



TEACHERS VIEWS RELATED TO TEACHING OF MATHEMATICS COURSE SUBJECTS WITH THEIR HISTORICAL DEVELOPMENTS

Hasan Yasin Tolⁱ, Selin (Inag) Çenberciⁱⁱ, Ayşe Yavuzⁱⁱⁱ

ⁱEreğli BelKaya Multi-Program Anatolian High School, Ereğli, Konya, Turkey

ⁱⁱDepartment Of Mathematics Education, Secondary School Math. Teaching Program,
Necmettin Erbakan University, Turkey

ⁱⁱⁱDepartment Of Mathematics Education, Elementary School Math. Teaching Program,
Necmettin Erbakan University, Turkey

Abstract:

The mathematical history plays an important role in the context of becoming the mathematics courses are intriguing, the active participation of the students and being learned the mathematical concepts in the meaningful way together with their historical processes. For this reason, this study was conducted to take teacher's opinion what kind of effect will be on the students and also how teaching of mathematics will be affected when given examples about the history of mathematics in mathematics lessons and when mentioned the historical development of the subjects. The sample of the research was composed of 20 math teachers working in Konya. The data were collected during the fall semester of the academic year 2016-2017. Teachers were asked the open-ended questions based on sub-problems involving the utilization of the historical development of mathematics at teaching mathematics subjects and it was taken their opinions. The analysis results were examined in detail by using descriptive statistics and content analysis in the findings section. As a result of the research, it is clearly seen that teaching mathematics subjects with their historical developments constitutes a more effective and permanent educational environment. It was observed that a large majority of the participants supported to be lectured by using mathematics history, but there were substantial deficiencies in practice due to the lack of material with regard to mathematics history and be neglected its benefits.

Keywords: mathematics education, mathematics history, teacher's views

1. Introduction

Mathematics is a science that arises from the abstraction of mathematical concepts (Altun, 2008). In other words, The revealing the objects such as number, point, set, function type; is the abstracted form of life (Yıldırım, 2010; Dönmez, 2002). Whereas, according to Umay (2003); mathematics is giving important skills such as increasingly complex thinking, linking events, reasoning, making predictions, problem solving besides teaching numbers, operations. Many explanations was made in response to the question of "What is mathematics?". No common definition has been able to be delivered so far. The reason is that individuals' perspectives of the mathematics are different (Göker, 1997).

Mathematical science is a serious matter, not a lesson of fear but rather an interest area of fun and relaxation for the person (Dönmez, 2002). Nevertheless, it is still perceived as a lesson of fear by many people (Özdemir & Göktepe, 2012).

Educators in different countries are looking for the ways which enable to make the mathematics be liked and make it more attractive. The problems of mathematics education in our country stem from the characteristics of mathematics education in our schools (Umay, 1996). The individual's perspective of mathematics is related to how the individual learns mathematics (Hare, 1999). According to all these, it can be said that the way of presenting mathematics is important in the positive or negative judgment developed by individual.

One of the factors that will make the student like mathematics, introduce him to the nature of mathematics, show him which phases it has passed until today, how to use it in everyday life, in short, rule out negative thoughts against mathematics is the teaching of the mathematics history (Gürsoy, 2010). For this reason, it is clear that the correct and planned use of the history of mathematics when lecturing the course will make the teaching effective.

"The history of mathematics makes the subject vital. In other words, it combines mathematics with people and their needs. Mathematics is a whole of information that has been integrated by people for thousands of years. People have made the same mistakes for years and have searched for solutions to the same problems. Because mathematics is human-centered, teaching mathematics should be based on this, including the history of mathematics."

(Swetz, 1994)

The history of mathematics plays an important role to make mathematics courses becoming more interesting and in student-centered education. Swetz, (1987) emphasizes the importance of students' participation in historical reconnaissance.

Karakuş (2009) emphasized that inclusion the mathematics history in teaching mathematics will change students' views on mathematics and they will value mathematics. Benefiting from the mathematics history in courses helps to create a feeling at students towards mathematics that it is a living thing, has feelings and is always intriguing. According to Gulikers & Blom (2001), enjoyable examples, different perspectives on the subject, the looking in-depth to the origin of the problem, comprehension, method and proofs increase the interest and motivation of the students. Referring to interesting stories about mathematics and mathematicians is important in terms of gaining the teaching motivation (Nasibov & Kacar, 2005).

1.1 Literature

As the result of a literature review about teaching mathematics subjects with their historical developments, it is encountered that studies on the questions of how to make the mathematics teaching more effective and what the role of the mathematics history in this.

In his master thesis study, Tozluyurt (2008) took the opinions of 8 senior high school students who were attending public school at the end of the lectures performed with activities - related to the numbers learning domain - which were selected from within mathematics history, and interpreted these opinions by categorizing them with the phenomenographic method. The comments of all the students regarding the inclusion of the mathematics history in the lectures were positive. Students indicated that they found the lectures which were made together with the history of mathematics are enjoyable, easy and interesting.

On one hand, Gürsoy (2010), with his master thesis study, tried to determine the attitudes of prospective mathematics teachers of the primary education regarding the use of the mathematics history in mathematics lessons, on the other hand he investigated how the mathematics history course affected the attitudes of the prospective teachers. The purpose of this study was specified as; *“determining the thoughts of the prospective teachers about the use of the mathematics history in mathematics teaching, investigating the influences on their beliefs and attitudes with regard to be used mathematics history in teaching mathematics, and revealing whether the course provides permanence on their beliefs and attitudes”*. At the end of the study, it was seen that the attitudes of the prospective teachers towards using the mathematics history in the lessons were affected positively. As a result of the semi-structured interviews, it was

found that the prospective teachers had the opinion of using the mathematics history in mathematics education could be beneficial both for teaching and learning purposes.

In his study, Albayrak (2011) aimed to implement an instructional design immingled with the history of mathematics about the volumes of pyramids, cone and globe and measure the effect of this design on the perception of mathematics self-efficacy and achievement with an experimental design. As a result of the study, it was again seen that the lessons performed with the mathematics history had a positive change in the self-efficacy perception and achievement. Students generally expressed a favourable opinion on the mathematics history.

In the master thesis study done by Başbüyük (2012), it was aimed to investigate the influences of which the method using in order to find the approximate values of the square-rooted numbers and also used by İbrahim Hakkı, the Babylonian method and the old and new methods in the Ministry of National Education textbooks on the success of students, and revealing the attitudes about teaching mathematics lessons by using mathematics history of students who were part of the groups educated by using mathematics history. At the end of the study, there was found a significant difference between the success of the group in which the method used by İbrahim Hakkı was applied and the success of the group in which the method in the Ministry of National Education textbook was applied. Although there was a difference between the group in which the Babylonian method was applied and the Ministry of National Education group, this difference was not found significant.

In his thesis titled *"The Affect of Using Drama Method at Mathematics History Course on Knowledge, Beliefs and Attitudes of Primary School Mathematics Prospective Teachers"*, Kaşıkçı (2015) aimed to investigate the affects that teaching mathematics history lessons by using drama method and its techniques on the prospective teachers' attitudes, their beliefs about mathematics history, their knowledge of mathematics history and the persistence of their knowledge. As a result of the research, it was obtained positive results with regard to the use of mathematics history in teaching mathematics in prospective teachers' attitudes and beliefs. Again, prospective teachers indicated that the presentation of the mathematics history with drama method provides persistence and make the lessons enjoyable.

In Baki and Bütüner's (2013) article titled *"Uses of Mathematics History in 6-7 and 8th grade Mathematics Textbooks"*, it was examined in what ways and why mathematics history was included in 6th, 7th and 8th grade textbooks. At the end of the study, it was determined that mathematics history was included in the student textbooks by adding only a little historical information.

Yenilmez (2011) aimed to determine the opinions of the prospective mathematics teachers regarding the Mathematics History course in his article. According to the results of the research, prospective teachers think that the learning of some subjects which is in the context of this course together with their historical developments are beneficial to themselves. It was also seen that prospective teachers think that learning the historical development of mathematical concepts and the life stories of famous mathematicians contribute a lot to them and they are keen on passing this knowledge to their students in future mathematics lessons.

1.2. The Purpose of the Study

As it is understood from the result of the literature reviews, the deficiency of lectures which performed using mathematics history was determined. The mathematics curriculum was updated with emphasis on the historical development of mathematics in the context of making students develop a different perspective on the events. Taking this matter into account, it is of great importance to teach mathematics subjects with their historical developments. Teaching the historical processes of the subjects increases the awareness of the students and provides meaningful learning, thus making it easier for them to grasp the importance of the use of concepts in interdisciplinary transitions. It is thought the use of mathematical history is necessary so as to students are enable to develop positive attitude towards understanding mathematics, meaningfully grasp historical developments of mathematical concepts and understand that mathematics developed as a result of requirement. Taking these importance and deficiencies into account, this study was conducted to take teacher's opinions what kind of effect will be on the students and also how teaching of mathematics will be affected when given examples about the history of mathematics in mathematics lessons and when mentioned the historical development of the subjects.

2. Method

In the research, in the context of data, while using mainly quantitative research methods, qualitative research methods were also used in terms of being supportive. It was investigated in detail by making descriptive statistics and content analysis. The main reason of having been chosen these methods was to be able to elaborate the thoughts of participants about benefiting from historical developments when teaching mathematics subjects, with quantitative and qualitative methods. The data were collected from 20 teachers who were serving in various schools in Konya province.

Thus, in the study, it was aimed to be determined the opinions of teachers about using of mathematics history when teaching the mathematics subjects.

3. Research

3.1. Research Group and Sample

The sample of the research was composed of 20 mathematics teachers serving in the Province of Konya. The data were collected during the fall semester of the 2016-2017 academic year. Teachers' opinions were taken by being asked open-ended questions based on sub-problems involving the importance, benefits and necessities of utilizing the historical development of mathematics when teaching mathematics subjects. Those opinions were scrutinized in detail in the findings part.

3.2. Means of Data Collection and Data Analysis

The means of data collection were determined by taking into consideration the problems that were aimed to examine in the research. Five questions that were prepared about the use of mathematics history in teaching mathematics subjects were asked to the teachers in the research. The questions were prepared to examine the following sub-problems:

- 1- What is the effect of lecturing the mathematical subjects with their historical development on the students?
- 2- What are the level and the manner of the use of mathematics history in the course environment?
- 3- What is the level of being used the mathematics history in the curriculum and in the textbooks?
- 4- What are the sufficiency of current activities about the mathematics history and the level of using these activities?
- 5- What is the effects of teaching the mathematics subjects with their historical developments on the individual's thinking skills?

Descriptive research is a type of research that describes an existing case in terms of quantitative (using numbers) or qualitative (revealing the characteristics of an individual or a group) (McMillan & Schumacher, 1984, p.167). The data obtained in this method are summarized and interpreted under previously determined titles (eg themes) (Altunışık, Coşkun, Bayraktaroğlu, Yıldırım, 2012, p.324). The data collected in written were analyzed by taking into account aforementioned sub problems and

classified by titles. Descriptive statistics and content analysis were used as the analysis method. Content analysis ensured that the findings were examined in detail.

4. Findings and Interpretations

When the answers given by the participants to the question regarding the sub problem of "What is the effect of lecturing the mathematical subjects with historical development on the students?" are analyzed it is seen that 95% of the teachers think the effect on the students is positive. And 5% of them have the opinion that it affects negatively. The distribution of the answers of 95% of participants who think that the effect of lecturing the mathematical subjects with historical development on the students is positive is examined at Table 1 under sub-themes.

The distribution of the answers given by the participants to the question regarding the sub problem of "What is the effect of lecturing the mathematics subjects in historical development on the students?"

Sub-Themes	Frequency (f)	Percentage (%)
It increases students' interest in mathematics	11	44
It affects students' motivation towards mathematics	5	20
It makes mathematics class fun	1	4
It helps to reduce students' concerns about Mathematics	2	8
For students it provides meaningful learning of mathematics subjects	4	16
It leads students to discover Mathematics	1	4
It enables students to think differently and be productive	1	4
Total	25	100

At Table 1, the answers to question 1 were analyzed and seven different sub-themes were identified. The obtained analyzes were included in these sub-themes. According to this, 44% of the teachers argue that the mathematics history will increase the interest of the students. The concept of interest is defined as any commitment, relation, relevance, connection or belonging between two things in the Turkish Language Association's Dictionary (TDK, 2016). According to this, it is an important phase in the realization of learning to increase the relation, commitment and therefore interest of the individual to the lesson. 20% of the participants stated in their responses that using mathematics history in mathematics class would increase students' motivation. One of the most important factors that affects academic achievement is motivation to learn (Alderman, 2004). Motivation is an internal condition that elicits, directs, and sustains

behavior (Sternberg & Williams, 2009; Slavin, 2006). Therefore, increasing motivation in teaching mathematics will positively affect learning. 16% of participants argue that lecturing mathematics subjects with their historical developments will lead to meaningful learning. The meaningful learning of students is closely related to their ability to apply knowledge in different environments, to establish relations between concepts, and to transform knowledge into various forms of representation (MEB, TTKB, 2005). According to this, the individuals who learn meaningfully can relate mathematical concepts, and as a consequence they will reach a solution more easily when they encounter different questions. One of the participants stated that thus students could discover mathematics and another one stated that it would enable students to think differently and be productive. 8% of the participants stated that the mathematics history would reduce students' concerns about mathematics. The percentage of those who think that the mathematics history allows them to discover mathematics is 5%. Again, 5% of them stated that the mathematics history will provide productivity and different thinking.

Some of the answers given by the participants to the question 1 regarding the sub problem of "*What is the effect of lecturing the mathematical subjects in historical development on the students?*" are shown at Table 2.

Table 2: Some of the Answers given by the participants

Student

Code

- T1 It varies from student to student. I think this kind of information is boring for students with high numerical intelligence.
- T2 It affects positively and improves students' curiosity. The history and the development process of mathematics should be lectured and watched several weeks before the mathematics course, like music history is given to music students.
- T3 I think that if the relation of mathematics history together with scientific and technological development to mathematics can be made understood, it will have a positive effect on interest and learning.
- T4 Learning the mathematicians' life can have a positive affect. It may lead students to think why mathematics is needed. It helps students to learn mathematical concepts more meaningfully. It establishes a relation between mathematics and society.
- T5 Knowing how a mathematical concept was found in history, by whom it was found and how it developed can further enhance understanding of the concept. If we think that everything is born out of necessity, for example; if the process of emergence of whole numbers is explained after natural

numbers, the whole numbers can both be better understood and attract attention.

The answers given by the participants to the question regarding the sub problem of "What are the level and the way of the use of mathematics history in the class environment?" are analyzed at Table 3 and Table 4.

Table 3: The distribution of the answers given by the participants to the question regarding the sub problem of "What is the level of the use of mathematics history in the class environment?"

Sub Themes	Frequency (f)	Percentage (%)
I benefit from mathematics history in the class environment.	14	70
I don't benefit from mathematics history in the class environment.	6	30
Total	20	100.00

Table 4: The distribution of the answers given by the participants to the question regarding the sub problem of "What is the way of the use of mathematics history in the class environment?"

Sub Themes	Frequency (f)	Percentage (%)
Lecturing lives of mathematicians	9	56.25
The history of mathematics subjects	6	37.50
Lecturing famous problems in the history	1	6.25
Total	16	100.00

As it is seen at Table 3, 70% of the participants stated that they use mathematics history in class environment in some way and 30% of them stated that they never benefit from mathematics history. At Table 3, the answers given by the participants who use the mathematics history in class environment are classified according to three determined sub-themes. According to this, 56,25% stated that they had referred to mathematician lives. Some teachers stated that they had referred to the lives of scientists such as; Pythagoras, Euclid, Tales, Cahit Arf. 37.50% of the participants stated that they had lectured the mathematics history subjects while 6.25% of them stated that they had told about the famous problems in the history.

The answers given by the participants to the question 3 regarding the sub problem of "What is the level of the use of mathematics history in the curriculum and in the textbooks?" are analyzed at Table 5.

Table 5: The distribution of the answers given by the participants to the question regarding the sub problem of "What is the level of the use of mathematics history in the curriculum and in the textbooks?"

Sub Themes	Frequency	Percentage
------------	-----------	------------

Hasan Yasin Tol, Selin (Inag) Çenberci, Ayşe Yavuz -
TEACHERS VIEWS RELATED TO TEACHING OF MATHEMATICS COURSE SUBJECTS
WITH THEIR HISTORICAL DEVELOPMENTS

	(f)	(%)
It is included adequately in the curriculum and in the textbook.	3	15
It is not included adequately in the curriculum and in the textbook.	16	80
I have no knowledge about this subject.	1	5
Total	20	100.00

At Table 5, according to the answers given by the participants to the question regarding the sub problem of "What is the level of the use of mathematics history in the curriculum and in the textbooks?" 15% of participants stated that mathematics history is adequately included in the curriculum and in the textbooks, 80% of them stated that it is not adequately included, and 5% of them stated that they had no knowledge about the subject.

The answers given by the participants to the question 4 regarding the sub problem of "What are the sufficiency of current activities and the level of the use of these activities?" are analyzed at Table 6 and 7.

Table 6: The distribution of the answers given by the participants to the question regarding the sub problem of "What is the level of the use of current activities?"

Sub Themes	Frequency (f)	Percentage (%)
I benefit from mathematics history activities.	9	45
I don't benefit from mathematics history activities.	11	55
Total	20	100.00

Table 7: The distribution of the answers given by the participants to the question regarding the sub problem of "What is the sufficiency of current activities?"

Sub Themes	Frequency (f)	Percentage (%)
There are enough mathematics history activities.	18	90
There are not enough mathematics history activities.	2	10
Total	20	100.00

According to Table 6, 55% of the participants stated that they did not benefit from mathematics history activities, 45% of them stated that they benefited from mathematics history activities. At Table 7, 90% of the participants stated that there were not enough mathematics history activities, while 10% of them stated that there were enough mathematics history activities.

The answers given by the participants to the question 5 regarding the sub problem of “What is the influence of lecturing mathematics subjects with their historical developments on the individual’s thinking skills?” are analyzed at Table 8.

Table 8: The distribution of the answers given by the participants to the question regarding the sub problem of “What is the influence of lecturing mathematics subjects with their historical developments on the individual’s thinking skills?”

Sub Themes	Frequency (f)	Percentage (%)
It has positive effect	18	90
It has no effect	2	10
Total	20	100.00

According to Table 8, 90% of participants stated that lecturing mathematics subjects with their historical developments would positively influence students' thinking skills and 10% of them stated that it would have no effect.

Some of the answers given by the participants to the question 5 regarding to sub problem of “What is the influence of lecturing mathematics subjects with their historical developments on the individual’s thinking skills?” are shown at Table 9.

Teacher Code *Some of the answers given by the participants to the question 5*

- T1** Of course it influences positively, knowing the historical development of the concept, how the concept arose and where it was used improves problem-solving skills. Everyone needs to develop their own problem solving skill. For this, I think that he needs to know the rationale of the concept, where it comes from, its historical development. Unfortunately, this is not the case today.
- T2** When he faces with problems related to mathematics, a person needs to know what he knows about the problem and process this information in his mind. He needs to answer the questions in his mind such as; which formula he will use or which concept will work, whether the way he uses will work, whether he will come through. For this he needs to know historical development of a mathematical concept.
- T3** A student cannot develop his own system without knowing the process. He will follow the development of the process so that he can develop appropriate strategies for himself for new problems that he faces. Do we, mathematics teachers, practice this? No. Especially math practice class is an opportunity for this. But we need to be aware of that.
- T4** For a student knowing the historical development of a mathematical concept is, of course, important in terms of planning new activities and finding different solutions.
- T5** Most students choose to memorize rather than understand the concept. I think that explanation of the concept by its historical development will prevent this. It also would allow students to think differently.

As it is seen at Table 9, the T1 participant noted problem solving ability. He indicated that knowing how concepts arose would contribute to problem solving skills. T2 stated that when a student faced a problem he would acquire what he needed to know, which concept and rule he needed to use by mathematical history. T3 stated that a student needed to know the historical process to form his own thinking system and develop strategies against different problems. T4 concluded that knowing mathematics history was effective in finding different solutions. T5 stated that knowing the historical development would provide the concept to be understood and it would save the student from reciting.

5. Conclusion and Recommendations

According to the analysis in the findings part, it is observed that a big majority of participants support lecturing by using mathematics history; however, due to the lack of material related to mathematics history and paying no mind to this, there are significant shortcomings in practice. It is clear that teaching mathematics with their historical developments constitutes a more effective and lasting educational environment. And, although 95% of the teachers stated that teaching mathematics with their historical developments had a positive effect on students, it was concluded that the level of its use was very low accordingly. One of the most important reasons for this is that teachers' knowledge and experience regarding how to integrate mathematics history that they acquired from their teacher training programs or schools in classes are not sufficient (Tozluyurt, 2008). Those, who used it, talked about scientists like Euclid, Pythagorean, Gauss and their life stories that were mentioned constantly. This suggests that teachers do not do enough research on this issue and do not take the importance of the issue seriously. In addition to this, also in the books of the Ministry of National Education, it is seen that the mathematics history is included mostly by using mathematicians' life stories and there are no activities that will increase the interest and curiosity of the students and the teachers about the mathematics history. Also the teachers who participated in the research emphasized the deficiency of this issue. Nevertheless, views which state that including mathematicians' life stories or mathematicians' pictures in the use of mathematics history is required but not enough also can be found in the literature (Fried, 2001, Swetz, 1997).

Using mathematics history helps them to explore mathematics and influences their attitudes toward mathematics positively and reduces their worries, by increasing individuals' interest, motivation, meaningful learning, ability to think differently and productivity. These features mentioned in the realization of learning constitute an

important phase. One of these phases is the attitude of students' not being able to ascribe a meaning to mathematics. It is an approach that guides students to answer the questions of how a mathematical concept was found in the history, by whom it was found, how it developed, why it was needed, in short why mathematics exists and helps them to understand why they learn mathematics. For example, the i concept in the complex numbers can not be understood by the students. But teaching how this concept developed in the history and upon which need it arose clears this complexity for students. Knowing why the i concept arose will contribute to different thinking and get the subject better understood. For this reason, individuals will comprehendingly and permanently learn the concept rather than memorize it. Thus, it allows students to develop different perspectives, find different solutions to the problems they face in their daily lives, and improves their thinking skills.

The mathematics history has a rich content in terms of usability in the teaching environment. In education faculties the mathematics history should be made compulsory as an undergraduate course in the departments related to mathematics education, and the information about how to use mathematics history in the classes should be given to prospective mathematics teachers. Because it is the duty of the teachers to show the students why mathematics exists and how it should be studied. Furthermore, in-service training should be given to mathematics teachers and teachers should be informed about the strategies of using mathematics history. Also teachers should be supported in developing activities that they can use in the class. Including diverse activities and works that will increase interest and curiosity of the students and teachers about the mathematics history in the textbooks is needed.

References

1. Albayrak, Ö. (2011). *Effects of History of Mathematics Integrated Instruction on Mathematics Self-Efficacy and Achievement*, Master's Thesis, Boğaziçi University Institute of Science and Technology, İstanbul.
2. Alderman, M. K. (2004). *Motivation for achievement: Possibilities for teaching and learning*. New Jersey: Lawrence Erlbaum Associates Publishers.
3. Altun, M. ve Yılmaz, A.(2008) "*Lise Öğrencilerinin Tam Değer Fonksiyonu Bilgisini Oluşturma Süreci*", Ankara University Institute of Education Journal, 40-2.
4. Altunışık, R., Coşkun, R, Bayraktaroğlu, S., Yıldırım, E. (2012). *Sosyal Bilimlerde Araştırma Yöntemleri*, p. 324.

5. Baki, A., Bütüner, S. Ö. (2013). "6-7 ve 8. Sınıf Matematik Ders Kitaplarında Matematik Tarihinin Kullanım Şekilleri", *Elementary Education Online*, 12(3), 849-872, 2013.
6. Başbüyük, K. (2012). *Matematik Tarihinin Matematik Derslerinin Öğretiminde Kullanılması: İbrahim Hakkı Perspektifi ve Babil Yöntemi Örneği*. Atatürk University Institute of Educational Sciences, Erzurum.
7. Dönmez, A. (2002). *Matematiğin Öyküsü ve Serüveni*. İstanbul: Social Transformation Publications.
8. Fried, N. M. (2001). *Can mathematics education and history of mathematics coexist?* *Science and Education*, 10, 391-408.
9. Göker, L. (1997). *Matematik Tarihi ve Türk-İslam Matematikçilerinin Yeri* (1th Edition). İstanbul: MEB Publications.
10. Gulikers, I. & Blom, K. (2001). *A Historical Angle, a Survey of Recent Literature on the Use and Value of History in Geometrical Education*. *Educational Studies in Mathematics* 47, 223-258.
11. Gürsoy, K. (2010). *İlköğretim Matematik Öğretmen Adaylarının Matematik Tarihinin Matematik Öğretiminde Kullanılmasına İlişkin İnanç ve Tutumlarının İncelenmesi*. Master Thesis. Karadeniz Technical University. Institute of Science and Technology. Trabzon.
12. Hare, M. (1999). *Revealing What Urban Early Childhood Teachers Think About Mathematics and How They Teach It: Implications For Practice*. University Of North Texas, December, s.11.
13. Karakuş, F. (2009). *Matematik Tarihinin Matematik Öğretiminde Kullanılması: Karekök Hesaplama Babil Metodu*. Necatibey Education Faculty Electronic Science and Mathematics Education Journal.
14. Kaşıkçı, M. (2015). *Matematik Tarihi Dersinde Drama Yönteminin İlköğretim Matematik Öğretmen Adaylarının Bilgi, İnanç Ve Tutumlarına Etkisi*, Dokuz Eylül University Educational Sciences Institute. İzmir.
15. McMillan, James H. and Sally Schumacher (1984), *Research in Education: A Conceptual Introduction*, Boston and Toronto: Little Brown and Company, s167.
16. MEB, Talim Terbiye Kurulu Başkanlığı (2005). *İlköğretim matematik dersi 6-8. sınıf programı*, Ankara: Devlet Kitapları Müdürlüğü.
17. Nasibov, F. & Kaçar, A. (2005). *Matematik ve Matematik Eğitimi Üzerine*. Kastamonu Education Journal Vol. 13, No 2,p 339-346.
18. Özdemir, A.Ş. & Göktepe, S. (2012). *Matematik Tarihi Etkinlikleriyle Matematik Derslerinin İlişkilendirilmesi*. Paper presented at the X. Ulusal Fen ve Matematik Eğitimi Kongresi, Niğde.

19. Slavin, R. E. (2006). *Educational Psychology Theory and Practice* (8th Edition). Boston: Pearson.
20. Sternberg, R. J., & Williams, W. M. (2009). *Educational Psychology* (2nd Edition). New Jersey: Pearson.
21. SWETZ, Frank J. (1987) *Capitalism and Arithmetic The New Math of the 15th Century*. Open Court. LaSalle.
22. SWETZ, FRANK J. (1994). *Learning Activities from the History of Mathematics*. Weston Walch Publisher. Portland.
23. Swetz, J.W.(1997). *Using problems from the history of mathematics in classroom instruction*, İçinde, (Ed: Swetz, F., Fauval, J., Bekken, O., Johansson, B.,& Katz, V.). Learn from the masters, The Mathematical Association of America.
24. Tozluyurt, E. (2008). *Sayılar öğrenme alanı ile ilgili matematik tarihinden seçilen etkinliklerle yapılan dersler hakkında lise son sınıf öğrencilerinin görüşleri*. Master Thesis, Gazi University Educational Sciences Institute, Ankara.
25. Türk Dil Kurumu (2016), Erişim Tarihi: 10.11.2016, *Büyük Türkçe Sözlük*, www.tdk.org.tr
26. Umay, A (1996), *Matematik Eğitimi ve Ölçülmesi*, Hacettepe University Faculty of Education Journal. Ankara.
27. Umay, Aysun. (2003). *Matematiksel Muhakeme Yeteneği*. Hacettepe University Faculty of Education Journal. 24. pp.234-243.
28. Wilson, P. S., & Chauvot, J. B. (2000). *Who? How? What? A Strategy for Using History to Teach Mathematics*.
29. Yenilmez, K. (2011). "Matematik Öğretmeni Adaylarının Matematik Tarihi Dersine İlişkin Düşünceleri", Pamukkale University Journal of Education Faculty, Issue 30 (July 2011 / II), pp. 79-90.
30. Yıldırım, C. (2010). *Matematiksel Düşünme*. İstanbul: Remzi Kitabevi.

Creative Commons licensing terms

Author(s) will retain the copyright of their published articles agreeing that a Creative Commons Attribution 4.0 International License (CC BY 4.0) terms will be applied to their work. Under the terms of this license, no permission is required from the author(s) or publisher for members of the community to copy, distribute, transmit or adapt the article content, providing a proper, prominent and unambiguous attribution to the authors in a manner that makes clear that the materials are being reused under permission of a Creative Commons License. Views, opinions and conclusions expressed in this research article are views, opinions and conclusions of the author(s). Open Access Publishing Group and European Journal of Education Studies shall not be responsible or answerable for any loss, damage or liability caused in relation to/arising out of conflicts of interest, copyright violations and inappropriate or inaccurate use of any kind content related or integrated into the research work. All the published works are meeting the Open Access Publishing requirements and can be freely accessed, shared, modified, distributed and used in educational, commercial and non-commercial purposes under a [Creative Commons Attribution 4.0 International License \(CC BY 4.0\)](https://creativecommons.org/licenses/by/4.0/).