003).

5.2.4   Research Question 4
The fourth research question included themes of opportunities and problems. The first theme contains three sub-themes: administration support, peer support, and positive outlook. The second theme contains five sub-themes: lesson planning problems, design problems, repetition problems, classroom environmental problems, and educational problems. Overall results indicated that teachers believed that their administrators have already helped them to implement learning object based instruction by promoting approach through controlling teachers, like observations and lesson plans, and on-going support. Teachers also indicated that colleague support and positive outlook they have on learning objects can be supported by other classrooms teachers who have valuable knowledge and good perceptions about learning object. On the other hand, professional

in-service training and increasing lesson preparation time were the main issues teachers addressed as barriers to implementing a learning object approach.

5.2.4.1 Opportunities

School administrators support teachers in integration of learning objects into their learning environments by requiring teachers to use learning objects and ensuring that all necessary technical equipment needed during instruction is available. All participants saw their administrators as supportive in the use of such technology in their schools, but according to teachers, administrators accomplish this through such controls as classroom observation, lesson planning, and monthly meetings. According to Ertmer et al. (1999), inadequate administrative support could be a barrier to teachers' use and integration of technology in support of learning objects in lesson activities.

Other teachers who had knowledge and positive perceptions regarding using and creating learning objects was another enabler helping teachers to use learning object. Most of the teachers, six participants, indicated that peer acceptance and pressure was one of the factors affecting learning object usage, in addition to their peer contribution and cooperation for promoting this approach. Banks (2001) indicated the importance of peer support as well as pressure for increasing the usage of learning objects in the classroom environment, especially when teachers encounter a problem during the implementation process.

Teachers generally had a positive outlook on learning-object based instruction, with only a few negative thoughts and comments. All participants indicated positive attitudes towards learning object usage in terms of course area, different level, and time. Five participants also emphasized the feasibility of the approach to implementation in their educational area. According to Sallas and Ellis (2006), teachers implemented these resources into their educational content because of time saving benefit, cost effectivity, and increasing school productivity. Kay and Knaack (2007c) also examined teachers' perceptions to reveal the perceived benefits of using learning objects at the elementary level. The study indicated that teachers were more positive than students regarding benefits of learning objects, and most of the teachers agreed that learning objects promote student learning and lesson engagement, and are beneficial by saving time in creating a good lesson plan. .

5.2.4.2 Problems

Despite the support of administrators and peers and the perceived benefits of learning object based instruction from teacher and students' point of view, teachers identified many obstacles that impede the approach during the lesson or planning stages. The biggest obstacle discussed by almost all of the teachers was the amount of time it took to plan a lesson based on learning objects. Teachers discussed the heavy curriculum with many responsibilities to teachers and students as one of the major problems in planning lesson activities. Increasing lesson duration was seen as the second problem related to the lesson planning, which affects adequate planning for learning object based lessons. Swaim and Swaim (1999) indicated the same issue, and also noted that because of limited time for the required activities in the curriculum, teachers prefer not to use learning

objects. McCormick et al. (2004) additionally pointed out that time has a negative effect on teachers' attitudes towards these learning materials.

Design problems of learning objects were cited as the second main obstacle to their effective use. Irrelevant objects, too much text and some grammatical errors in learning objects were three problems teachers identified regarding quality of learning objects they used in their lessons. MacLeod (2006) notes that teachers and learners are encouraged to use learning objects in their learning and teaching activities when high quality and sufficient number of learning objects are available over the internet or in digital repositories. According to Powel (2007) learning object quality is one of the ongoing issues for teacher that needs to consider and work on it to be used by teachers effectively.

Overuse of learning object was seen as an obstacle by a few teachers, according to complaints from their students. They stated three major issues related to overuse of learning objects in their lessons: losing attention of students, addiction to using learning objects, and shifting from tool to objective. Teachers thought that when they implement learning objects in almost every lesson, sometimes students want the teacher to revert to a traditional teaching method. Some teachers also expressed that using a learning object can be a "must-have" tool in their classroom, and for them, these types of learning materials are not a tool to support learning, but instead an objective they have to achieve in each lesson.

While teachers stated that all the technical equipment they need were available, a few teachers expressed some issues related with the physical environment of the classrooms, such as large class size, sound problems in classrooms, and lack of tools and resources (Turel & Gurol, 2011). Three teachers described large class size as one of the problems preventing effective implementation of learning objects.

Many participants also discussed the importance of having in-service training based on a practical model of learning object based instruction. They expressed that a lack of appropriate practical training was an important problem in using such kinds of technology in the classrooms. Two teachers identified their past experiences as an obstacle in implementing of the approach.

5.3   Implications of the Study

As noted before, Hudak (2007) stated that learning object based instruction is more accessible than traditional classroom activities, more appropriate for different types of learning style and levels, and useful for complementing teaching and learning with online materials. Parris (2004) also pointed out that teachers need sufficient and appropriate directions and practical applications to accomplish implementation of learning objects in effective and efficient ways within the educational environment. Results of this study may have significant implications for teachers, instructional designers or curriculum developers, who wish to implement learning object based instruction and integration of learning objects into the learning environment. Deployment of learning objects may help teachers create an environment that provides different activities and applications to meet

student needs and to motivate them.To achieve this result, however, would require a systematic approach removes uncertainties teachers have about learning object based instruction definitions, characteristics, and existing applications. This study may also have implications for school administrators who want to encourage their teachers to use these learning materials by supporting them in different ways, such as with technical equipment, in-service training, teacher assistants, or other administrative supports.

5.3.1 Significance of the Study

According to Turban et al. (2005), in today world, it is becoming a fact that new technological innovations can help to achieve, maintain, and meet requirements of a global economy, to implement strategic goals in education, and to change existing, teaching strategies. On the other hand, Robleyer (2006) stated that technology can help teachers only to provide raw materials to enhance their teaching and learning experiences or strategies. He added that teachers are the only responsible party who can decide how to use these "powerful devices" in their lessons. This current phenomenological study examined only the learning object and its implementation in education through the lived experiences of elementary school teachers.

The study revealed that while almost all teachers have positive attitudes and perceptions towards learning objects, teachers generally complain about the amount of time it takes to plan their lessons with learning objects, having a heavy curriculum to follow, and the lack of in-service training related to learning object instruction approach. Teachers know or understand learning objects in general or in parts. However, they do not have a clear understanding of an approach that addresses different opportunities for students and teachers, such as to present information in different ways to allow students to explore a lesson objective from different perspectives, to provide an interactive environment to practice what they have learned, to illustrate many complex concepts that cannot be presented easily on the blackboard, and to form lesson activities to make them more accessible over the internet. Teachers use learning objects, but in some ways that do not appropriately fit the concept.

In addition, the study showed that some teachers did not consider the importance of getting data regarding their students' habits, behaviors, and perceptions to use them in the planning phase when using learning objects for creating an appropriate instruction. The process of learning object based instruction that teachers need to consider to more effectively implement this approach according to their lived experiences and perceptions is shown in Figure 5-1.

Planning Phase

Physical Environment:
**Classrooms, Tool, and
Resources**

Students' Learning Ability:
**Habit, behaviors, and
perceptions**

Instructional Strategies:
**Class Discussion
Scaffolding
Constructivist**

Varied
Content
Products
Process

in-service
Training

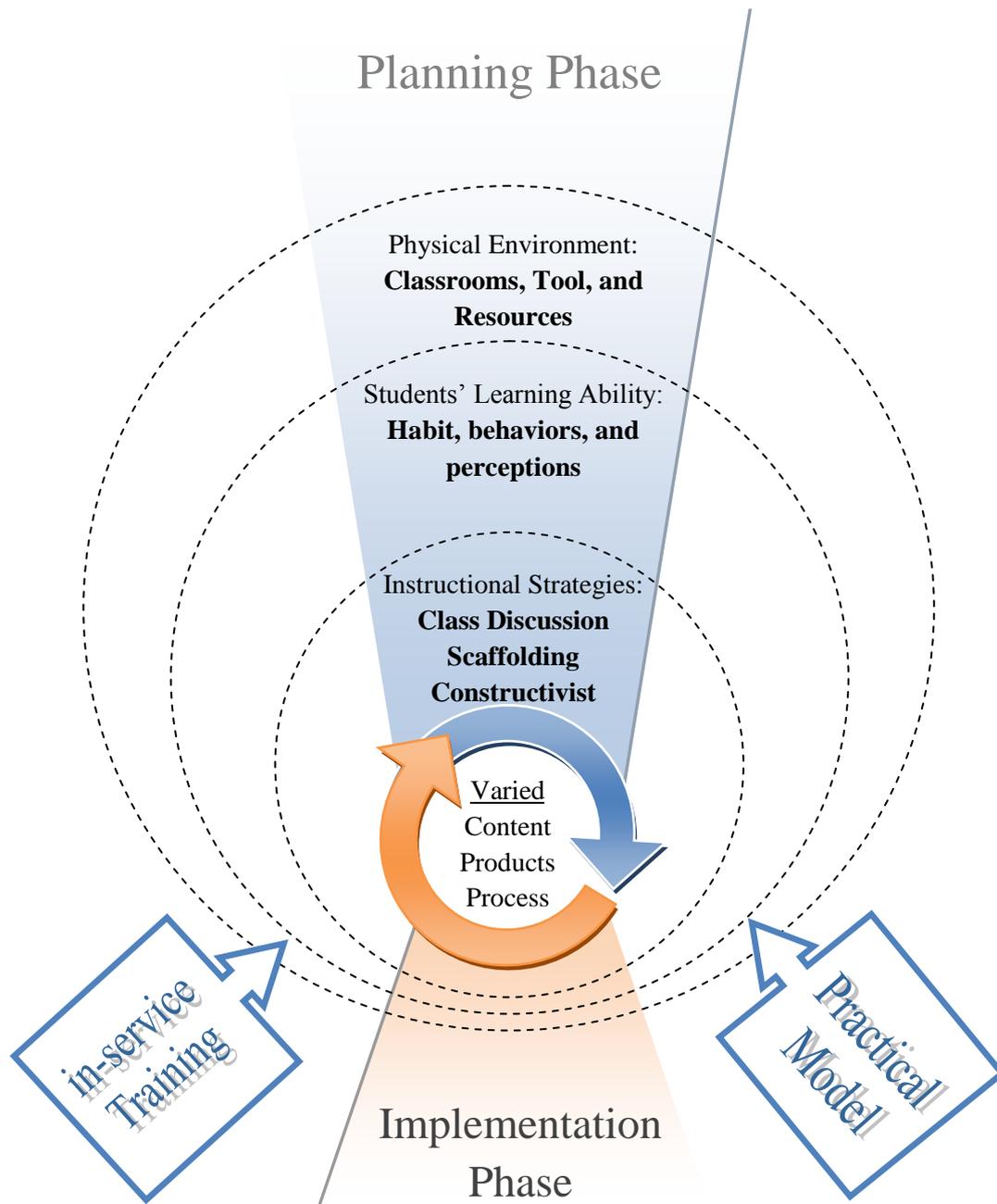Practical
Model

Implementation
Phase

Figure 5-1 Process of Learning Object Based Instruction

5.4   Recommendations of the Study

The main objective of this phenomenological study was to reveal elementary teachers'
perceptions, feelings, and lived experiences about conducting the learning object based
instruction, including definition and application of approach, teacher perception as

instructional leader, teacher usage of the repositories, and advantages and disadvantages of the approach during implementation. The result of the study revealed that classrooms teachers do not have a clear understanding of the term "learning object" and instruction based on learning objects. Tomlinson (2005) stated the importance of professional development including reflective, informed, applied, collaborative and supportive training. A future study examining effectiveness of in-service training in using learning objects in the classroom environment may help teachers to gain valuable information about methods for improving teacher practice.

This study also revealed that almost all participants have positive perceptions and attitudes towards using a learning object repository due to the growing number of learning objects in LORs and their accessibility to almost all potential users (Arms, 2000; Neven & Duval 2002; Parrish, 2004; Yacovelli, 2004;). A further study that is only focus on the elementary teacher experiences with learning object repositories may provide in-depth information about their uses of the repository in more detail with concomitant advantages and disadvantages.

According to Olson and Colough (2001), new and innovative educational technology in often applied without providing sufficient information and explanation based on teachers' concerns and needs. On the other hand, many research studies indicate that teachers' perceptions and attitudes affects their use of technology in many different ways, including the lack of the resources (computer of software), lack of time to plan lessons, and insufficient technical or administrative support (Gray, 2001; Vannatta & Fordham, 2004; Wang, Ertmer, & Newby, 2004). In a future study, the effect of technology perceptions of elementary school teachers on learning object usage could be investigated to reveal the potential relationship, if any, between learning objects and use of technology in the light of teachers' perceptions, needs, and concerns.

5.5   Concluding Statement

Teachers generally prefer to use same teaching method to teach their students because they feel comfortable and safe in teaching in a way that they already know and use. Although they believe learning objects are helpful in terms of many aspects, such as administrative and colleague support, positive outlook, technical background,and students' positive reaction, they perform this approach reactively rather than proactively as expected by this instructional modal. Result showed that successful implementation of learning object-based instruction depends on totally teachers' understanding of approach including learning object, repositories, and practical applications. According to overall results, colleagues and school administrators promote the approach and teachers have positive attitude towards the approach in theory, but teachers have lack a clear understanding of the approach and implementations practices so they perceive the approach negatively in terms of classroom applications. The fundamental idea behind learning object concept is that the approach maximizes usability of these learning materials in different contexts and different platforms to enhance learning by addressing preferences, learning styles, interest, and abilities. On the other hand, teachers define

reusability as being able to use materials in different years for different students, not in different contexts or platforms.

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APPENDIX A

OBSERVATION FORM

Purpose

The purpose of this observation guide is to describe teachers implementation process and student interactions related with a lesson based on learning objects. Two training sessions will be applied with teachers, who participated in the study to show them how to use learning object repository and learning objects. After the training, how teachers transfer their information to the educational environment, what kinds of problems they encounter during the application, what kinds of strategy they use, and the change in quantity of information students receive from teacher will be observed.   The observational research questions listed in below will be used a guideline for observation.

1. How do elementary education teachers integrate digital learning objects as an instructional tool into their classrooms after attending the training about learning objects and repositories?
2. What kinds of problem do teacher encounter when using learning objects in their classrooms during and after the lesson?

Significance

Teachers play very important role in today's technology based classrooms by using different teaching and learning tools with different instructional techniques to create effective learning settings. It is significant that teachers decide how, when, and if to use technology in their classrooms. One way to do this is by utilizing learning objects in the lessons. Learning object generally perceived as a digital learning recourses shared over the internet and reused in different learning contexts. Although these resources offer much potential to improve educational practices, and are available in repositories on internet, they are not sufficiently known and used by teachers. Because of this, understanding teachers' subjective experience with learning objects and learning objects repository may better inform what teacher give meaning to learning objects. This study provides new information that is lacking in the literature. In addition, by exploring teachers' experience using learning objects and learning objects repository, teachers will be able to get rich information about how to use, and develop learning objects, and how learning objects have to potential to change teaching practices from different aspects;

Data Collection

One course in fifth grade level in elementary school will be observed for two sessions to explore the implementation process of learning object based instruction after teachers created their learning activities. Before the observation, the researcher will give teachers all information about how to use learning object and learning objects repositories. A tape recorder will be used to record interaction and classroom climate after the permission from the teacher. The activity created by the teacher is ready to present, the researcher will observe the implementation process. The data will be collected on the following aspects of implementation process.

1. Contex: information about physical settings and the human settings (description of physical environment, and characteristic of students and teachers)
2. Instructional strategies and activities during conducting lesson

INTERVIEW SCRIPT –FIRST VERSION

1. Background information
    — Which university did you graduate from?
    — Why did you decide to become a teacher?
    — Have you ever had any experience about learning objects before the interview?
2. Have you ever thought to create a learning object with the help of the computer?
    — If yes,
        ▪ Can you tell me something more about it?
        ▪ Could you please give me examples of your thinking about this topic?
        ▪ What it means to create learning object?
        ▪ How does it differ from creating those learning by (with) hand?
    — If No,
        ▪ Why?
        ▪ What it means to create learning object?
        ▪
3. How can you define learning object according to your experiences?
4. Did this process make any difference in your thinking after you have used learning objects?
5. What are the results of using learning objects in your classroom when thinking this process in all of the aspects?
    — In aspect of lesson productivity?
    — In aspect of lesson preparation time?
    — In aspect of students' achievement?
    — In aspect of students' motivation?
    — In aspect of students' behavior toward technology?
6. Do you want to create any learning object related with your profession?
    — If yes,
        ▪ Why?
        ▪ Which properties of learning objects you have used impress you?
            ✓ Reusability?

     ✓ Interactivity?
     ✓ Interoperability?
     ✓ Granularity?

— If no,

   ▪ Why?
   ▪ Do you think creating a learning object is difficult?
   ▪ Do you think you need so much time and effort to create a learning object?
   ▪ Do you think learning object did not meet your expectations? (time, effort, and quality)

— Dou you think the problem related with not using learning objects in your classrooms is because of the learning object or repository?

APPENDIX C

INTERVIEW SCRIPT –SECOND VERSION

1. Background information,

    — Which university did you graduate from?

    — How old are you?

    — How many years of teaching experience?

2. Have you tried to create a learning object with the help of the computer?
    — If yes,
        ▪ Can you tell me something more about it?
        ▪ Could you please give me examples of your thinking about this topic?
        ▪ What it means to create learning object?
        ▪ How does it differ from creating those learning by (with) hand?
        ▪ Did you share them with your friends?
    — If No,
        ▪ Why?
        ▪ What it means to create learning object?

3. Did this process make any difference in your thinking after you have used learning objects?
    — Potential benefit?
    — Do you do it always, or only under some condition?

4. How can you define learning object according to your experiences?

5. How can you define learning object repositories according to your experiences?
    — What are the positive and negative aspects of using a LOR?

6. What are the results of using learning objects in your classroom when thinking this process in all of the aspects?
    — In aspect of classroom environment?
        ▪ Physical space (seating arrangement, print on walls, centers, etc.)
        ▪ Classroom culture (teacher/student interactions; student/student interactions, classroom management, etc.)
    — In aspect of lesson productivity?
        ▪ Content
        ▪ Material
    — In aspect of lesson planning?
    — In aspect of students' achievement?
    — In aspect of students' motivation?

- — In aspect of students' behavior toward technology?
- — In terms of school administrators' attitude?
- — Anything you want to add about what it make this process difficult or easy to use learning objects during a lesson or while planning a lesson?

7. Do you want to use or create learning objects related with your profession when needed?

If yes,

- — Why?
- — Which properties of learning objects you have used impress you?
  - *Reusability?*
  - *Interactivity?*
  - *Interoperability?*
  - *Granularity?*

If no,

- — Why?
- — Do you think creating a learning object is difficult?
- — Do you think you need so much time and effort to create a learning object?
- — Do you think learning object did not meet your expectations? (time, effort, and quality)
- — Dou you think the problem related with not using learning objects in your classrooms is because of the learning object or repository?

INTERVIEW SCRIPT --TURKISH VERSION

1. Bazı temel bilgiler alalım,

   — Hangi üniversiteden mezun oldunuz?

   — Yaşınız?

   — Kaç yıldır çalışıyorsunuz?

2. Bilgisayar yardımıyla bir öğrenme nesnesi oluşturmayı hiç denediniz mi?
   Eğer evetse,

   — Bu konu hakkında biraz daha fazla bahseder misiniz?

   — Oluşturduğunuz her hangi bir öğrenme nesnesini örnek verir misiniz?

   — Bir öğrenme nesnesi oluşturmak sızın için ne ifade ediyor?

   — Bilgisayarla oluşturmakla elle hazırlamanın arasındaki farklar nedir?

   — Is arkadaslarinizla paylaştınız mı?

   Eğer hayırsa,

   — Neden?

   — Bir öğrenme nesnesi oluşturmak sızın için ne ifade ediyor?

3. Deneyimlerinize dayanarak bir öğrenme nesnesini nasıl tanımlarsınız?

4. Deneyimlerinize dayanarak nesne ambarlarini nasil tanımlarsınız?

   — Pozitif/negatif yanlari nerlerdir?

5. Öğrenme nesnelerini kullandıktan sonra eğitim ve öğretime donuk düşüncelerinizde olumlu ya da olumsuz herhangi bir değişiklik oldu mu?

   — Olasi faydalari acisindan?

   — Bunu devamlimi kullandiniz yoksa belli sartlar altinda mi?

6. Bu sürece bütün açılardan baktığınızda derslerinizde öğrenme nesnelerini kullanmanın sonuçları sizce nelerdir?

   — Sinif ortami acisindan?

     ▪ Fiziksel ortam

     ▪ Kulturel ortam

   — *Dersin verimliligi acisindan?*

   — *Dersin planlama süreci açısından?*

   — *Öğrencilerin başarısı açısından?*

   — *Öğrencilerin motivasyonu açısından?*

   — *Öğrencilerin teknolojiye karşı tutumları açısından?*

   — *Dersin planlanma ve uygulama süresince bu yaklışımı uygulamayı kolaylaştıran yada zorlastıran eklemek ştediğiniz herhangı bır sey var mı?*

7. Alanınızla ilgili öğrenme nesneleri ihtiyaç duydukça kullanmayı yada olusturmayı düşünüyor musunuz?

    Eğer evetse,

    — Neden?

    — Nesnelerin hangi özelliği sizi en çok etkiliyor?

        ▪ *Tekrar tekrar kullanılabilmesi?*
        ▪ *İnteraktif olması?*
        ▪ *Farklı konu ve gruplarda kullanılabilmesi?*
        ▪ *Parçalı yapısı?*

    Eğer hayırsa,

    — Neden?

    — Sizce bir öğrenme nesnesi oluşturmak ya da kullanmak zor mu?

    — Öğrenme nesnesini kullanmak için çok fazla zaman ve gayret mi harcıyor sunuz?

    — Var olan öğrenme nesneleri sizin beklentilerinizi karşılamıyor mu? (kalite, fiyat, zaman)

    — Sizce Öğrenme nesnelerini kullanmama nedeniniz nesne ambarlarımı ve hangi problemi?

PARTICIPANT PROFILES

DZC1. My mom and my father they both grew at_____. I have one older brother, 38. I was born and raised in_____. Education was/is always very important for my family and they always encouraged me to become a teacher. I like playing tennis and swimming since I was probably 6 years old.

After graduating from university as an elementary classroom teacher, I worked in a village school for two years where technology was not a core value in the classrooms and for lesson activities. Actually, it was so hard to find the technological equipment you need to conduct a lesson at those times. Today, I feel very connected. I have a laptop, an iPad, and iPhone. I can check emails, internet, or other social networks whenever I want. I can say that it is a part of my life. My main concern is, today, about how I am going to use technology in my classrooms, how I can incorporate it into my activities. I have a good computer in my class and an overhead projector. I use projector daily for power point presentations. I try to use most of the technology because I feel that it really help students in different ways, such as motivation, achievement, time. I noticed that when I use learning materials in my lesson activities, students learn more easily and get higher achievement scores. It is also a motivational tool for them. Sometimes I play music from the internet or show short video clips to prepare them for the lesson.

I love teaching, especially when I see a smile in their faces after a lesson because I think that they are happy so I am happy. Teaching is a very different and difficult experience that allows you to wear many "hats" as you are a teacher, counselor, coach, etc.

DZC2. I am married to assistant professor, so we value education. We live in _____ now. We are ambitious readers and enjoy outdoors activities. I have two younger sisters, 16, 21. For my parent, university is only option for me but I always like school.

I have been able to keep up with technology and because of that I am always very comfortable when I use technology in my life. Or even I can say that I am addicted to it. I am not going anywhere without taking my phone. It is a very important part of my lessons; however I have an old PC and projector in my class. Honestly, I always wanted to become a teacher; I loved school. I love reading, writing, taking time to students.

I think technology in the classroom, you can it as media literacy, is very important, especially in today's time. Students know everything about media and they are using different media tools for their daily/lesson activities including text, videos, sounds, ppts, the internet, etc. I think that these resources can absolutely help them stay on tract.

Sometimes they said that it is very boring to read from a book. I suppose it is essential to use technology for our students to prepare them to the future. We need to try everything to get an education for them, which is useful and includes all media instruments.

DZC3. Well, I am the youngest of the five children. I grew up a very sweet family. My father is a teacher so he had always pushed me to study since the beginning of my school years. Sometimes it was very boring for me, but now I understand why studying is important for me. I really like school.

Actually, I firstly had a chance to use computer in my university, and then I got a computer. In collage, there were two or three computer labs and every classroom had a computer and projector. We were general using projector for the presentations. I did a few presentations at the college with very little information about how to prepare a good presentation on a topic. Today, I have a very laptop and am using it to prepare my lesson plans and some activities for my students. I love teaching because I love kids. At the beginning, I do not want to be a teacher when I was in college, but know it is a great experience for me.

Technology is the part of my life. I think it is really important for todays' students because there is only one way for our students to learn these technologies in their daily life that is: to use it in the classrooms. I worked at a school in _____ for two years. They were very willing to learn some computer skills and I learned that most of my graduate students got a job because of their media literacy. We have to focus on this skill very early ages for the students so that they can get all information they need during their daily life. And also technology is important for us as teachers. I generally prefer to use email to communicate with other teachers working in the same subject area. We share our resources and get feedback from them about a lesson material we use. I often teach with power point presentations and sometimes videos and games. Why? Because they like to see this technology in the lesson and I think they are motivated easily and driven by such kind of technology.

DZC4. My father is a teacher and my mother is not working, she is, actually, dealing with us and I think that is the most difficult job to do for a mother, especially you have three children. I grew up in _____. Elementary and middle school were diverse according to my parent's economic situation. I went to university at _____. I played football I was a member of cheat clip in university.

I grew up with TV and video games and I learned something about computer in university and computers become the part of our life especially after university. Now, I have a laptop and iPhone. I bring my computer to the school for some presentations if I do not have time to download it into the school's computer. I like becoming a teacher. Media is important or even necessary for our students to be fully literate and participate in a technology driven society. I think students also like it. They want to see the media in their lesson activities. As they want, I use interactive games and power point presentations in my classroom to enhance their learning and to complement the activities. They especially like power point if they only listened the lecture and take some notes related to the lecture. All teachers that I know use games and power point presentations for the students

to enhance their learning and teaching. Some of the parents of my students regarding use of the media in the classroom also want to know how I use technology in the classroom, but I do not have a connection with parents about their thoughts on media in the classroom. Our school administrators are always insisting to use these resources in our lectures. And as you know, Ministry of Education did give regular presentations during in-service about how to effectively incorporate the media into our lesson plan and activities in the classroom.

DZC5. My family is very big and very close. I have two sisters and two brothers. I grew up in the very small town of _____.as all family do in Turkey, they expected me to do well in school and go the best university they know and I always want to make them proud. I was a volleyball player in the university and I still trying to play with my collages if we arrange a time for it.

I con not say that I am a "technology gay" because I am a little afraid of using technology. Sometimes I think that it is smarter than us. I did not use technology a lot when I was in high school and university and today I want to learn as much as I can do about media and technology and want to become more comfortable with computers and other technologies related to it so that I can use it for my students and myself. As I say, I want to learn more and I am still learning. I know anymore how to use websites and some programs for my benefits and my students' benefit. I need time to get more comfortable with it and to explore new things. I think I have enough passion to be a teacher because it is really difficult to deal with the children. I wanted to be a teacher and I am teacher.

I can say that media in the classroom may enhance the instruction. It also can be a way to interact with your students and reach the materials you need to enhance my students' learning. Technology, I think, is great for the students to see something differently and to better understand some concepts by using media in the classrooms. And also I suppose I have to use technology for the students because they like it. They enjoy playing games as the lesson activities. I think they know how to use a computer properly and effectively. As I said before, I am learning it with the kids in my classroom I mean technology is important for them so it is also important for me, too.

DZC6. I grew up in _____ and I went to the school there. Before I started high school, we moved a much more developed city than we lived. After that my parent got divorced. My mom and my brothers and my sister and I stayed in _____. At the same time, I went to the university because my mom did not want to take us out of the education. My father and my mom were living different cities so I spend my time in both places. I just liked taking photos and I had software to edit the photos and to add some visual effects on it. I am still dealing the photos and I can say that that is the only in-door activity that I like to do in these days.

In the high school, we did not have a lot of technology. Actually, we have a computer lab, however we did not have internet access and that lab was not always available or open for students. Teachers in our schools also did not use computers a lot or other technologies, such as projector or power point presentations. Today, as I said before, there are many teachers here who try to use media in their classrooms by incorporating power point

presentations into lesson activities. I think. Power point is the most used method for us to enhance our lectures. That is because we took some lesson in the university, especially education classes, that based on the power point presentations and professors wanted us to use power point to present a topic. I think Power point is not enough today; technology is everywhere and you have to know something about media for every job. I mean you need some basic computer skills. I do not know everything, but I know that without technology we used in our lectures to motivate our students and to teach better by using different media, it could not possible to do all things. So I want to use technology, but the only thing I emphasize is to use appropriate teaching strategies and methods if we use these resources for our students because sometimes these tools can be a must-have tool.

I use different media to teach my lessons and to keep my students motivated and engaged in lessons because they like to see different things or media and they think that they learn in a new and funny way. I think, they always respond it with a great interest if I use technology in my class. As I said, traditional lecture style can be sometimes boring for them. Anything that they learn in a different way than the traditional one can be interesting for them.

DZC7. My parent was quite poor. My mom did not go to elementary or high school. Because of that they always want to see me do good in the life and a lot of my family members expect to do so. They now live comfortable. I must to say that I am the first female to go the college. It was really difficult for me, and I think also for my family, to explain this situation other people we live together because at that time in villages families generally did not send female children to the school as girls are used to help at home. However, education was very important for my family because my father was a teacher in elementary school. I like the kids and spending my time for teaching and learning with young people was my desire and I am teacher now.

I did not have a chance to meet computer or other technologies, before I was in University. I learned how to type by using some instant messenger programs while talking my friends online. I learned how to use Internet and office programs, and how to use create a website in the university by taking some classes. Today, I am a basic technology user including Internet, Microsoft Office, email and some web 2.0 tools, such as Prezi and Slayt. Of course, I am using some of these resources in my classroom. I want to use all of them in my lectures however it depends on the technological equipment your school have. Kids like technology and I like being a teacher so I am trying to meet students with as much media as possible. I think Media literacy is essential not only for teacher but also for students because it allow them to be creative and express their learning in different ways.

I use projector every class period from beginning to the end. I also use presentations to motivate them because I think if the students do not have curiosity, they do not learn. It is very important to start a lesson with an intriguing resource. I mean it should attract students' attention. It can be a question or something else, however it should definitely be something taking attention of students because they motivate them. For example, I often show videos, pictures, and or sometimes movies related to topic we discussed during the lecture.

DZC8. I do not have brother or sister; my family has the only child and that is me. Actually, one sister and one brother died before I was born. My family is very normal; it is just a typical Turkish family. My father is a farmer and my mother is a housewife. I grew up in _____ from first grade to university graduation. I have been playing volleyball since I was in university. I am trying to play volleyball here with the teachers I think they like to be a part of such kind of sportive activity.

My family did not have technology at all, such as, computers, digital cameras, and printers so I did not use them before I started high school. In my high school and university, we had a lot of chance to "touch" technology daily. We had computer lab, computers in every class. Moreover, there were computer classes. That was not it all. Our teachers used a lot of media in their lectures. On the other hand, Technology was a new thing for me and I did everything to do my best to learn it in a good way. I liked technology in the classes in the university, and because of that I learned every tool that I can use for my future classes, power point, adobe, flash, and other office tools. Today, I can say that I have everything that can be used for my daily life and for my students, such as, laptop, iPhone, iPad, and a PC. Media literacy is important and can enhance learning. I love using media in my classroom activities because they fun, can be interactive, and give the students a chance to discover their skills with some kinds of technology. Of course it is related to the technical facilities in the school. In order to use technology, projection equipment at least should be in your classroom. I know it is not a simple thing to have them. You also need to have a laptop to bring it to the classroom, or a computer should be in the classrooms so that you can benefit from them. I had all these in my class last year and used a lot, however I do not have this year.

I think power point presentations, games, and music can complete the missing portion of my lectures. I use animation and movie to provide a visual representation of the topics that I explain in my lesson. And I use presentations to enhance lectures and to cover the overall ideas.

INFORMED CONSENT

Hello, my name is Kürşat ARSLAN and I am conducting a dissertation research that is about teacher perceptions and lived experiences of carrying out learning object based instruction.

I AM: a student at Middle East Technical University working on my PhD in partial fulfillment of the requirements of a doctoral degree. I will greatly appreciate your participation in the following study.

THE STUDY' PURPOSE IS: to explore the perceptions and lived experiences of teachers conducting learning object based instruction with advantages and disadvantages aspect of the approach, the reasons teachers may or may not use, select or create different kinds of learning objects, and the rationale under using learning objects based instruction in their classrooms.

YOUR CHOICE IS: to participate the study and you can also withdraw the interview at anytime without explaining the reason. There are no any expected and anticipated risks to the participants involved in the study. There may be no direct benefit to you, however your experiences and feeling gained from this interview may help elementary school educators attain better understanding of learning objects and learning object based instruction. Once the study is completed, you may receive the result of the study.

EVERTHING: gained from this interview such as your name, or your results will remain in confidence, that means no one else will know any information about you and your experiences and belief or ideas related with the study.

IF ANY QUESTIONS: arise before, during, or after the interview, you can ask without thinking to interrupt the interview, or you can reach me at 505-827-30-92 or kursata@gmail.com or my advisor at 312-210-4057.

REQUEST: May I record the interview?　　　☐ YES　　☐ NO

Sincerely,

Name of participant_____

Signature of participant_____

Email_____

Date_____

INTERVIEW VERIFICATION FORM

Kursat ARSLAN, Ph.D. Candidate
Phone: 312 210 4196
Email: karslan@metu.edu.tr

The Lived Experiences of Elementary School Teachers Implementing Learning Objects-Based Instruction: A Phenomenological Investigation

Dear Participant,
Please find a copy of the enclosed transcript of our interview about learning object based instruction. Please feel free to review it and to take some notes of any part of the interview that is not correct in terms of content and grammatical errors to you. Also, please evaluate the transcript as a whole and select appropriate statement below. Thank you.

Please select the appropriate statement below:
_____ I approve the interview transcript without reading.
_____ I approve the interview transcript as it.
_____ I approve the interview transcript with some changes and notes.
_____ I do not approve the interview transcript.

Name of participant_____

Signature of participant_____

Email_____

Date_____

APPENDIX H

THE MOST KNOWN LEARNING OBJECT REPOSITORIES

Title and Link	Description	Age Group of Content
MERLOT http://www.merlot.org	Multimedia Educational Resource for Learning and On-Line Teaching (MERLOT). Free and peer reviewed. Includes more than 39,000 learning objects.	Comprehensive
CAREO http://careo.ucalgary.ca/	Campus Alberta Repository of Educational Materials (CAREO). Free and peer reviewed. Includes more than 4,000 objects.	Comprehensive
ARIADNE http://ariadne.cs.kuleuven.be/finder/ariadne/	Alliance of Remote Instructional Authoring and Distribution Networks for Europe (ARIADNE). Free. Includes more than 800,000 learning resources	Comprehensive
CSTC http://www.cstc.org	Computer Science Teaching Center (CSTC). Includes more than one hundred materials.	College, graduate
CITIDEL http://www.citidel.org	Computing and Information Technology Interactive Digital Educational Library (CITIDEL).	College, graduate

Title and Link	Description	Age Group of Content
Connexions http://http://cnx.org	Connexions is a place to view and share educational material made of small knowledge chunks called modules that can be organized as courses, books, reports, etc. includes about 22,000 reusable learning object/ modules .	Comprehensive
DLESE http://www.dlese.org	Digital Library for Earth System Education. Free and peer-reviewed. Including thousands of resources that support Earth system science education.	Comprehensive
GEM http://www.thegateway.org/	Gateway to Educational Materials (GEM). It provides users access to a collection of over 1,000,000 resources to educators worldwide. Free and peer-reviewed.	Comprehensive
HEAL http://library.med.utah.edu/heal/	Health Education Assets Library (HEAL). It gives users access to a collection of over 22,000 freely College, Graduate available digital materials for health sciences education.	College, Graduate
JORUM http://www.jorum.ac.uk	The JISC Online Repository for Learning and Teaching Materials (JORUM). It provides users to find and share learning and teaching resources for all Further and Higher Education Institutions in the United Kingdom (UK).	Comprehensive

Table continued

Title and Link	Description	Age Group of Content
Alberta http://www.learnalberta.ca/Home.aspx	Alberta includes multimedia learning materials for use by K-12 educators	Elementary, Middle, High School
ATANESA http://atanesa.atauni.edu.tr/	ATANESA is the first and most comprehensive learning objects repository including more than 9,000 learning materials in different categories, such as animation, simulation, presentation, quiz, etc. free, but available only in Turkish language.	College, Graduate

APPENDIX I

PERMISSION LETTER FROM METU

UYGULAMALI ETİK ARAŞTIRMA MERKEZİ
APPLIED ETHICS RESEARCH CENTER

ORTA DOĞU TEKNİK ÜNİVERSİTESİ
MIDDLE EAST TECHNICAL UNIVERSITY

Sayı: 28620816/34 ~ 221

06 Mart 2013

Gönderilen: Prof.Dr. Soner Yıldırım
Bilgisayar ve Öğretim Teknolojileri
Eğitimi Bölümü

Gönderen: Prof. Dr. Canan Özgen
IAK Başkan Yardımcısı

İlgi: Etik Onayı

Danışmanlığını yapmış olduğunuz Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü Doktora öğrencisi Kürşat Arslan'ın "Öğrenme Nesnelerine Dayalı Bir Eğitim Modeli Uygulayan İlköğretim Öğretmenlerinin Gerçek Deneyimleri: Fenomonolojik Bir Çalışma" isimli araştırması "İnsan Araştırmaları Komitesi" tarafından uygun görülerek gerekli onay verilmiştir.

Bilgilerinize saygılarımla sunarım.

Etik Komite Onayı

Uygundur

06/03/2013

Prof.Dr. Canan ÖZGEN
Uygulamalı Etik Araştırma Merkezi
(UEAM) Başkanı
ODTÜ 06531 ANKARA

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CODING CATEGORIES FOR QUALITATIVE DATA

Categories and codes listed below were created by researcher through an evaluation of the face-to-face interviews on learning object based instruction and the repositories. These themes and codes listed under each research questions were used during data analysis and results of the study.

- Research Question1:How do teacher perceive their role as a teacher of using and developing learning objects in their class
  a. **Teacher use of the repository**
     1. Advantages
        - i. Variety of LO (5)
        - ii. Communication tool(1)
        - iii. Variety of LOR (5)
        - iv. Locating LO (2)
        - v. Easily accessible (3)
     2. Disadvantages
        - i. Subscription (2) (+1)
        - ii. Quality of LO (3)
        - iii. Links surfing (2)
     3. Quality o LO in LOR
        - i. very simple objects(6)
        - ii. good quality (3)
        - iii. poor quality (4) *
        - iv. prefer to create own objects (4) *
     4. Making own repository (6)
     5. Type of LOR
        - i. Forums (4)
        - ii. Web portal (17)
        - iii. Search engines (5)
        - iv. Blog (1)
  b. **Teacher use of the multiple learning objects**
     1. Power Point Presentation (21) (-1)
     2. concept map
     3. video (1)
     4. excel (2)
     5. games (4)
     6. movies (3)
     7. cartoon (2)
     8. animations (8)

    9. simulation (3)

    10. printed documents (2)

    11. videos (5)

  c. **Purposeful implementation**

    1. Always (2)

    2. Mostly (5)

    3. Irregularly (3)

    4. Rarely (1)

  d. **Classroom Environment**

    1. Traditional settings,

    2. nontraditional setting

    3. Print-rich walls

  e. **Creating a learning object**

    1. Taking time (9)

    2. Power point presentation (17)

    3. Difficult (2)

    4. Special education (6)

    5. In-service training (7)

    6. Unique (3)

  f. **Created learning object**

    1. Concept map (1)

    2. Power point presentations (5)

    3. Video (1)

- Research Question2: What instructional strategies do teachers use to conduct learning object-based instruction

  a. **Instructional Strategies**

    1. Class discussion (3),

    2. Interactive learning,

    3. Scaffolding ()

    4. Problem solving (1)

    5. Constructivist learning (3)

  b. **Implementation Process**

    1. (1) Selection of content,

    2. (2) searching of learning object

     i. Web Portals

     ii. Search engines

     iii. Forums

     iv. Blog

    3. (3) selection of learning object

     i. Taking student attention (4)

     ii. Student level (7)

     iii. According to learning outcomes (6)

     iv. Should be funny (1)

    4. (4) revising of learning object, if needed (17)

     i. No changes (1)

        ii.   Adding/removing slayts (13)

        iii.   Making some changes (2)

        iv.   Removing irrelevant things (1)

    5. (5) implementation of LO

        i.   Based on technological equipment (4)

        ii.   Based on the LO (4)

        iii.   As a part of lesson (13)

        iv.   If needed (2)

c. **Teacher differentiation in Implementation**

    1. changing teaching style (11)

    2. giving more choice,

    3. giving more time to students [social activities with students] (3)

    4. adjusting difficulty (3)

d. **Student new role**

    1. Preparing presentation (LO) (2)

    2. Using internet for their homework (3)

- Research Question 3: How teacher understand learning objects and learning object based instruction through the implementation process?"

    a. **Teacher Education**

        1. teacher area (7)

        2. course area (11)

        3. past experiences (+15) -2

        4. ability

        5. adaptation (5)

    b. **Teacher Definition**

        1. **Real LO (3)**

        2. No information about LO (7)

        3. Digital or non-digital (7)

        4. An object retaining of knowledge (7)

        5. A guiding tool (4)

        6. A facilitator tool (8)

        7. A motivational tool (3)

        8. A helper for teachers (4)

        9. A supplementary tool (2)

        10.   Properties of Learning Object

           i.   Objectivity (8)

           ii.   Granularity (4)

           iii.   Timesaver (2),

           iv.   developable, (2)

           v.   reusability (6)

           vi.   and enjoyable

           vii.   colorful (2)

           viii.   easy to remember (5)

    c. **Teacher Reaction**

        1. Future plans (1)

    2. Positive (21)

    3. Achievement (7)

    4. Student reaction (23)

      i. Always positive (12)

      ii. Sometimes (5)

      iii. Needed change (3)

      iv. Based on subject (2)

  d. **Perceived Benefit**

    1. support

    2. course area

    3. taking students' attention (13)

    4. peer and student support (21)

    5. class participation (7)

- Research Question 4: What are the obstacles and opportunities of learning object-based instruction affecting teacher performance and implementation?

  a. **Opportunities**

    1. Administrative Support/pressure (9)

    2. Peer Support

      i. Peer pressure (6)

      ii. Peer contribution (8)

      iii. Peer cooperation (5)

      iv. Peer critique (1)

    3. News curriculum support/pressure (5)

    4. Student pressure (2)

    5. technological pressure (5)

    6. Course area (11)

    7. Different Level (10)

    8. Time (11)

  b. **Problems**

    1. Lesson planning problems

      i. Heavy curriculum (8) (-1)

      ii. Increase lesson duration (9)

      iii. increase lesson preparation time (+13) -1

    2. Design problems

      i. Irrelevant objects in presentation(3)

      ii. Too much text (2)

      iii. Too simple (2)

      iv. Grammatical errors (1)

    3. Repetition problems

      i. Losing attention of students (5)

      ii. Addiction to using learning object (3)

      iii. Shifting from tool to object (3)

    4. Classroom environment problems

      i. Lack of Space (3) (classroom space)

      ii. Sound problem (2)

5. Educational problems
    i.   In-service training (8)
    ii. Old experiences (3)
    iii. Lack of Technical Support (3)
6. Implementation Problems (12)

CURRICULUM VITAE

Personal Information

Surname, Name: Arslan, Kürşat
Nationality: Turkish (TC)
Date and Place of Birth: 14 August 1981, Aşkale
Phone: +90 312 210 4196
E-mail: kursata@gmail.com

EDUCATION

Degree	Institution	Year of Graduation
BS	Ataturk University, Computer Education and Educational Technology	2003
High School	Erzurum Ataturk Vocational High School	1999

WORKEXPERIENCE

Year	Place	Enrollment
2011 – 2013	TechKnowledge Birmingham, Birmingham, Alabama, USA	Programmer
2011 – 2012	Birmingham, Alabama, USA	Chairperson of Documentation Committee in SDPS conference
2011 – 2012	UAB, Alabama, USA	Research Fellow
2007 – 2008	METU, Ankara	Technical Support
2005 – Present	METU, Ankara	Research Assistant
2000 – 2003	Ataturk University, Erzurum	Technical Support

RESEARCH PROJECT

2011-Present: Ezsnips, University of Alabama at Birmingham, Birmingham, AL, USA.
http://www.ezsnips.com/

WORKSHOPS

1. Brande, S., **Arslan, K.** Workshop (2013). EZSnips--A New Tool for Easing the Use of Video in the Classroom, and Collaboration Among Domain Experts, 6th Annual Scholars Institute, UAB, Alabama, USA.
2. Brande, S., **Arslan, K.**, Yildirim, S. Workshop (2012). The Explosive Use of Video Technology in the Service of Education:Opportunities and Challenges, Society for Design and Process Science, Berlin, Germany.

SKILLS

- Programming Languages: Delphi5, Delphi7
- Web Programming: HTML/CSS, Asp, Asp.NET, JavaScript
- Tools: MS Visual Studio, Borland, Asp Studio
- Database: MySQL
- Web Desing: Frotpage, Dreamviwer
- Image Editing: Macromedia Fireworks
- Package Program: MS Office
- Statistical Analysis: SPSS 11-15
- Qualitative Analysis: ATLAS.ti
- LMS Management: Moddle

PUBLICATIONS

INTERNATIONAL
Journal Paper

1. **Arslan, K.** & Yildirim, S. "Elementary School Teachers' opinions on a Learning Object Repository in Turkey," Journal of Integrated Design and Process Science, Vol. 14, No. 3, pp. 53-61, Sep 2010.

Conference Paper

1. **Arslan, K.**, Yildirim, S. (2013) What do elementary teachers in Turkey know about a learning object and learning object repository? International Conference on New Trends in Education and Their Implications- ICONTE 2013, Antalya, Turkey.
2. **Arslan, K.**, Brande, S. (2012) Digital Video Technology in the Service of Edcutacion: EZSNIPS. The Society for Design and Process Science 2012 (SDPS), June, 2012.
3. **Arslan, K.**, Yildirim, S. (2011) A Test-Bed for the Learning Object Repository for Elementary Scholl Teachers in Turkey. The Society for Design and Process Science 2011 (SDPS), June, 2011.
4. **Arslan, K.** (2010). Evaluation of Learning Objects From Different Aspects of Effectiveness: Learning, Learning Object Benefit, and Learning Object Quality. In C. Crawford et al. (Eds.), Proceedings of Society for Information Technology & Teacher Education International Conference 2010 (pp. 2143-2149). Chesapeake, VA: AACE.
5. **Arslan, K.**, Gök, A. & Saltan, F. (2010). Motivating Teachers To Use Learning Objects. In C. Crawford et al. (Eds.), Proceedings of Society for Information

Technology & Teacher Education International Conference 2010 (pp. 2637-2644). Chesapeake, VA: AACE.

6. Saltan, F., **Arslan, K.** & Gök, A. (2010). Teachers' Acceptance of Interactive White Boards: A Case Study. In C. Crawford et al. (Eds.), Proceedings of Society for Information Technology & Teacher Education International Conference 2010 (pp. 2360-2365). Chesapeake, VA: AACE.

7. Gök, A., **Arslan, K.** & Saltan, F. (2009). The Online Teacher Education Trends: A Research Review Study of Recent Years. In I. Gibson et al. (Eds.), Proceedings of Society for Information Technology & Teacher Education International Conference 2009 (pp. 374-380). Chesapeake, VA: AACE.

8. Saltan, F. & **Arslan, K.** (2009). A New Teacher Tool, Interactive White Boards: A Meta Analysis. In I. Gibson et al. (Eds.), Proceedings of Society for Information Technology & Teacher Education International Conference 2009 (pp. 2115-2120). Chesapeake, VA: AACE.

AWARDS

- 2012, Outstanding Achievement Award, The Society for Design and Process Science

INTELLECTUAL PROPERTY

- **Generation and Consumption of Discrete Segments of Digital Media**, U.S. Utility Patent Application No. 13/651,156 – patent pending