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CURRENT STATE OF THE MATHEMATICS EDUCATION COMMUNITY IN TURKEY

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ABSTRACT: The purpose of this study was to investigate the current state of the mathematics education community in Turkey with respect to research studies and staff. The sample of the study included six universities in different parts of Turkey. Two questionnaires developed by the researchers were used in the study.

According to the findings of this research, although the number of researchers in mathematics education is not sufficient, there is an increase in their numbers in the last few years.

KEY WORDS: *Mathematics education community*

ÖZET: Bu araştırmanın amacı, üniversitelerimizde matematik eğitimi alanında yapılan çalışmaları ve öğretim elemanlarının durumunu incelemektir.

Araştırmanın örneklemini matematik eğitimi birimleri olan altı universite oluşturmaktadır. Araştırmadaki veriler araştırmacılar tarafından geliştirilen iki bilgi toplama formuyla elde edilmiştir.

Çalışmanının bulgularına göre, matematik eğitimi alanında araştırmacı olarak çalışan öğretim elemanlarının sayıca az olduğu; bu nedenle yayın sayılarının ve yurt dışı ilişkilerin yetersiz düzeyde bulunduğu ortaya çıkmaktadır. Ancak yıllara göre incelendiğinde görülen nicel ve nitel artış umut vericidir.

ANAHTAR SÖZCÜKLER: *Matematik eğitimi grubu*

1. INTRODUCTION

This study was set out to investigate the current state of the mathematics education community in Turkey and how it varies between universities and years. The study consisted of two parts: (Appendix 1) case studies of mathematics education divisions chosen from eight universities; (Appendix 2) analysis of the staff of the mathematics education divisions or the staff of educational science departments who carry out research on mathematics education. The study was carried out during the 1997-1998 academic year, fall semester. To collect data, two questionnaires were developed, one of which was for the head of the science education departments and the other was for the staff in mathematics education divisions or in educational science departments.

Eight universities in the research were chosen out of 13 universities that have mathematics education divisions in science education departments. Answers to the questionnaires were received only from six heads of the science education departments and 27 pupils from the staff in mathematics education division or in educational science department, spread across the six universities. Middle East Technical University (METU/ODTÜ) and Bosphorous University (BU) are English medium universities whose student intake has an exceptionally high academic background.

2. RESULTS TAKEN FROM THE HEAD OF THE DEPARTMENTS

Table 1 below presents the number of the staff of mathematics education divisions in six universities. Member is a staff who has his/her doctorate degree and a position as an assistant professorship or above, whereas instructor is a staff who has his/her doctorate degree or at least has passed his/her doctorate competency exam. Mem-

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ber and instructor can give lectures in the departments. Research assistant, however, is a staff who is still doing his/her master or doctorate degree.

Table 2 shows starting dates for master and doctorate degree programs in mathematics education divisions, and the number of theses completed or will be completed in these programs.

Table 1. Number of staff in mathematics education divisions

Universities	Member	Instructor	Research Assistant	Total
METU (Ankara)	3	1	3(2 at broad)	7
Hacettepe (Ankara)	3	-	3	6
Gazi (Ankara)	6	2	1	9
BU (Istanbul)	2	-	1	3
Selçuk (Konya)	4	6	3	13
Karadeniz Teknik (Trabzon)	1	5	2(1 at broad)	8
Total	19	14	13	46

Table 2: Starting dates for graduate programs and the number of theses completed in these programs in mathematics education divisions

Universities	Starting date for the master program	Starting date for the doctorate program	Numberof theses completed or will be completed in the master program	Number of theses completed in the doctorate program
METU	1982	1982	9+	3
Hacettepe	1992	-	6+3	-
Gazi	1993	-	3+2	-
BU	1998 Febru	-	-	-
Selçuk	1993	-	2+2	-
Karadeniz Teknik	1996	1996	+1	-

Note: Eg. 6 + 3 means 6 theses were completed and 3 theses will be completed

Besides the number of theses given in Table 2 there are a few more theses that were completed in the educational science departments. It has been found that 28 master theses and 6 Ph.D. theses were completed so far. Along with these ones, 6 master theses are expected to be completed in near future. The distribution of the number of theses according to the years is presented in Table 3. The titles of the theses which were completed and will be completed are given at the end of this paper (see Appendix 1).

Table 4 presents the universities' conditions for giving financial support for their staff to attend the conferences. In addition to the universities, Turkish Scientific and Technical Research Council (TÜBİTAK) could also give some financial support for attending the conferences abrond. University staff could also get partial financial contribution from TÜBİTAK for publications in journals that are cited in Science and Social Science Index.

Table 3. The distribution of the number of theses according to the years

Years	The number of theses on mathematics education		Universities
	Master	Ph. D.	
1985 - 1989	7	-	6 METU, 1 BU
1990 - 1994	8	6	9 METU, 4 Hacettepe, i Selçuk
1995 - 1999	13 +6		(4 +) METU, (3 + 3) Hacettepe, (2 + 2) Selçuk, 3 Gazi, 1 BU, (+1) Karadeniz Teknik

Note: 13 + 6 means 13 theses were completed and 6 theses are expected to be completed in near future.

Table 4. Universities conditions for giving financial support for their staff to attend to the conferences

Universities	Financial Contribution for Conference
METU	Partial financial contribution for staff who do presentation
Hacettepe	None
Gazi	None
BU	Partial financial contribution for staff who do presentation
Selçuk	None
Karadeniz Teknik	Partial financial contribution for staff who do presentation. The payment includes accommodation and travel costs for Turkey, and approximately $ 150 for abroad in 1997-1998.

3. RESULTS FROM THE STAFF OF THE MATHEMATICS EDUCATION DIVISIONS

Detailed questionnaire data were obtained from 24 staff in mathematics education divisions and 3 staff in educational science departments, spread across the 6 universities (Table 5). From educational science departments only the staff who carry out research on mathematics education were included.

Table 6 shows the mathematics education staff's education background and Table 7 shows the number of publications completed on mathematics education.

As can be seen in Table 6, most of the staff working in mathematics education divisions gained their masters and doctorate degrees from mathematics departments. The reason is that graduate programs on mathematics education have been started in one of the universities in 1982. The other universities go back to 1992 (see Table 2).

Detailed information related to Table 6 and 7 is given in Appendix 2. When we look at Table 7 and Appendix 2 closely, we see that the international publications have been done either by the staff in English medium universities or by the staff who completed their graduate degrees in an overseas university on mathematics education.

Table 5. The number of staff who responded to the questionnaire from each university

Universities	Faculty Member	Instructor	Research Assistant	Total
Mathematics Education				
METU (Ankara)	2	1	1	4
Hacettepe (Ankara)	3	-	3	6
Gazi (Ankara)	4	1	-	5
BU (Istanbul)	1	-	1	2
Selçuk (Konya)	3	-	-	3
Karadeniz Teknik (Trabzon)	1	3	-	4
Educational Sciences				
METU (Ankara)	2	-	-	2
Hacettepe (Ankara)	1	-	-	1
Total	17	5	5	27

Table 6. The educational background of the staff

Degrees	Math	Math.Edu.	Math and Certificate	Educational Science	Others
Undergraduate (n= 27)	13	10	3	-	1
Master (n = 23)	13	6	-	2	2
Ph.D. (n =19)	10	5	-	3	1

Table 7. The number of international and national publications

Publications	International	National
Journal	11	20
Conference Proceedings	13	7
Conference Paper	10	23
Book (author or editor)	-	4
Book Chapter	2	7
Total	36	61

When the publication titles were examined, it has been seen that the pupils who have done research in mathematics education have studied on the following research areas:

- difficulties in learning mathematics,
- use of computers in mathematics teaching,
- problem solving in mathematics,
- attitudes towards mathematics,
- math anxiety,
- measurement in mathematics education,
- statistics teaching,
- evaluation of mathematics teaching in primary school,
- evaluation of mathematics examinations,
- change in mathematics curriculum,
- teacher training programs in mathematics education,
- evaluation of mathematics course books.

The answers given to the question related to the reasons for not attending the international conferences can be summarized as follows:

- financial difficulties,
- difficulty to attend to the conferences during the semester time,
- difficulty to get information about the conferences,
- difficulty in using foreign language other than Turkish,
- having only very few people working on mathematics education who are able to do research at the international standards and present it at the international conferences,
- institutions and ministry do not give necessary interest and support,
- hesitating to go abroad,
- overburdening with teaching and other things such as administrative duty.

There were some differences between the responses of staff from the English medium universities and those from other universities, with those from the English medium universities expressing relatively less concern related to the difficulty in using language.

The case in national conferences is that there have not been many conferences directly related to the mathematics education. However, in the last few years, there is an increase on the conferences related to science and mathematics education.

4. DISCUSSION

When we look at the data above, we may claim that the results are not very promising. However, the analyses of the data more closely show that the first master thesis on mathematics education was gained in 1985 in Turkey. The academic research study in mathematics education goes back to the beginning of 1980's. Compared to the represented countries like United Kingdom, America, and Israel in international conferences such as International Conference for Psychology of Mathematics Education (PME) 'mathematics education' is a very new discipline to be explored in Turkey. Although it is new, there is a growing enthusiasm due to international and national projects. The result shows that there is an increase in the numbers of thesis completed according to the years.

To develop mathematics education as a discipline in Turkey, the following suggestions are offered:

- the number of staff who do research on mathematics education should be increased,
- mathematics education should be considered as a discipline other than educational science and mathematics,
- cooperation between the universities and the schools should be established,
- teachers and mathematicians should be encouraged to conduct research on mathematics education,
- the Ministry of National Education can take the initiative to establish associations (e.g. National Council of Teachers of Mathematics (NCTM)) among the mathematics teachers in order to organize symposiums and workshops, to publish periodicals, and to set-up and maintain a web-side.

Appendix 1

Master Theses

1. Bayraktar, M. (1985). **The effect of feedback treatment on math-anxiety levels of sixth grade 'Yükseliş Lisesi' students.** Middle East Technical University, Ankara.
2. Garipağaoğlu, H. (1985). The relationship between cognitive development level and sex, age, science achievement and mathematics achievement. Middle East Technical University, Ankara.
3. Bulut, S. (1988). The relationship between mathematics self-concept and some related characteristics of mathematics education Turkish Freshmen at METU. Middle East Technical University, Ankara.
4. Köksal, İ. M. (1988). The effects of computer assisted instruction on students' mathematics achievement. Middle East Technical University, Ankara.
5. Cankoy, O. (1989). Difference between traditional method and mathematics laboratory instruction in terms of achievement related to a probability unit. Middle East Technical University, Ankara.
6. Çalıkoğlu, G. (1989). The relationship between computer attitude, mathematics attitude and knowledge about computer of prospective mathematics teachers at METU by grade level and sex. Middle East Technical University, Ankara.
7. Erktin, E. (1989). Prevalence and correlates of math anxiety in Turkish high school students. Bosphorous University, Istanbul.
8. Tartıcıoğlu, S. (1990). Assessment of a junior high school basic programming course with respect to achievement, attitudes and the opinions of the people involved in various degrees at Arı Lycee. Middle East Technical University, Ankara.
9. Ubuz, B. (1991). The effect of problem solving method with handout material on achievement in solving calculus word problems. Middle East Technical University, Ankara.
10. Tuncer, D. (1993). The effects of individual and group computer based problem solving on students' affective and cognitive outcomes in secondary school mathematics. Middle East Technical University, Ankara.
11. Çakıroğlu, E. (1994). Modules in pre-service training of mathematics teachers in probability and statistics. Middle East Technical University, Ankara.
12. Tanaçan, M. (1994). Orta okullarda bir bilinmeyenli denklemlerin öğretiminde bilgisayar destekli eğitimin rolü. Hacettepe University, Ankara.
13. Taşpolatoğlu, S. S. (1994). İlkokullarda ve ortaokullarda denklem çözümlerinde kullanılan tekniklerin karşılaştırılması. Hacettepe University, Ankara.

14. Toluk, Z. (1994). A case study on the secondary school teachers' views on the importance of mathematical knowledge they teach and pedagogical knowledge and when they acquired this knowledge. Middle East Technical University, Ankara.

15. Yakıcı, A. (1994). Liselerde matematik puanının fen, Türkçe ve sosyal puanlar arasındaki ilişkileri. Hacettepe University, Ankara.

16. Emirzeoğlu, H. (1995). İlkokullarda matematik dersinde değişken ve bilinmeyen kavramının incelenmesi. Hacettepe University, Ankara.

17. Esirgemez, M. (1995). İlkokul matematik ders kitaplarının öğrenmeyi sağlamadaki katkıları yönünden öğretmen görüşleri. Hacettepe University, Ankara.

18. Şahin, B. (1995). Belirtisiz istatistiğin eğitime uygulanması. Hacettepe University, Ankara.

19. Yenal, E. (1995). Differential item functioning analysis of the quantitative ability section of the first stage university entrance examination. Middle East Technical University, Ankara.

20. Sıvacı, S. Y. (1996). İlköğretim ikinci kademe dersi programı uygulama ve yeterlilik düzeyinin değerlendirilmesi. Selçuk University, Konya.

21. Sulak, H. (1996). Bilgisayar destekli matematik öğretiminde karşılaşılan problemler. Selçuk University, Konya.

22. Çeziktürk, Ö. (1997). Needs assessment for a training program of parents to promote increased parent involvement in mathematics education. Bosphorous University, Istanbul.

23. Eski, İ. (1997). Öğretmenlik uygulamalarında araştırma okulları modeli. Gazi University, Ankara.

24. Güler, Ş. (1997). ılköğretim II. kademe öğrencilerinin matematik derslerine karşı tutumlarının eğitim sistemi açısından değerlendirilmesi: Kırşehir il örneği. Gazi University, Ankara.

25. İşeri, İ. A.(1997). Diagnosis of students' misconceptions in interpreting and applying decimals. Middle East Technical University, Ankara.

26. Tuluk, G. (1997). Logo matematiğin öğretmen adayları üzerinde etkisi. Gazi University, Ankara.

27. Çoşkungönüllü, R. (1998). The effects of multiple intelligence theory on fifth graders' mathematics achievement. Middle East Technical University, Ankara.

28. Koç, Y. (1998). The effect of different teaching methods on mathematical problem solving performance. Middle East Technical University, Ankara.

Ph.D. Theses

1. Saygı, M. (1990). Assesment and analysis of prospective mathematics teachers mathematical problem-solving skills for selected variables for math-ability. Reading comprehension and attitudes toward mathematics. Middle East Technical University, Ankara.

2. Yavuz, H. (1991). A study on the effectiveness of different teaching methods and mathematics achievement levels on achievement, retention, and attitude toward mathematics and selected topic. Middle East Technical University, Ankara.

3. Sulak, H. (1992). Lise matematik öğretim programlarının fen dersleri programlarının uygunluğu. Selçuk University, Konya.

4. Umay, A. (1992). Matematiksel düşünmede süreci ve sonucu yoklayan testler arasında bir karşılaştırma. Hacettepe University, Ankara.

5. Çağlar, M. (1993). The acquisition and development of basic mathematical concepts in Turkish Cypriot students ranging 5th to 11th grades. Middle East Technical University, Ankara.

6. Bulut, S. (1994). The effects of different teaching methods and gender on probability achievement and attitudes toward probability. Middle East Technical University, Ankara.

Master theses which have not been completed yet

1. Ceylan, N. Cebir öğretimindeki yanılgıların teşhisi. Selçuk University, Konya.
2. Erdik, C. Özel ihtiyaçlı ve düşük kabiliyetli öğrencilerin matematik öğretimi. Selçuk University, Konya.
3. Bayraktar, E. Matematik öğretmenlerinin bilgisayar destekli matematik öğretimi deneyimleri. Karadeniz Teknik University, Trabzon.
4. Dedeoğlu, İ. Türkiye'de üniversite programlarının sıralanışı. Hacettepe University, Ankara.
5. Tanaçan, S. Matematikte tutorial tarzı öğretim ile klasik öğretimin karşılaştırılması. Hacettepe University, Ankara.
6. Göksu, F. D. Ortaokullarda matematik yazılımlarının değerlendirilmesi. Hacettepe University, Ankara.

Appendix 2

The education background of mathematics education staff and their research completed on mathematics education

Universities	Undergraduate	Master	Ph.D.	Research on Math.Edu
Mathematics Education				
METU				
Research assistant	Math.Edu	Math. Edu 1997	–	no
Instructor 1	Math and Teaching Certificate (1986)	Math. Edu (1988)	Math. Edu (1994)	4 NJ, 2 NBC, 7 NCP, 2 ICP
Faculty member 1	Math. Edu (1989)	Math. Edu (1991)	Math. Edu* (1996)	3 IJ, 8 ICPr, 1 ICP, 1NBC
Faculty member 2	Math. Edu (1979)	Educ. Scien	Educ. Scien	1 IJ, 1 IBC, 1 NB, 1 NJ, 1 NCPr, 1 NCP
Hacettepe				
Researh asistant 1	Math. Edu	Math	Math	no
Researh asistant 2	Math. Edu (1995)	Math	–	no
Researh asistant 3	Math Edu (1989)	Math (1992)	–	no
Faculty member 1	Math (1984)	Math	Math	no
Faculty member 2	Math	Math	Math	no
Faculty member 3	Math. Edu (1987)	Math (1989)	Math (1994)	no
Gazi				
Instructor 1	Math (1970)	Math (1989)	–	no
Faculty member 1	Math	Math	Math*	no
Faculty member 2	Math (1969)	–	Math	no
Faculty member 3	Math (1983)	Math (1987)	Math (1994)	no
Faculty member 4	Math. Ed	Math	Math	no
BÜ				
Research asistant 1	Math and Teaching Certificate	Math. Edu (1997)	–	1 NCP, 1 NCPr
Faculty member 1	Math and Teaching Certificate (1982)	Math. Edu (1989)	Business Administration (1994)	5 ICP, 1 NB, 2 NCP, 1 NBC

Selçuk				
Faculty member 1	Math (1967)	Math (1976)	Math (1988)	no
Faculty member 2	Math (1969)	Math	Math. Edu. (1992)	2NBC, 1 NMB,
Faculty member 3	Math. Edu and Math	Math	Math	1 ICP, 1 NJ, 3NBC, 3 NCP, 1 NB
Karadeniz Teknik				
Instructor 1	Math Engineering (1982)	–	–	no
Instructor 2	Math (1971)	–	–	no
Instructor 3	Math-Astronomy (1970)	–	–	no
Faculty member 1	Math. Edu (1982)	Math. Edu* (1989)	Math. Edu* (1994)	2 IJ, 2 ICPr, 1 IBC, 5 NJ, 3 NCP, INBE
Educational Science				
METU				
Faculty member 1	Math (1974)	Educ. Scien (1977)	Educ. Scien	4 IJ, 3 ICPr, 1ICP, 4 NJ, 5 NCPr, 2 NCP, 1 NB, 1 NMB
Faculty member 2	Chem. Edu	Chem. Edu	Educ. Scien	1 IJ, 2 NCP
Hacettepe				
Faculty member 1	Math	Statistics	Math. Edu	5 NJ, 2 NCP

Note: IJ- International journal,
ICP International conference paper
NJ- National journal
NCP- National Conference Paper
NMB- National mathematics book
NME- National Book Editing
ICPr- International conference proceeding,
IBC- International book chapter
NBC- National book chapter
NCPr- National conference proceeding
NB- National Book

* Degrees completed at an overseas university (UK, USA)