Australian Journal of Teacher Education

Volume 38 | Issue 2 Article 9

2013

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Guney Haciomeroglu
Canakkale Onsekiz Mart University, guneyh@gmail.com

Recommended Citation
Haciomeroglu, G. (2013). The Field Experiences of Student Teachers and Effective Mathematics Teaching in Turkey. *Australian Journal of Teacher Education, 38*(2).
http://dx.doi.org/10.14221/ajte.2013v38n2.5

This Journal Article is posted at Research Online.
http://ro.ecu.edu.au/ajte/vol38/iss2/9

The Field Experiences of Student Teachers and Effective Mathematics Teaching in Turkey

Guney Haciomeroglu
Canakkale Onsekiz Mart University
Turkey

Abstract: The aim of this study was to investigate the cooperative teachers' supervision for effective mathematics teaching from the perspective of elementary student teachers during their field experiences. The participants were 259 senior elementary education majors (189 female and 70 male) who were enrolled in practicum courses at a Turkish university. Results of the study revealed that cooperative teachers as a supervisor seemed to be deficient for interacting with student teachers as well as assisting them to develop critical point of views for teaching mathematics effectively. The study suggests that faculty-school partnership should be reconsidered for selection and professional development of cooperating teachers.

Introduction

Field experience is often viewed as one of the most critical elements in teacher education (e.g., Darling-Hammond, 1998; Koerner 1992), and teacher educators recognize the importance of field experiences in preparing student teachers for teaching. Most previous studies examining field experience have concentrated on roles, experiences, views and expectations of student teachers, university supervisors as well as cooperating teachers for teaching and learning different subjects (e.g., Fernandez & Erbilgin, 2009; Freidus, 2002). Hiebert, Carpenter, Fennema, Fuson, Wearne, Murray, and Human (1997) argued that there is a lack of preparation of student teachers to effectively teach to students to support their understanding of mathematics. Research concerning mathematics student teachers' field experiences has received attention in various fields of mathematics education (e.g., Arztz, 1999; Fernandez & Erbilgin, 2009; Frykhol, 1996; Goodell, 2000; Hudson, 2009; Ronfeldt & Reinninger, 2012; Zeichner, 2002). Within this large body of research, it is surprising that few studies focused on student teaching at the elementary level. Therefore, this study sought to examine elementary student teachers' perceptions regarding their cooperative teachers' supervision for mathematics teaching.

Student Teaching and Supervision

Previous studies suggest that cooperating teachers who provide guided teaching experience on a daily basis have strong influence on student teachers' practice (Cook, 2007; Frykholm, 1996; LaBoskey & Richert, 2002; Smagorinsky, Sanford, & Konopak, 2006). Koskela and Ganser (1995) found that cooperating teachers perceived their role as facilitators

of professional growth. Stanulis (1995) stated, "it is the classroom teacher who, because of the close interaction during the practice of teaching, potentially exerts the greatest influence on the development of a perspective teacher" (p. 331). Koerner, Rust and Baumgartner (2002) added the finding that student teaching experience is influenced by the interactions between student teachers, cooperating teachers, and university supervisors. Similarly, Putnam and Borko (2000) argued that weekly meetings between university supervisors and student teachers have an important role in balancing between providing guidance and supporting student teachers' construction of new practices.

Despite the important role of university supervisors in improving student teaching, studies reported that university supervisors do not visit student teachers often enough or provide continuing feedback to have an impact on student teachers and their cooperating teachers (Borko & Mayfield, 1995; Fryhkolm, 1996). In addition, it was observed that due to cooperating teachers' views and methods, many student teachers used traditional teaching practices, which were not aligned with reform-based teaching methods taught in their teacher education programs (Britzman, 1991; Feiman-Nemser & Buchmann, 1985; Ronfeldt & Grossman, 2008; Zeichner & Gore, 1990).

The quality of student teaching has significant and positive effects on teacher outcomes (Ronfeldt & Reininger, 2012) because it is a cornerstone of teacher preparation, which provides opportunities for student teachers to link theory and practice (Boyd, Grossman, Lankford, Loeb, & Wyckoff, 2009; Zeichner, 2002). Although classroom and school settings, behavior management, student teacher responsibilities are important factors affecting student teaching (e.g., Frykholm, 1996; LaBoskey & Richert, 2002), Grande, Burns, Schmidt, and Marable (2009) argued that more attention should be given to the discussion of teachable moments, stereotypes, realties of urban schools, and students. Boyd et al. (2009) also suggested that teacher preparations directly related to teaching practices appear to benefit student teachers in their first year. Student teachers' views about teaching and learning are often shaped by their experiences as a student (Feiman-Nemser & Buchmann, 1985; Plourde, 2002) and might continue to use traditional methods despite reform-based practices taught in their college courses (Artz, 1999). Frykholm (1996) confirmed these findings that student teachers were unable to implement the reform ideas during their field experience. From the preceding review of literature, it is clear that both cooperating teachers and university supervisors should provide feedback and help student teachers develop their content and pedagogical knowledge for teaching mathematics (Artz, 1999; Blanton, Berenson & Norwood, 2001).

The Turkish Elementary Teacher Education Program

With the support of the World Bank, Turkish Ministry of Education Project-Higher Education Council reorganized teacher education programs to improve the quality of teachers at elementary and secondary levels (Higher Education Council, 1998; Kiraz, 2003; Simsek & Yildirim, 2001) and strengthen school-university partnerships with an increased focus on effective field experience for student teachers. In addition, all teacher education programs at four-year universities have used a standardized curriculum prepared by Higher Education Council since 1998. The curriculum at the elementary levels consists of three domains: content courses (e.g., mathematics, mathematics education, science, and technology education), general education courses (e.g., computer literacy, foreign language, and Turkish history and language), and pedagogy courses (e.g., educational psychology, classroom management, and counseling). General education courses are designed to provide student teachers with backgrounds in social, cultural, and historical topics. Content courses focus on

the development of student teachers' content and pedagogical content knowledge in areas such as mathematics, science, and social studies. In addition, pedagogy courses are designed to guide student teachers for the development of their pedagogical knowledge. In this program, elementary pre-service teachers would be professionally certified to teach subjects such as mathematics, social studies, science, and technology at grades 1 through 4 upon graduation (Higher Education Council, 2007).

Supervision in the Elementary Teacher Education Program

Supervision of student teachers involves the participation of cooperating teachers, student teachers, and university supervisors. Each party has responsibilities that that are outlined on the Student Teaching Handbook (Higher Education Council, 1998, 2007). At the beginning of the semester, student teachers are placed in schools to work with cooperating teachers to develop their teaching skills. University supervisors collaborate with collaborating teachers as they supervise interns and evaluate their teaching practices. In-service elementary teachers who are selected as cooperating teachers are required to supervise and guide student teachers as they plan and teach.

Elementary pre-service teachers are enrolled in a course called, School Experience, in the second half of their third year to complete a series of assignments in elementary classrooms (e.g., observe classes, learn school policies and procedures). The pre-service teachers are expected to meet with their university supervisors to discuss their observations and turn in their field notes and assignments. The internship is a yearlong experience, and elementary pre-service teachers are enrolled in two practicum courses in their fourth year. In groups of 2 or 3, student teachers prepare and teach lessons at 1st through 4th grade levels under the supervision of their cooperating teachers for 14 weeks. Each week, student teachers meet with their university supervisor to discuss their teaching experiences and reflect on their teaching. At the end of the semester, they submit a portfolio that includes lesson plans, and student evalutation and peer observation forms. There are no selection criteria for cooperating teachers due to large number of student teachers. Any in-service elementary teacher can be considered as a potential cooperating teacher.

Purpose

This study sought to examine elementary student teachers' perceptions regarding their cooperative teachers' supervision for mathematics teaching during their field experiences.

Method

Participants

The participants were senior elementary education majors who were enrolled in practicum courses to earn academic credit for internship at a university in the northwest region of Turkey. Of the 360 students, 259 students agreed to participate in the study. There were 189 females and 70 males.

Instrument

The Mentoring for Effective Mathematics Teaching Instrument ([MEMT], Peard & Hudson, 2006) was designed to measure student teachers' views about their mentors' guidance for mathematics teaching. The MEMT instrument consists of five subscales

measuring factors of effective mentoring practices in primary mathematics teaching. In this study, the Turkish adaptation of the MEMT instrument ([T-MEMT], Haciomeroglu & Sahin Taskin, 2010) was used to obtain the perceptions of elementary student teachers regarding their mentors' practices for mathematics teaching. The students read and rated the 34 items of the T-MEMT on a scale (1 (*strongly disagree*) to 5 (*strongly agree*)). The reliability coefficients of the five subscales, Developing Critical Perspectives (14 items), Guidance on Planning (9 items), Modeling (4 items), Feedback (4 items), and Effective Mathematics Teaching (3 items) were 0.95, 0.92, 0.80, 0.80, and 0.70, respectively. The internal reliability of the T-MEMT was 0.97.

Procedure

All students received standardized instructions and were tested in their classrooms. All participating students gave their informed consent before completing the survey. Completion of the T-MEMT survey was not timed. The students completed the survey in approximately 15 minutes. Data analysis was conducted using the Statistical Package for Social Sciences (SPSS) software.

Findings

Descriptive and inferential statistics were used to analyze the student teachers' scores on the Turkish Mentoring for Effective Mathematics Teaching Instrument (T-MEMT). Analyses of the subscales revealed that overall mean scores on the subscales were low Developing Critical Perspectives (M=2.78; SD=0.89), Guidance on Planning (M=2.69; SD=0.97), Modeling (M=2.95; SD=0.96), Feedback (M=3.03; SD=1.01), and Effective Mathematics Teaching (M=3.04; SD=0.93), suggesting insufficient or lack of mentoring. When analyzing the student teachers' responses to the items on the developing critical perspectives sub-scale, more than fifty percent (52.1%) of the cooperating teachers failed to express what student teachers needed to improve in their teaching and show how to assess elementary students' learning of mathematics. Nearly half of the student teachers (51.8%) indicated that their cooperating teachers did not listen to them attentively about teaching of mathematics. In addition, more than half (52.5%) claimed that cooperating teachers did not provide strategies for solving their mathematics teaching problems and did not discuss the aims of mathematics teaching. The student teachers perceived that cooperating teachers did not help for developing their strategies for teaching mathematics (49.5%), and 45% of the cooperating teachers did not review student teachers mathematics lesson plans before teaching mathematics, did not discuss the knowledge for teaching mathematics, and did not make them feel more confident as a teacher. Approximately 40% of the cooperating teachers did not have well-designed mathematics activities for the students, did not utilize effective classroom management when teaching mathematics, and failed to assist student teachers to reflect on improving their mathematics teaching practices. Only 38.6% of the cooperating teachers were perceived to instill positive attitudes towards teaching mathematics. More surprising is that approximately one-third (26.3%–29.3%) of the cooperating teachers were perceived to articulate expectations, discuss assessment of students' learning, have well-designed activities, provide written feedback, and discuss aims and problem solving in teaching mathematics (see Table 2).

Percentage					
Item	SA	A	U	D	SD
33. clearly articulated what I needed to do to improve my mathematics teaching.	8.1	20.8	18.9	27.4	24.7
31.listened to me attentively on mathematics teaching matters.	7.3	26.3	14.7	25.5	26.3
32. showed me how to assess the students' learning of mathematics.	5	23.2	19.7	29.3	22.8
29. had well-designed mathematics activities for the students.	8.5	20.8	27.4	20.5	22.8
20. provided me with written feedback on my mathematics teaching.	4.6	23.2	15.1	27.4	29.7
27. provided strategies for me to solve my mathematics teaching problems.	5.8	20.5	21.2	29.3	23.2
25. discussed with me the aims of mathematics teaching.	5.4	21.2	20.8	29.7	22.8
28. reviewed my mathematics lesson plans before teaching mathematics.	6.9	28.2	18.9	24.7	21.2
23. assisted me to reflect on improving my mathematics teaching practices.	6.2	30.1	21.2	25.5	17
21. discussed with me the knowledge I needed for teaching mathematics.	5.8	28.2	20.5	26.6	18.9
26. made me feel more confident as a mathematics teacher.	8.5	25.5	20.8	25.5	19.7
14. developed my strategies for teaching mathematics.	5.8	24.3	20.5	29	20.5
22. instilled positive attitudes in me towards teaching mathematics.	6.6	32	23.6	22	15.8
12. modeled effective classroom management when teaching mathematics.	6.6	31.3	22	22.4	17.8

*SA: Strongly agree; A: Agree; U: Undecided; D: Disagree; SD: Strongly disagree.

Table 2. Individual item percentages for the Developing Critical Perspectives subscale

When the responses to the items on the guidance on planning sub-scale were analyzed, more than 63% of the cooperating teachers did not guide the student teachers with mathematics lesson preparation. More than half of the student teachers claimed that the cooperating teachers did not outline the curriculum for teaching mathematics or give clear guidance for planning to teach mathematics for student teachers. Nearly half the cooperating teachers were perceived not to assist with timetabling their mathematics lessons or assist the student teachers for implementing mathematics teaching and classroom management strategies. Many cooperating teachers also appeared not to discuss questioning skills and evaluation of the student teachers' mathematics teaching (See Table 3).

Percentage					
Item	SA	A	U	D	SD
3. guided me with mathematics lesson preparation.	4.6	20.8	11.2	29.7	33.6
4. discussed with me the school policies used for mathematics teaching	5.8	29	13.5	25.1	26.6
11. outlined state mathematics curriculum documents to me.	5.8	26.3	15.8	27	25.1
24. gave me clear guidance for planning to teach mathematics.	6.6	19.7	18.1	30.1	25.5
6. assisted me with classroom management strategies for mathematics teaching.	8.5	26.3	18.5	27	19.7
10. assisted me with timetabling my mathematics lessons.	5.8	22	22.8	24.7	24.7
8. assisted me towards implementing mathematics teaching strategies.	6.2	28.2	20.8	27.4	17.4
13. discussed evaluation of my mathematics teaching.	6.6	30.9	18.1	23.9	20.5
18. discussed with me questioning skills for effective mathematics teaching.	6.2	32	18.9	23.2	19.7

*SA: Strongly agree; A: Agree; U: Undecided; D: Disagree; SD: Strongly disagree.

Table 3. Individual item percentages for the Guidance on Planning subscale

The student teachers' responses to the items on the modeling scale are summarized in Table 4. The student teachers perceived that they received modeled mathematics teaching (29.3%), displaying enthusiasm (43.2%) and support for teaching mathematics (44.4%), and modeling a rapport with their students (49%).

Percentage					
Item	SA	A	U	D	SD
7. had a good rapport with the students learning mathematics.	7.3	41.7	26.6	13.9	10.4
9. displayed enthusiasm when teaching mathematics.	10.8	32.4	22.4	19.7	14.7
5. modeled mathematics teaching	5	24.3	19.7	30.1	20.8
1. was supportive of me for teaching mathematics.	9.7	34.7	14.3	20.8	20.5

*SA: Strongly agree; A: Agree; U: Undecided; D: Disagree; SD: Strongly disagree.

Table 4. Individual item percentages for the Modeling subscale

Analyses of the responses to the items on the feedback sub-scale revealed that although the cooperating teachers were perceived to be comfortable in talking with the student teachers (46.7%) and provide new viewpoints (38.6%) and oral feedback on their mathematics teaching (51.3%), approximately 50% of their cooperating teachers provided feedback without observation (See Table 5).

Percentage					
Item	SA	A	U	D	SD
16. provided oral feedback on my mathematics teaching.	8.1	43.2	12.7	22.4	13.5
17. seemed comfortable in talking with me about mathematics teaching.	10.4	36.3	19.3	21.2	12.7
34. observed me teach mathematics before providing feedback.	12.7	36.3	18.1	16.2	16.6
30. gave me new viewpoints on teaching mathematics.	9.3	29.3	18.9	18.5	23.9

*SA: Strongly agree; A: Agree; U: Undecided; D: Disagree; SD: Strongly disagree.

Table 5. Individual item percentages for the Feedback subscale

The student teachers' responses to the effective mathematics teaching sub-scale indicated that only 40.5% of the cooperating teachers used language from the mathematics syllabus. The cooperating teachers were perceived not to model effective mathematics teaching (27.5%) and the use of hand-on materials (36.7%). Considering the mean scores of all student teachers, results of this present study revealed that student teachers prepared and taught their lessons with limited guidance and support from their cooperating teachers (See Table 6).

Percentage					
Item	SA	A	U	D	SD
19. used hands-on materials for teaching mathematics.	9.7	35.1	18.5	21.6	15.1
2. used mathematics language from the current mathematics syllabus.	5.4	35.1	24.3	21.6	13.5
15. was effective in teaching mathematics.	7.7	37.8	27	15.1	12.4

*SA: Strongly agree; A: Agree; U: Undecided; D: Disagree; SD: Strongly disagree.

Table 6. Individual item percentages for the Effective Mathematics Teaching subscale

Discussion

This study focused on elementary student teachers' perceptions regarding their cooperative teachers' supervision for mathematics teaching and was not designed to examine the interactions between cooperating teachers and student teachers. Although the teachers and students were not interviewed, the results revealed unsatisfactory mentoring and inadequate supervision on the majority of the items of the MEMT instrument measuring factors of effective mentoring practices. In particular, many cooperating teachers did not review student teachers mathematics lesson plans before teaching mathematics and provided feedback without observation. Due to the lack of communication with their cooperative teachers, many student teachers faced with the complexities of instructional practices regarding schools, classrooms, and students on their own. Under these circumstances, student teachers' teaching practices would be more likely to be shaped by their prior learning experiences as a student rather than current research-based teaching practices. These findings support the conclusions of other researchers (Haciomeroglu & Sahin-Taskin, 2010; Kiraz & Yildirim, 2007; Kilan, Ibret, Pektas, Aydinozu & Incikabi, 2013) who reported lack of mentoring and inadequate supervision due to student teaching placements with untrained mentors. Similarly, Everhart and Turner (l996), Louis, Kruse and Raywid (l996), and Seferoglu (2000) found that teachers' inadequate knowledge and skills contribute to their difficulties in becoming effective mentor.

In teacher education, a great deal of effort is directed toward developing pre-service teachers' teaching practices. University supervisors and cooperating teachers as a mentor/supervisor are in a key position for training student teachers to become effective elementary teachers. Although student teaching is a central component for most of the teacher education history, reviews of the literature identify field experiences to be poorly understood (e.g., Clift & Brady, 2005; Guyton & McIntyre, 1990; McIntyre, Byrd, & Fozz, 1996; Wilson, Floden, & Ferrini-Mundy, 2001; Rozelle & Wilson, 2012). In addition, research studies have generally found that student teaching tends to move pre-service teachers away from methods and strategies learned in teacher education (Clift & Brady, 2005; Hewson, Tabachnick, Zeichner, & Lemberger, 1999). They move towards traditional approaches used by their cooperative teachers as they confront teachings' realities in the school settings. Rarely, exceptional mentors or innovative structure of student teaching

change these patterns and leads new teachers to become educationally open-minded (e.g., Goodnough, Osmond, Dibbon, Glassman, & Stevens, 2009; Nilssen, 2010). Unfortunately, many of the cooperative teachers and university supervisors were not able to fulfill their roles to support student teachers during their field experiences (e.g., Clift & Brady, 2005; Guyton & McIntyre, 1990; McIntyre, Byrd, & Fozz, 1996). It is likely that the use of untrained mentors is one of the contributing factors to unsatisfactory results in field experiences. Teacher education programs in Turkey do not offer any workshops or mentoring courses for in-service teachers, and mentors, who do not complete any training, are often selected based on school location (urban vs rural), which vary by program. In addition, elementary teachers teach 6 hours per week. As a result, teachers who have heavy teaching loads (and who have no training) fail to guide, support and provide constructive feedback to student teachers during field experience. The results support the findings of Bourke (2001) and Merc (2010) who reported that mentoring courses should be offered for cooperating teachers to explore strategies and develop their supervisory skills and knowledge. Only after sufficient professional development is provided to support the change in the training of cooperative teachers (National Teacher Strategy Workshop, 2011), teacher education programs will produce elementary teachers who are ready, willing, and able to meet the needs of their students (Tekkaya, Cakiroglu & Ozkan, 2004).

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