A Descriptive Content Analysis of the Studies on Mathematics Education in International Classroom Teaching Education Symposium (USOS)

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Abstract

By using the descriptive content analysis, this research study aimed to evaluate the studies on mathematics education presented within the scope of International Classroom Teaching Education Symposium (USOS) and published in proceeding book between 2014-2018. Findings of the study indicated that the number of studies conducted about mathematics teaching has increased in last five years. In terms of publishing language, the studies were in Turkish and conducted by Turkish researchers although USOS is an international scientific event. In terms of research field, the number of the studies conducfted in the field of geometry and examining mathematics and geometry together is quite few. In terms of study group/sample, the research studies were conducted with elementary students, pre-service elementary teachers and elementary teachers. In terms of research model/pattern, survey and case studies were preferred by a majority. Besides, the information on research model/pattern was not stated in a majority of research studies. As a data collection tool; test, interview form, scale, open-ended question and questionnaire were mostly used. In some studies, the information about data collection tool was not given. As data analysis technique, content analysis and predictive statistical techniques were commonly used. In a majority of the studies, the information about data analysis technique was not given.

Keywords: Elementary teaching, Descriptive content analysis, Mathematics teaching, Symposium, Paper

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INTRODUCTION

Mathematics is a part of modern life. It can be said that having basic mathematical knowledge and skills makes it easier to meet daily life needs. Depending on the scientific and technological developments, the individuals who can understand and achieve mathematics will have many more opportunities in terms of their future in gradually digitalizing world (National Council of Teachers of Mathematics [NCTM], 2000). Mathematics equips the individual with strong tools as logical reasoning, problem solving and the ability of concrete thinking for understanding and changing the world. Mathematics is important for most employment areas in everyday life (Department for Education and Employment [DfEE], 1999). It is clear that many professions require mathematical efficacy. From this point of view, it can be identified that having mathematical efficacy is an important factor for slightly opening the doors of a better future.

Mathematical efficacy includes five elements patterned into each other as conceptual understanding, operational fluency, strategic competence, adaptable reasoning and productive tendency. Conceptual understanding includes the comprehension of concepts, operations and relationships. Operational fluency expresses flexible, correct and relevant way of doing the operations. Strategic competence contains the skills of formulating, representing and solving mathematical problems. Adaptable reasoning is associated with the capacity of logical reasoning, explaining, reflecting and justifying. On the other hand, productive tendency expresses accepting mathematics as contributive and worth the effort, combining individual belief in diligence with personal efficiency (Kilpatrick, Swafford and Findell, 2001). Conducting mathematical instruction by focusing on mathematical efficacy elements will increase the quality of teaching. Thus, the students will not be exposed to a way of mathematics teaching depending on the presentation of a mere teacher or a context of a book and they will perform behaviors towards mathematical efficacy elements. Consequently, they will be grown up as competent and qualified individuals who are able to apply mathematics.

It can be stated that efficiency and effectiveness of mathematical instruction is related to the interaction among mathematical context, teacher and student. The teachers' way of using mathematical knowledge and mathematical context, their concern about the students and participation of students in mathematical tasks are effective in mathematics learning and teaching (Kilpatrick et al., 2001). Teachers' way of motivating students in activities, their expectations from students, their interactions with the students, the contents and presentations they prepare can be listed as the main factors effecting teaching and learning.

Elementary school is the place where the students primarily meet mathematics as a subject which is instructed. This meeting is the start point of a long journey of developing mathematical knowledge and questioning. Elementary school years are the times when the students learn to love or hate mathematics, the feelings of hopelessness and failure appear first, misconceptions frequently occur and get lost very hard. Therefore, elementary teachers should be aware of their own roles in overall mathematics teaching process. Elementary teachers introduce mathematical language, symbolism, meanings and ways of thinking to the students. Thus the basic opinions which will be needed in following years will be established strictly in an early stage (Cowan, 2006; Lerman, 1998).

Encouraging, motivating and interesting tasks and activities should be used by teachers in order that the acquisition of basic mathematical skills can be at the required level and their achievement by all students can be provided (Cowan, 2006). The students should have the tendency of using mathematics in order to develop mathematical methods for interpreting the world, to develop problem solving skills and solve the problems they encounter (Jorgensen and Dole, 2011). Elementary mathematics teaching should adopt the pedagogies that address to the variety within the classroom. It is important for students to be able to associate mathematics with real world beside of being able to establish relationships between mathematics and the other fields. Elementary teachers have a significant role in providing students with the awareness of the fact that mathematics is a discipline directing many areas of the life. Elementary teachers should appreciate students and believe that all

students can learn mathematics. They should develop instructional activities towards improving the knowledge and self-confidence of the students towards using and applying mathematics.

The scientific studies examining the continuous interactions among teacher, students and mathematical context are important in determining the effectiveness of teaching. The existing and further scientific studies about the nature, development and evaluation of mathematical efficacy will direct mathematics teaching. Scientific proofs will provide making improvements, making effective decisions and updating curriculums in mathematics teaching. Depending on this, it can be said that extensive, systematic and continuous scientific research studies are needed. It can be identified that national and international scientific events have an effective role at this point. USOS held in Turkey in the field of elementary teaching education is an important scientific event where the studies conducted about the field are shared with scientists, undergraduates and graduates, and teachers. The event organized first in 1994 with the name of National Classroom Teaching Education Symposium has continued to be held on different dates and hosted by different universities. The seventeenth symposium of the event having had an international status from the fourteenth one was organized in 2018.

Investigating the literature, Bektaş, Dündar and Ceylan (2013) did a study investigating the papers presented in National Classroom Teaching Education Symposium between 2006-2010 years in terms of various variables. They investigated 705 papers by approaching their different dimensions in their research. In this study, it is aimed to evaluate the papers related to only mathematics teaching, presented within the scope of USOS and published in proceeding book in last five years (2014-2018). The factors that the electronic and published versions of abstract books of these years can be reached and USOS has been held as an international scientific event since 2015 were effective in preferring the last five years. Current status of elementary level will have been described via this research that focuses on mathematics teaching. Thus, it is considered that contributive information can be presented to the researchers by providing a holistic viewpoint to mathematics teaching in primary school. With this purpose, abstract books of the symposiums held between 2014-2018 years were investigated. The following research questions were searched within this scope.

1. What is the distribution of the research studies in terms of number according to years?

2. What is the distribution of the research studies in terms of language according to years?

3. What is the distribution of the research studies in terms of number of authors according to years?

4. What is the distribution of the research studies in terms of author title according to years?

5. What is the distribution of the research studies in terms of author nationality according to years?

6. What is the distribution of the research studies in terms of research field according to years?

7. What is the distribution of the research studies in terms of their purpose according to years?

8. What is the distribution of the research studies in terms of their subject according to years?

9. What is the distribution of the research studies in terms of study group/sample according to years?

10. What is the distribution of the research studies in terms of research model/pattern according to years?

11. What is the distribution of the research studies in terms of data collection tool according to years?

12. What is the distribution of the research studies in terms of data analysis technique according to years?

METHOD

In this research, descriptive content analysis was used. The research results and tendencies are systematically evaluated by approaching all the research studies done on any subject in descriptive content analysis (Çalık and Sözbilir, 2014; Lin, Lin and Tsai, 2014; Selçuk, Palancı, Kandemir and Dündar, 2014; Sözbilir, Kutu and Yaşar, 2012). With this purpose, the general tendencies of the research studies can be determined by systematically investigating the qualitative and quantitative research studies having been done in association with the determined subject (Selçuk et al., 2014). Thus, the general status and the tendencies related to the field can be presented to the researchers (Cohen, Manion and Morrison, 2007). In this research, the qualitative and quantitative research studies towards mathematics teaching were approached in terms of USOS and the results were presented by being evaluated through descriptive content analysis technique.

Data Collection

The data were obtained by document analysis. With this purpose, electronic or published versions of five abstract books of USOS organized between 2014-2018 years were reached. The following criteria were determined in order to provide that the papers in abstract book were entirely related to the aim of the research: (i) The papers should be presented at USOS between 2014-2018 years, (ii) The papers should be published in USOS abstract book between 2014-2018 years, (iii) The papers should be related to mathematics teaching. Regarding these criteria, the abstract books of five years were investigated and the research studies that would be included in content analysis were determined. When table of contents sections of abstract books were investigated, it was seen that the papers were divided according to their subject fields. Depending on this, the papers placed within the scope of mathematics teaching section were investigated in each abstract book. Consequently, 244 papers were included in content analysis.

Data Analysis

Content analysis technique was used for analyzing the data. The similar data are interpreted by being grouped within the frame of the determined themes and categories and presented to the reader in a comprehensible way in content analysis (Creswell, 2014; Yıldırım and Şimşek, 2011). A coding technique existing in the literature can be used in content analysis while a new coding technique can be developed. Additionally, the intended data can be reached by adding new codes to an existing coding technique within the scope of research requirements (Smith, 2000). A form including descriptive information about the papers that were approached within the scope of the research purpose was developed in this research. The descriptive information in the form are as follow; research year, research language, research author number, title of the author(s) conducting the research, author(s) nationality, study field of research, research purpose, research subject, research study group/sample, research model/pattern, data collection tools used in the research and the techniques used for analyzing research data. The papers were coded by the researcher carefully within this frame. In order to provide coding reliability, the researcher repeated coding operation three weeks after the first coding. Finally, the coding forms were compared. Any differences were not found between the coding forms compared. After this operation, the data were analyzed in regard to the coding form and the findings are presented in tables.

FINDINGS

The findings obtained on the basis of the questions determined in accordance with research purpose are respectively presented in tables. The distribution of the research studies in terms of number according to years is given in Table 1.

Table 1. Distribution of the Research studies in Terms of Number According to Years

	2014	2015	2016	2017	2018	Total
Number of Research studies	22	36	77	43	66	244

Investigating Table 1, it is seen that minimum number of research studies related to mathematics teaching were done in 2014 with 22 research studies while maximum number of research studies were in 2016 with 77 research studies. Totally 244 research studies were done in this field in five years.

The distribution of the research studies in terms of language according to years is given in Table 2.

Table 2. Distribution of Research studies in Terms of Language According to Years

Research Language	2014	2015	2016	2017	2018
Turkish	22	35	74	42	65
English	-	1	3	1	66
Total Research Number	22	36	77	43	66

Investigating Table 2, it is seen that all of the research studies were written in Turkish in 2014. One study in 2015, three studies in 2016 and one study in 2017 were written in English. In 2018, all of the studies (except for one) are given with both their Turkish and English version.

The distribution of the research studies in terms of number of authors according to years is given in Table 3.

Table 3. Distribution of Research studies in Terms of Number of Authors According to Years

Number of Authors	2014	2015	2016	2017	2018	Total
Single Author	4	7	14	13	14	52
Two Authors	10	16	35	15	43	119
Three Authors	4	12	23	8	5	52
Four Authors	2	1	3	7	2	15
Five Authors	2	-	2	-	2	6

Investigating Table 3, it is seen that the research studies were most frequently conducted by two authors. The number of the research studies with four and five authors is few.

The distribution of the research studies in terms of author titles according to years is given in Table 4.

Table 4. Distribution of Research studies in Terms of Author Titles According to Years

Author Title	2014	2015	2016	2017	2018
Prof.	2	2	8	-	8
Assoc. Prof.	8	8	16	-	14
Assist. Prof.	11	15	30	-	24
Res. Assit.	11	18	25	-	19
Res. Assit. Dr.	2	-	3	-	2
Instructor	1	1	2	-	1
Teacher	4	12	28	-	8
Graduate Student (Master)	-	4	20	-	15
Graduate Student (PhD)	1	-	3	-	3
Undergraduate	1	1	-	-	3
Unspecified	9	11	-	-	5
Total Number of Authors	50	72	135	-	102

*In the studies with mutual authors, an author is evaluated with the number of studies where his/her name is stated.

Investigating Table 4, it is seen that titles of research authors are not placed in abstract book published in 2017. Author titles are not stated in the abstract books published in some years. The research studies were generally conducted by academic staff. Among academic staff, mostly assistant professors and research assistants conducted the research studies. The number of the research studies conducted by undergraduates is quite few. Additionally, it can be said that the number of research studies conducted by teachers and graduates is also few.

The distribution of the research studies in terms of author nationality according to years is given in Table 5.

Table 5. Distribution of Research studies in Terms of Author Nationality According to Years

Author Nationality	2014	2015	2016	2017	2018
Turkey	50	72	135	94	102
Other	-	-	-	-	-

Investigating Table 5, it is seen that the authors of the research studies carried out in last five years towards mathematics teaching are all Turkish. USOS has been continued as an international event since 2015. Nevertheless, a foreign researcher is not found among the conductors of the research studies towards mathematics teaching within the scope of USOS.

The distribution of the research studies in terms of study field according to years is given in Table 6.

Table 6. Distribution of Research studies in Terms of Study Field According to Years

Study Field	2014	2015	2016	2017	2018	Total
Mathematics	20	32	63	38	62	215
Geometry	1	3	11	4	4	23
Mathematics and Geometry	1	1	-	1	-	3

Investigating Table 6, it is seen that the maximum number of studies were conducted on mathematics in terms of study field. It can be implied that the number of studies conducted in geometry field is small; the number of studies where geometry and mathematics fields are studied together is quite few.

The distribution of the studies in terms of their purposes according to years is given in Table 7.

Table 7. Distribution of Studies in Terms of Purpose According to Years

Purpose	2014	2015	2016	2017	2018	Total
Described	5	15	23	13	25	81
Measured	14	13	22	16	16	81

[*]The research studies, purpose of which is clearly stated and all information is completely given are considered only.

Investigating Table 7, the research studies are approached under two headings as described and measured. By described heading, qualitative research studies; by measured heading quantitative research studies are represented. The number of studies within the scope of described and measured titles varies according to years. Even so, the total numbers of studies approached under two headings in five years are equal. More detailed information about research purposes is given in Table 7a.

Table 7a. Distribution of Research studies in Terms of Purpose According to Years

Purpose		2014	2015	2016	2017	2018	Total
Described	Opinion/Thought	1	6	12	8	4	31
	Strategy	-	-	-	1	5	6
	Metaphor	2	-	1	1	4	8
	Behavior	-	1	-	-	1	2
	Error	-	3	2	2	4	11
	Perception	2	2	3	1	3	11
	Awareness	-	-	2	-	1	3
	Skill	-	3	3	-	3	9
Measured	Achievement	3	4	8	5	6	26
	Motivation	-	-	3	2	1	6
	Attitude	1	2	3	2	2	10
	Belief/Faith	3	3	-	3	2	11
	Anxiety	1	3	1	3	-	8
	Value	-	-	-	-	1	1
	Perception	1	-	1	-	-	2
	Awareness	-	-	1	-	-	1
	Skill	5	1	5	1	4	16

Investigating Table 7a, it is seen that the research studies approached within the scope of described heading are mostly related to opinion and thought. It is aimed to reveal the opinions and thoughts about the related subject in this type of research studies. On the other hand, the studies related to achievement are the most frequent ones within the scope of measured heading. In this type of studies, it is aimed to measure the achievement in related subject. In addition to this, perception and awareness related research studies are found within the scope of both described and measured headings. At this point, describing the perception or awareness is aimed in one study it is aimed to measure it in another one.

The distribution of the studies in terms of their subjects according to years is given in Table 8.

Table 8. Distribution of Research studies in Terms of Subject According to Years

Subject		2014	2015	2016	2017	2018	Total
Mathematics	Numbers (Natural numbers, fractions, whole numbers)	1	4	9	3	9	26
	Four Operations	-	2	3	3	7	15
	Problem	7	7	10	8	11	43
	Pattern	-	1	1	-	2	4
	Proof	-	-	1	-	1	2
Mathematics Education	Mathematical Language-Literacy	-	1	2	-	1	4
	Teaching Experience	-	-	1	-	1	2
	Thinking Techniques	-	2	1	2	4	9
	Mathematics Teaching	1	8	5	7	2	23
	Program	-	-	4	2	1	7
	Field Knowledge	-	1	3	1	1	6
	Game	-	-	1	1	1	3
	Technology	-	2	2	4	1	9
	International Comparison	-	-	1	-	2	3
	Mathematical Modeling	1	2	2	3	2	10
	Realistic Mathematics Education	1	-	-	1	1	3
	Conception	1	3	6	2	9	21
	Misconception	1	-	1	1	1	4
	Activity	2	-	5	1	3	11
	Mathematics Course	3	5	6	2	10	26
	Book	1	2	1	3	1	8

*Some studies are included in both headings according to their subjects.

Investigating Table 8, the research studies are approached under two headings as mathematics and mathematics education in terms of their study subjects. The subjects of problems and numbers were studies within the scope of mathematics heading. A majority of the studies related to numbers is about fractions. Under the heading of mathematics education, the subjects of mathematics course, mathematics teaching and conception were intensively studied.

The distribution of the studies in terms of study group/sample according to years is given in Table 9.

Table 9. Distribution of Research studies in Terms of Study Group/Sample According to Years

Study Group/Sample	2014	2015	2016	2017	2018	Total
Elementary Students	7	5	27	9	31	79
Pre-service Elementary Teachers	8	14	14	10	12	58
Elementary Teachers	1	7	16	4	5	33
Middle School Students	2	2	3	1	2	10
Course books	1	2	2	2		7
Pre-service Mathematics Teachers	-	-	4	3	-	7
PISA-TIMSS Data	1	-	2	2	1	6
Mathematics Teaching Program	-	-	2	1	1	4
Elementary Teacher and Students	-	2	1	-	1	4
Middle School Mathematics Teacher	-	-	1	3	-	4
Graduate Dissertations	1	-	-	2	-	3

Pre-service Elementary, Mathematics and Science Teachers	-	-	2	-	-	2
Pre-service Preschool Teachers	-	-	-	1	1	2
Elementary and Mathematics Teacher	-	-	-	-	2	2
Pre-service Elementary and Mathematics Teachers	1	-	-	-	-	1
Pre-service Preschool and Elementary Teachers	-	1	-	-	-	1
Preschool and Elementary Teacher	-	1	-	-	-	1
Developed Course Content	-	1	-	-	-	1
Academic Publications about Problem Solving	-	1	-	-	-	1
Academic Articles about Mathematical Proof	-	-	1	-	-	1
Documents about Material Subject	-	-	1	-	-	1
Scientific Articles about Reasoning Skill	-	-	1	-	-	1
5-6 Age Group Children				1	-	1
Mathematical Modeling	-	-	-	1	-	1
Pre-service Elementary, Preschool, Mathematics and Science Teachers	-	-	-	1	-	1
History of Mathematics	-	-	-	1	-	1
Geogebra Program	-	-	-	1	-	1
High School Students	-	-	-	-	1	1
Studies about Conceptual Image	-	-	-	-	1	1
Mathematical Gender Stereotypes	-	-	-	-	1	1
Studies about Metacognition	-	-	-	-	1	1
Studies about Measurement Learning Domain	-	-	-	-	1	1
Studies on Mathematics Achievement and Attitude	-	-	-	-	1	1
Eric Carle Books	-	-	-	-	1	1
3rd Grade Elementary Mathematics Course	-	-	-	-	1	1
Studies about Mathematical Problem Solving	-	-	-	-	1	1
Notebooks of Elementary Students	-	-	-	-	1	1

Investigating Table 9, it is seen that elementary students, pre-service elementary teachers and elementary teachers generally constitute the study groups/samples of the research studies. Besides, there are some studies including pre-service elementary, preschool, mathematics and science teachers, pre-service elementary and mathematics teachers, pre-service preschool and elementary teachers, pre-service elementary, mathematics and science teachers, elementary and mathematics teachers, preschool and elementary teachers together. Once again, there are some studies sample of which are constituted by pre-service mathematics teachers, pre-service preschool teachers, middle school students, middle school mathematics teachers and high school students.

The distribution of the research studies in terms of research model/pattern according to years is given in Table 10.

Table 10. Distribution of Researches in Terms of Research Model According to Years

Research Model/Pattern		2014	2015	2016	2017	2018	Total
Quantitative	Survey	5	4	4	8	5	26
	Quasi-Experimental	-	1	7	2	3	13
	Correlational Survey	1	5	3	1	1	11
	Experimental	1	-	3	2	2	8
	Causal Comparative	-	-	1	2	-	3
	Meta-analysis	-	1	-	-	1	2
	Correlational Survey	-	-	-	-	1	1
Qualitative	Case Study	1	4	17	8	15	45
	Document Analysis	1	-	4	-	3	8
	Phenomenology	1	1	1	1	2	6
	Specific Case Study	-	3	-	2	-	5
	Action Research	-	-	-	1	2	3
	Meta-synthesis	-	-	1	-	-	1
Mixed Pattern		-	-	2	2	2	6
Unspecified		12	17	34	14	29	106

Investigating Table 10, it is seen that the number of the studies not including the information of research pattern/model is relatively high in all the abstract books of five years. While surveys and case studies were more commonly preferred, meta-analysis and meta-synthesis studies were conducted less often.

The distribution of the research studies in terms of data collection tools according to years is given in Table 11.

Table 11. Distribution of Research studies in Terms of Data Collection Tools According to Years

Data Collection Tool		2014	2015	2016	2017	2018	Total
Single Data Collection Tool	Test	2	4	10	7	10	33
	Interview Form	1	7	14	-	9	31
	Scale	6	6	10	5	3	30
	Open-ended Question	1	2	13	2	3	21
	Question/Problem Form	-	-	-	2	9	11
	Questionnaire	-	5	1	3	-	9
	Mathematics Teaching Program	-	-	4	1	1	6
	Course book	1	1	-	2	1	5
	Statement of Opinion Form	2	-	-	2	-	4
	Graduate Dissertation	1	-	-	2	1	4
	Student Documents/Activities	-	-	2	-	1	3
	Video Record	-	1	-	-	2	3
	Observation Form	1	-	-	-	1	2
	Student Notebooks	-	1	-	-	1	2
	TIMSS Data	1	-	-	-	1	2
	Non-routine Problems	-	-	2	-	-	2
	Lesson Plans	-	-	-	-	1	1
	Publications about Metacognition	-	-	-	-	1	1
	Teacher Documents	-	-	-	1	-	1
	Question Paper	-	1	-	-	-	1
	Behavior Checklist	-	-	-	-	1	1

	Studies about Measurement Learning Domain	-	-	-	-	1	1
	Studies about Conceptual Image	-	-	-	-	1	1
	Studies about Problem Solving	-	1	-	-	-	1
	Personal Information Form	-	-	1	-	-	1
	Publications about Mathematical Proof	-	-	1	-	-	1
	Mathematical Modeling Activities	-	-	-	1	-	1
	Publications about Reasoning Skill	-	-	1	-	-	1
	Documents of Material Use	-	-	1	-	-	1
	Studies Examining the Relationship Between Mathematical Attitude and Achievement	-	-	-	-	1	1
Multiple Data Collection Tools	Scale and Test	2	2	1	1	1	7
	Observation and Interview	-	1	1	1	1	4
	Test and Interview Form	-	-	-	1	2	3
	PISA and TIMSS Data	-	-	1	2	-	3
	Scale and Interview Form	-	2	1	-	-	3
	Scale and Opinion Form	-	-	-	-	1	1
	Scale and Personal Information Form	-	-	1	1	-	2
	Questionnaire and Interview	-	-	1	1	-	2
	Question Form and Interview	-	-	-	-	2	2
	Scale and Inventory	1	-	-	-	-	1
	Scale and Diary	-	-	1	-	-	1
	Scale and Interview	-	-	1	-	-	1
	Questionnaire and Test	-	-	1	-	-	1
	Test and Inventory	1	-	-	-	-	1
	Interview and Video Record	-	-	-	-	1	1
	Interview Form and Rubric	-	-	-	1	-	1
	Teacher Documents and Interview Form	-	-	-	-	1	1
	Lesson Plan and Interview Form	1	-	-	-	-	1
	Video Record and Observation Notes	-	-	-	-	1	1
	Question Form and Video Record	-	-	-	-	1	1
	Student Papers and Observation	-	-	1	-	-	1
	Scale, Test, Interview and Video Record	-	-	1	-	-	1
	Test, Scale and Open-ended Questions	-	-	-	1	-	1
	Interview, Observation and Teacher Documents	-	-	-	1	-	1
	Observation Form, Peer Evaluation Form and Self-Evaluation Form	-	-	1	-	-	1
Unspecified		1	2	5	5	6	19

Investigating Table 11, it is seen that the data collection tool used is not stated in some research studies. Test, interview form, scale, open-ended question and questionnaire were most commonly used as data collection tools in the research studies. Whereas the data collection tools were generally used singly, multiple data collection tools were used in some research studies.

The distribution of the research studies in terms of data analysis technique according to years is given in Table 12.

Table 12. Distribution of Research studies in Terms of Data Analysis Technique According to Years

Data Analysis Technique		2014	2015	2016	2017	2018	Total
Single Data Analysis Technique	Content Analysis	1	7	20	5	19	52
	Predictive Statistics Techniques (t-Test, ANOVA, Chi-Square etc.)	7	7	19	10	9	52
	Descriptive Analysis	1	2	4	4	11	22
	Descriptive Analysis Techniques (%, f, mean, standard deviation, etc.)	-	2	3	1	3	9
Multiple Data Analysis Techniques	Predictive and Descriptive Statistical Techniques	-	3	4	3	1	11
	Descriptive Analysis and Content Analysis	-	3	2	2		7
	Predictive Statistical Techniques and Content Analysis	-	-	-	-	1	1
Unspecified		13	12	25	18	22	90

Investigating Table 12, it is seen that content analysis and predictive statistical techniques were most frequently used as data analysis techniques. In some studies, multiple techniques were used together. Additionally, it has been seen that the data analysis technique was not stated in a majority of the research studies.

DISCUSSIONS, RESULTS, AND RECOMMENDATIONS

In this study, the research studies presented in USOS and published in abstract books have been investigated through content analysis method. According to research findings, it is seen that the number of studies conducted about mathematics teaching has increased for the last five years. There were 65 research studies about mathematics teaching in National Classroom Teaching Education Symposium between 2006 and 2010 years (Bektaş et al., 2013). The number of research studies conducted between 2014 and 2018 is 244. Depending on this, it can be said that the number of researchers towards elementary mathematics teaching and interest in the field has increased.

It has been seen that the research studies are generally in Turkish in terms of their publishing languages. On the other hand, the Turkish and English versions of the research studies were published together in the abstract book of 2018. Similarly, Çiltaş, Güler and Sözbilir (2012), stated that a majority of mathematics education research studies conducted between 1987 and 2009 years were published in Turkish. It can be said that publishing English versions of the research studies is important in terms of international literature. Hence, the researchers will be provided with being referenced in international literature and conducting mutual research studies. Thereby it can be said that the researchers should be encouraged to publish their works in English.

The research studies were generally carried out by two authors. This result is consistent with the literature (Alper and Gülbahar, 2009; Kutluca, Birgin and Gündüz, 2018; Kutluca and Demirkol, 2016; Tatar, Kağızmanlı and Akkaya, 2013). The number of the studies conducted by four or five authors is quite few. Accordingly, it can be said that the researchers in the field are not in enough cooperation and teamwork. Additionally, the point belonging to each author decreases as the number of authors increases when the scientific research studies are graded in Turkey. This might be encouraging researchers for working individually or with fewer colleagues.

It has been identified that the research studies are carried out by academics generally. Among the academics, assistant professors and research assistants have a larger place. Investigating the literature (Kutluca et al., 2018; Kutluca and Demirkol, 2016), similar results have been obtained. Depending on this, it can be said that the participation of elementary teachers, undergraduates who study in elementary teaching department and graduates who carry out research studies in this field should be promoted in USOS.

USOS has been organized as an international symposium since 2015. However, it has been seen that all of the research studies in last five years in USOS were conducted by Turkish researchers. Depending on this, it can be expressed that USOS should be introduced within a larger international scale. Participation at an international level can be provided in this way.

The research studies mostly focus on mathematics field. It has been seen that the number of studies in geometry field or both in mathematics and geometry fields is few. When elementary mathematics teaching program is reviewed, geometry-related outcomes are placed at each grade from 1st to 4th grades in terms of learning domain (MoNe, 2017). Regarding this, it can be said that more studies are needed towards teaching geometry in elementary schools. Revealing opinions and thoughts and measuring achievement was intended mostly in the research studies. Correspondingly, it can be enounced that there are not enough studies regarding implementation. Important contribution can be provided to the field by conducting practical research studies.

The studies related to problems and numbers were carried out in terms of mathematics subjects. In mathematics teaching issues, the subjects of mathematics course, mathematics teaching and conceptions were intensively studied. This result is similar to some research results in the literature. Kutluca, Birgin and Gündüz (2018) stated in their research that mathematics education related issues were generally studied; pedagogical field knowledge and conceptual issues had a larger place among these. Ulutaş and Ubuz (2008) stated that the numbers subject was mostly studied in the research studies conducted in the field of mathematics education. According to Yaşar and Papatğa's (2015) research results, four operations and problem solving subjects were most frequently studied. When elementary mathematics teaching program is reviewed (MoNE, 2017), outcomes related to the learning domains of numbers and operations are predominant. In addition to this, the outcomes related to the learning domains of geometry, measurement and data processing are placed in the program with different bodies. Thereby it can be said that the number of studies towards geometry, measurement and data processing learning is few, many more studies are needed in these domains.

In terms of study group/sample, the research studies were generally carried out with elementary students, pre-service elementary teachers and elementary teachers. This result has similarity with the studies in the literature (Bektaş et al., 2013; Küçüoğlu and Ozan, 2013; Ulutaş and Ubuz, 2008). Besides, there are some studies including pre-service mathematics teachers, pre-service preschool teachers, middle school students, middle school mathematics teachers and high school students as study group/sample. USOS focuses on classroom/elementary teaching. Therefore, it can be said it is expected that elementary students, elementary teachers and pre-service elementary teachers are focused by the research studies.

In terms of research model/pattern, surveys and case studies were more frequently preferred. This result is similar to existing literature (Çiltaş et al., 2012; Çiltaş, 2012; Küçüoğlu and Ozan, 2013). The meta-analysis and meta-synthesis studies were done rarely. The studies conducted within a certain field can be approached in a holistic way through meta-analysis and meta-synthesis studies (Çalık and Sözbilir, 2014). Thus, the current status of the field can be determined and the researchers can be offered with an insight to the field. Thereby it can be said that there is a need of meta-analysis and meta-synthesis studies at elementary level. Additionally, it has been identified that the information of research model/pattern was not stated in a majority of research studies. Similarly, Küçüoğlu and Ozan (2013) determined some studies not including the pattern in their research studies. It can be stated that this is an important deficiency. Hence, it can be expressed that the research studies not including research model/pattern should not be placed in abstract books. Furthermore, it has been observed in

the research studies in which some overall expressions like *"in this quantitative/qualitative study …, …quantitative/qualitative approach has been accepted, in the study where quantitative/qualitative research paradigm was accepted …, the research is a qualitative/quantitative research and …"* etc. were used and the research model/pattern was not stated. Depending on this, it can be said that the researchers should be careful when deciding on the expressions they will use.

Test, interview form, scale, open-ended question and questionnaire were mostly used as data collection tool in the research studies. This result is similar to the research results in the literature (Çiltaş et al., 2012; Çiltaş, 2012; Ulutaş and Ubuz, 2008; Yaşar and Papatğa, 2015). It has been seen that only one data collection tool was utilized in the research studies. The information obtained from a single measurement tool, method and technique can be limited and subjective (Denzin, 1989). Variety in research studies provides the opportunity of reaching more extensive and deeper knowledge (Miller and Fox, 2004). Accordingly, it can be identified that multiple data collection tools can be used in the research studies in order to reach more extensive and reliable results. Once again, the information of data collection tool was not given in some research studies. It can be considered that this can cause problems with validity and reliability of the research results.

Content analysis and predictive statistics techniques were mostly used as data analysis techniques. Similarly, Çiltaş et al., (2012), Küçüoğlu and Ozan (2013) pointed out in their research studies that descriptive statistics and predictive statistics methods were used as data analysis techniques. According to Çiltaş (2012), Bektaş et al., (2013), predictive statistics and descriptive statistics were mostly used. Differently in this research, it has been revealed that content analysis technique was commonly used for data analysis. Depending on this, it can be said that the use of qualitative research methods has increased. Single data analysis technique was utilized in the research studies. It can be said that this result is directly related to data collection tools. As the variety of data collection tools extends, the probability of using multiple data analysis method will increase. It can be said that validity and reliability of the research studies will be affected positively. In a majority of the research studies, the information of data analysis technique was not given. In some studies, general expressions like *"the data was analyzed through qualitative techniques, quantitative method was used in data analysis"* were used. This will affect validity and reliability of research results negatively.

Stating the steps followed in the research studies in a clear and comprehensible way will provide reaching scientifically correct results. Therefore, it can be said that the studies not including enough information about the steps such as study group/sample, research method/pattern, data collection tool, data analysis technique etc. should not be placed in scientific publications like abstract books. Thereby it will be beneficial in terms of the scientific perspective if the researchers become more regardful by considering the related factors when conducting their studies.

REFERENCES

Alper, A., & Gülbahar, Y. (2009). Trends and issues in educational technologies: A review of recent research in TOJET. *The Turkish Online Journal of Educational Technology-TOJET, 8*(2), 124-135.

Bektaş, M., Dündar, H., & Ceylan, A. (2013). Ulusal sınıf öğretmenliği eğitimi sempozyumu (USOS) bildirilerinin çeşitli değişkenler açısından incelenmesi. *Uşak Üniversitesi Sosyal Bilimler Dergisi, 6*(2), 197-222. DOİ: 10.12780/UUSBD167

Cohen, L., Manion, L., & Morrison, K. (2007). *Research methods in education.* New York: Routledge.

Cowan, P. (2006). *Teaching mathematics: A handbook for primary and secondary school teachers.* New York: Routledge.

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th edition). Thousand Oaks: Sage.

Çalık, M., & Sözbilir, M. (2014). İçerik analizinin parametreleri. *Eğitim ve Bilim, 39*(174), 33-38. DOI: 10.15390/EB.2014.3412

Çiltaş, A. (2012). 2005-2010 yılları arasında matematik eğitimi alanında Türkiye'de yapılan yüksek lisans ve doktora tez çalışmalarının içerik analizi. *The Journal of Academic Social Science Studies, 5*(7), 211-228. DOİ: 10.9761/JASSS_235

Çiltaş, A., Güler, G., & Sözbilir, M. (2012). Türkiye'de matematik eğitimi araştırmaları: Bir içerik analizi çalışması. *Kuram ve Uygulamada Eğitim Bilimleri, 12*(1) ,565-580.

Denzin, K. N. (1989) *The research act: A theoretical introduction to sociological methods* (3rd edit.). New Jersey: Prentice-Hall, Inc.

Department for Education and Employment (DfEE). (1999). *The National Curriculum: Handbook for Primary Teachers in England.* London: DfEE and QCA.

Jorgensen, R., & Dole, S. (2011). *Teaching mathematics in primary schools.* Australia: Allen & Unwin.

Kilpatrick, J., Swafford, J., & Findell, B. (Eds.). (2001). *Adding it up: Helping children learn mathematics.* Washington, DC: National Academy Press.

Kutluca, T., Birgin, O., & Gündüz, S. (2018). Türk Bilgisayar ve Matematik Eğitimi Dergisi'nde yayımlanmış makalelerin içerik analizi bağlamında değerlendirilmesi. *Türk Bilgisayar ve Matematik Eğitim Dergisi, 9*(2), 390-412. DOI: 10.16949/turkbilmat.332518

Kutluca, T., & Demirkol, M. (2016). Dicle Üniversitesi Ziya Gökalp Eğitim Fakültesi Dergisinin bibliyometrik analizi. *Dicle Üniversitesi Ziya Gökalp Eğitim Fakültesi Dergisi, 28*, 108-118. DOI: 10.14582/DUZGEF.674

Küçükoğlu, A., & Ozan, C. (2013). Sınıf öğretmenliği alanındaki lisansüstü tezlere yönelik bir içerik analizi. *Uluslararası Avrasya Sosyal Bilimler Dergisi, 4*(12), 27-47.

Lerman, S. (1998). Research on socio-cultural perspectives of mathematics teaching and learning. In J. Kilpatrick and A. Sierpinska (Eds.), *Mathematics Education as a Research Domain: A Search for Identity.* Vol. 1, (pp. 333-350). Dordrecht: Kluwer.

Lin, T. C., Lin, T. J., & Tsai, C. C. (2014). Research trends in science education from 2008 to 2012: A systematic content analysis of publications in selected journals. *International Journal of Science Education, 36*(8), 1346-1372, DOI: 10.1080/09500693.2013.864428

Miller, G., & Fox, K. J. (1997). Building bridges. The possibility of analytic dialogue between ethnography, conversation analysis and foucault. In D. Silverman (Ed.), *Qualitative research: theory, method and practice* (pp. 35-55). London: Sage Publication.

Milli Eğitim Bakanlığı, (2017). *Matematik dersi öğretim programı. İlkokul ve ortaokul 1, 2, 3, 4, 5, 6, 7 ve 8. sınıflar.* Ankara: MEB Talim ve Terbiye Kurulu Başkanlığı.

National Council of Teachers of Mathematics, (2000). *Principles and standards for school mathematics.* Reston, VA: NCTM.

Selçuk, Z., Palancı, M., Kandemir, M., & Dündar, H. (2014). Eğitim ve bilim dergisinde yayınlanan araştırmaların eğilimleri: İçerik analizi. *Eğitim ve Bilim, 39*(173), 430-453.

Smith, C. P. (2000). Content analysis and narrative analysis. In H. T. Reis & C. M. Judd (Eds.), *Handbook of research methods in social and personality psychology* (pp. 313-335). UK: Cambridge University Press.

Sözbilir, M., Kutu, H., & Yaşar, M. D. (2012). Science education research in Turkey: A content analysis of selected features of papers published. In J. Dillon & D. Jorde (Eds.), *The world of science education: Handbook of research in europe* (pp.341-374). Rotterdam: Sense Publishers.

Tatar, E., Kağızmanlı, T. B., & Akkaya, A. (2013). Türkiye'deki teknoloji destekli matematik eğitimi araştırmalarının içerik analizi. *Buca Eğitim Fakültesi Dergisi, 35,* 33-50.

Ulutaş, F., & Ubuz, B. (2008). Matematik eğitiminde araştırmalar ve eğilimler: 2000 ile 2006 yılları arası. *İlköğretim Online, 7*(3), 614-626.

Yaşar, Ş., & Papatğa, E. (2015). İlkokul matematik derslerine yönelik yapılan lisansüstü tezlerin incelenmesi. *Trakya Üniversitesi Eğitim Fakültesi Dergisi, 5*(2), 113-124.

Yıldırım, A., & Şimşek, H. (2011). *Sosyal bilimlerde nitel araştırma yöntemleri*. Ankara: Seçkin Yayıncılık.

Proceeding Books Included in Descriptive Content Analysis

XIII. Ulusal Sınıf Öğretmenliği Eğitimi Sempozyumu Özet Kitapçığı. Retrieved *www.usos2014.org*

USOS 2015 Uluslararası Katılımlı Sınıf Öğretmenliği Sempozyumu Bildiri Özetleri. Ankara: Pegem Akademi.

15. Uluslararası Sınıf Öğretmenliği Eğitimi Sempozyumu Bildiri Özetleri Kitabı. Ankara: Pegem Akademi.

16. Uluslararası Sınıf Öğretmenliği Eğitimi Sempozyumu. Retrieved *www.usos2017.com*

17. Uluslararası Sınıf Öğretmenliği Eğitimi Sempozyumu Özet Bildiri Kitabı. Retrieved *usos2018.soedernegi.org*