NEAR EAST UNIVERSITY
INSTITUTE OF EDUCATION SCIENCES
DEPARTMENT OF
CURRICULUM AND INSTRUCTION

THE ATTITUDES OF HIGH SCHOOL TEACHERS TOWARDS PROBLEM BASED LEARNING APPROACH TO PRACTICE IN CLASSES

MASTER THESIS

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Nicosia
January, 2011

JURY MEMBER'S SIGNATURES

We certify that we have read the thesis submitted by Dilek Necibe Tekin titled "The Attitudes of High School Teachers Towards Problem Based Learning Approach to Practice in classes" and reached a consensus that it is fully adequate, in scope and in quality, as a thesis for the Master degree department of Curriculum and Instruction.

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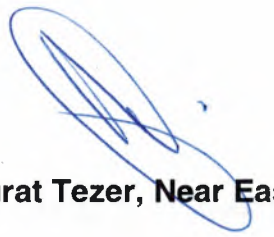

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ACKNOWLEDGMENTS

The completion of my master degree and this thesis represents the work of many people to whom I am very thankful for their encouragement, support and help.

First of all, I would like to express my deepest gratitude to my supervisors *Prof. Dr.* Hüseyin Uzunboylu and Dr. Birikim Özgür for their invaluable advices, patience and guidance during my research.

I am very thankful to my family members for their encouragement and moral support through the process. Special thanks to my parents; their lifelong devotion to education became my major inspiration to be an educator and they never stopped trusting me. I would like to thank to my brothers Ali, for his help and support, and İsmail and Sadi for their moral support. Their existence means much more to me than I will ever be able to express.

Special heartfelt thanks to my fiance Tolga Utaş for his help, support, continuous encouragement and sensibility. He was with me in every step of the process and where I need help. I feel very fortunate that I have someone like you.

Thanks are also extended to my all instructors in Near East University. Firstly, I'd like to tanks ELT Department instructors under the chairmanship of Mustafa Kurt for my undergraduate Education. Then, Institute of Educational Sciences Master instructors: Assoc. Prof. Dr. Zehra Özçınar, and Asst. Prof. Dr. Murat TEZER.

Finally, I express my sincere thanks to my master education members for their willingness, their valuable friendship and their invaluable comments.

Thank you all very much indeed.

SUMMARY

TITLE

Author : Dilek Necibe TEKİN

Quality of Thesis : Master

Main Art : Curriculum and Instruction

Advisor : Prof. Dr. Hüseyin UZUNBOYLU

The purpose of the study was carried out to determine high school teacher's views about the Problem-Based Learning method in Turkey. It was also determined to apply more often and what difficulties teachers face during this time in the classes on applying PBL. And also it was carried out to find out the effects of the teachers' seniorities, academic levels.

The study aimed at finding the answer to the question: *What are the attitudes of high school teachers towards to use of PBL approach in classes?*

This study is descriptive research; one of the screening model relational models was used for scanning.

In the review of the literature, Cognitive and Meta-cognitive Learning, Content-Based Learning, Problem-Based Learning, Project-Based Learning, Task-Based Learning and Researches, Studies, Findings and Results on PBL were investigated.

The research was designed with Relational Scanning Model, reliability analysis for Likert Type Scale, Frequency and Percentage Values, Hypothesis Tests: T (Student) and F (variance) Tests and Tukey test.

During the pre-application data collection tool for teachers, the subject was presented a sample study for inform them. It lasted 5 minutes. So that it assumed that the issue answered correctly by them. Data collection was Questionnaire and it consisted 3 chapters. The first one was personal qualified questions, second was needs analysis for PBL and the last one was recommendations about PBL.

The sample consisted of 180 teachers who are training at Antalya High School, Yavuz Selim High school and Bileydi Anatolian High school in Antalya. They are central high schools in Antalya and they selected randomly for research. By the survey application 148 teachers have been reached and only they were taken into consideration.

In conclusion, teachers not exactly have an idea and experience on PBL. The average shows that value is the average participation of women teachers expressed *"I'm not sure",* while the average participation of teachers tends Male *"I'm not sure"* is the score. Women teachers than male teachers, albeit very small in the average level of participation has shown upward trend. But this difference between the two groups was not statistically significant.

Key words: Problem- Based Learning, Cognitive and Meta-cognitive Learning, Task-Based Learning, Content-Based Learning, Project-Based Learning

GENİŞ ÖZET

Yazar	: Dilek Necibe TEKİN
Tezin Niteliği	: Yüksek Lisans
Anabilim Dalı	: Eğitim Programları ve Öğretimi
Danışman	: Prof. Dr. Hüseyin UZUNBOYLU

Bu araştırma, Türkiye'de ortaöğretim kurumlarında çalışan öğretmenlerin Probleme Dayalı Öğrenme yöntemine karşı tutumlarını belirlemek amacıyla yapılmıştır. Öğretmenlerin, bu yöntemi ne kadar sıklıkla uyguladıklarını, uygularken karşılaştıkları güçlüklerin neler olduğunu tespit etmek amaçlanmıştır. Ayrıca, öğretmenlerin mesleki kıdemleri ve mezun oldukları fakülteler de incelenmiştir.

Bu araştırmanın cevap aramaya çalıştığı soru cümlesi: *"Ortaöğretim kurumlarında görev yapan öğretmenlerin PDÖ yaklaşımına karşı tutumları nelerdir?"*

Bu çalışmada tanımlayıcı araştırma; tarama modeli, ilişkisel tarama modelleri kullanılmıştır. İlgili araştırmalar ise: Bilişsel ve Meta-bilişsel öğrenme, İçerik Tabanlı Öğrenme, Görev tabanlı öğrenme ve Araştırmaları, Proje Tabanlı Öğrenme, Probleme Dayalı Öğrenme, PDÖ ile ilgili Çalışmalar, Bulgular ve Sonuçlarıdır.

Araştırma, İlişkisel Tarama Modeli, Likert Tipi Ölçek, Frekans ve Yüzde Değerler, Hipotez Testleri: T (Öğrenci) ve F (Varyans) Test için güvenilirlik analizi ile tasarlanmıştır. Ayrıca değişkenlerin anlamlı fark gösterip göstermediği için Tukey testi uygulanmıştır.

Veri aracı uygulanmadan önce öğretmenlere konuyla ilgili örnek çalışma sunulmuştur. 5 dakika konu için dikkat çekilmiştir. Böylelikle öğretmenlerin konuya hâkim olarak anketi cevapladıkları varsayılmıştır. Veri toplama aracı olarak anket yöntemi seçilmiştir. Bu anket 3 bölümden oluşmaktadır. Birinci bölümde kişisel bilgiler yer almakta, ikinci bölümde ihtiyaç analizi aranmakta ve üçüncü bölümde ise PDÖ' ye ilişkin önermeler yer almaktadır.

Araştırmanın evreni ortaöğretim öğretmenleridir. Örneklemini ise 3 okuldan 180 öğretmen oluşturmaktadır. Bu okullar; Antalya Merkez ortaöğretim okullarından Antalya Lisesi, Yavuz Selim Lisesi ve Bileydi Anadolu Lisesidir. Bu okullar araştırma örneklemi için rastgele seçilmiştir. Bu anket uygulanırken toplam 148 öğretmene ulaşılmış ve anketleri değerlendirmeye alınmıştır.

Bulgularda, öğretmenlerin PDÖ ile ilgili tam olarak bir fikir ve deneyimleri olmadığına rastlanmıştır. Öğretmenlerin ortalama katılım ve görüşleri, Erkeklerde "emin değilim" Kadınlarda da "emin değilim" eğilimlerine rastlanmıştır. Kadın öğretmen erkek öğretmen de olsa istatistiksel olarak iki grup arasında ortalama görüş "emin değilim" olmuştur.

Sonuç olarak, öğretmenlerin PDÖ ile ilgili eksik bilgileri ve uygulamaları olduğu, sadece kitaplardan bir yaklaşım olarak bildikleri görülmüştür. Bu konu ile ilgili önemli derecede ihtiyaç giderilmesi gerekmektedir. Genel olarak yeni öğretim yaklaşımlarına ilişkin benim gözlemlerim; yeterli düzeyde uygulanmamasının en önemli sebebi sınava yönelik çalışma yöntemleridir. Sınav test ve teknikleri artık gelenekselleşmiş bir yapı oluşturmaktadır. Nitekim, ortaöğretim okullarında yeni öğretim yaklaşımlarının sınav sistemiyle entegre edilip öğrencilere sunulması gerekmektedir. Bunun için öğrenci seçme sınavına hazırlanan öğrencilere yeni öğretim yaklaşımlarından da yararlanmaları için fırsat verilmesi kaçınılmazdır.

Anahtar Kelimeler: Probleme Dayalı Öğrenme, Bilişsel ve Meta-bilişsel Öğrenme, Görev-Öğrenme, İçerik Tabanlı Öğrenme, Proje- Tabanlı Öğrenme

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LIST OF SYMBOLS

PBL/ PDÖ	: Problem Based Learning
PBL (Chapter 2.1.4)	: Project Based Learning
TBL	: Task Based Learning
CBL	: Content Based Learning
NMSA	: National Middle School Association
NBME	: National Board of Medicine Exam
ES	: Effect Size
SDL	: Self Directed Learning
HT	: Hypothesis Test
T	: T (Student) test
F	: Variance Test
ANOVA	: Analysis of Variance
MSc	: Master of Science
P	: Significance
HMM	: Hacı Mehmet Malike
SPSS	: Statistical Package for Social Sciences

CHAPTER 1
INTRODUCTION

In this chapter, the research problem, purpose of the study, the significance of the study, assumptions and limitations are decribed.

1.1 Problem

Problem-based learning (PBL) is an instructional approach that exemplifies student centred learning. It emphasizes solving complex problems in rich contexts and aims at developing higher-order thinking skills (Savery & Duffy, 1995).

"This approach keeps a constant flow going between teacher and student, and you can't put a price tag on that."

To create an effective learning situation in the classroom, Combs (1976) says that three characteristics are needed:

1- The atmosphere should facilitate the exploration of meaning. Learners must feel safe and accepted. They need to understand both the risks and rewards of seeking new knowledge and understanding. The classroom must provide for involvement, interaction, and socialization, along with a business-like approach to getting the job done.

2- Learners must be given frequent opportunities to confront new information and experiences in the search for meaning. However, these opportunities need to be provided in ways that allow students to do more than just receive information. Students must be allowed to confront new challenges using their past experience without the dominance of a teacher/giver of information.

3- New meaning should be acquired through a process of personal discovery. The methods used to encourage such personal discovery must be highly individualized and adapted to the learner's own style and pace for learning.

In problem-based learning classrooms, the roles and responsibilities of both teachers and learners are different from in more traditional types of school-based learning. Generally, in problem-based classrooms, the teacher acts as a coach for or facilitator of activities that students carry out themselves. The teacher does not simply present information or directly control the progression of work. Instead, the teacher provides students with appropriate problems to work on, assists them in identifying and accessing the materials and equipment necessary to solve the problems, gives necessary feedback and support during the problem solving process, and evaluates students' participation and products, with the goal of helping them develop their problem-solving as well as their language and literacy skills (Mathews-Aydinli,2007).

It is claimed that a PBL approach produces more motivated students, develops a deeper understanding of the subject, encourages independent and collaborative learning, develops higher order cognitive skills and develops a range of skills which include problem solving, group working, critical analysis and communication. In PBL, the curriculum is organised around the problems. Consequently, students learn the 'content' that is required to solve those problems. So problems have to be carefully matched to the desired learning outcomes (Overton, 2005).

In PBL, students work in groups to solve the problems. There are no lectures, instead students engage in self-directed learning and the tutor acts as a facilitator, mentor or guide. Research suggests that PBL students perform as well as or slightly worse than students from traditional courses on conventional examinations of knowledge. However, PBL students are superior with respect to their approach to study and learning, long-term retention of knowledge, motivation, and use of resources, key skills and subsequent success as postgraduates. Problems that are used for PBL should address curriculum objectives, be real and engaging, be 'fuzzy', place the group in a professional role (i.e. as scientists), require students to

develop a problem solving strategy, require the acquisition of new knowledge and require the students to make judgements, approximations and deal with omitted/excess information (Overton, 2005).

During the first classroom session the students are divided into groups and presented with the problem. They may brainstorm in order to clarify the nature of the problem and identify their learning needs; they may delegate roles within the groups and share existing knowledge. The tutor's role is one of observation, guidance and support. Outside the classroom session, the students engage in independent study in order to fill any gaps in subject knowledge. They come together again in a group or classroom session to share and critically evaluate resources and information gathered. Using the newly acquired information they work towards a solution to the problem. Again, the tutor's role is one of guidance and support. This cycle of independent study, group interaction and critical analysis may be repeated as many times as dictated by the problem. Eventually the students present their solution and reflect on the process and solution (Overton, 2005).

As this is a very different type of learning activity it may not be appropriate to assess students in a traditional way. The assessment should be matched to the desired learning outcomes. Assessment may focus on the solution to the problem, or the problem solving process or the skills development aspect. Tutors must decide whether they wish to give each member of a group the same mark or whether they wish to build in an individual element. Students may be involved in assessing each other's contribution to the activity or may be involved in self-assessment and reflection. Useful assessment tools include logbooks and diaries, written reports, oral presentations and reflective evaluation (Physical Sciences Centre, 2005).

There are studies in the literature which aimed at adapting problem-based learning for use in elementary and high school settings (Achilles & Hoover, 1996; Gallagher, Stepian, Sher, & Workman, 1995; Gordon, Rogers,

Comfort, Gavula, & Mcgee, 2001; McBroom & McBroom, 2001; Sage, 1996; Savoie & Hughers, 1994; West, 1992). Results, in general, revealed that the PBL creates an environment in which students actively participate in the learning process, take responsibility for their own learning, and become better learners in terms of time management skills, ability to define topics, ability to access different resources, and ability to evaluate validity of these resources. Moreover, it was found that PBL appears to improve critical thinking, communication, mutual respect, teamwork, interpersonal skills and increase students' interest in the course and make students apprentice scientists. Furthermore, it was suggested that PBL encourages students to identify knowledge deficiencies, coordinate actions and people, realize goals and continuously monitor understanding (Galand, Bentein, Bourgeois & Frenay, 2003; Karabulut, 2002; Paris & Paris, 2001).

Perterson M. (1997) suggests that PBL has gained acceptance and has been found effective within a variety of disciplines in higher education. PBL satisfies three important criteria that promote optimal learning;

First, it provides an environment where the student is immersed in a practical, on-going activity in which he/she receives feedback from other students and the instructor.

Second, the student receives guidance and support from his/her friends and peers. Learning is not uni-directional (teacher to student), but multidirectional, including other students, tutors, and professors. As Savery and Duffy state, learning occurs through the multiple interactions within the learning environment.

Third, the learning is functional-based on solving a real problem. According to Camp, PBL is based on a foundation of collaboration and integration within a small group context. Simply stated, PBL depends upon the ability of students to work together to identify and analyze problems, and/or generate solutions.

Problem-based learning purposefully combines cognitive and meta-cognitive teaching and learning. It is an approach that has been around since the late 1960s (Neufeld&Barrows,1974) and engages language students in learning how to learn while they also learn language and content Roschelle (1999) held that problem-based learning is rooted in John Dewey's project-based pedagogy of the early 20th century (e.g., Dewey, 1929, 1933, 1938). Within the area of second language learning and teaching, problem-based learning aligns with approaches in which students learn the target language by *using* it, rather than being presented with and then practicing predetermined language structures. Approaches based on similar principles include task-based learning (Ellis, 2003; Skehan, 1998; Willis, 1996), content-based learning (Garner & Borg, 2005; Rodgers, 2006), and project-based learning (Alan & Stoller, 2005; Lee, 2002; Moss & Van Duzer, 1998). What makes problem-based learning unique is its core focus on learning through solving real, open-ended problems to which there are no fixed solutions (Ertmer, Lehman, Park, Cramer, & Grove, 2003). Students work alone or in groups first to understand a particular problem and then to find possible solutions to it.

To be successful in the workplace of the 21st century, individuals must not only have an extensive store of knowledge, but also must know how to keep that knowledge current, apply it to solve novel problems, and function as a member of a team. This modern view of the workplace has compelled many educators to rethink the ways in which students are prepared (Hmelo & Evensen, 2000).

In recent decades, teachers, instructional designers, and other educators have increasingly been urged to adopt a variety of constructivist approaches in order to facilitate student-centered learning environments (Becker, 2000: Howard, McGee, Schwartz, & Purcell, 2000). Among various constructivist approaches, problem-based learning (PBL) has been

advocated as an exemplar because it promotes students' understanding, integration, and retention of concepts, facts, and skills (Gallagher, 1997; Savery & Duffy, 1995).

Problem-based learning is an instructional method (Major, 1998) or educational approach (Major & Palmer, 2001; Ngeow & Kong, 2001) that is characterized by the use of real world problems (Barrows, 1999; Dombrowski, 2002; Duch, 1995; Major &Palmer, 2001) as a stimulus for learners to utilize critical thinking and problem solving skills (Barrows, 1999; Duch, 1995). Considered a process as well as a curriculum (Major & Palmer, 2001), PBL is significantly different from traditional pedagogical methods (Martin, 1996) that employ the use of lecture as the primary method of instructional delivery (Jones, 1996). Contrary to this traditional method, PBL places an emphasis on active engagement that involves learners in the meta-cognitive process of thinking about their learning (Harper-Marinick, 2001). It is by this process that the learner moves from the shallow surface learning of traditional approaches to deep understanding that reflects the level or depth of understanding that is characteristic of problem-based instruction. With its roots in constructivism, PBL has an extensive history in the traditional university in the field of health sciences. In the early part of the twentieth century, institutes of higher learning and medical schools were growing concerned by the lack of quality in students' abilities to engage actively in learning; "studies were showing that student learning in traditional classrooms was not effective, as students largely forgot the content" (Savin-Baden & Major, 2004, p. 17) that was delivered in the didactic mode.

Therefore, in 1966 problem-based learning was born with the purpose of simulating patient problems that would reflect the authentic setting of a practicing physician. These open-ended problems that focus on "real-life" scenarios enabled medical students to immediately apply the knowledge gained. As a result of this practical application, learner motivation increased, as well as problem solving skills and the ability for self-regulated learning

(Barrows & Tamblyn, 1976). The use of PBL as an instructional method in the twentieth century mainly occurred in the face-to-face environment, but this appears to be changing as we begin the twenty-first century. In the last several years, literature has begun to surface indicating that PBL is now being implemented in virtual environments (Donnelly, 2004; Gibson, 2002; Harvey, 2003). Once again, the field of health sciences appears to have taken the lead in pioneering the delivery of online PBL. Evidence of online PBL being used in other disciplines, such as business, engineering, and information technologies is beginning to surface as well. PBL focuses on the education fundamental learner-centered objectives as was done in the traditional setting. Of significance for this study is evidence that in classrooms PBL is now being explored for teacher education (Donnelly, 2004; Gibson 2002; Harvey 2003).

Recent research in this area concentrates on design concerns and the environment in which online PBL is conducted. In one such study, Harvey (2003) describes the process of re-designing a traditional print-based simulation for use in a hybrid teacher education course; the study addressed considerations faced in the redesign such as creation of materials, technical support, as well as time and resources. Donnelly (2004) writes about a hybrid approach for in-service teacher training; the study focused on facilitating an environment for participants to develop, deliver, support, and evaluate a course within their own discipline. Ortiz (2004) examined research on distance education environments and teacher education that have attempted to utilize the traditional PBL format and put forth suggestions for the modification of particular areas when PBL is implemented. More recently, teaching-learning environment often started to be implemented in a variety of learning approaches. This study is determined to practice PBL in the classes. Also, it is to measure the attitudes of teachers towards PBL method.

1.2 Purpose

The main purpose of this research is to determine high school teacher's attitudes about the Problem-Based Learning. In line with the main purpose, this study aims to find answers to the sub questions below:

1) Do teachers' attitudes differ with regards to the following variable;

1. 1. Type of school
1. 2. Graduate
1. 3. Branches
1. 4. Graduation Degree
1. 5. Genders
1. 6. Age Status
1. 7. Seniority
1 .8 Class Levels they trained

2) What are teachers' interests and needs towards this method;

2.1. When teachers apply PBL?
2.2. What are the difficulties face to teachers with PBL?
2. 3. How often teachers use PBL?
2. 4. Where do they inform about PBL?
2. 5. How do they feel needs about PBL?
2. 5 How often they apply PBL?

3) What are teachers' views and recommendations about PBL.

These cases are intended to bring research and recommendations.

1.3 Significance of the Study

The result of this research will be a guide to teachers, researchers, school directors, and Education authoritatives who will improve the education cirruculum. According to results expecially;

- It is hoped that teacher-centred classes will be taken away in learning process. Teachers will practice on some skills by using PBL for student-centred classes. Also, students will be more active in classes and they will not memorize everything, they can solve the problems with using Problem Based Learning.
- It is believed that lessons, teachers, exams and all about school objects will be more fun and the students will participate with their classmates to solve the problem.
- It is believed Problem Based Learning can be solution for Turkish Education; elementary schools, secondary schools, high schools, and the others.

1.4 Assumptions and Limitations

Following assumptions and limitations were encountered for this study:

Limitations

1. Theoretical part of this study was scanned with written literature.
2. The study contains only the opinions of the teachers working in secondary education institutions.
3. This study is limited to serving teachers in Antalya High School, Bileydi Anatolian High School and Yavuz Selim High School.

CHAPTER 2

REVIEW OF LITERATURE

This chapter includes the review of the literature relevant with Cognitive and Meta-cognitive Learning, Content-Based Learning, Problem-Based Learning, Project-Based Learning, Task-Based Learning and Researches, Studies, Findings and Results on PBL.

2.1 Approaches based on similar principles with PBL

2.1.1 Cognitive and Meta-cognitive Learning

In an attempt to make such a distinction clear, Flavell (1976) suggested that cognitive strategies 'facilitate' learning and task completion, whereas metacognitive strategies 'monitor' the process. To use a clear-cut example by Flavell (1976), asking oneself questions about this article might function either to improve one's knowledge (a cognitive function) or to monitor it (a metacognitive function), hence demonstrating co-existence and interchange ability of cognitive and metacognitive functions. For Forrest-Pressley and Waller (1984), cognition is referring to the actual processes and strategies used by the learner, whereas metacognition is referring to what a person knows about his/her cognitions and to the ability to control these cognitions.

Although, originally, Flavell used the term meta-cognition to describe the awareness "of knowing" in relation to memory, more recently Babbs and Moe (1983), based on the preceding theoretical work of Flavell, Baker and Brown, have presented a model for meta-cognition related specifically to the reading task. They claimed that certain strategies have been traditionally taught as comprehension, critical reading, and study skills, but now are relabelled "as meta-cognitive skills because they can be consciously invoked

by the reader to aid in focusing on the important content in monitoring comprehension" (p. 423). These skills include the following acts by the reader: (1) consciously intending to control the reading act; (2) establishing the goal of the reading act; (3) focusing on meta-cognitive knowledge; (4) planning the regulation and monitoring of the reading act; and (5) periodically assessing reading success. Babbs and Moe (1983) claim the advantage in viewing these reading skills metacognitively is that the reader must assume more responsibility for this knowledge and control.

Perhaps the most straightforward definition of metacognition is that it is 'thinking about thinking' (Flavell, 1999; Bogdan, 2000; Metcalfe, 2000); however, this definition requires further elaboration, because metacognition also involves knowing how to reflect and analyse thought and how to draw conclusions from that analysis, and how to put what has been learned into practice. In order to solve problems, students often need to understand how their mind functions.

Hacker (1998) points out the difference between 'cognitive tasks' (remembering things learned earlier that might help with the current task or problem) and 'metacognitive tasks' (monitoring and directing the process of problem-solving), stressing the importance of learning more about thinking. Cornoldi (1998) emphasizes the role of learners' beliefs about thinking, and makes the point that if students feel confident that they can solve problems, they tend to do better work. In defining metacognition as 'thinking about thinking' or 'second-order cognition', Weinert (1987) acknowledges that purpose, conscious understanding, ability to talk or write about tasks, and generalizability to other tasks are also important factors in determining whether a given task is metacognitive and this viewpoint is supported by Brown (1987), who agrees that metacognition requires the thinker to use and describe the process of mental activity.

Many other researchers also make the point that metacognition is best defined by acknowledging that it is both knowledge about and control over thinking processes (Allen & Armour-Thomas, 1991). Thinking takes place in a variety of ways. Where thinking is purposeful and is based on experiential data, we call it cognition. So where the objects of purposeful thinking are real objects (as perceived by the individual concerned) or are abstractions of real objects and their properties, then the thinking is cognition. In this sense, cognition mediates between the learner and the experiential world and the objects of cognition are real objects, ideas and abstractions. Hence learners can be engaging in cognition when they are working with parallel lines, whether or not a drawing of parallel lines exists in their sight. Another form of purposeful thought, and one that is also involved with problem solving, is metacognition. Metacognition mediates between the learner and their cognition. While cognition can be considered as the way learners' minds act on the 'real world', metacognition is the way that their minds act on their cognition.

This relationship is indicated in figure 2.1

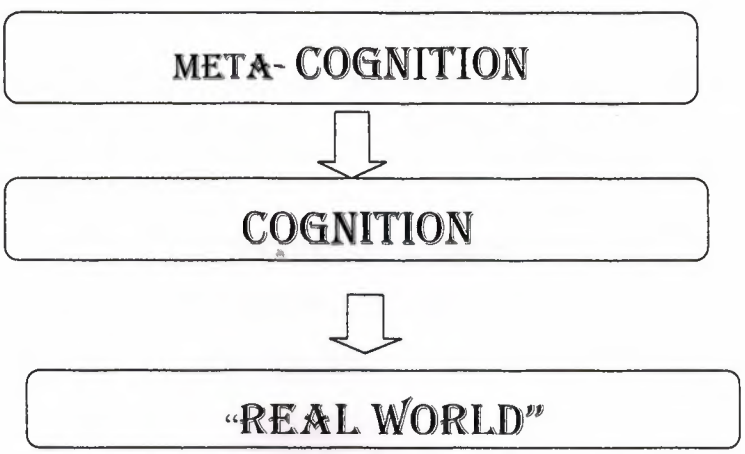

Figure 2.1. the relationship between metacognition, cognition and the 'real world'.

It is worth noting that metacognition comes into play when cognition becomes problematic. Metacognition becomes essential when tasks are more challenging. This may occur at any stage in a contemplative situation from the beginning to the end. Hence metacognition has been strongly linked with problem solving where problems are usually not of any standard type. Metacognitions are second-order cognitions: thoughts about thoughts, knowledge about knowledge, or reflections about actions. However, problems arise when one attempts to apply this general definition to specific instances. These problems concern whether metacognitive knowledge must be utilized, whether it must be conscious and verbalizable, and whether it must be generalized across situations.

Children's value of learning also decreases with age, particularly during the transition from elementary to junior high school. Older children's preference for challenge, curiosity and independent mastery is much lower than that of the younger children and children's mean levels of value of academic task get lower when they grow older (Eccles & Midgley, 1989).

Meta-cognition is thinking about thinking, knowing "what we know" and "what we don't know." Just as an executive's job is management of an organization, a thinker's job is management of thinking. The basic meta-cognitive strategies are:

1. Connecting new information to former knowledge.
2. Selecting thinking strategies deliberately.
3. Planning, monitoring, and evaluating thinking processes. (Dirkes, 1985)

Strategies for Developing Meta-cognitive Behaviors:

1. Identifying "what you know" and "what you don't know."

At the beginning of a research activity students need to make conscious decisions about their knowledge. Initially students write "What I

already know about..." and "What I want to learn about...." As students research the topic, they will verify, clarify and expand, or replace with more accurate information, each of their initial statements.

2. Talking about thinking.

Talking about thinking is important because students need a thinking vocabulary. During planning and problem-solving situations, teachers should think aloud so that students can follow demonstrated thinking processes. Modelling and discussion develop the vocabulary students need for thinking and talking about their own thinking. Labelling thinking processes when students use them is also important for student recognition of thinking skills. Paired problem-solving is another useful strategy. One student talks through a problem, describing his thinking processes. His partner listens and asks questions to help clarify thinking. Similarly, in reciprocal teaching (Palinscar, Ogle, Jones, Carr, & Ransom, 1986), small groups of students take turns playing teacher, asking questions, and clarifying and summarizing the material being studied.

3. Keeping a thinking journal.

Another means of developing meta-cognition is through the use of a journal or learning log. This is a diary in which students reflect upon their thinking, make note of their awareness of ambiguities and inconsistencies, and comment on how they have dealt with difficulties. This journal is a diary of process.

4. Planning and self-regulation.

Students must assume increasing responsibility for planning and regulating their learning. It is difficult for learners to become self-directed when learning is planned and monitored by someone else.

Students can be taught to make plans for learning activities including estimating time requirements, organizing materials, and scheduling procedures necessary to complete an activity. The resource center's

flexibility and access to a variety of materials allows the student to do just this. Criteria for evaluation must be developed with students so they learn to think and ask questions of themselves as they proceed through a learning activity.

5. Debriefing the thinking process.

Closure activities focus student discussion on thinking processes to develop awareness of strategies that can be applied to other learning situations.

A three step method is useful. First, the teacher guides students to review the activity, gathering data on thinking processes and feelings. Then, the group classifies related ideas, identifying thinking strategies used. Finally, they evaluate their success, discarding inappropriate strategies, identifying those valuable for future use, and seeking promising alternative approaches.

6. Self-Evaluation.

Guided self-evaluation experiences can be introduced through individual conferences and checklists focusing on thinking processes. Gradually self-evaluation will be applied more independently. As students recognize that learning activities in different disciplines are similar, they will begin to transfer learning strategies to new situations.

Learning orientation, rich strategies and meta-learning:

Learners who adopt a learning orientation may also be those who have a richer conception of learning, which engages more elements and more complex relationships. At the same time, they may have a richer range of learning strategies, but here a further connection emerges. Learners may "possess" learning strategies, but not employ them, or employ them ineffectively. So it is the process of selection and use which comes to the fore. This is where the metacognitive strategies of monitoring and reviewing are vital: indeed one review concluded that direct teaching of "study skills" to

students without attention to reflective, metacognitive development may well be pointless. Since the development we seek refers to learning (i.e. more than just thinking) we consider the term meta-learning more accurate.

So learning about learning aims to:

1. Focus on learning as opposed to performance
2. Promote a rich conception of learning, and a rich range of strategies
3. develop meta-learning to monitor and review

In what ways can classrooms foster this? Is there any evidence that such learning leads to high levels of performance, and if so under what conditions? The choice of performance measures and whether they assess high-level learning will be critical.

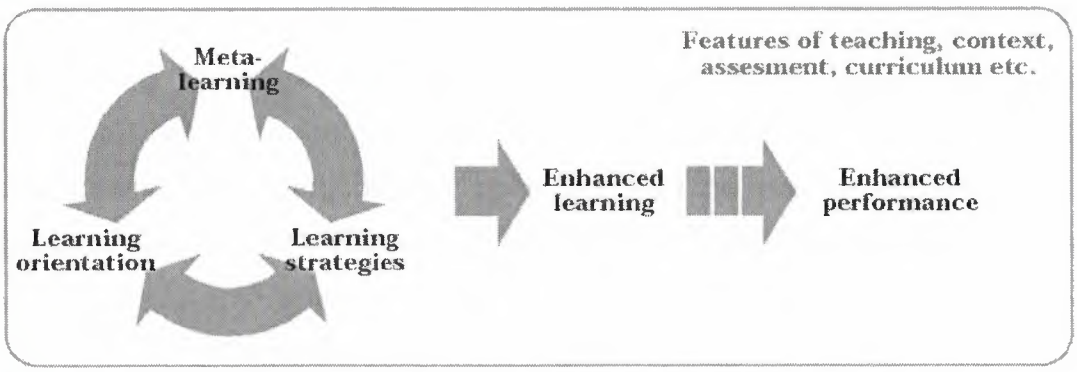

Figure 2. 2. Relations between the major elements connecting learning and performance.

Learning about Learning in Secondary School:

(The Institute of Education-No: 13, 2001) In this journal the research indicates us, for nearly 20 years it has been known that students with more elaborated conceptions of learning perform better in public examinations at age 16. Lower attainment at that age is correlated with perceived pressure from adults, while higher attainment is positively related to independence, competence and a meaning-oriented approach to learning. Recent data confirms the connection: students with qualitative and experiential conceptions of learning were likely to use meaning-oriented approaches, whereas students with quantitative conceptions of learning tended to use

surface approaches. Similar findings appear in 14-year olds in Hong Kong. Learning orientation is significantly associated with adaptive learning strategies, and performance orientation with maladaptive learning strategies (229 12 year-olds). Learning orientation is also associated positively with students' beliefs that they are able to regulate themselves and their learning. The more students are supported as autonomous learners, the higher their school performance, as demonstrated by the grades in French, Maths, Biology and Geography (263 15 year-old students in Canada).

2.1. 2 Task Based Learning

Integrated teaching and problem-based learning (PBL) are powerful educational strategies. Difficulties arise, however, in their application in the later years of the undergraduate medical curriculum, particularly in clinical attachments. Two solutions have been proposed the use of integrated clinical teaching teams and time allocated during the week for PBL separate from the clinical work. Both approaches have significant disadvantages. Task-based learning (TBL) is a preferred strategy. In TBL, a range of tasks undertaken by a doctor are identified, e.g. management of a patient with abdominal pain, and these are used as the focus for learning. Students have responsibility for integrating their learning round the tasks as they move through a range of clinical attachments in different disciplines. They are assisted in this process by study guides. Method The implementation of TBL is described in one medical school. One hundred and thirteen tasks, arranged in 16 groups, serve to integrate the student learning as they rotate through 10 clinical attachments. Results this trans-disciplinary approach to integration, which incorporates the principles of PBL offers advantages to both teachers and students. It recognizes that clinical attachments in individual disciplines can offer rich learning opportunities and those attachments can play a role in an integrated, as well as in a traditional, curriculum. In TBL, the contributions of the clinical attachments to the curriculum learning outcomes must be clearly

defined and tasks selected which will serve as a focus for the integration of the students' learning over the range of attachments.

What is a task?

A task is an activity "where the target language is used by the learner for a communicative purpose (goal) in order to achieve an outcome."

Types of tasks

1. Listing: brain storming, fact-finding

Outcome: Completed list or draft mind map.

2. Ordering and sorting: sequencing, ranking, categorising, classifying

Outcome: Set of information ordered and sorted according to specified criteria.

3. Comparing: matching, finding similarities, finding differences

Outcome: Could be items appropriately matched or assembled, or the identification of similarities and/or differences.

4. Problem solving: analysing real situations, analysing hypothetical situations, reasoning, decision making.

Outcome: Solutions to the problem, which can then be evaluated.

5. Sharing personal experiences: narrating, describing, exploring and explaining attitudes, opinions, reactions Outcome: Largely social.

6. Creative Tasks: brainstorming, fact-finding, ordering and sorting, comparing, problem solving and many others.

Outcome: End product which can be appreciated by a wider audience.

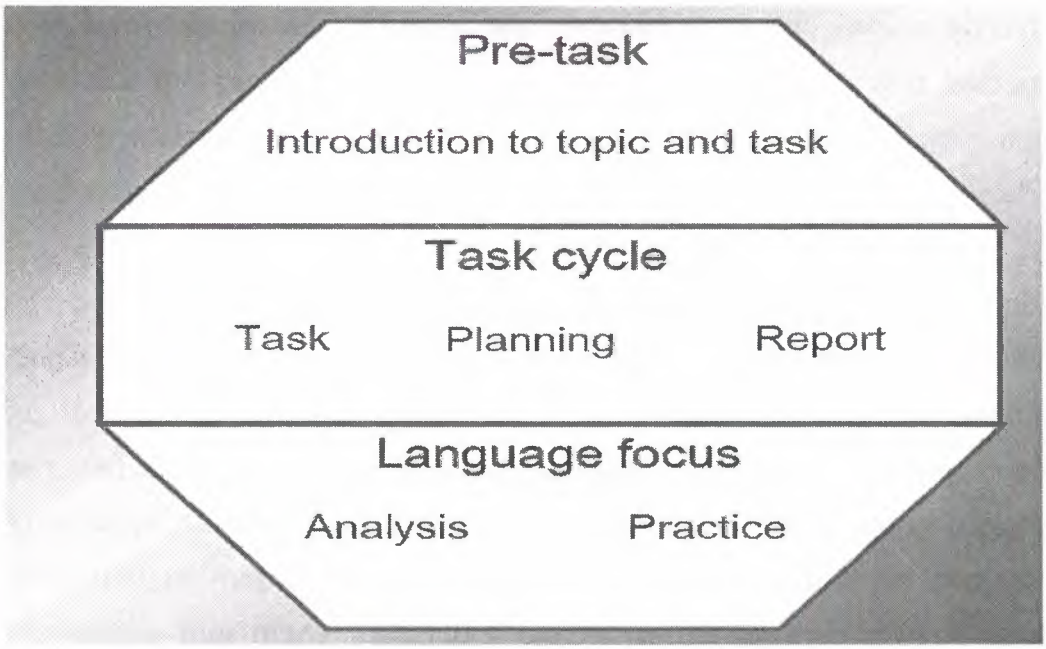

Figure 2.3. the TBL Framework

2.1.3 Content Based Learning

Briton, Snow and Wesche state that "content-based instruction aims at eliminating the artificial separation between language instruction and subject matter classes which exists in most educational settings" (2003). "Communication-based instruction can be an effective tool for providing English language learners access to content area learning" (Hernandez, 2003). Met suggests that "content in content-based programs represents material that is cognitively engaging and demanding for the learner, and is material that extends beyond the target language or target culture" (n.d.). Since it is important to produce students who comprehend English without translating into their native languages, choose effective impact on the brain. While students learn about a certain topic, they are required not only to use their background knowledge, but also to think, doubt, and solve tasks. In other words, they need to reflect critically on the content, encouraging them to utilize a range of intellectual skills. This makes it possible for them to store new information in their knowledge bank. According to Kennedy, "enriched experiences neural growth and thus enhance learning, indicating that brains

construct themselves through life experiences. The more stimulation received, the greater the learning. Emotion, experiences, and learning of meaningful information strengthens useful connections and results in cortical pyramidal cell branching" (2006).

Content-based instruction allows English learners to acquire not only English but also certain themes or topics. It is surely valuable since there is no isolation of language and content. Students also need to employ all required skills to comprehend the content, and store the newly acquired knowledge. Content-based instruction, in addition, has a strong connection with student motivation. Although materials development is one of the challenges that many instructors encounter during their career, content-based English instructors also need to set a target for both of English ability and understanding of the content. Materials should have motivating, comprehensible, and real-world relevance. The problematic part in content-based instruction is evaluation. Instructors should familiarize themselves with methods of assessment in order to evaluate students as accurately as possible.

2.1.4 Project- Based Learning

Project-based learning (PBL) is a model that organizes learning around projects. According to the definitions found in PBL handbooks for teachers, projects are complex tasks, based on challenging questions or problems, that involve students in design, problem-solving, decision making, or investigative activities; give students the opportunity to work relatively autonomously over extended periods of time; and culminate in realistic products or presentations (Jones, Rasmussen, & Moffitt, 1997; Thomas, Mergendoller, & Michaelson, 1999). Other defining features found in the literature include authentic content, authentic assessment, teacher facilitation but not direction, explicit educational goals, (Moursund, 1999), cooperative learning, reflection, and incorporation of adult skills (Diehl, Grobe, Lopez, & Cabral, 1999). To these features, particular models of PBL add a number of

unique features. Definitions of "project-based instruction" include features relating to the use of an authentic ("driving") question, a community of inquiry, and the use of cognitive (technology-based) tools (Krajcik, Blumenfeld, Marx, & Soloway, 1994; Marx, Blumenfeld, Krajcik, Blunk, Crawford, Kelly, & Meyer, 1994); and "Expeditionary Learning" adds features of comprehensive school improvement, community service, and multidisciplinary themes (Expeditionary Learning Outward Bound, 1999).

The five criteria are centrality, driving question, constructive investigations, autonomy, and realism.

PBL projects are central, not peripheral to the curriculum. This criterion has two corollaries. First, according to this defined feature, projects are the curriculum. In PBL, the project is the central teaching strategy; students encounter and learn the central concepts of the discipline via the project. There are instances where project work follows traditional instruction in such a way that the project serves to provide illustrations, examples, additional practice, or practical applications for material taught initially by other means. However, these "application" projects are not considered to be instances of PBL, according to this criterion. Second, the centrality criterion means that projects in which students learn things that are outside the curriculum ("enrichment" projects) are also not examples of PBL, no matter how appealing or engaging.

PBL projects are focused on questions or problems that "drive" students to encounter (and struggle with) the central concepts and principles of a discipline. This criterion is a subtle one. The definition of the project (for students) must "be crafted in order to make a connection between activities and the underlying conceptual knowledge that one might hope to foster." (Barron, Schwartz, Vye, Moore, Petrosino, Zech, Bransford, & The Cognition and Technology Group at Vanderbilt, 1998, p. 274). This is usually done with a "driving question" (Blumenfeld et al., 1991) or an ill-defined problem (Stepien and Gallagher, 1993).

PBL projects may be built around thematic units or the intersection of topics from two or more disciplines, but that is not sufficient to define a project.

The questions that students pursue, as well as the activities, products, and performances occupy their time, must be "orchestrated in the service of an important intellectual purpose" (Blumenfeld et al., 1991).

Projects involve students in a constructive investigation. An investigation is a goaldirected process that involves inquiry, knowledge building, and resolution. Investigations may be design, decision-making, problem-finding, problem-solving, discovery, or model-building processes. But, in order to be considered as a PBL project, the central activities of the project must involve the transformation and construction of knowledge (by definition: new understandings, new skills) on the part of students (Bereiter & Scardamalia, 1999). If the central activities of the project represent no difficulty to the student or can be carried out with the application of already-learned information or skills, the project is an exercise, not a PBL project. This criterion means that straightforward service projects such as planting a garden or cleaning a stream bed are projects, but may not be PBL projects.

Projects are student-driven to some significant degree. PBL projects are not, in the main, teacher-led, scripted, or packaged. Laboratory exercises and instructional booklets are not examples of PBL, even if they are problem-focused and central to the curriculum. PBL projects do not end up at a predetermined outcome or take predetermined paths. PBL projects incorporate a good deal more student autonomy, choice, unsupervised work time, and responsibility than traditional instruction and traditional projects.

Projects are realistic, not school-like. Projects embody characteristics that give them a feeling of authenticity to students. These characteristics can include the topic, the tasks, the roles that students play, the context within which the work of the project is carried out, the collaborators who work with

students on the project, the products that are produced, the audience for the project's products, or the criteria by which the products or performances are judged. Gordon (1998) makes the distinction between academic challenges, scenario challenges, and real-life challenges. PBL incorporates real-life challenges where the focus is on authentic (not simulated) problems or questions and where solutions have the potential to be implemented.

2.2 Problem- Based Learning

"Education will begin with a problem"

To be successful in the workplace of the 21st century, individuals must not only have an extensive store of knowledge, but also must know how to keep that knowledge current, apply it to solve novel problems, and function as a member of a team. This modern view of the workplace has compelled many educators to rethink the ways in which students are prepared (Hmelo & Evensen, 2000). Unlike the traditional, objectivist approach to teaching that focuses on identifying the elements that the learner must know, this new, constructivist approach emphasizes the importance of learning in context. That is, it is no longer enough for learners to acquire concepts in isolation; knowledge which often remains inert. Instead, learners must develop and continually modify their understanding of the world as they interact with other learners to solve realistic problems situated in meaningful tasks (Driscoll, 2005).

Since in the days of Plato memoires were found of experiences detailing students taking an integral part in the learning process as they actively engaged in whatever was taking place. More recently, as early as the 20th century, PBL was supported by numerous well known researchers like Dewey (1910, 1944); Piaget (1954); Bruner (1959, 1961); Rogers (1969) and Ausubel, Novak and Hanesian (1978). Dewey, Piaget and Bruner among other well known educators advocated that learning took place as students participated in the process by interacting intimately with materials and method. To this end PBL has been used in psychology (Reynolds, 1997);

medical training (Barrows, 1996), engineering (Cawley, 1989) and architecture (Donaldson, 1989; Maitland, 1991) to mention a few. Defined in a variety of ways, PBL uses authentic or real-life problems/scenarios/situations to allow users opportunity for investigation, self-directed study, collaborative analysis, solution, synthesis and evaluation. To get the most out of the experiences, participants often work in small or reasonably sized break-out groups (about five to six). The facilitator serves in a multiplicity of roles as resource person, coach, referee, adjudicator, counselor, friend and fellow learning partner. Basically, there is a non traditional relationship that is meant to foster meaningful exchange of ideas in a non threatening atmosphere that encourages inclusion and accelerates learning. While Barrows and Tamblyn (1980:18) defined PBL *as 'the learning that results from the process of working toward the understanding or resolution of a problem',* Evenson and Hmelo (2000) viewed PBL as an approach to instruction that uses concrete problems to provide scaffolding for learning and teaching.

The modern history of problem based learning begins in the early 1970s at the medical school at McMaster University in Canada. Its intellectual history is far older. Thomas Corts, president of Samford University, sees PBL as "a newly recovered style of learning" In his view; it embraces the question-and answer dialectical approach associated with Socrates as well as the Hegelian thesis-antithesis-synthesis dialectic. As John Cavanaugh puts it: "It's like discovery-based learning in the 1960s. We knew about it; we didn't do it. Dewey talked about it when he talked about 'engagement.' Dewey had it right on the abstract level. We do the details better now, that's all, and that's because of advances in cognitive science and in technology." Until recently the PBL approach has flourished mainly in medical and professional schools. Slowly the sciences in general have begun taking it up, and even more slowly, the humanities. PBL does not have a store of transferable techniques or methods like Cooperative Learning, no "jigsaw," no "think-pair-share" or that sort of thing. Opinions vary on whether

PBL should be implemented for entire courses or whether it can be used merely to teach certain parts of courses. In general, advocates accept faculty easing into the approach piecemeal, but favour course-long continuity.

2.2.1. What is Problem Based Learning?

Problem based learning (PBL) is a style of learning in which the problems act as the context and driving force for learning. All learning of new knowledge is done within the context of the problems. PBL differs from problem solving in that in PBL the problems are encountered before all the relevant knowledge has been acquired and solving problems results in the acquisition of knowledge and problem-solving skills.

Problem-based learning (PBL) is an instructional approach that exemplifies student centred learning. It emphasizes solving complex problems in rich contexts and aims at developing higher-order thinking skills (Savery & Duffy, 1995). According to Barrows (1996), PBL has these characteristics: (a) learning is student-centred; (b) authentic problems form the organizing focus for learning; (c) new information is acquired through self-directed learning; (d) learning occurs in small groups; and (e) teachers act as facilitators.

Barrows (1998) articulated what has become one of the most widely used definitions of PBL. He termed it "authentic PBL" and argued that it has four key characteristics:

1. ***Problem-based.*** It begins with the presentation of a real life (authentic) problem stated as it might be encountered by practitioners.

2. ***Problem-solving.*** It supports the application of problem-solving skills required in "clinical practice." The role of the instructor is to facilitate the application and development of effective problem-solving processes.

3. ***Student-centred.*** Students assume responsibility for their own learning and faculty act as facilitators. Instructors must avoid making students dependent on them for what they should learn and know.

4. ***Self-directed learning.*** It develops research skills. Students need to learn how to get information when it is needed and will be current, as this is an essential skill for professional performance.

5. ***Reflection.*** This should take place following the completion of problem work, preferably through group discussion, and is meant to enhance transfer of learning to new problems.

As Barrows (1996) noted, PBL has taken on a myriad of definitions, pushed in part by institutions wanting to refine their particular approach. Maudlsey (1999) cautioned us not to assume that those making use of the term, *problem-based learning* were all referring to the same concept, especially since the use of problems as a teaching strategy does not necessarily constitute a PBL-oriented instructional methodology. One of Barrows' most recent definitions (2002) identified the following key components of PBL:

• Ill-structured problems are presented as unresolved so that students will generate not only multiple thoughts about the cause of the problem, but multiple thoughts on how to solve it.

• A student-centered approach in which students determine what they need to learn. It is up to the learners to derive the key issues of the problems they face, define their knowledge gaps, and pursue and acquire the missing knowledge.

For many educators, problem-based learning (PBL) represents a particularly useful example of instruction that is consistent with constructivist learning principles. Problem-based learning is an instructional method in which students learn through facilitated problem solving. In PBL, students learn by focusing on a complex problem that does not have a single correct answer, and they work together in collaborative teams to identify what needs

to be learned in order to solve the problem. Furthermore, learners "engage in self-directed learning and then apply their new knowledge to the problem and reflect on what they learned and the effectiveness of the strategies employed" (Hemlo-Silver, 2004, p. 235). In theory, learning in PBL environments not only promotes more effective knowledge construction, but results in better learning transfer over time (Bransford, Brown, & Cocking, 2000).

Problem-based learning (PBL) is an instructional approach that challenges students to seek solutions to real-world (open-ended) problems by themselves or in groups, rather than learn primarily through lectures or textbooks. More importantly, PBL engages students in developing skills as self-directed learners. Problems are selected to exploit natural curiosity by connecting learning to students' daily lives and emphasizing the use of critical and analytical thinking skills. According to Gallagher (1997), the primary goal of PBL is characterized as learning for capability rather than leaning to acquire knowledge. The effectiveness of PBL depends on the nature of student engagement and the culture of the classroom, as well as the appropriateness of the problem tasks assigned. Proponents of PBL believe that when students develop their own problem-solving procedures, they are integrating their conceptual knowledge with their procedural skills. Having its origins in the medical field, PBL is an effective and practical way of training physicians. Medical students engaged in PBL are more successful than traditionally prepared students with respect to problem-solving, self-evaluation, data gathering, other learning skills (Albanese & Mitchell, 1993).

According to another sources, Problem-based learning (PBL) is an instructional method (Major, 1998) or educational approach (Major & Palmer, 2001; Ngeow & Kong, 2001) that is characterized by the use of real world problems (Barrows, 1999; Dombrowski, 2002; Duch, 1995; Major & Palmer, 2001) as a stimulus for learners to utilize critical thinking and problem solving skills (Barrows, 1999; Duch, 1995b). Considered a process as well as a

curriculum (Major & Palmer, 2001), PBL is significantly different from traditional pedagogical methods (Martin, 1996) that employ the use of lecture as the primary method of instructional delivery (Jones, 1996). Contrary to this traditional method, PBL places an emphasis on active engagement that involves learners in the meta-cognitive process of thinking about their learning (Harper-Marinick, 2001). It is by this process that the learner moves from the shallow surface learning of traditional approaches to deep understanding that reflects the level or depth of understanding that is characteristic of problem-based instruction.

PBL may be an effective way to structure middle school curricula because it exhibits all three characteristics of effective middle school curricula: "challenging, integrative, and exploratory" (National Middle School Association, 1995). PBL is challenging in that it involves solving ill-structured problems but is also integrative because it incorporates cross-disciplinary content (Hmelo-Silver, 2004). For example, a PBL unit regarding river pollution involves disciplinary knowledge related to chemistry, biology, social studies, economics, and business. In a PBL unit, knowledge is not used in isolation but must be integrated as part of a whole solution, which is especially important in a middle school context (Toepfer, 1992; Vars, 1998). In addition, because PBL involves group work, it may allow students to explore and further develop their areas of strength by completing tasks that more closely suit their talents (Torp & Sage, 1998; Wood, 1992).

2.2.2. Roles and Procedures

Usually, a class is divided into groups of approximately five students each. The groups' membership generally remains constant throughout the term. At the purest level, the groups define the "learning issues" they believe each new problem presents and decide how to divide their labours to resolve them. Thus, aggressive PBL implementation requires ample library resources. Likewise, large class situations require an adequate number of tutors to act as support and facilitators to the groups.

Indeed, this facilitator role poses the strongest challenge for some faculty. Knowing how to work with groups (as well as how to train groups how to work with each other) is not something most faculties presume expertise in. Knowing how to guide without seeming to be coyly hiding the answer is no mean feat. And it's not an easy matter posing authentic problems, problems with certain open-endedness about them, either.

In problem-based learning classrooms, the roles and responsibilities of both teachers and learners are different from those in more traditional types of school-based learning. Generally, in problem-based classrooms, the teacher acts as a coach for or facilitator of activities that students carry out themselves. The teacher does not simply present information or directly control the progression of work. Instead, the teacher provides students with appropriate problems to work on, assists them in identifying and accessing the materials and equipment necessary to solve the problems, gives necessary feedback and support during the problemsolving process, and evaluates students' participation and products, with the goal of helping them develop their problem-solving as well as their language and literacy skills. These activities are described below.

2.2.3. Four steps in implementing problem-based learning

Many works have described the process of problem-based learning from the perspective of students (e.g., Albion & Gibson, 1998; Boud, 1985; Butler, 2003). This process generally includes four main steps, which are illustrated in Figure 2.4 under "Process for Students": (1) being introduced to the problem, (2) exploring what they do and do not know about the problem, (3) generating possible solutions to the problem, and (4) considering the consequences of each solution and selecting the most viable solution. However, we have had little information about what actions each of these steps require from the teacher. What, for example, can teachers do to help introduce students to the problem and explore what they know and do not know about it? What is the teacher's role when students are generating possible solutions and choosing among them? What are the teacher's options after the process is complete? Figure 2.4 also gives some guidelines to address these questions, developed by the author of this brief. Further details on the teacher's role as outlined in Figure 2.4 are then described in the following section, "Considerations for Teachers."

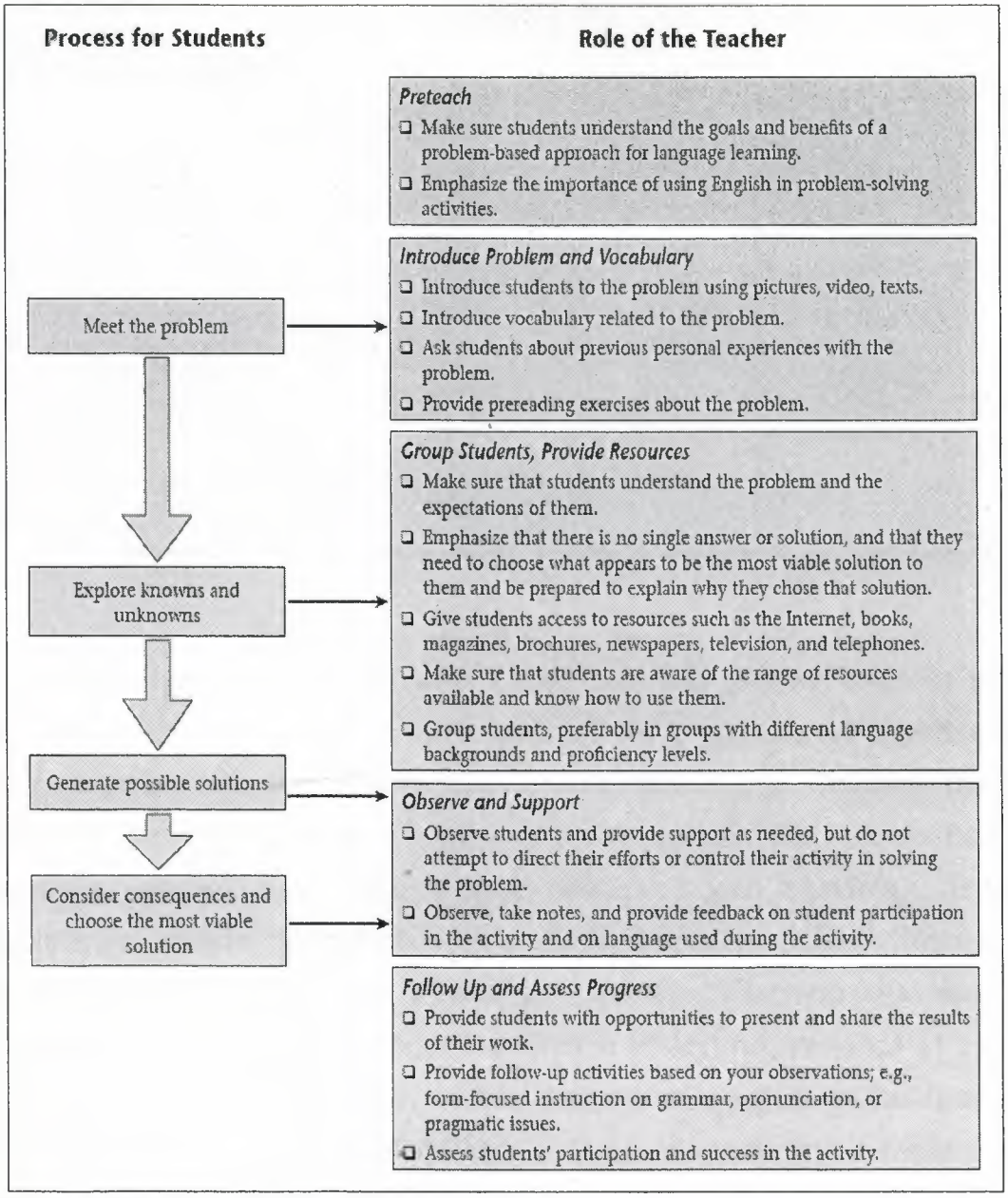

Figure 2. 4. Student and Teacher Roles in Problem-Based Learning

The teacher's role in problem-based learning begins with pre-teaching and continues through assessment of students' performance throughout the project. It includes the following steps: *Pre-teach, introduce the problem to work on it, Group students and provide resources, Observe and support, Follow up and assess progress.*

Figure 2. 5.Teaching techniques for the Problem Based Learning teacher (after Wolff, 2000)

Communicative actions	Role personae
• Staying silent • Probing questions: e.g. Why? What do you mean? What does that mean? • Reflecting questions: How does this idea help you? • Involvement questions e.g. who else has ideas on this? • Physical positioning in group • Educational diagnosis questions: e.g. how do you feel about the way you formulated your ideas ? • Stimulating interest • Decreasing challenge where there are signs of boredom or 'over challenge' • Helping students to address issues with interpersonal dynamics, e.g. by asking questions about dysfunctional group behaviours	• Learner • Creator • Director • Challenger • Evaluator • Negotiator • Modeller • Designer • Facilitator • Supporter

In the classroom, the Problem Based Learning teacher employs their knowledge of the 'subject' area to support the processes of cognitive or meta-cognitive development and/or enculturation. The Problem Based Learning literature suggests a number of techniques that the Problem Based Learning teacher may adopt in their interaction with students. These techniques include the adoption of particular role personae and forms of communicative action (see Figure 2.5 above). Teachers will require preparation and support for both the change to and maintenance of these role personae – in particular, visible institutional support in the form of recognition of the high level of skill required and adequate time to prepare for and carry out the role.

Model for Large Groups

Howard Barrows argues that a more accurate title for the model he and his collaborators developed might be 'student-centred, problem based, inquiry-based, integrated, collaborative, reiterative, learning' (Barrows, 2000). However, the label Problem Based Learning has stuck. And it is this uppercase 'PBL' that is the focus of this Curriculum Guide. The different concepts and theories that appear to influence Problem Based Learning are summarised in Figure 2.6

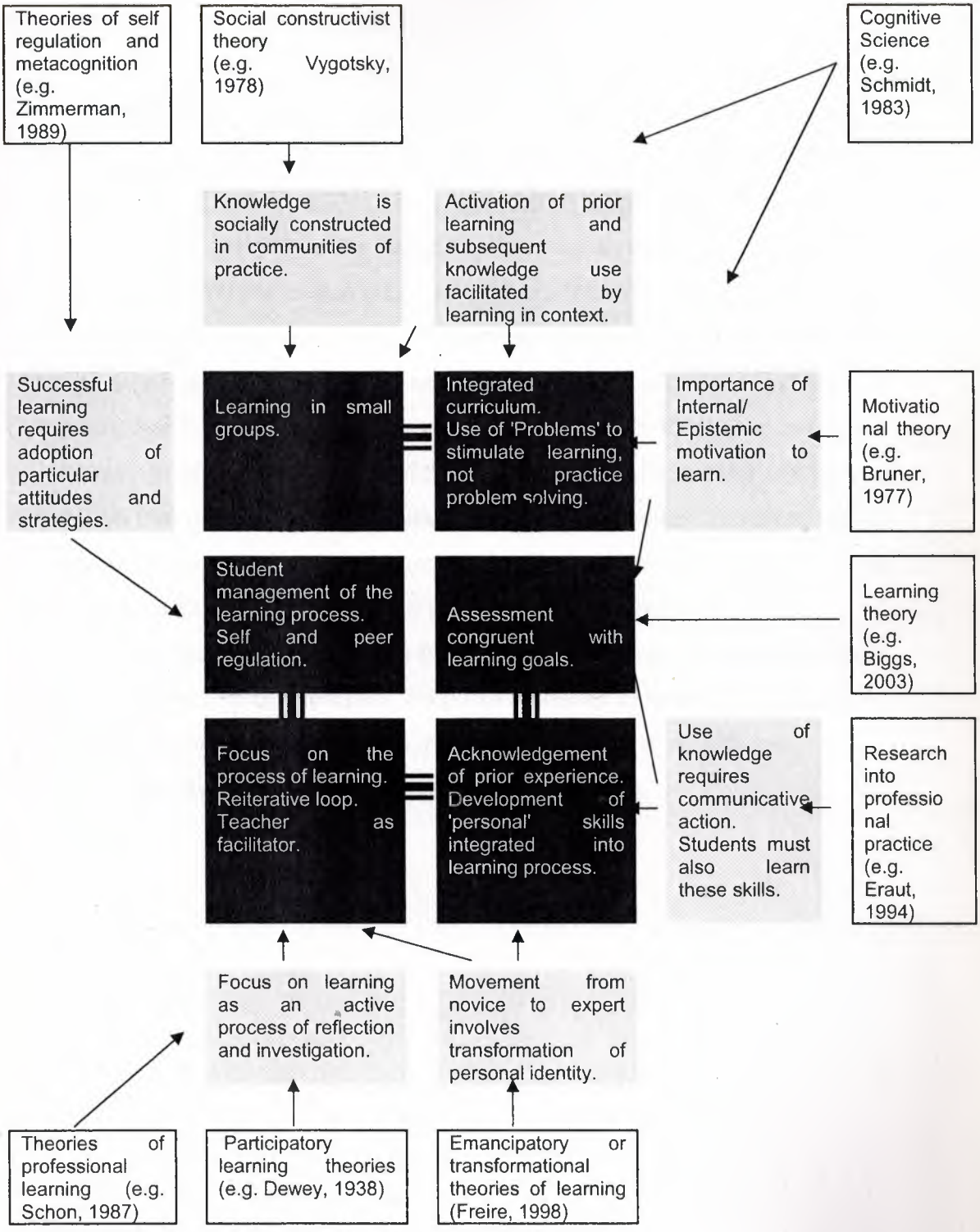

Figure 2.6 Summary of the key features and conceptual basis of Problem Based Learning

Model for Small Groups

The small group is an integral part of the Problem Based Learning approach, used consciously and conscientiously to achieve the learning outcomes (Benson *et al.*, 2001). It is argued that purposefully designed and successful small group learning facilitates learning through the development of a learning environment that supports and promotes both cognitive and metacognitive development. The links between the structures of small group learning emphasised in Problem Based learning and the actions and learning outcomes that it is claimed result from these actions are illustrated in Figure 2. 7 below. Implicit in the design of the Problem Based Learning small group is the idea that many of these 'positive actions', such as co-operation, do not just happen by themselves, whereas many of the 'negative actions', such as conflict, are a routine and inevitable part of working in a group. The 'structures' in small group Problem Based Learning, along with the tutorial process and the use of scenarios, help the students to learn how to learn in groups and learn how to anticipate, prevent, cope and deal with the difficulties that they will experience working in this way.

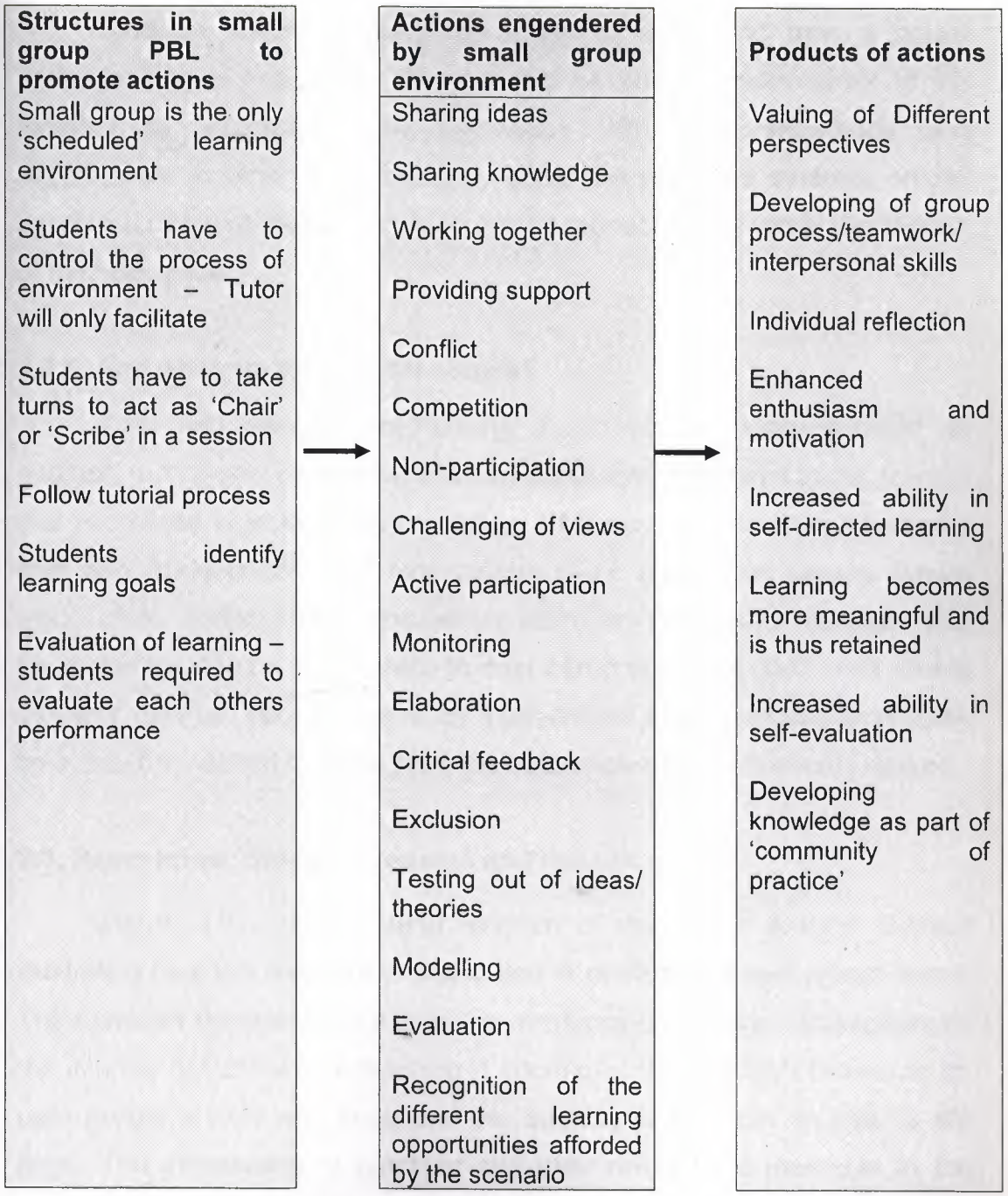

Figure 2.7 Structures, actions and products of small group learning

2.2.4. What are the advantages of PBL?

Students should develop the ability to learn and gain a sound understanding of knowledge. They should be able to make sense of the material by integrating new knowledge with prior knowledge and experiences. In order to successfully solve the problems students should develop a range of critical, cognitive and transferable skills within the context of their discipline.

2.2.5. And what are the disadvantages?

Time and resource implications should not be underestimated. In addition, the content covered in this way is reduced compared to the amount that is covered in lecture-based courses. PBL may be a new experience for staff and students and they may require some support or training. Group work often suffers from non-participation or personality clashes and strategies have to be put in place to deal with groups that don't work. Some students may not take the need for independent study seriously and some time may be required to make clear the outcomes and commitment required.

2.3. Researches, Studies, Findings and Results on PBL

Figure 2.8 shows a Venn diagram of the hits in Google Scholar illustrating how the literature is distributed in relation to these search terms. The numbers represent the hits in the overlapping domains. Unsurprisingly, the quantity of literature on teaching is enormous; the quantity of literature on peer review is also very large and the quantity of literature on PBL is still large. The intersection of teaching and peer review is comparable to the literature on PBL. The quantity of literature on peer observation is significant and comparable to the intersection of peer review, teaching and PBL. However, when these terms are combined any further, only small numbers of papers are identified.

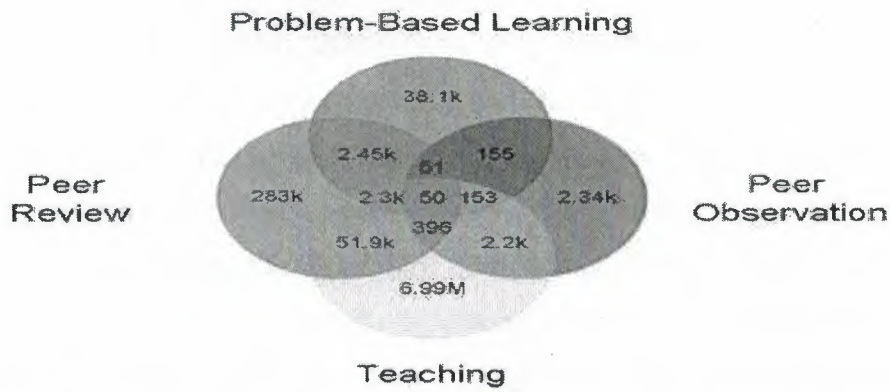

Figure 2.8 Venn diagram of the number of hits of search terms on Google Scholar (Key: k = kilo, 10_3 = 1 000, M = mega, 10_6 = 1 000 000)

This might imply a small but specific emergent literature on the subject. However, it is worth bearing in mind that Google Scholar, in the form of the search used, looks for the presence of the search terms anywhere in the document. A more detailed inspection of the 50 documents identified at the intersection, which could be readily accessed, revealed that the majority of papers only mentioned PBL in passing. Peacock (2001), for example, discusses the training of Librarians as teachers, including peer observation and review as components of this teaching, and PBL is mentioned in the background discussion of the institution's teaching and learning environment. Another example is Chappell (2007), who describes how the use of teaching observation as part of teaching staff induction led him to challenge convention methods of teaching and adopt PBL. Major and Palmer (2006) describe PBL as a method of reshaping teaching, but only mentioned peer review and observation in passing. Other documents turned out to be duplicated papers, general handbooks or textbooks on teaching or collections of abstracts where the terms appeared in different papers. There appear to be very few papers addressing the specific issue of how to conduct peer review or observation of PBL teaching.

Although there is a vast amount of research and literature available on problem based learning (Barrows, 1999; Camp, 1996; Dombrowski, 2002; Duch, 1995; Evensen & Hmelo, 2000; Greening, 1998; Major, 1998; Major & Palmer, 2001; Savery & Duffy, 1996; Savin-Baden & Major, 2004), few studies have explored PBL when practice in classrooms. Examples of online PBL can be found in specific medical programs such as oncology (Minasian-Batmanian, 2002), paediatrics (Kamin, Deterding, Wilson, Armacost, & Breedon, 1999), and in the health sciences (Sword, Valaitis, Jones, & Hodges, 2002). Online PBL has also begun to be explored in teacher education (Donnelly, 2004; Gibson, 2002; Harvey, 2003; Lopez Ortiz, 2004); however, among studies that have investigated online PBL in teacher education, none have focused on its impact on the perceptions and planning practices of teachers who are learning to integrate technology into their teaching practices.

Sage (2000) studied the overall PBL experience from the perspective of students and instructors involved in the process. She focused on a set of elements each with a continuum of possible values, the combination of which has an impact on the online PBL experience. Courses that attempt to implement online PBL will encounter several starting characteristics of teachers and students that will be somewhat given. These cannot necessarily be changed during a single learning experience. Teachers and students bring their assumptions, skills and preferences related to both teaching and learning. They also bring their previous experiences and abilities in teaching and learning in traditional, constructivist, PBL and online environments. The more experienced both teachers and students are in all the factors that compose the PBL experience; the more flexibility educators will have to implement experiences that are closer to the models of this methodology that view students as more self-directed.

Taplin (2000) reports on the experiences of educators who are beginners in the transition from more traditional educational methods to the implementation of online PBL. She also points out the importance of considering student characteristics in the design of the course particularly regarding their flexibility to devote time to identifying and evaluating resources by themselves, individual accountability and group work. The limited schedules of distance learners is what makes them turn to anytime anywhere flexible opportunities for learning. Their availability needs to be taken into account and balanced with provision of resources and the design of group experiences so the assumed highlights of such undertakings do not turn into deterrents of learning. Teacher experience and availability to facilitate is also deemed important by this author.

Poon (1997) describe a hybrid environment in which educational efforts are triggered by problems that depict what students can do within a subject domain instead of what students should know. The distance learning technologies together with face-to-face experiences help deliver the content that students will use in order to solve the problems. The face-to-face component is also the setting in which students encounter the problem and initialize the process of problem definition and process organization. Then students undergo the iterative process of consulting sources of information and devising the solution. In the final stage, students not only construct the solution, but also reflect about what they have done and relate it to future practice.

Research on PBL in middle and high school settings has been primarily limited to gifted (e.g., Gallagher et al., 1992; Torp & Sage, 1998) and average populations (e.g., Chin & Chia, 2005; Saye & Brush, 2002). In these contexts, PBL has positively affected students' problem-solving skills (Gallagher et al.; Kolodner et al., 2003), self-directed learning skills (Hmelo-Silver, 2004; Sungur & Tekkaya, 2006), and content knowledge (Dods, 1997). Some researchers have investigated how gifted and/or average

middle and high school students interact during PBL, and have suggested methods by which teachers can promote student success. These methods include addressing misconceptions, promoting reflection, and providing conceptual and metacognitive support to students as they are working (Lepper, Drake, & O'Donnell-Johnson, 1997; Saye & Brush, 2002; Simons & Ertmer, 2006).

A few researchers have explored the use of PBL among middle school students with special needs in self-contained classrooms (Belland, Ertmer, & Simons, 2006; Bottge, 2001), suggesting that these students received affective and academic benefits from PBL (Belland et al.; Bottge) and effectively solved the presented problem (Bottge). In this paper, *students with special needs* refer to students who are eligible for special education services due to learning, emotional, or other cognitive disabilities (Individuals with Disabilities Education Act, 2004).

According to the National Center for Education Statistics (2005), half of all students with special needs in America spent at least 80% of every school day in mainstreamed classrooms (general education classes serving students with special needs alongside their average peers). Though some authors debate the merits of inclusion (Lipsky, 2005; Peetsma, Veergeer, Roeleveld, & Karsten, 2001; Rea, McLaughlin, & Walther-Thomas, 2002), it is likely that inclusion will continue into the near future (Putnam, Spiegel, & Bruininks, 1995). Thus, it seems appropriate to explore the use of PBL in a mainstreamed classroom in order to develop a stronger understanding of how mainstreamed students respond to PBL.

Research on PBL has focused on two issues: Educational processes and knowledge outcomes. Research conducted in medical settings suggests that there are four essential characteristics of effective PBL facilitators: Collaboration, directing, integration, and interaction/accountability. Collaboration consists of stimulating brainstorming by asking questions and follow-up clarifications. Directing the learning process includes helping students generate learning issues and indirectly drawing attention to students' gaps in knowledge. Stimulating integration of knowledge encourages students to examine their information in the context of previous cases or course material. Finally, stimulating interaction and individual accountability encourage students to make an inventory of learning resources (DeGrave, Dolmans, & van derVleuten, 1999). Results of research on student learning have been mixed. An early review of PBL in medical education suggested that when compared with a traditional curriculum, PBL was associated with greater long-term retention of content, better self directed learning skills and improved critical thinking skills (Norman & Schmidt, 1992). In examining PBL's effects in a graduate clinical psychology training program, interactive skills such as working within a team, responsiveness to supervision and collective efficacy appeared to improve over time (Stedman, Wood, Curle, & Haslam, 2005; Wood, 2004).

Albanese and Mitchell (1993) focused on the English-language international literature from 1972 to 1992 to gain insight into the eff ectiveness of PBL within the domain of medical education. They reviewed ten studies that provided data on outcome measures of basic science knowledge, measured by the National Board of Medicine Exam (NBME 1), and seven studies that reported outcome measures of clinical knowledge and performance (NBME 2). NBME 1 assesses understanding and application of important concepts of the sciences basic to the practice of medicine, with special emphasis on principles and mechanisms underlying health, disease, and modes of therapy. NBME 2 assesses application of medical knowledge, skills, and understanding of clinical science essential for the provision of

patient care under supervision and includes emphasis on health promotion and disease prevention.

Research questions by Albanese and Mitchell (1993) included:

Do PBL students develop the cognitive scaffolding necessary to easily assimilate new basic sciences information? To what extent are PBL students exposed to an adequate range of content? Does faculty dislike PBL because of the concentrated time commitment required? Results of assessments of basic science knowledge indicated an overall negative effect size (ES), meaning that students engaged in the traditional classroom learning approach tended to perform better on the standardized tests (NBME 1). The authors augmented the results with two additional points. The fi rst was that standardized examinations "have been criticized for providing only a measure of the examinee's ability to recognize the correct answer from a limited list of potentially correct answers and of being heavily oriented toward recall" (p. 56). The second point was that, although the ES favored the traditional approach and the expectation was that PBL students would not perform as well in the area of basic science knowledge assessments, this assumption was "not always true" (p. 57). However, the authors took this tendency as evidence of support for inadequate cognitive scaffolding development on the part of PBL students, as well as support for the idea that PBL students may not have adequate exposure to a range of content. Interestingly, though, the results also indicated that PBL graduates did perceive that they were disadvantaged relative to their traditional learning counterparts. However, they viewed themselves as better prepared in self-directed learning skills, problem-solving, information gathering, and self-evaluation techniques. Results also indicated that the rates at which PBL graduates were selected for their first choice residency positions were higher than for traditional program graduates.

Vernon and Blake (1993) focused on 22 studies within the period from 1970 to 1992. Their study selection parameters included all identifiable research on health-related educational programs that contained significant PBL emphasis. That is, the studies used quantitative methods, provided data that compared PBL with more traditional educational methods, and measured outcomes that were of an evaluative nature. They excluded studies that were only descriptive or provided no comparison of the two learning approaches, PBL and traditional. The purpose of their research was to summarize all available data that compared PBL with more traditional education methods, to analyze variations via meta-analytic techniques, and to review perceived strengths and weaknesses of research in this field. The results indicated that, in terms of academic achievement (knowledge tests), the results for standardized NBME 1 assessment outcomes showed significant trends favouring students engaged in the traditional learning approach. For clinical knowledge and performance outcomes (NBME 2), results slightly favoured the PBL students, while assessment outcomes of clinical performance (observation-based supervisor ratings) significantly favoured the PBL students.

Berkson (1993) did a narrative review of 10 pre-1992 studies, seeking evidence of the effectiveness of the PBL curriculum in medical education. Her research questions included: Does PBL teach problem solving better than traditional schools? Does PBL impart knowledge better than traditional schools? Does PBL enhance motivation to learn medical science better than traditional schools? Does PBL promote self-directed learning (SDL) skills better than traditional schools? Berkson's review indicated that there was no evidence to suggest that a PBL approach taught problem solving better than the traditional approach. Results did not demonstrate an advantage of one approach over the other for imparting knowledge. However, results indicated that students and faculty favored PBL. In addition, academic achievement and knowledge assessment favored the traditional approach, while clinical assessments favored PBL. With regard to academic process, PBL students

placed more emphasis on meaning (understanding) rather than reproduction (memory), which was the opposite pattern from students engaged in traditional learning methods. Berkson concluded that it was unlikely students will suff er detrimental consequences from participation in PBL programs.

Kalaian, Mullan, and Kasim (1999) focused on medical education studies from 1970 to 1997—22 studies on NBME 1 outcome measures, and 9 studies on NBME 2 outcome measures. The purpose of the research was to examine outcomes from primary research comparing impact of PBL and traditional curricula on NBME 1 and NBME 2. The set of primary studies reviewed included studies examined by previous reviews, augmented through online searches for studies within the 1970 to 1997 time parameter, and manual searches of medical education journals published in 1997. The exclusion criteria eliminated studies that did not provide data needed to compute ES for PBL and traditional learning approaches, as well as studies that examined only specific subtests of the NBME, rather than the overall NBME. The researchers found negative ES for NBME 1, and positive ES for NBME 2, which was consistent with previous findings that traditional learning approaches tended to produce better results for basic science knowledge, while PBL tended to produce better results for clinical knowledge and skills.

Colliver (2000) reviewed the medical education literature, starting with three reviews published in 1993 (Albanese & Mitchell; Vernon & Blake; Berkson) and included studies published from 1992 to 1998 comparing PBL to the traditional curriculum. The purpose was to focus on the credibility of claims about ties between PBL intervention and educational outcomes, particularly achievement (knowledge and skills), and on effect sizes of the intervention on said outcomes. As a study selection strategy, Colliver's search was limited to those articles that involved a comparison of curriculum tracks or schools. Where effect sizes were not provided, Colliver calculated them himself. Results indicated that there was no convincing evidence that

PBL improved the knowledge base and clinical performance, at least not to the extent that may be expected for a PBL curricular intervention. Colliver acknowledged that PBL may provide a more challenging, motivating and enjoyable approach to medical education, as noted in the earlier research findings on student and faculty satisfaction and motivation, but claimed that its educational effectiveness, compared to traditional methods, remained to be seen.

Dochy, Segers, Van den Bossche, and Gijbels (2003) reviewed 43 studies, where 33 of them measured knowledge effects and 25 of them measured application of knowledge effects. Their study selection criteria stipulated that the work had to be empirical. Although no empirical literature and literature reviews were selected as sources of relevant research, this literature was not included in the analysis. The characteristics of the learning environment had to fit the core model of PBL. The dependent variables used in the study had to comprise an operationalization of the knowledge or skills (i.e., knowledge application) of the students. The subjects of study had to be students in tertiary education. Also, the study had to be conducted in a real-life classroom or programmatic setting rather than under more controlled laboratory conditions.

Research questions were:

What are the effects of PBL on knowledge and skills? What are the moderators on the effects of PBL? Results indicated that assessment methods that focus more on recognition (e.g., NBME 1), showed significant negative effects for almost all knowledge and favored the traditional learning approach. Assessment methods that focused more on application of knowledge (e.g., NBME II) showed larger effects for PBL versus traditional learning environments. Researchers stated that the better an instrument was able to evaluate students' skills, the larger the ascertained eff ects of PBL.

Newman (2003) selected studies cited in the following papers which provided evidence of the effectiveness of PBL: Albanese and Mitchell (1993); Vernon and Blake (1993); Berkson (1993); Smits, Verbeek, and De Buisonje (2002a); and Van Den Bossche, Gijbels, and Dochy (2000). The fi nal count was12 studies with extractable data in the medical education domain. The minimum criteria for study selection consisted of only including participants in post school education programs. Study designs had to be controlled trials; studies that used only qualitative approaches were excluded. The minimum methodological inclusion criteria across all study designs were the objective measurement of student performance and behavior or other outcomes. The minimum inclusion criteria for interventions consisted of a cumulative integrated curriculum, learning via simulation formats that allowed free enquiry (i.e., not problem solving learning), small groups with either faculty or peer tutoring, and an explicit framework implemented in tutorials.

Research questions included: Does PBL result in increased participant performance when compared to other non-PBL teaching and learning strategies? Does an authentic PBL curriculum deliver a greater improvement in performance than "hybrid" curricula? Results indicated that knowledge related outcomes favored the traditional learning environment. Also consistent with previous findings, study approaches and student satisfaction tended to favor PBL. However, improvements in applied practice returned mixed results, whereas previous studies reported better outcomes in a PBL environment.

Gijbels, Dochy, Van den Bossche, and Segers (2005) reviewed 40 studies that were published between 1976 and 2000. Study selection parameters stipulated that each study had to be empirical. Second, the characteristics of the problem-based learning environment had to fit the previously described core model of PBL (Barrows, 1996). Third, each study had to include some course or curriculum comparison between a PBL environment and a more traditional educational setting. Fourth, the study subjects had to be students in higher education. Finally, each study had to be conducted in a real-life classroom or programmatic setting rather than under more controlled laboratory conditions.

The research question was: What are the effects of PBL when the assessment of its main goals focuses, respectively, on (1) understanding concepts, (2) understanding principles that link concepts, and (3) linking of concepts and principles to conditions and procedures for application? Results indicated that PBL students performed better at knowledge levels that emphasized principles (understanding the link between concepts) and application knowledge structures. The effect size of PBL interventions was larger when the assessment strategy focused on the understanding of principles that link concepts. Most studies reported positive outcomes of the traditional classroom approach on conceptual knowledge assessment, but when weighted average ES was taken in to account, PBL students performed at least as well as students in a traditional environment. This demonstrated the potential influence of the assessment strategy and tool on outcome measures. The authors stated that the better the capacity of an instrument to evaluate the application of knowledge by the student, the greater the ascertained effect of PBL.

In summary, the first general tendency of noted in the research was that traditional learning approaches tended to produce better outcomes on assessment of basic science knowledge but, according to Albanese and Mitchell (1993), not always. A second trend noted was that a PBL approach tended to produce better outcomes for clinical knowledge and skills. Interestingly, more recent research studies revealed that the assessment strategy and tool influence outcome measures.

There are studies in the literature which aimed at adapting problem-based learning for use in elementary and high school settings (Achilles & Hoover, 1996; Gallagher, Stepian, Sher, & Workman, 1995; Gordon, Rogers, Comfort, Gavula, & Mcgee, 2001; McBroom & McBroom, 2001; Sage, 1996; Savoie & Hughers, 1994; West, 1992). Results, in general, revealed that the PBL creates an environment in which students actively participate in the learning process, take responsibility for their own learning, and become better learners in terms of time management skills, ability to define topics, ability to access different resources, and ability to evaluate validity of these resources. Moreover, it was found that PBL appears to improve critical thinking, communication, mutual respect, teamwork, interpersonal skills and increase students' interest in the course and make students apprentice scientists. Furthermore, it was suggested that PBL encourages students to identify knowledge deficiencies, coordinate actions and people, realize goals and continuously monitor understanding (Galand, Bentein, Bourgeois & Frenay, 2003; Karabulut, 2002; Paris & Paris, 2001)

CHAPTER 3

METHODOLOGY

This chapter includes information about design of the study, instruments, participants, and analysis of data.

3.1 Design of the Study

Quantitative method was used to collect data. Variables of this study can be categorized as Independent Variables and Dependent Variables. Independent variable of this study was teachers' seniority, type of graduate, degree, gender, and age. Dependent variables of this study were the scores on the PBL recommendations.

3.2 Participants

The participants of this study were selected randomly in Antalya. The Administrator of National Education in Antalya approved 3 central high schools which are popular schools. The Universe was teachers of secondary schools within the branches.

Universe and sample surveys, with numerical analysis are summarized in Graph 1

Graph 1 Teachers of secondary schools within the branches.

High Schools	Antalya	H.M.M Bileydi Anatolian	Yavuz Selim	Total
Sample	80	55	45	180
Number of Teachers Participated	68	45	35	148

The sample consisted of 180 teachers who are training at Antalya High School, Yavuz Selim High school and Bileydi Anatolian High school in Antalya. They are central high schools in Antalya and they selected randomly for research. The survey reached 148 teachers and only they were taken into consideration.

3.3 Instruments

Data collection was Questionnaire and it consisted of 2 sections. The first one was personal qualified questions and needs analysis for PBL and the second one was recommendations about PBL.

Personal information Questions: In the first part with questions relating to personal information of teaching, the group responsible for injury to describe the (professional seniority, age), etc... The second part consists of the questions on PBL implementation and evaluation of comments received from teachers.

Name of the instrument: In the second section, the attitude scale of Problem Based Learning (See Appendix - A). An instrument previously developed by Demirel and Turan (2008) was applied. According to the study findings of Demirel and Turan (2008), the reliability of the scale was found to be high ($\alpha = 0.95$). In addition, the scale's ability to distinguish students with different attitudes was found to be statistically significant ($p<0.001$). The results of the study indicate that the scale has good psychometric properties. The scale was used by the permission Demirel and Turan (2008).

During the pre-application data collection tool for teachers, the subject was presented a sample study for inform them. It lasted 5 minutes. So it assumed that the issue answered correctly by them. (See Appendix - A)

3.4 Analysis of Data

Study used questionnaire and analyses the data with using SPSS package program. The questions in the survey that shows the first frequency distribution and percentage tables. The research was designed with Hypothesis Tests: t (Student) and F (variance) Test.

If more than two of the group means comparison of the F test with a name other Analysis of Variance (ANOVA, Analysis Of Variance) is applied. With more than two significant differences between the average tests shows F test of the hypothesis. The post hoc analysis (Tukey's Honestly Significant Difference, HSD) was used to determine exactly which groups were different.

In the third section (PBL recommendations) of the survey for this application, the reliability of the scale (Cronbach α) was 0.95.

To explore teachers' Problem-Based Learning for answers to express the values of the frequency and percentage values are the average and standard deviation. The average value can be interpreted as follows. (Balcı, 2004)

- 1.00 ≤ 1.80 ≤ average is "Definitely Disagree"
- 1.80 <2.60 ≤ average the "Disagree"
- 2.60 <3.40 ≤ average the "Neutral"
- 3.40 <4.20 ≤ average the "Agree"
- 4.20 <5.00 ≤ average is "Absolutely agree"

CHAPTER 4

RESULTS AND CONCLUSION

In this chapter findings discussed in three chapters. First, teacher's personal of information and tasks to promote their institution and for the frequency of questions consists of the percentage distribution. Second, teachers' Problem-Based Learning for answers to express the values of the frequency and percentage values is the average and standard deviation. Third, if more than two of the group means comparison of the F test with a name other Analysis of Variance (ANOVA, Analysis Of Variance) is applied. With more than two significant differences between the average tests shows F test of the hypothesis.

4.1. Teacher's Personal Informations Results

Under this title participation of teachers in the survey is given as in the tables below. Tables show about number of teacher's attendance, type of schools, education levels of teachers , genders, ages, professions. It also gives the results of teacher's needs and interests about PBL in the class.

4.1.1 The findings by Type of School

The distrubition of teachers according to schools are given in the table.

Table 1: The Distrubition of Teachers by Type of School

School	Frequency	Percent
Antalya Lisesi	68	45.9
HMM Bileydi A.L	45	30.4
Yavuz Selim Lisesi	35	23.6
Total	148	100.0

Boarded by three schools respondents participated from: 45.9% in "Antalya Lisesi", % 23.6 in "Yavuz Selim Lisesi" and 30.4% in "HMM Bileydi Anatolian High School".

4.1.2 Teacher's Recent Graduates

The Table 2 below shows the recent graduation types of teachers.

Table 2: The Distribution of Teachers by Type of Recent Graduates

Type of graduate	Frequency	Percent
Faculty of Education	96	65.8
Science Faculty of Arts	47	32.2
Training High School	1	0.7
Faculty of Theology	1	0.7
Training Institute	1	0.7
Total	146	100.0

The teachers surveyed recently graduated from the school by the type of allocation, 0.7% by "Training Institute", 0.7% by "Training High School", 65.8% by "Faculty of Education", 32.2% by "Science Faculty of Arts "and 0.7% with the" Faculty of Theology ".

Graph 2.

The distribution of teachers' branches with numbers is given in the table below.

Branch Distribution Table

Branch	Frequency
English Language Teaching/Literature	29
Turkish Language Teaching/Literature	25
Mathematics	25
Physics	14
Biology	11
History	10
Chemistry	10
Geography	8
German	7
Painting	2
Religious	2
Turcology	1
Sociology	1
Psychology	1
Philosophy	1
Physical Education	1

Looking at the research branch of the majority of participating teachers; English, Turkish Language and Literature and Mathematics as can be seen. Later respectively; Physics, Biology, History, Chemistry, Geography, German, Painting, Religious Culture and Moral Knowledge, Turcology, Sociology, Psychology, Philosophy and Physical Education are followed.

4.1.3 Teacher's Graduation Degrees

Teachers' graduation degrees are given in the table below.

Table 3 The Distribution of Teachers by Type of Graduation Degree

Degree	Frequency	Percent
License	122	91.0
Master	11	8.2
Associate Degree	1	0.7
Total	134	100.0

The teachers surveyed by the type of graduation degree, 0.7% with "Associate Degree", 91% with the "License" and 8.2% with the "Master" in the form varies.

4.1.4 Teacher's Genders

Teachers' genders are given in the table below.

Table 4: The Distribution of Teachers by Type of Gender

Gender	Frequency	Percent
Male	79	53.7
Female	68	46.3
Total	147	100.0

The teachers surveyed by the gender 46.3% of "Women", and 53.7% of "Male".

4.1.5 Age Status

Teachers' age status results are given in the table below.

Table 5: The Distribution of Teachers' Age

Age	Frequency	Percent
Between 36-45	93	63.7
Between 26-35	37	25.3
46 and over	16	11.0
Total	146	100.0

According to the age distribution of teachers, 25.3% respondents centred "Between 26-35", % 63.7 respondents "Between 36-45" and 11% respondents"46 and over"

4.1.6 Teacher's Seniorities in Teaching

Teachers who worked several years is given numerically in the table below.

Table 6 The Distribution of Teachers' Teaching Seniority in Profession

Profession years	Frequency	Percent
Between 15-19	48	32.7
Between 10-14	47	32.0
20 Years and Over	28	19.0
Between 5-9	20	13.6
Between 0-4	4	2.7
Total	147	100.0

Respondents of 2.7% "Between 0-4 years", 13.6% "Between 5-9 Years," 32% "Between 10-14 Years", % 32.7 "Between 15-19 Years" and 19% "20 Years and Over" has a professional seniority.

4.1.7 Teacher's Class Levels Trained

The grade levels taught by teachers are given in the table below.

Table 7 The Distribution of Teachers Current Teaching Class Levels

Classes	Number of respondents
High 1	69
High 2	96
High 3	99
High 4	77

The classes of schools included in the "High School 1" number of teachers in classes 69 respondents, "High 2" number of teachers in classes 96, "High 3" number of teachers in classes 99 and "High 4" classes 77 number of teachers. So High 2 and School 3 classes' respondents are greater than the others.

4.2 Teachers' Interests and Needs Results and Findings

In this part, the results obtained are discussed in to questionnaire of the" What are teachers' interests and needs towards PBL?"

4.2.1 Frequency of applying PBL

When the question "How often do you practice PBL in your lessons?" was asked, the teacher's answers are given in the table 8 according to the frequency adverbs.

Table 8: The Frequency of Using Problem-Based Learning in Classes Distrubition

How often do you practice PBL in your lessons?	Frequency	Percent
Somehow	49	33.1
Never	37	25.0
Often	35	23.6
Very often	17	11.5
Always	10	6.8
Total	148	100.0

The teachers answered " Problem-Based processing to learn how often do you use?" The question is transmitted respondents according to percentages; 6.8% "Always", 11.5% "Very often", % 23.6 "Often", % 33.1 " Somehow "and 25% of" Never "was the answer given.

4.2.2 The Difficulties face to Teachers When Practice PBL Findings

Under the table below gives the difficulties questions for teachers.

Table 9: Having difficulties when using Problem-Based Learning Distribution (Number of Teachers N = 148)

The difficulties	Number	Percent
I cannot find enough time	80	54.05
The number of students is blocking	74	50.00
I have insufficient technical equipment	58	39.19
Technique in practice, I feel inadequate in terms of information	49	33.11
Other	11	7.43

The respondents indicated the question "What are the difficulties of Problem-Based Learning when using and practicing? A majority of teachers transmitted 54.05% "I cannot find enough time" was the answer given. Then teachers, 50% "The number of students is blocking", % 39.19 respondents said "I have insufficient technical equipment", and 33.11% "technique in practice, I feel inadequate in terms of information" response was received. In addition, 7.43% of the teachers "Other" response was given.

These are;

- No textbooks
- Not enough questions in the textbook
- I do not use
- No place in the curriculum
- Not suitable for my branch
- Not a valid method for me
- There are infrastructure deficiencies in students

- Secondary students in terms of information in the form of incomplete

  Answers were coming.

4.2.3 Teacher's resources for inform about PBL

When the question"Where do you inform about PBL and who helps you?" asked the teachers responded as the table below.

Table 10: Teacher's resources if they inform about PBL Distribution (Number of Teachers N = 148)

Resources	Number	Percent
Boks	98	66.22
Experiences	67	45.27
Seminars	62	41.89
Other colleagues	21	14.19
School Guadiance Service	17	11.49
Others	18	12.16
Universities	12	8.11

Surveyed the teachers, "Problem-Based Learning When do you apply and who would benefit from?" The question is transmitted to the majority of teachers; 66.22% than "books", 45.27% rate "of my Experience" and 41.89% than "Seminars" response was given. Respectively, than 14.19% "Other colleagues" than 11.49 "from our school guidance service" and 8.11% rates "of the Universities" is followed by responses. In addition, 12.16% of the teachers' "Other" response was given. These are;

- I did not apply and use
- The working papers and additional publications from my researchs
- I have no information
- I have learned in new ways.

4.2.4 The teacher's feelings how much they know the PBL Results

The table below shows that the teacher's knowledges and skill capacities when using PBL.

Table 11: The Distribution of "Problem-Based Learning for the knowledge and skills in yourself, how do you feel?"

Knowledge and skill capacity	Frequency	Percent
I am adequate	51	34.7
I am little adequate	50	34.0
Poor	41	27.9
I am very adequate	5	3.4
Total	147	100.0

The respondents answered the question "Problem-Based Learning for the knowledge and skills in yourself, how do you feel?" Teachers responses revealed that; 9% of them "Poor", 34% of them "I am little adequate ", % 34.7 of them "I am adequate " and % 3, 4 of them "I am very adequate" response was given.

4.2.5 Teacher's needs to apply PBL in classes

Because of the find the teacher's needs about PBL the question below was asked to teachers. The results are shown as the table below.

Table 12: The Distribution of ""How do you feel need education to Problem-Based Learning to Practice?"

Need of education	Frequency	Percent
I need a little	80	54.4
I need education	50	34.0
I don't need	17	11.6
Total	147	100.0

Teachers surveyed "Problem-Based Learning to Practice Relating to How do you feel need?" Teachers responses revealed that; % 34 "I need education", % 54.4 of them "I need a little", and 11.6% of them "I don't need" answer was given.

4.2.6 The teacher's preference if they apply PBL or not

To find the using PBL in classes by teachers the question below was asked. Their preferences by the degrees are shown under the table below.

Table 13: The Distribution of question by "What degree would you prefer PBL?"

Preference	Frequency	Percent
I would not prefer	47	32.0
I would prefer the third degree	44	29.9
I would prefer the second degree	37	25.2
I would prefer in the first degree	19	12.9
Total	147	100.0

Teachers surveyed "Problem-Based Learning to what degree would you prefer?" Teachers responses revealed that; % 12, 9 "I would prefer in the first degree", % 25.2 "I would prefer the second degree", % 29.9 "I would prefer the third degree" and 32% "I would not prefer" response was given.

4. 3 Teacher's Attitudes about PBL Results

Survey results are evaluated in the table given below. There are 20 proposal sentences about PBL and 5 options in the survey. It was answered by 148 teachers. The result of the analysis are given in the table below. Then, all sentences are explained by the results one by one.

4.3.1 The Teachers' expressions and attitudes about PBL Distribution

Table 14

	PBL/ In PBL		Definitely Disagree	Disagree	Unsure	Agree	Absolutely agree	Total	Mean	Std. Deviation
1	Creates a positive learning environment	f	2	6	19	78	42	147	4.03	0.84
		%	1.4	4.1	12.9	53.1	28.6	100		
2	Enables learning to love	f	1	5	31	82	29	148	3.90	0.77
		%	0.7	3.4	20.9	55.4	19.6	100		
3	Is useless application	f	57	52	32	4		145	1.88	0.85
		%	39.3	35.9	22.1	2.8		100		
4	Is colouring the educational program	f	3	5	44	66	28	146	3.76	0.87
		%	2.1	3.4	30.1	45.2	19.2	100		
5	Time passes in a boring way	f	41	44	52	8	2	147	2.22	0.96
		%	27.9	29.9	35.4	5.4	1.4	100		
6	Learners enjoy sharing	f	1	5	34	64	43	147	3.97	0.85
		%	0.7	3.4	23.1	43.5	29.3	100		
7	Is fun	f	2	5	48	63	28	146	3.75	0.85
		%	1.4	3.4	32.9	43.2	19.2	100		
8	Is not eligible for the program	f	75	32	27	11	2	147	1.86	1.05
		%	51.0	21.8	18.4	7.5	1.4	100		
9	Is painful	f	97	28	19	3	1	148	1.53	0.84
		%	65.5	18.9	12.8	2.0	0.7	100		
10	Learning makes consolidate	f	1	3	22	73	47	146	4.11	0.78
		%	0.7	2.1	15.1	50.0	32.2	100		
11	Labour productivity increases	f	3	3	22	65	53	146	4.11	0.88
		%	2.1	2.1	15.1	44.5	36.3	100		
12	Time is loss	f	43	33	61	8	1	146	2.25	0.97
		%	29.5	22.6	41.8	5.5	0.7	100		
13	The goal is unclear	f	69	48	24	4	3	148	1.81	0.94
		%	46.6	32.4	16.2	2.7	2.0	100		
14	Is a good educational experience for learners	f	3	4	25	73	41	146	3.99	0.87
		%	2.1	2.7	17.1	50.0	28.1	100		
15	Is strengthen to learning	f	39	41	53	13	1	147	2.29	0.98
		%	26.5	27.9	36.1	8.8	0.7	100		
16	Heads will cause confusion	f	37	41	58	9	1	146	2.29	0.94
		%	25.3	28.1	39.7	6.2	0.7	100		
17	The students are punished	f	75	49	17	3	2	146	1.68	0.86
		%	51.4	33.6	11.6	2.1	1.4	100		
18	Provides the scientific learning process	f	2	4	21	80	39	146	4.03	0.80
		%	1.4	2.7	14.4	54.8	26.7	100		
19	Will allow us pleasure in the process	f	2	5	23	70	46	146	4.05	0.86
		%	1.4	3.4	15.8	47.9	31.5	100		
20	Is a method of breaking learning enthusiasm	f	64	62	18	3	1	148	1.75	0.80
		%	43.2	41.9	12.2	2.0	0.7	100		

In the table above explore the participated teachers' values of the frequency, percentage, average and standard deviation for expressions on PBL.

Teachers scores on the PBL recommendations can be interpreted as follows.

- "Learning makes consolidate." The fewer respondents said (0.7%) “Absolutely Disagree,” “Disagree” respondents were 2.1% ", % 15.1 respondents said “Unsure”, a majority of them centred (50.0%) “I agree” and the second more (% 32.2) “Definitely agree” response was given. The average value is 4.11 on average for these expressions of teachers **“agree”** that tend to indicate.

- "Labour productivity increases." The fewer respondents said (% 2, 1) “Absolutely Disagree”, “Disagree” respondents were 2.1%, % 15.1 respondents said “Unsure”, a majority of them centred (% 44.5) “I agree” and the second more (% 36.3) “Definitely agree” response was given. The average value is 4.11 on average for these expressions of teachers **"agree"** that tend to indicate.

- "Education will allow us pleasure in the process." Teachers said; 1.4% "Definitely Disagree" 3, 4% "Disagree", % 15.8 "Unsure",% 47.9 " agree "and 31.5% to" definitely agree "response was given. The average value is 4.05 on average for these expressions of teachers **"agree"** that tend to indicate.

- "Creates a positive learning environment." The fewer respondents said 1.4% "Definitely Disagree",% 4.1 of them said "Disagree",% 12,9 of them "Unsure",(% 53.1) a majority of them centred " agree "and the second more (28.6%) "Definitely agree "response was given. The average value is 4.03 on average for these expressions of teachers **"agree"** that tend to indicate.

- "Provides the scientific learning process." The fewer respondents said (1.4%) "Definitely Disagree", % 2, 7 of them said "Disagree", % 14.4 of them said "Unsure", a majority of them (% 54.8) centred “I agree” and the second more (% 26, 7) "Definitely agree "response was given. The average value is 4.03 on average for these expressions of teachers **"agree"** that tend to indicate.

- "It is a good educational experience for learners." The respondents of % 2,1 believed "Absolutely Disagree," 2.7% " of them thought " Disagree ", % 17.1 of them said "Unsure", 50.0% of them said "I agree" and 28.1% of them "definitely agree" response was given. The average value is 3.99 on average for these expressions of teachers **"agree"** that tend to indicate.

- "It may learn to enjoy sharing." The fewer of respondents said (0.7%) "Absolutely Disagree," 3, 4% of them indicated "Disagree", % 23.1 of them said "Unsure", 43.5% of them said "I agree "and 29.3% of them " Definitely agree "response was given. The average value is 3.97 on average for these expressions of teachers **"agree"** that tend to indicate.

- "Enables learning to love." The fewer of respondents said (0.7%) "Absolutely Disagree," 3, 4% of them said "Disagree", % 20.9 of them said "Unsure", a majority of them centred (55.4%) "Agree" and the second more (19.6%) "Definitely agree" response was given. The average value is 3.90 on average for these expressions of teachers **"agree"** that tend to indicate.

- "Ensures colouring the educational program." The fewer of respondents said (% 2.1) "Absolutely Disagree," 3.4% of them said "Disagree", % 30.1 of them said "Unsure", a majority of them said (% 45.2) "I agree "and the second more (19.2%) "Definitely agree "response was given. The average value is 3.76 on average for these expressions of teachers **"agree"** that tend to indicate.

- "Is fun." requested of teachers; 1.4% said "Definitely Disagree", 3.4% said "Disagree",% 32.9 answered "Unsure",% 43.2 centred "I agree" and % 19.2 "Definitely agree" response was given. The average value is 3.75 on average for these expressions of teachers **"agree"** that tend to indicate.

- "Strengthen to learning." The respondents signed out; (26.5%) "Definitely Disagree", (% 27.9) "Disagree", % (36.1) "Unsure", (8.8%) "I agree" and (0.7%) have "definitely agree" response was given. The average value is 2.29 on averages for these expressions of teachers **"Disagree"** tend to indicate that.

- "Heads will cause confusion." 25.3 of respondents believed "Definitely Disagree",% 28.1of them said "Disagree",% 39.7 indicated "Unsure",% 6.2 of them "I agree "and fewer of them (0.7%) have" definitely agree "response was given. The average value is 2.29 on averages for these expressions of teachers **"Disagree"** tend to indicate that.

- "Time loss." Requested of teachers, 29.5% of them "Definitely Disagree", % 22.6 of them "Disagree", % 41.8 of them "Unsure", 5.5% o them "I agree" and fewer of them 0.7% have "definitely agree" response was given. The average value is 2.25 on averages for these expressions of teachers **"Disagree"** tend to indicate that.

- "Time passes in a boring way." Requested of teachers; 27.9% of them said "Definitely Disagree",% 29.9 of them said "Disagree",% 35.4 of them centred "Unsure",% 5.4 of them said" agree "and (1.4%) fewer of them" absolutely agree "response was given. The average value is 2.22 on averages for these expressions of teachers **"Disagree"** tend to indicate that.

- "Useless application it is." The responses indicated that; 39.3 of them "Definitely Disagree", % 35.9 of them "Disagree", 22.1% of them "Unsure", 2.8% of them "I agree" gave the answer. The average value is 1.88 on averages for these expressions of teachers **"Disagree"** tend to indicate that.

- "Education is not eligible for the program." The responses indicated that;% 51.0 of them "Definitely Disagree",% 21.8 of them "Disagree",% 18.4 of them "Unsure", 7.5% of them " agree "and 1.4% of them " absolutely agree "response was given. The average value is 1.86 on averages for these expressions of teachers **"Disagree"** tend to indicate that.

- "The goal is unclear." Requested of teachers; 46.6% of them "Definitely Disagree", % 32.4 of them "Disagree", % 16.2 of them "Unsure", % 2.7 of them "Agree" and 2.0% of them "Definitely agree" response was given. The average value is 1.81 on averages for these expressions of teachers **"Disagree"** tend to indicate that.

- "Is a method of breaking learning enthusiasm." The responses indicated that; % 43.2 of them "Definitely Disagree",% 41.9 of them "Disagree", 12.2% of them "Unsure",% 2.0 of them " agree "and 0.7% of them have" definitely agree "response was given. The average value is 1.75 on average for these expressions of teachers **"Definitely Disagree"** tend to indicate that.

- "The students are punished." The responses indicated that; % 51.4 of them "Definitely Disagree", % 33.6 of them "Disagree", % 11.6 of them "Unsure", 2.1% of them "I agree" and 1.4% of them "absolutely agree" response was given. The average value is 1.68 on averages for these expressions of teachers **"Definitely disagree"** tend to indicate that.

- "Is painful." A majority of respondents said (65.5%) "Definitely Disagree", 18.9% of them said "Disagree",% 12.8 of them believed "Unsure",% 2.0 of them "I agree" and the fewer of them (0.7%) have "definitely agree" response was given. The average value is 1.53 on average for these expressions of teachers **"Definitely Disagree"** tend to indicate that.

4. 4 t- Test Results

t (Student) test is used in order to investigate between the two sample groups in terms of averages whether the differences sigifically acceptable or not.

4.4.1 The significance differences between the Teachers' Levels and PBL recommendations

The table below shows whether the participated teachers' expressions of PBL show significantly difference according to recent graduates or not.

Table 15: t Test on the Teachers' Level of Incorporation of PBL with regards to Field of Education

Faculty Type	Respondent	Mean	Std. Relevance	t	Significance (P)
Education	96	2.956	0.209	-0.615	0.539
Arts and Sciences	47	2.980	0.218		

Participated teachers' opinions releated with problem-based learning recommendations ***does not show*** significant differences according to recent graduates.

According to the t-test results by using 95% confidence level, the value of meaning in column p = 0.539 was found. P> 0.05. So, participating in research related to teachers' problem-based learning with the opinions expressed by the type of faculty does not show significant differences. The average values of the Faculty of Education graduates looking statements related to the average tendency to participate 2.956 points (I'm not sure), while the average participation of graduates of Faculty of Arts and Sciences tend 2.980 (I'm not sure) is the score. This difference between the two groups was not statistically significant.

4.4.2 The significance differences between the teachers' type of faculties and PBL recommendations

It is shown under table below whether the participated teachers' expressions of PBL show significantly difference by type of graduates or not.

Table 16 t Test on the Teachers' Level of Incorporation of PBL with regards to Education Variable

Graduation Degree	Respondent	Mean	Std. Relevance	t	Significance (P)
Undergraduate	122	2.967	0.223	0.770	0.443
Master of Arts	11	2.913	0.177		

Participated teachers' opinions releated with problem-based learning recommendations **does not show** significant differences by type of graduates.

According to the t-test results by using 95% confidence level, the value of meaning in column p = 0.443 was found. P> 0.05. So, participating in research related to teachers' problem-based learning to express opinions which do not vary significantly according to the type of graduation. The average of value shows that the average participation in Master's Degree in the related expressions tend 2.967 points (I'm not sure), while the average participation of MSc graduates tend 2.913 (I'm not sure) is the score. According to the graduates of Bachelor's Degree Master's, very small upward trend in the average level of participation has shown. But this difference between the two groups was not statistically significant.

4.4.3 The significance differences between the teachers' type of faculties and PBL recommendations

Whether the participated teachers' expressions of PBL show significantly difference by type of gender or not results are shown as the table below.

Table 17: t Test on the Teachers' Level of Incorporation of PBL with regards to GenderVariable

Gender	Respondent	Mean	Std. Relevance	t	Significance (P)
Female	68	2.985	0.205	1.142	0.255
Male	79	2.944	0.220		

Participated teachers' opinions releated with problem-based learning recommendations **does not show** significant differences by type of gender.

According to the t-test results by using 95% confidence level, the value of meaning in column p = 0.255 was found. P> 0.05. So, participating in research related to teachers' problem-based learning to express opinions which do not vary significantly according to the type of gender. The average of value shows that average participation of women teachers expressed about the tendency 2.985 points (I'm not sure), while the average participation of teachers tend Male 2.944 (I'm not sure) is the score. This difference between the two groups was not statistically significant.

4.4.4 The significance differences between the teachers' age status and PBL recommendations

Under the table below shows whether the participated teachers' expressions of PBL show significantly difference according to age or not.

Table 18: One Way Anova Analysis on the Teachers' Level of Incorporation of PBL with regards to Age Variable

Age	Respondent	Mean	Std. Relevance	F	Significance (P)
26-35 years	37	2.918	0.208	4.854	0.009
36-45 years	93	2.999	0.195		
46 and over	16	2.845	0.267		
Total	146	2.961	0.212		

Compared using post hoc analysis (Tukey's Honestly Significant Difference, HSD) to determine exactly which groups were different. Teachers between the ages of 36-45 were statistically significant. Participated teachers' opinions releated with problem-based learning recommendations **show** significant differences according to age.

According to the F test results by using 95% confidence level, the value of meaning in column p = 0.009 was found. P <0.05. So, participating in research related to teachers' problem-based learning to express opinions that vary significantly according to age. Average values of teachers between the ages of 36-45 looking statements related to the tendency that the average participation is higher than other teachers. Age groups are the differences between the average scores was statistically significant.

4.4.5 The significance differences between the teachers' age status and PBL recommendations

It is shown under the table below whether the participated teachers' expressions of PBL show significantly difference according to the seniority or not.

Table 19:One Way Anova Analysis on the Teachers' Level of Incorporation of PBL with regards to Experience Variable

Seniority	Respondent	Mean	Std. Relevance	F	Significance (P)
0-4 Years	4	2.962	0.047		
5-9 Years	20	2.940	0.226		
10-14 Years	47	2.948	0.193	4.487	0.002
15-19 Years	48	3.056	0.184		
20 and over	28	2.858	0.242		
Toplam	147	2.965	0.213		

Compared using post hoc analysis (Tukey's Honestly Significant Difference, HSD) to determine exactly which groups were different. Participated teachers' opinions releated with problem-based learning recommendations **show** significant differences according to seniority in the profession.

According to the F test results by using 95% confidence level, the value of meaning in column p = 0.002 was found. P <0.05. So, participating in research related to teachers' problem-based learning to express opinions that vary significantly according to seniority in the profession. The average shows that value between 15-19 years of professional teachers who have seniority of the relevant expressions of opinion 3.056 score at the highest level, while 20 Years and Over with professional seniority of the teachers about the expressed opinions as to the 2.858 score is the minimum level. Between the average scores for groups of professional seniority differences were statistically significant.

CHAPTER 5

This chapter includes the conclusion, recommendations for results, and recommendations for further research.

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

According to the research results the followings included conclusions and comments;

According to the statements results the teachers agree with in PBL; learning makes consolidate, labour productivity increases, education will allow us pleasure in the process, creates a positive learning environment, provides the scientific learning process, it is a good educational experience for learners, it may learn to enjoy sharing, allows learning to love, ensures colouring the educational program, enjoyable.This means that teachers in high schools suppose the PBL is a good way to exercise. Because above items are positive opinions about PBL.

According to statement results the teachers agree with in PBL; Time is loss and method of breaking learning enthusiasm. So there is a problem with time and enthusiasm in the lesson when using PBL.

In this research related to teachers' problem-based learning to express opinions that vary significantly according to ages and seniorities. It shows that older teachers and experienced teachers have different ideas on the subject of PBL.

Finally, according to my observations teachers would prefer traditional ways. They applied examination and they said that they only practice on OSS exam testing.

5. 2 Recommendations for Results

Teachers, researchers, school directors, and education authoritatives in high schools can use Barrows (2000) and Benson (2001) models which are described in chapter 2. These models can help to using PBL more effectively in learning process.

5. 3. Recommendations for Further Research

Recommendations for researchers;

1. The attitudes of teachers towards PBL can be investigated one by one branch like Maths teachers, English teachers etc.
2. The effect of PBL on different grade levels can be investigated.
3. The effect of PBL on students from different schools can be investigated and compared.
4. The effect of PBL on retention can be investigated.
5. Some other instructional methods can be implemented in the unit of lessons and compared with the effectiveness of PBL.
6. Experimental researches on PBL can be investigated a variety of branch.
7. PBL studies in Turkish National Schools can be well-known. Through this aim researches can be study on teachers, students and education systems by practice PBL.

Recommendations for teachers;

8. Problems must be chosen from among the problems which are the most fitting to the real world.
9. Problem must be open-ended.
10. It must arouse sense of curiosity.
11. It must focus on only one issue.
12. It must teach good and ethical behaviours rather than negative events and behaviours.
13. It must help students to reflect on freely and express themselves.
14. By making suitable personifications, students must be given the opportunity to treat the problem as if it were their problem and to be willing in solving it.

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http://coe.sdsu.edu/eet/articles/problembl/start.htm

Problem-Based Learning" by Tara Fenwick and Jim Parsons, 1997 (ERIC Document: ED409272). Find further bibliographic information posted at www.ntlf.com.

Problem Based Learning for English as a Second Language Learners
www.pblforesl.com

APPENDICES

APPENDIX A

Sevgili öğretmenler, Çağdaş öğretim tekniklerinden biri olan Probleme Dayalı Öğrenme konusunda araştırma yapmaktayım. Söz konusu yöntemi aşağıda özetledim dilerseniz okuyabilirsiniz. Dilerseniz direkt anket bölümüne geçebilirsiniz. Katkılarınız eğitim içindir. Teşekkürler.

PROBLEME DAYALI ÖĞRENME

1.1. Tarihi Temelleri

Genel olarak bakıldığında problem çözme eylemi yeni bir şey değildir. Tarih içerisinde Probleme Dayalı Öğretim Stratejisi'nin ilkel örneklerini görmek mümkündür. Protogoras ve Aristotalesten başlayarak Sokrates'e kadar uzanan bir kullanım ağı gözümüze çarpar. İlk çağda bu yöntemi en etkin olarak Sokrates kullanmıştır. Hatta onun yöntemine soru-cevap diyalektiği, Sokratik Doğurtum adları da verilmiştir. İleriki yüzyıllara gelindiğinde Dewey'i görebiliriz. Dewey öğrenmeyi incelerken düşünceyi fiilin aktif hali olarak görmüş ve öğrenmede problemin önemine dikkat çekmiştir. Bizim ele alışımızdan farklı olarak Problem Çözme Tekniği öğretim litaratürüne Dewey'in sınıflaması ile girmiştir. (Excellence in College Teaching, 2000:1)

Ancak PBL bir öğretim stratejisi olarak literatüre 1960lı yıllarda McMaster Universty, Medical School'da Barrows ve Tombly'in tarafından yalpan bir araştırma sonucunda girmiştir. Bu araştırmada öğrencilerin akıl yürütme yetenekleri araştırılmıştır. Barrows ve Tamblyn problem çözmenin öğrenme üzerine getirtiği farklılıklara dikkati çekmişlerdir. İlk denemelerde öğrencilerden küçük gruplar oluşturulmuş, problemle durum arasında karar

vermeleri beklenmiştir. (Rhem, 1998: 1) Günümüzde Kanada, Amerika, Australia, İngiltere gibi ülkelerde özellikle Tıp Öğretiminde yüksek öğretimde kullanılan bir öğretim stratejisidir.

Türkiyedeki eğitim araştırmaları incelendiğide Probleme Dayalı Öğretim Stratejisi'nin Dokuzeylül Üniversitesi, Hacettepe Üniversitesi ve Pamukkale Üniversitesi Tıp Fakültelerinin çalışmaları ile sınırlı olduğu görülmektedir.

1.2. Probleme Dayalı Öğretme Stratejisi Nedir?

Probleme dayalı öğretim stratejisi öğrenme-öğretme sürecinde yeni bir paradigmayı temsil eder. Bu stratejide öğrenci karmaşık bir durum veya olay ile karşı karşıya bırakılır. Önemli olan nokta öğrencilerin bu sorunu sahiplenmeleri, ondan sorumlu olmalarıdır. Sorumluluk ve sahiplenme tam olarak gerçekleşmişse öğrenciler geçerli bir çözüme varmada tüm yolları denerler. Öğretmenin strateji başlangıcında yapması gereken ise problemin gerçek hayattan seçilmesine dikkat etmektir. Torp ve Sage'ye göre "Problem çözmeye dayalı öğrenme, karmaşık ve gerçek hayat problemlerinin araştırılması ve çözümü etrafında organize edilmiş ve bireylerin hem zihin hem de beceri yönünden aktif katılımlarını gerektiren, tecrübeye dayalı öğrenmeyi temsil eder" (Saban, 200:157)

Probleme dayalı öğretim stratejisi öğretimin hedeflerinden, öğrenci davranışına, kullanılacak yöntem ve teknikten, yapılacak olan ölçme ve değerlendirme işlemlerine kadar problemi merkeze alan bir yaklaşımdır. Bu nedenle böyle bir yaklaşımda hedeflerin ve davranışların öncelikli olarak belirlenmesi gerekmektedir. Bu belirleme yapıldıktan sonra problemi çözme aşamasında kullanılacak yöntem ve tekniklerin tespit edilmesi gerekecektir.

1.3. Geleneksel Öğretim Stratejileri ve Probleme Dayalı Öğretim Stratejisi

Öğretim Stratejisi	Amaç	Öğretmenin Rolü	Öğrencinin Rolü	Bilgi
Direkt Öğretim Stratejileri	Öğrencilerin öğrendikleri bilgileri kendilerinden istendiğinde olduğu gibi tekrar etmelerini sağlamak	1- Uzman olarak öğretmen, bilgiyi elinde bulundurur ve öğrencilerin düşünmelerini yönetir 2- Kontrol edici olarak öğretmen, öğrenci öğrenmesini yönetir ve öğrencileri değerlendirir	1- Alıcı olarak öğrenci, pasiftir ve boş bir depo olarak algılanır. 2- Takip edici olarak öğrenci, öğretmen önderliği ve liderliği için bekler	Bilgi, öğretmen tarafından organize edilir ve öğrencilere sunulur
Problem Çözmeye Dayalı Öğretim Stratejisi	Öğrencilerin bir problem durumuna çözüm üretebilmeleri için onların kendi bilgilerini yine kendilerinin inşa etmelerini sağlamak	1- Bir bilişsel rehber olarak öğretmen, öğrencileri bir problem durumu ile karşı karşıya bırakır, 2- Bir kaynak kişi olarak öğretmen, öğrencilere sorular yöneltir, öğrencilerin dünyası ile ilişkiler kurar ve öğrenci öğrenmesini yönlendirir	1- Birer problem çözücüler olarak öğrenciler, karşılaştıkları problemlere var olar kaynakları değerlendirerek, çeşitli çözüm önerileri üretirler. 2- Birer katılımcılar, olarak öğrenciler öğrenme sürecinde aktiftirler ve problemi içerden araştırırlar.	Bilgilin çok az bir bölümü öğretmen tarafından sunulur; bilginin büyük bölümü ise öğrenciler tarafından toplanır ve inşa edilir.

Hedef Basamağı	Öğrenciden Beklenen Davranış
Bilgi	Öğrenci bu basamakta problem ile ilgili terim, kavram, tanım, düşünce, ilke ve gerçekleri hatırlamalı tanımalıdır.
Kavrama	Her problemde olduğu gibi verilenler istenenler ayrımı yaparak, verilenleri değerlendirmeli, eldeki malzemeyi açıklamalı ve yorumlamalıdır.
Uygulama	Bir problemi çözmek için çeşitli prensipleri belirlemeli, üzerinde uzlaşılmış kriterleri problem üzerinde denemeledir
Analiz	Problemi bölünebilecek en ufak parçalarına ayırmalı, alt problemler belirlemeli, birimler oluşturmalıdır.
Sentez	Analiz ettiği birimlerden yeni bir ürün meydana getirmeli, probleme farklı bir yaklaşım modeli geliştirebilme, orijinal yönleri tespit etmelidir
Değerlendirme	Saptadığı kararlar hakkında hüküm vermeli ve problemin çözümünü ortaya koymalıdır.

4. Probleme Dayalı Öğretim Stratejisinde Ölçme ve Değerlendirme İşlemleri

PDÖ Olayları	PDÖ Ürünleri	PDÖ Formları	PDÖ Kriterleri	Öğretmenin Rolü
Problemi Tanımlama	Problemin ifadesi	Öğrenci günlüğü Problem Haritası Sözlü sunular Posterler	Problemin doğası, Problemin karmaşıklığı, Problemin çözülebilirliği	Öğrencilerin problem ifadelerini okumak ve dinlemek
Plan Yapma	Plan	Görev analizi, Zaman çizelgesi, Akış çizelgesi, Basamaklar, Araştırma önerisi, Maliyet analizi,	Açık, kapsamlı, mantıksal ve problemin doğasına ilişkin görevleri seçme ve konu dışı değişkenleri kontrol etme	Öğrencilerin planlarını ve görevlerini gözden geçirmek
Veri Toplama	Bilgi kayıtları, Araç gereçlerin kullanımı, Yeteneklerin sergilenmesi	Tablolar, çizelgeler, alan notları, anketler, gözlemler, görüşmeler, testler	Bilgiyi eksiksiz ve doğru olarak kaydetme, araç-gereci doğru kullanma becerisi	Gözlemlemek, öğrenci günlüklerini okumak, tutulan notları ve toplanan bilgileri gözden geçirmek
Verileri Analiz Etme	Bulguların özeti, Frekans tabloları,	Veri destekli özet cümleler, derlenmiş ve bir araya getirilmiş ispatlar ve deliler	İstatistiksel tekniklerin doğru olarak kullanımı, mantıklı yorumlar, Bulguların paylaşımı	Tabloları, grafikleri, şekilleri ve figürleri okumak ve analiz etmek
Verileri sentez etme ve sunma	Sergiler, Gösteriler, Sunular	Gazete yayınları, şiirler, öneriler, münazara, panel, karar, makale, model	Görüşmeleri sergileme, karar/çözüm önerisinin ifadesi,	Öğrenci performanslarını gözlemek ve değerlendirmek

PROBLEME DAYALI ÖĞRENME YÖNTEMİNİN ORTA ÖĞRETİM KURUMLARINDA UYGULANMASINA İLİŞKİN ÖĞRETMEN GÖRÜŞLERİNİN İNCELENMESİ

Bu çalışma orta öğretim kurumlarında görev yapan öğretmenlerin, Probleme Dayalı Öğrenme konusundaki görüşlerini ve uygulamalarını belirlemek üzere hazırlanmıştır. Vereceğiniz cevaplar araştırmanın güvenilirliğini etkileyecektir. Katkılarınız için şimdiden teşekkür ederim.

Yüksek Lisans Öğrencisi

Dilek Necibe TEKİN

Bu bölümde kişisel bilgilerinize ilişkin sorular bulunmaktadır. Maddeleri dikkatli okuyarak size en uygun olan seçeneğe ayrılan parantez içine çarpı **(X)** işareti koyunuz.

1. Çalıştığınız okulun Adı: .....

2. En son mezun olduğunuz okulun türü?

A) Eğitim Enstitüsü ( )

B) Eğitim Yüksekokulu ( )

C) Eğitim Fakültesi ( )
D) Fen-Edebiyat Fakültesi ( )
E) Açık öğretim Fakültesi ( )
DİĞER: .....

3. Mezun olduğunuz bölümün adını yazınız.(branşınız) :
.....

4. Mezuniyet türünüzü işaretleyiniz.
A) Ön lisans( ) B) Lisans ( ) C) Yüksek lisans ( )
Diğer:.....

5. Cinsiyetiniz? A) Kadın ( ) B) Erkek ( )
6. Yaşınız: .....

7. Mesleki Kıdeminiz?
( ) 1. 0-4 yıl
( ) 2. 5-9 yıl
( ) 3. 10-14 yıl
( ) 4. 15-19 yıl
( ) 5. 20 yıl ve üzeri
8. Şu anda kaçıncı sınıfı (sınıfları) okutuyorsunuz?.....
Lise I ( ) Lise 2 ( ) Lise 3 ( ) Lise 4 ( )

BÖLÜM II.

1) Derslerinizi işlerken Probleme Dayalı Öğrenmeyi hangi sıklıkla kullanıyorsunuz?

A)Her zaman ( ) B) Çok sıklıkta ( ) C) Orta sıklıkta( )

D) Çok az sıklıkta ( ) E) Hiçbir zaman ( )

2) Probleme Dayalı Öğrenme yöntemini kullanırken yaşadığınız güçlükleri işaretleyiniz. Birden fazla seçenek işaretleyebilirsiniz.

A) Yeterli zaman bulamıyorum ( ) B) Öğrenci sayısının çokluğu engelliyor ( )

C) Tekniği uygulamada kendimi bilgi açısından yetersiz hissediyorum ( )

D) Teknik donanım yetersizliğim var ( ) E) Büyük şehirde görev yaptığımdan ( )

Diğer:

.....

...

3) Probleme Dayalı Öğrenmeyi uygularken, nereden ve kimlerden yararlanıyorsunuz? (Birden fazla yanıt verebilirsiniz).

A) Kitaplardan ( ) B) Seminerlerden( ) C) Okulumuzdaki rehberlik servisinden( )

D) Üniversitelerden ( ) E) Diğer meslektaşlardan ( ) E) Tecrübelerimden ( )

Diğer.....

4) Probleme Dayalı Öğrenmeye yönelik bilgi ve becerilerinizde kendinizi nasıl hissediyorsunuz?

A) Yetersizim( ) B) Biraz yeterliyim( ) C) Yeterliyim( ) D) Çok yeterliyim( )

5) Probleme Dayalı Öğrenmeyi uygulamaya ilişkin ne kadar ihtiyaç hissediyorsunuz?

A) Eğitim ihtiyacım var ( ) B) Biraz ihtiyacım var ( ) C) İhtiyacım yok ( )

6) Probleme Dayalı Öğrenmeyi hangi derecede tercih ediyorsunuz?

A) Birinci derecede tercih ediyorum ( )

B) İkinci derecede tercih ediyorum ( )

C) Üçüncü derecede tercih ediyorum ( )

D) Tercihlerim arasında bulunmuyor ( )

BÖLÜM III

Aşağıda probleme dayalı öğrenme ile ilgili önermeler bulunmaktadır. Yanıtlarda doğru ya da yanlış yoktur mümkün olduğunca sizin için doğru olduğu şekilde yanıtlayınız. Önermeleri yanıtlamak için 1 ile 5 arasındaki ölçeği kullanınız, 1 kesinlikle katılmıyorum 5 ise kesinlikle katılıyorum anlamındadır.

Önermelere katılma ölçünüzü belirten puanı daire içene alarak yanıt veriniz.

Aşağıdaki Önermeleri Probleme-Dayalı Öğrenmeyi Düşünerek Yanıtlayınız		Kesinlikle Katılmıyorum	Katılmıyorum	Emin Değilim	Katılıyorum	Kesinlikle Katılıyorum
Probleme-dayalı öğrenme/ Probleme-dayalı öğrenmede						
1.	Olumlu bir öğrenme ortamı oluşturur	1	2	3	4	5
2.	Öğrenmeyi sevmeyi sağlar	1	2	3	4	5
3.	Yararsız bir uygulamadır	1	2	3	4	5
4.	Eğitim programının renklenmesini sağlar	1	2	3	4	5
5.	Zaman sıkıcı bir şekilde geçer	1	2	3	4	5
6.	Öğrenilenleri paylaşmanın keyfine varılır	1	2	3	4	5
7.	Eğlencelidir	1	2	3	4	5
8.	Eğitim programları için uygun değildir	1	2	3	4	5
9.	Izdırap vericidir	1	2	3	4	5
10.	Öğrenilenlerin pekişmesini sağlar	1	2	3	4	5
11.	Çalışma verimini artırır	1	2	3	4	5
12.	Zaman kaybıdır	1	2	3	4	5
13.	Amacı belli değildir	1	2	3	4	5
14.	Öğrenci için iyi bir eğitim tecrübesidir	1	2	3	4	5
15.	Öğrenmeyi güçleştirir	1	2	3	4	5
16.	Kafa karışıklığına neden olur	1	2	3	4	5
17.	Öğrenciler cezalandırılmaktadır	1	2	3	4	5
18.	Bilimsel sürecin öğrenilmesini sağlar	1	2	3	4	5
19.	Eğitim sürecinden keyif alınmasını sağlar	1	2	3	4	5
20.	Öğrenme şevkini kıran bir yöntemdir	1	2	3	4	5

APPENDIX B

YAKIN DOĞU ÜNİVERSİTESİ

1988

(NEAR EAST UNIVERSITY)

ATATÜRK EĞİTİM FAKÜLTESİ

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T.C Milli Eğitim Bakanlığı

Eğitimi Araştırma ve Geliştirme Dairesi Başkanlığı

ANKARA

Eğitim Programları ve Öğretimi Ana Bilim Dalı Yüksek Lisans Programı, **20032719 no.lu öğrencimiz Dilek Necibe Tekin** şu an tez çalışmasında olup, tezi ile ilgili uygulama çalışmalarını yapabilmesi için kendisine gerekli olan izinin verilmesi hususunda müsaadelerinizi arz ve rica ederim.

Doç. Dr. Hüseyin UZUNBOYLU

Dekan Yardımcısı

EK:

1) Öğrenci Belgesi
2) Öğrenci Dilekçesi
3) Anket
4) Araştırma Önerisi

Tez Konusu: Probleme Dayalı Öğrenme Yaklaşımının Ortaöğretim Kurumlarında Uygulanmasına ilişkin Öğretmen Görüşleri

APPENDIX C

T.C.
MİLLÎ EĞİTİM BAKANLIĞI
Eğitimi Araştırma ve Geliştirme Dairesi Başkanlığı

Sayı : B.08.0.EGD.0.33.05.311- 358/3297 16./12/2009
Konu : Araştırma İzni

DIŞ İLİŞKİLER GENEL MÜDÜRLÜĞÜNE

İlgi : a) 18.11.2009 tarih ve B.08.0.DİG.0.17.02.722.99.CY/9897 sayılı yazı
b) 28.02.2007 tarih ve B.08.0.EGD.0.33.05.311-311/1084 sayılı Makam Onayı ile Uygulamaya Konulan "Millî Eğitim Bakanlığına Bağlı Okul ve Kurumlarda Yapılacak Araştırma ve Araştırma Desteğine Yönelik İzin ve Uygulama Yönergesi

Kuzey Kıbrıs Türk Cumhuriyeti Yakındoğu Üniversitesi Eğitim Programları ve Öğretimi Anabilim Dalı Yüksek Lisans öğrencisi Dilek Necibe TEKİN'in "Probleme Dayalı Öğrenme Yaklaşımının Ortaöğretim Kurumlarında Uygulanmasına İlişkin Öğretmen Görüşleri" konulu araştırmasında kullanılacak veri toplama araçlarının Antalya Lisesi, Antalya Bileydi Anadolu Lisesi ve Antalya Yavuz Selim Lisesinde görevli öğretmenlere uygulama izni talebi incelenmiştir.

İlgili üniversite tarafından kabul edilen onaylı bir örneği Bakanlığımızda muhafaza edilen (3 sayfa-34 sorudan oluşan) veri toplama araçlarının Antalya Lisesi, Antalya Bileydi Anadolu Lisesi ve Antalya Yavuz Selim Lisesinde görevli öğretmenlere uygulanmasında bir sakınca görülmemektedir.

İlgi (b) Yönergenin 5. Maddesinin (o) bendi uyarınca taahhütnamenin ve araştırmanın bitiminde sonuç raporunun iki örneğinin Başkanlığımıza gönderilmesi gerekmektedir.

Bilgilerinizi ve gereğini arz ederim.

Dr. Halil Rahman AÇAR
Daire Başkanı

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