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PROBLEM-BASED LEARNING STUDIES: A CONTENT ANALYSIS

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ABSTRACT

Problem Based Learning (PBL) is basically an approach that enables students to learn and engage in a context meaningfully so as to manage or solve complex real-life problems, and to foster students' critical thinking and problem-solving process skills. It is of great importance to analyze researches conducted in Turkey systemically and periodically. Thus, we can have a comprehensive idea about the reflection of PBL upon the Turkish education system, enabling insight for new or experienced researchers interested in PBL to be informed about existing researches and publishing. In this study, master's and PhD theses related to PBL indexed on National Thesis Center during the years between 2014 and 2018 have been analyzed contextually from the point of different variances. The master's (n=27) and PhD theses (n=13) that are involved in this study has been considered according to the categorized 10 *themes* in total. The data of this research have been gathered through the descriptive model. The findings of the study demonstrate that the majority of the theses have been carried out by female researchers (62,5%), at the level of master's (67,5%), based on the mixed research method (55,0%), with experimental research model (81,4%), at Ataturk University (17,5%) in Erzurum (18,4%), and in 2014 (27,5%).

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STRUCTURED ABSTRACT

Introduction

Taking its main origins from the Greek philosophy, PBL is basically an approach that enables students to learn and engage in a context actively and meaningfully while developing "*meta-cognitive skills*" so as to manage or solve complex real-life problems (Baden and Major, 2004), to foster students' "*intellectual make-up*" in terms of critical thinking and problem-solving process skills, to have life-long learning attitude and content knowledge (Yew and O'Grady, 2012). Furthermore, PBL is dynamic and interactive learning conducted in *heterogeneous* groups to involve students into a reconstruction period of their schemata in their own knowledge by building on one another's ideas, which reinforces the nature of questioning, investigation, negotiation and productivity toward a compelling problem (Duch, Groh and Allen, 2001).

PBL starts with "*an issue, case, or ill-structured problem that can be researched, studied or even 'solved'*" (Levin, 2001). The crucial point is that there is not one correct answer or solution, but several possible solutions should be adaptable to the relevant problem. Differently from multiple choice questions, filling in the blanks activities or simply answering questions about a paragraph, PBL offers complex, real-world and authentic problems rather than exercises.

Teachers during the learning issues of students perform as a facilitator or tutor *scaffolding* students learning (Grave, Dolmans, and Vleuten, 1999). Instruction in PBL is more student-centered and less teacher directed, students' responsibility for their own learning is more considerable, and "*learning is active rather than passive, integrated rather than fragmented, cumulative rather than isolated, and connected rather than disconnected*" (Levin, 2001).

During recent years, when reviewed the literature related to Problem-Based Learning, there can be found out remarkable researches and studies not only in Turkey but also all over the world. In addition to its popularity around the world, PBL approach has a significant domain on research subjects accomplished in Turkey during recent years. Accordingly, it is figured that a study providing a critical overview of the literature gives researchers a supportive outlook in their future studies on this field. Fundamentally, the main purpose of this study is to carry out a content analysis of the research studies presented on the topic of Problem-Based Learning in Turkey. When the relevant literature is reviewed, there have been figured out content analysis studies until the year 2013 investigating the theses in which researches were conducted within the framework of the PBL method. Particularly, the master's and PhD theses indexed on the National Thesis Center during the years between 2014 and 2018 are contextually analyzed from the point of different variances.

Methodology

In this part of the study, a content analysis approach has been used. Furthermore, it includes a thematic analysis of certain categories by means of scanning materials such as printed, visual etc. in a systematic way (Saban, 2009).

The scope of the study

The theses analyzed in this research are limited to the ones that are available as Portable Document Format (PDF) on the National Thesis Center as of the date of 21st of December, 2018 which is the first time to be scanned the theses. The theses written in both Turkish and English are in the scope of this research. There were reached 46 theses in total including master's and PhD theses related to PBL in respect of the years between 2014 and 2018 as a result of the analysis on the National Thesis Center. 86 percent of all theses (n=40) are included in this research; however, 13.1 percent of them (n=6) cannot be accessed due to the lack of permission of the authors. Thus, this study is limited to the 40 theses.

Research model

The data of this research have been gathered through the descriptive model. The analysis templates basically consist of 10 questions that are attentively determined by the researcher so as to analyze all of the 40 theses related to PBL taken into the scope of this study. Each of these questions is evaluated as a "theme."

Data collection and analysis

The sample of this study consists of researches conducted within the framework of teaching via Problem Based Learning Method. The key words to be taken into consideration in the literature search were initially determined to obtain the data. The key words are given in Table 1.

Table 1: Key words used to gather the data

Turkish Key Words

Problem based learning
Problem based
Probleme dayalı öğrenme (Problem based learning)
Probleme dayalı (Problem based)

The theses subjected to the content analysis were read over, and sub-themes have been categorized according to the questions involved in the content analysis template. The data gathered by coding the theses within the scope of study have been analyzed using a statistical software. The frequency and percentage rates of all themes and sub-themes have been presented in tables.

Discussion and Conclusion

Following the last decades, the main purpose of education has become different together with certain changes in all aspects of life itself. Today with which an individual should be ready to face is totally challenging compared to even ten years ago. Thus, the problems of today's world can only be solved if someone works interdisciplinary, thinks critically, discovers innovative approaches and gains complex problem-solving skills (Duch, Groh and Allen, 2001). At this point, Problem-Based Learning seems to allow students to have a connection with the real world, to learn how to learn, to construct new information meaningfully, to put away the understanding of ready-to-use

knowledge, and to acquire critical thinking skills. Despite these essential features of PBL, the findings obtained as a result of the content analysis of the theses related to PBL conducted in Turkey stimulate attention towards the fact that there exists a remarkable decrease in practices based on PBL. PBL took considerable attention in 2014 with 11 theses (27,5%) in total; on the other hand, only 7 theses (17,5%) has been accomplished in 2018 at last. As the importance and productive influence of the applications of PBL on the learning process are obvious, more academic studies and researches are needed to be conducted so as to reignite and increase the dissemination of PBL method. Hereby, the implementation of the PBL method around the country and elaboration of the concept of the PBL processes as one component within a holistic framework can pointedly contribute to teaching and learning processes.

The research model of a study are "the master category" since the research is mainly based on the investigator's choice (Vogt, Gardner and Haefele, 2012). When considered the findings of the study, the vast majority of the research models utilized in the theses about PBL (81,4%) corresponds to the experimental research model. Literature search (7,0%), model-building (4,7%), action research (2,3) and other research models (2,3) is respectively preferred by the researchers. It is quite apparent that there is a need for more researches conducted in terms of other research models. To include different research models in this field would offer notable and distinctive contributions in terms of science and educational practices.

When the distribution of the sample types as a part of this study is examined, there could not be come across with a research that has been experienced with primary school students, which is really worthy of consideration. Besides its potential benefits to learners at early ages, PBL should be applied to vocational schools that give the integrated disciplines and an ability to practice. The problem-solving process help students transfer the relevant knowledge into authentic situations, thus overcoming the challenges and reconstructing their schemata in their minds together with their experiences on their meaningful learning journey (Chiang and Lee, 2016). The results of the theses related to PBL conducted at vocational schools and colleges demonstrate that there is only one research (2,6%) studied at a vocational school in Turkey during the last five years until the end of 2018.

PBL can be regarded as a multidisciplinary method allowing the learners to resolve real-life problems and situations in every aspect. Considering the distribution of the theses in terms of the institutes under which the researches have been conducted, the large part of it belongs to the Institution of Educational Science (65%). Nevertheless, PBL method can be readily adapted into other different academic areas. The researches and studies under different institutes can broaden diversified, innovative and limitless horizons.

The fact that all theses related to PBL in the scope of this study have been written in Turkish (n=40, 100%) is a serious point. It is remarkable that conducting the researches in English can be regarded as more professional, since writing a thesis or research in English could make it more acceptable and valuable in the sight of the international research community, and a thesis in English could broaden the target

audiences who perform researches related to PBL and other fields. Additionally, these theses and researches will inarguably provide researchers all around the world with the convenience of analyzing and comparing them with the ones conducted in their countries.

Keywords: Problem-Based Learning, Content Analysis, Master's and PhD Theses conducted in Turkey

PROBLEME DAYALI ÖĞRENME: İÇERİK ANALİZİ

ÖZ

Probleme dayalı öğrenme (PDÖ) yöntemi, temelde öğrencilere gerçek hayatta karşılaşılabilecekleri karmaşık problem senaryoları sunmayı ve öğrencilerin bu problemlere farklı çözümler üretebilmeleri için anlamlı öğrenme imkanı sağlamayı amaçlayan bir yaklaşımdır. Bu sayede, öğrencilere problem çözme, bilgiyi analiz etme, eleştirel düşünme, işbirliği yapma vb. becerilerin kazandırılması hedeflenmektedir. Bu çalışmanın amacı, Türkiye'de yapılan araştırmaları sistemli ve periyodik olarak analiz etmek, böylelikle probleme dayalı öğrenme yönteminin Türk eğitim sistemi üzerindeki yansımaları ile ilgili kapsamlı bir fikre sahip olmak ve bu yöntemle ilgili ilgilenen araştırmacılar için derinlemesine bir bakış açısı sağlayabilmektir. Bu çalışmada, 2014 ve 2018 yılları arasında Yüksek Öğretim Kurumu Ulusal Tez Merkezi'ne indekslenmiş olan Probleme Dayalı Öğrenme (PDÖ) yöntemi ile ilgili yüksek lisans ve doktora tezleri farklı değişkenler açısından içerik analizi yöntemi ile incelenmiştir. Bu çalışma kapsamında bulunan yüksek lisans (n=27) tezleri ve doktora (n=13) tezleri toplamda 10 farklı *tema* altında kategorilere ayrılmıştır. Araştırmanın bulguları, çalışmaların büyük bir bölümünün 2014 yılında (%27,5) kadın araştırmacılar (%62,5) tarafından Erzurum (%18,4) ilinde Atatürk Üniversitesi (%17,5) bünyesinde yüksek lisans (%67,5) düzeyinde karma araştırma yöntemine (%55,0) göre deneysel desende (%81,4) gerçekleştirildiğini göstermektedir. Ayrıca, yapılan çalışmaların çoğu ortaokul (%57,9) düzeyinde gerçekleştirilmiştir. Araştırma sonucuna göre, Türkiye'de son yıllarda probleme dayalı öğrenme yöntemi ile ilgili çalışmalarda kayda değer bir azalma görülmektedir.

Anahtar Kelimeler: Probleme Dayalı Öğrenme, İçerik Analizi, Türkiye'de yapılmış Yüksek Lisans ve Doktora Tezleri

1. Introduction

The epistemological question "What is the nature of reliability of human knowledge?" was strongly taken into consideration by the Sophists during the fifth and fourth century BC with the intention to inquiry the knowledge itself, which is closely associated with the problem-based learning based on the exploration of the nature of the knowledge to help students develop reasoning abilities. As the first Greek philosopher and the father of these notions, Socrates put forward the idea that knowledge is personal; that is, unattainable. To reveal the understanding that moral concepts and ideas are inconsistency and inadequate, Socrates used the *dialogos*, the current notion of the Socratic dialogue, and questioning approaches to internally trigger students to think critically and to guide them

in their continuous pursuit of the truth itself. This questioning and probing of assumptions and beliefs establishing the core idea of the Problem-Based Learning (PBL) lead students to question their knowledge against a newly encountered problem. Another notion behind the foundation of PBL stands on the theory of realism proposed by Aristotle who believed that the reality would be acquired through logical reasoning and rationality. Thus, Aristotle used the *dialectic* in which students experienced a disciplined inquiry to "*reconcile oppositions presented in a thesis or problem*". These conceptions linked with PBL in the sense of understanding knowledge, engaging in questioning and developing rationality date back from the ancient Greek philosophers (Baden and Major, 2004).

Taking its main origins from the Greek philosophy, PBL is basically an approach that enables students to learn and engage in a context actively and meaningfully while developing "*meta-cognitive skills*" so as to manage or solve complex real-life problems (Baden and Major, 2004), to foster students' "*intellectual make-up*" in terms of critical thinking and problem-solving process skills, to have life-long learning attitude and content knowledge (Yew and O'Grady, 2012). Instruction in PBL is more student-centered and less teacher directed, students' responsibility for their own learning is more considerable, and "*learning is active rather than passive, integrated rather than fragmented, cumulative rather than isolated, and connected rather than disconnected*" (Levin, 2001).

PBL has dramatically become popular in the area of teaching and learning since the 1960s. It was essentially due to the fact that educators started questioning traditional teaching within the frame of instruction issues implemented as teacher-oriented, passive learning by memorizing and imitating and directed by inclusive guidance. Under these circumstances, an overwhelming desire, particularly in the area of medical education, to engage students into an active and deeper understanding of the concepts allied to problem-solving and critical thinking skills preponderated over "*dissatisfaction with the traditional teacher-centered paradigm*" (Baden and Major, 2004). This inevitably forced to adopt novel approaches to learning connected with "*modern insights on learning: constructive, self-directed, collaborative and contextual learning*" (Dolmans, Grave, Wolfhagen and Vleuten, 2005). Hence, the preliminary and path breaking application of PBL can be based on the practical usage in the education of medical doctors at Case Western University in the USA in the 1950s for the purpose of the fact that it would strengthen self-directed learning and problem-solving skills. Subsequently, the renovative process was followed by McMaster University Medical School in Canada in 1960s, thus laying the way open for the rapid spread and implementation by instructors at medical schools throughout the world. This opportunity to innovate and enhance learning ultimately revealed the value of PBL approaches (Tan, 2003). Accordingly, the problem-based learning practices carried out within medical education has influenced other professions by virtue of its capacity to "*foster growth*" in many areas (Levin, 2001).

According to Brooks and Brooks (1999), constructivism enables students "*internalize and reshape, or transform, new information*" in striking contrast to the imposed information offered wholly by teachers with "*only one view of complex issues*" and "*one set of truths.*" PBL that is consistent with constructivism as one of the fundamental bases related to its theory starts with "*an issue, case, or ill-structured problem that can be researched, studied or even 'solved'*" (Levin, 2001). The crucial point is that there is not one correct answer or solution, but several possible solutions should be adaptable to the relevant problem. Differently from multiple choice questions, filling in the blanks activities or simply answering questions about a paragraph, PBL offers complex, real-world and authentic problems rather than exercises. That these problems are composed of undisclosed information, facts or phenomena that encourage and motivate students to be involved in further researches is a strict premise for "*generating possible hypotheses*" (Yew and Schmidt, 2012). While transferring their previous knowledge into practice and realize instinctively what they already know about the problem, students "*discover what they do not yet know or which questions still need to be answered and require study*" (Dolmans, Grave, Wolfhagen and Vleuten, 2005). The knowledge gaps of students herein result in the act of being forced to learn actively and self-directed in their own

learning, thus affecting *all subsequent learning* (Baden and Major, 2004) and moving to another phase that students meaningfully construct or even reconstruct new knowledge with a profound, deep and sophisticated understanding.

PBL is dynamic and interactive learning conducted in *heterogeneous* groups to involve students into a reconstruction period of their schemata in their own knowledge by building on one another's ideas. The problem necessarily lays the ground for collaboration and cooperation of all members so that it reinforces the nature of questioning, investigation, negotiation and productivity toward a compelling problem (Duch, Groh and Allen, 2001).

Teachers during the learning issues of students perform as a facilitator or tutor *scaffolding* students learning (Grave, Dolmans, and Vleuten, 1999). The concept of scaffolding refers to a teacher in an attempt to guide and empower students' own learning experiences and enable them to acquire the knowledge effectively and gain autonomy (Baden and Major, 2004). Besides the contributions to students' problem-solving skills, it provides teachers with chances to learn different teaching, even learning, opportunities, to broaden their experience in their professions, and reform their personal knowledge and beliefs as they mainly focus on the learning process that consists of a problem from "*a multitude of perspectives*" (Levin, 2001).

Together with the diversity in teaching methods due to the constant flow of the accumulating information, the importance and advantages of PBL that ensures learners to reach, use, research, construct and transfer the information effectively are obviously clear especially when considered traditional teaching techniques. Though PBL was applied in the medical education, it did not really take a long time to spread to other disciplines. During recent years, when reviewed the literature related to Problem-Based Learning, there can be found out remarkable researches and studies not only in Turkey but also all over the world.

In addition to its popularity around the world, PBL approach has a significant domain on research subjects accomplished in Turkey during recent years. Accordingly, it is figured that a study providing a critical overview of the literature gives researchers a supportive outlook in their future studies on this field. Fundamentally, the main purpose of this study is to carry out a content analysis of the research studies presented on the topic of Problem-Based Learning in Turkey. When the relevant literature is reviewed, there have been figured out content analysis studies until the year 2013 investigating the theses in which researches were conducted within the framework of the PBL method. Particularly, the master's and PhD theses indexed on the National Thesis Center during the years between 2014 and 2018 are contextually analyzed from the point of different variances.

2. Method

In this part of the study, a content analysis approach has been used. Content analysis, "*the fastest-growing technique of quantitative research*," can be defined as an analysis of message characteristics conducted systemically and objectively, and including the careful examination of human interaction (Neuendorf, 2002). Furthermore, it includes a thematic analysis of certain categories by means of scanning materials such as printed, visual etc. in a systematic way (Saban, 2009).

2.1. The scope of the study

The theses analyzed in this research are limited to the ones that are available as Portable Document Format (PDF) on the National Thesis Center as of the date of 21st of December, 2018 which is the first time to be scanned the theses. In addition, the database was scanned again between the dates of 22 December 2018-25 December 2018 in order to ensure reliability, comparing the results with the ones obtained from the previous scanning. The theses written in both Turkish and English are in the scope of this research. There were reached 46 theses in total including master's and PhD theses

related to PBL with the keywords "*problem based learning*," "*problem based*," "*probleme dayalı öğrenme*" and "*probleme dayalı*" in respect of the years between 2014 and 2018 as a result of the analysis on the National Thesis Center. 86 percent of all theses (n=40) are included in this research; however, 13.1 percent of them (n=6) cannot be accessed due to the lack of permission of the authors. Thus, this study is limited to the 40 theses. One of the most important points on this study is that since there exists no thesis related to PBL in English between 2014 and 2018, and all of the theses reached on the database have only been written in Turkish, this study is limited with the Turkish ones.

2.2. Research model

The data of this research have been gathered through the descriptive model. The analysis templates basically consist of 10 questions that are attentively determined by the researcher so as to analyze all of the 40 theses related to PBL taken into the scope of this study. Each of these questions is evaluated as a "*theme*." In an attempt to develop these questions and themes, the study related to Multiple Intelligences Theory conducted by Ahmet Saban (2009) is taken as a key reference. Following questions are tried to be answered:

1. What is the distribution of the types of the publication in the master's and PhD theses related to PBL?
2. What is the distribution of publication years of the master's and PhD theses related to PBL?
3. What is the distribution of the gender of the researchers in the master's and PhD theses related to PBL?
4. What is the distribution of the research models in the master's and PhD theses related to PBL?
5. What is the distribution of the research methods in the master's and PhD theses related to PBL according to?
6. What is the distribution of the data analyses tools in the master's and PhD theses related to PBL?
7. What is the distribution of the types of samples in the master's and PhD theses related to PBL?
8. What is the distribution of the cities in which the master's and PhD theses related to PBL are carried out?
9. What is the distribution of the universities in which the master's and PhD theses related to PBL are written?
10. What is the distribution of the masters and PhD theses related to PBL according to the institutes?

2.3. Data collection and analysis

The sample of this study consists of researches conducted within the framework of teaching via Problem Based Learning Method. The key words to be taken into consideration in the literature search were initially determined to obtain the data. The key words are given in Table 1.

Table 1: Key words used to gather the data

Turkish Key Words
Problem based learning
Problem based
Probleme dayalı öğrenme (Problem based learning)
Probleme dayalı (Problem based)

The database of the Turkish Higher Education Institution National Thesis Center was searched for the key words. In this way, a total of 40 (86%) out of 46 researches including 27 (67,5) master's and 13 (32,5) PhD theses have been reached.

The theses subjected to the content analysis were read over, and sub-themes have been categorized according to the questions involved in the content analysis template. To illustrate, 5 sub-themes are added for the theme in which the question "What is the distribution of the masters and PhD theses related to PBL according to the institutions?" is inquired, then the question is being viewed and coded under this sub-theme separately. The data gathered by coding the theses within the scope of study have been analyzed using statistical software that is SPSS Statistics 23. For this reason, all themes and sub-themes have been transferred to the SPSS program. The frequency and percentage rates of those themes have been presented in tables.

3. Results

In this part of the research, obtained results of the 40 theses published in the last five years have been discussed in the view of the main purpose of the study. Gathered data has been classified and tabulated in accordance with types of publication, publication years, gender, research models, research methods, data analyses tools, samples, cities, universities and institutes.

Types of Publication

Table 2 given below shows the distribution of the theses based on PBL according to the types of publication.

Table 2: Distribution of theses according to types of publication

Type of Publication	f	%
Master's	27	67,5
PhD	13	32,5

According to Table 2, it can be seen that the 67,5 percent (f=27) of the theses have been written at the level of master's, and the 32,5 percent (f=13) of the theses have been done at the level of PhD. It is obvious that most of the researchers gave preference to PBL in their master's theses, which indicates that there is a necessity for more studies related to PBL at the level of PhD.

Publication Years

The distribution of the theses based on the publication years is tabulated in Table 2.

Table 3: Distribution of theses according to publication years

Publication Year	f	%
2014	11	27,5
2015	9	22,5
2016	6	15,0
2017	7	17,5
2018	7	17,5

When Table 3 is considered, PBL took considerable attention in 2014 with 11 theses (27,5%) in total. However, it is clear that the frequencies of the theses related to PBL has gradually decreased, and only 7 theses (17,5%) has been accomplished in 2018 at last. Furthermore, the least number of the theses appears in 2016, in which 6 theses were written (15,0%).

Gender of the Researchers

Table 4 given below indicates the distribution of the researchers' gender who has written their theses between 2014 and 2018.

Table 4: Distribution of gender of researchers

Gender	f	%
Male	15	37,5
Female	25	62,5

In Table 4, it is indicated that 15 of all theses related to PBL (37,5) have been done by men; on the other hand, 25 of the theses (62,5) have been completed by women. As a consequence of that, it can be said that female researchers show appreciable interest to PBL much more than male researchers.

Research Models

The distribution information of the theses in the sense of research model is given in Table 5.

Table 5: Distribution of theses in the sense of research models

Research Model	f	%
Experimental	35	81,4
Action Research	1	2,3
Literature Search	3	7,0
Correlational Survey Model	1	2,3
Model-Building	2	4,7
Other	1	2,3

As seen in Table 5, the vast majority of the research models utilized in the theses about PBL (81,4%) corresponds to the experimental research model. Literature search (7,0%), model-building (4,7%), action research (2,3), relational screening (2,3) and other research models (2,3) is respectively preferred by the researchers. It is quite apparent that there is a need for more researches conducted in terms of other research models.

Research Methods

Findings concerning the research methods applied in the theses related to PBL is shown in Table 6 given below.

Table 6: Distribution of theses according to research method

Research Method	f	%
Quantitative	18	45,0
Mixed (Qualitative and Quantitative)	22	55,0

When considered the findings, it can be seen that the 45 percent of the researches (f=18) have been conducted based upon the quantitative research method, and the rest 55 percent of them (f=22) has been done based on the mixed (Qualitative and quantitative) research method.

Data Collection Tools

Table 7 given below illustrates the distribution of the data collection tools with the scope of this study.

Table 7: Distribution of Theses in terms of Data Collection Tools

Data Collection Tool	f	%
Observation Forms	6	4,7
Interview Forms	18	14,0
Survey Forms	8	6,2
Tests	41	31,8
Inventories	2	1,6
Scales	46	35,7
Scenarios	4	3,1
Worksheets	2	1,6
Lesson Plans	2	1,6

As in demonstrated in the table, there exists nine different tools having been used in the theses as a data collection tool. The most frequently used tools with the scope of this study are primarily scales (35,7%) and tests (31,8%). Of all data collection tools, inventories (1,6), lessons plans (1,6), worksheets (1,6) and scenarios (3,1) has been relatively favored much less comparing with the others.

Sample Types

The distribution of the sample types that researchers have used is pointed out in Table 8 given below.

Table 8: Distribution of theses in terms of sample type

Sample Type	f	%
Secondary School	22	57,9
High School	7	18,4
University	7	18,4
Vocational School/College	1	2,6
Adult Education	1	2,6

22 out of 40 theses have been carried out with the participation of students at secondary schools, which constitutes 57,9 percent of the theses in the scope of this study. High schools (18,4%), universities (18,4%), vocational schools/colleges (2,6%) and adult education (2,6%) come after secondary schools. Particularly, most of the studies have been done at secondary schools. It shows that more researches should be put into practice within other sample types, as well.

Researches according to Cities

Table 9 clearly shows the distribution of the theses related to PBL according to cities.

Table 9: Distribution of theses according to cities

City	f	%
Amasya	1	2,6
Ankara	6	15,8
Bartın	1	2,6
Çanakkale	1	2,6
Denizli	1	2,6
Düzce	1	2,6
Erzurum	7	18,4
Eskişehir	1	2,6
Giresun	1	2,6
Isparta	2	5,3
İstanbul	3	7,9
İzmir	4	10,5
Kahramanmaraş	1	2,6
Kastamonu	1	2,6
Kırıkkale	1	2,6
Kocaeli	1	2,6
Manisa	2	5,3
Nevşehir	1	2,6
Sinop	1	2,6
Yozgat	1	2,6

As the data given in the table, 40 researches have been practiced in 20 cities in total. The most of the researches between 2014 and 2018 have been experienced in Erzurum (n=7, 18,4%), Ankara (n=6, 15,8%) and İzmir (n=4, 10,5). It is seen that these cities have given significant importance towards Problem-Based Learning.

Universities where theses have been conducted

Considering Table 10, it could be seen the distribution of the universities where the theses involved within this study have been conducted.

Table 10: Distribution of theses according to universities

University	f	%
Amasya University	1	2,5
Ankara University	1	2,5
Atatürk University	7	17,5
Bolu University	1	2,5
Bozok University	1	2,5
Çanakkale University	1	2,5
Çukurova University	1	2,5
Dokuz Eylül University	4	10,0
Erzincan Binali Yıldırım University	1	2,5
Fırat University	1	2,5
Gazi University	3	7,5
Giresun University	1	2,5
Hacettepe University	2	5,0
Istanbul University	1	2,5
Kastamonu University	1	2,5
Kırıkkale University	1	2,5
Marmara University	2	5,0
Mustafa Kemal University	1	2,5
Necmettin Erbakan University	2	5,0
Ondokuz Mayıs University	1	2,5
Pamukkale University	2	5,0
Sakarya University	1	2,5
Süleyman Demirel University	1	2,5
Sütçü İmam University	1	2,5
Yıldız Technical University	1	2,5

When considered the findings shown in Table 10, 40 theses entered into this study have been written within twenty-five different universities, and 7 out of 40 theses related to PBL have proceeded under the name of Atatürk University (17,5) which is followed by Dokuz Eylül University (n=4, 10%).

Institutes to which theses have been submitted

Table 11 given below indicates the distribution of the institute to which the theses have been submitted between 2014 and 2018.

Table 11: Distribution of theses in terms of institute

Institute	f	%
Institute of Education Sciences	27	67,5
Institute of Fine Arts	1	2,5
Institute of Medical Sciences	1	2,5
Institute of Science and Technology	7	17,5
Institute of Social Sciences	4	10,0

As demonstrated in the table, the majority of the theses written between the years 2014 and 2018 have been submitted to the Institute of Education Sciences (n=27, 67,5%). The most striking finding is the research which is conducted under the Institute of Fine Art, which corresponds to 2,5% (n=1) among all the theses.

4. Discussion and Conclusion

Following the last decades, the main purpose of education has become different together with certain changes in all aspects of life itself. Today with which an individual should be ready to face is totally challenging compared to even ten years ago. Thus, the problems of today's world can only be solved if someone works interdisciplinary, thinks critically, discovers innovative approaches and gains complex problem-solving skills (Duch, Groh and Allen, 2001). For this reason, today's classrooms should be prepared so functionally and effective that they enable learners with a prosperous learning environment in which they realize every aspect of life and acquire necessary skills. At this point, Problem-Based Learning seems to allow students to have a connection with the real world, to learn how to learn, to construct new information meaningfully, to put away the understanding of ready-to-use knowledge, and to acquire critical thinking skills. Essentially, the more complex the 21st century is, the more dynamic the 21st education should be. Despite these essential features of PBL, the findings obtained as a result of the content analysis of the theses related to PBL conducted in Turkey stimulate attention towards the fact that there exists a remarkable decrease in practices based on PBL. PBL took considerable attention in 2014 with 11 theses (27,5%) in total; on the other hand, only 7 theses (17,5%) has been accomplished in 2018 at last. As the importance and productive influence of the applications of PBL on the learning process are obvious, more academic studies and researches are needed to be conducted so as to reignite and increase the dissemination of PBL method. Hereby, the implementation of the PBL method around the country and elaboration of the concept of the PBL processes as one component within a holistic framework can pointedly contribute to teaching and learning processes.

The research model of a study are "the master category" since the research is mainly based on the investigator's choice (Vogt, Gardner and Haeffele, 2012). When considered the findings of the study, the experimental research model holds the main majority of the research models (81,4%) utilized in the theses about PBL. Literature search (7,0%), model-building (4,7%), action research (2,3), relational screening (2,3) and other research models (2,3) is respectively preferred by the researchers. It is quite apparent that there is a need for more researches conducted in terms of other research models. To include different research models in this field would offer notable and distinctive contributions in terms of science and educational practices.

When the distribution of the sample types as a part of this study is examined, there could not be come across with a research that has been experienced with primary school students, which is really worthy of consideration. It would not be wrong to say that early education based on PBL can provide a critical basis in the way not only to create awareness but also to affect a perception towards *the Knowledge Age* (Trilling and Hood, 1999). Besides its potential benefits to learners at early ages, PBL should be applied to vocational schools that give the integrated disciplines and an ability to practice. The problem-solving process help students transfer the relevant knowledge into authentic situations, thus overcoming the challenges and reconstructing their schemata in their minds together with their experiences on their meaningful learning journey (Chiang and Lee, 2016). The results of the theses related to PBL conducted at vocational schools and colleges demonstrate that there is only one research (2,6%) studied at a vocational school in Turkey during the last five years until the end of 2018.

PBL can be regarded as a multidisciplinary method allowing the learners to resolve real-life problems and situations in every aspect. Considering the distribution of the theses in terms of the institutes under which the researches have been conducted, the large part of it belongs to the

Institution of Educational Science (65%). Nevertheless, PBL method can be readily adapted into other different academic areas. The researches and studies under different institutes can broaden diversified, innovative and limitless horizons.

The fact that all theses related to PBL in the scope of this study have been written in Turkish (n=40, 100%) is a serious point. It is remarkable that conducting the researches in English can be regarded as more professional, since writing a thesis or research in English could make it more acceptable and valuable in the sight of the international research community, and a thesis in English could broaden the target audiences who perform researches related to PBL and other fields. Additionally, these theses and researches will inarguably provide researchers all around the world with the convenience of analyzing and comparing them with the ones conducted in their countries.

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