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The Mentors: Reflections from Middle-School Mathematics Teachers

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The Mentors: Reflections from Middle-School Mathematics Teachers

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Abstract

The aim of this phenomenology research is to define the perceptions of middle school mathematics teachers about the mentor mathematics teachers and academicians. The twelve middle school mathematics teachers working at the public schools in the three medium-sized cities of Turkey were included in this study. The data were obtained through semi-structured interviews. The interviews were transcribed and coded in Nvivo 10. The perceptions of participant teachers were examined under three main themes: (i) the importance and contributions of mentors, (ii) the attitude of mentors to mentoring process and pre-service mathematics teachers, and (iii) qualities of a good mentors. The results indicate that middle school mathematics teachers attach importance to internship education, but have very negative experiences and perceptions towards their mentors.

Key words: Pre-service Mathematics Teachers, Mentor, Teacher Education

Introduction

Turkey, in line with developments in the world, is a country engaged in significant reform initiatives in mathematics education in the last 15 years. Within the scope of these reform initiatives, radical changes have been made in the middle school mathematics curriculum based on meaningful learning of mathematics (Ministry of Education [MEB], 2005, 2013, 2018). With the free textbooks, free courses and classes equipped with technology (MEB, 2012), students' learning of mathematics was supported by the government. However, the recent international exams (Trends in International Mathematics and Science Study [TIMSS] 2007, 2011 and 2015), indicated that the mathematics education reform initiatives in Turkey is not yield enough positive results. In general, the math performance of Turkish students remained below the international average in these exams (Mullis et al., 2012; Mullis et al., 2016; Olson et al., 2008).

The success of reform initiatives in the field of education is only possible if teachers can effectively bring the reform innovations to their classrooms (Day et al., 2005; Feiman-Nemser, 2001). However, many of the studies (for instance, Eraslan, 2008; Güneş, 2008; Karakuş & Yeşilpınar, 2013; Temizöz & Koca, 2010; Uçar & Demirsoy, 2010) indicated that mathematics teachers might be one of the major reasons for the failure of reform initiatives in Turkey. In general, it is reported in these studies that Turkish teachers have difficulties in adapting to the innovations in mathematics education and continue to teach mathematics lessons using traditional methods focused on operational learning. There is a need for innovative mathematics teachers who have adopted the principle of lifelong learning to achieve the objectives of reform initiatives carried out in the field of mathematics education in Turkey (Baki, 2001; Ersoy, 2005). One of the important factor in the training of mathematics teachers with these features is the mentoring program carried out in the pre-service teacher education process.

During the mentoring process, pre-service teachers are expected to improve their teaching knowledge and skills by applying their theoretical knowledge in real classroom settings (MEB, 2018; Council of Higher Education [YÖK], 1998). In this process, they need to recognize their professional strengths and weaknesses and gain the habit of self-development by going over their weaknesses (Donche et al., 2003; Endedijk et al., 2012; Kremer-Hayon & Tillema, 1999; Oosterheert & Vermunt, 2001). In acquiring this habit, mentors (mentor mathematics teachers and academicians) take on important responsibilities. Mentor mathematics teachers and academicians should be a good guide and role model for pre-service teachers with their rich professional knowledge and experience, as well as their desires and efforts to improve themselves (Göktaş & Şad, 2014; Hacıömeroğlu, 2013).

However, many researches (for example, Boz & Boz, 2006; Demir et al.; Demircan, 2007; Kıldan et al., 2013; Kiraz & Yıldırım, 2007; Ören et al., 2009; Özkılıç et al., 2008; Özmen, 2008; Turgut et al., 2008) conducted with the different branches of the pre-service teachers reveal the inadequacy of Turkish mentors. For example, in the research of Özmen (2008), the pre-service teachers complained that the mentors (mentor

teachers and academicians) did not support them sufficiently, that they did not give effective feedback to their teaching practices during the mentoring process. In the research of Özkılıç et al. (2008), it was revealed that approximately 30% of pre-service teachers did not get enough support from the mentors. In the research of Boz and Boz (2006), pre-service teachers stated that they did not feel like teachers and did not have the chance to practice enough during the mentoring process. In the research conducted by Kiraz and Yıldırım (2007), pre-service teachers stated that, surprisingly, inexperienced mentor teachers showed more competent behaviors and practices compared to senior mentor teachers.

Based on the literature reviewed, very limited number of researches (Eraslan, 2008; Erhan-Kurt, 2016; Hacıömeroğlu, 2013) focusing on mentors (mentor mathematics teachers and academicians) of Turkish pre-service middle-school mathematics teachers were found. In general, these researches reveal that mentor middle-school mathematics teachers and academicians cannot successfully fulfill their mentoring responsibilities. In the one of this researches (Hacıömeroğlu, 2013), the pre-service middle-school mathematics teachers stated that the mentor mathematics teachers did not pay enough attention to the lesson plans they prepared, did not observe the practical lessons carefully and did not provide effective feedback to them. Hacıömeroğlu (2013) emphasized that pre-service middle-school mathematics teachers could not communicate effectively with mentor mathematics teachers. In the research conducted by Eraslan (2008), pre-service middle school mathematics teachers stated that they did not get enough care and support from mentors and that this mentoring process affected them negatively. In the research of Erhan-Kurt (2016) examining the expectations of pre-service middle school mathematics teacher from the mentoring process, the most important expectations of pre-service teachers from mentor mathematics teachers and academicians were defined as effective communication and cooperation.

These findings provide important feedback on the performance of mentor mathematics teachers and academicians. However, these findings, which were obtained through survey, did not comprehensively describe the pre-service middle school mathematics teachers' experiences and perceptions towards their mentor mathematics teachers and academicians. In this study, these experiences and perceptions were tried to be defined through in-depth interviews with 12 novice middle school mathematics teachers. Through this method and these participants, who have recently experienced both pre-service and in-service mathematics teacher roles, it is expected that more comprehensive and valid descriptions for mentor mathematics teachers and academicians will be obtained. It is expected that these descriptions contribute the development of the related literature and the mentoring system in Turkey.

Method

Research Design

Phenomenology, which is one of the qualitative research designs, has been adopted in this research. This research design focuses on a group of individuals' common experiences and meanings towards a phenomenon. Phenomenology researchers aim to derive universal (general) descriptions that reflect essences or structures of these shared experiences and meanings (Creswell, 2007; Moustakas, 1994). The phenomenon that is the focus of this research is mentors (mathematics teachers and academicians) of pre-service middle school mathematics teachers. As a result of this research, the shared experiences and perceptions of the participating middle school mathematics teachers about their mentors were tried to be described and explained.

Participants

In this phenomenological research, the twelve middle school mathematics teachers who had worked in the state schools of the three medium-sized cities of Turkey included. In order to determine the participants, convenience and criterion sampling methods, which are one of the purposeful sampling methods, were used together. The aim of selecting these methods is to gain speed and practicality and to include data-rich situations in the research.

Within the scope of these methods, first of all, the novice middle school mathematics teachers (who have not completed 5 years in the profession), who are recognized by the researchers, were listed. Preliminary interviews were conducted with these teachers and then, 12 teachers who volunteered to participate in the research identified and so the participant group of the research was formed. The purpose of considering the criterion of "not completing 5 years in the profession" in determining the participants is to obtain richer and more realistic data towards the mentors from the participants who have recently completed their internship training. In the research, the real names of the participants were hidden and the code name was used for each participant. In the table below (Table 1), information about the participants is presented.

Table 1. Information about the participants

Name	Internship City	Work City	Years of Service
Şeyma	Van	Rural	2
Reyhan	İzmir	Rural	3

Sedat	Ankara	Urban	3
Musa	İstanbul	Rural	2
Niyazi	Ankara	Rural	2
Mehmet	Uşak	Rural	4
Cennet	Konya	Urban	1
Elif	Bursa	Urban	3
Selma	Bolu	Urban	2
Azra	Rize	Urban	2
Buket	Denizli	Urban	1
Mahmut	Uşak	Rural	4

Half of the participants, consisting of seven women and five male teachers, work in rural schools and the other half in urban schools. Two teachers (Mahmut and Mehmet) from the participant group who have had internship training experience in 11 different cities completed their internship training in the same city. The cities where the participants did their internship are metropolitan, except three (Uşak, Rize and Bolu).

Data Collection Process

The data were obtained through two semi-structured interview forms (preliminary interview form, main interview form) prepared from the relevant literature and the expert opinions. The purpose of using the preliminary interview form with a total of seven questions is to get to know the participants more closely as a mathematics teacher and to create a sense of trust between the researchers and the participants. In the main interview form with a total of 12 questions, it was aimed to determine the experience and perceptions of the participants regarding their mentor mathematics teachers and academicians.

In the process of forming data collection tools, first, draft forms were prepared by using the relevant literature (for example, Avalos, 2011; Boz & Boz, 2006; Feiman-Nemser, 2001; MEB, 2018; YÖK, 1998). Then, the pilot applications were carried out with the three volunteer middle school mathematics teachers working in Uşak and draft forms were regulated in line with the observations regarding these applications. Finally, by receiving the opinions of two academicians who are experts in the fields of mathematics education and qualitative research, the interview forms were finalized.

All interviews conducted during the data collection process were held in the schools where the participants worked, in a suitable environment for the interview. The preliminary interviews took about twenty minutes and the main interviews took about thirty minutes. All interviews were recorded using a voice recorder within the information and consent of the participants.

Data Analysis Process

The main purpose in analyzing the data obtained in this research is to reveal the codes and themes that define the experiences and perceptions of the participants regarding their mentor mathematics teachers and academicians. For this purpose, data analysis was carried out in two phases (data editing, data coding). In the data editing phase, which is the first of these stages, a total of 24 audio recordings (approximately 600 minutes) obtained from the interviews were transcribed. During the transcript process, the statements of the participants were tried to be transcribed as much as possible. The accuracy of the transcripts was checked by listening to the audio recordings and reading the transcripts simultaneously. After the data editing phase completed in about 1 month, the data coding phase was initiated.

In the coding process, a draft coding key was first formed by using of the explanations, concepts and findings in the relevant literature (for example, Avalos, 2011; Boz & Boz, 2006; Feiman-Nemser, 2001; MEB, 2018; YÖK, 1998). The draft coding key was tested with the pilot study data and necessary arrangements (adding, removing, and editing codes or themes) were made. Then, the coding key was finalized (Table 2) after receiving expert opinion. Then the coding process was started.

In the coding process, a total of 24 transcript documents were examined in detail on the Nvivo 10 program with the participation of all researchers. Detailed discussions were made for the disagreements that occurred during coding, and decisions were made by reaching agreement. The coding process was completed in a period of approximately 2 months.

Table 2. The coding key

General Themes	Descriptions and Sub-Codes
Importance of mentors	The participants' belief in the importance of mentor mathematics teachers and academicians <ul style="list-style-type: none"> - Giving importance - Considering worthless
Contribution of mentors	The participants' belief in mentor mathematics teachers' and academicians'

	<p>contribution to pre-service teachers' professional development</p> <ul style="list-style-type: none"> - Contributing to the development of general teaching competencies (communication skills, cooperation skills, planning skills etc.) - Contributing to the development of mathematics teaching competencies (increasing students' motivation to learn mathematics, using technological resources in mathematics teaching, using materials in mathematics teaching etc.) - No contribution
Attitude of mentors	<p>The participants' belief in mentor mathematics teachers' and academicians' attitude to internships and pre-service teachers</p> <ul style="list-style-type: none"> - Positive approach: Valuing, caring, having positive expectations etc. - Negative approach: Ignoring, having negative expectations etc.
Qualities of mentors	<p>The participants' belief in the qualifications that mentor mathematics teachers and academicians should have</p> <ul style="list-style-type: none"> - Volunteering - Having professional competence (effective use of different teaching methods, effective classroom management, effective communication, having professional experience etc.) - Having good character traits (Self-confidence, patience, collaboration, etc.)

Results

The Importance and Professional Contribution of Mentors

In the interviews, the participant middle school mathematics teachers defined the mentor mathematics teachers as the most important factor in the internship education process of a pre-service middle school mathematics teacher. They believe that the motivation and approach of the mentor mathematics teachers is the most important factor determining the success of the internship process. It was observed that they attributed less importance to the mentor academicians than the mentor mathematics teachers did. They think that the mentor academicians is away from the internship schools and therefore cannot contribute to the professional development of the pre-service mathematics teachers, especially the development of mathematics teaching skills. The participants often defined tasks controlling the internship process for the mentor academicians:

Buket: ... I think the most important factor is our [mentor] teacher in internship school. I think it is important whether he really wants us to be there at school. Does he really want to contribute to us, this is very important. Otherwise, the teacher in university (mentor academicians) cannot do much. What can he/she do? He follows the most. It communicates with the other teacher (mentor mathematics teachers). Is this whether we come or not? I do not think there are too many tasks for them...

Regarding the professional contributions of the mentor mathematics teachers, most of the participants (10 participants) stated that they have contributed from their mentor teachers in terms of the development of their general teaching competence (e.g. effective communication, classroom management, tolerance). For example, Elif and Sedat stated that they achieved significant gains from their mentor teachers about how they should approach the student in school:

Elif: ...I loved my mentor teacher's tolerant and warm-hearted nature and the relationship with the students. When I started to work, I tried to treat my students like this. For example, I do not model him completely. However, I model this feature of him to establish a better relationship with students...

Sedat: ...I thought that the students would consist of a profile that listens more and does not cause much problems. When the students behaved improperly in the classroom, that attitude of the teacher changed my perspective on students. I realized that I should be more tolerant to the students...

However, two participants (Reyhane and Niyazi) believe that their mentor mathematics teachers had no professional contribution:

Reyhan: ...I do not believe [mentor teacher] has any contribution if we consider the internship I live in.

Niyazi: ...I want to believe, but I think she has no contribution.

Approach of Mentors to Internship Process

In the interviews, it was observed that the participants believed that their mentor mathematics teachers and academicians did not attach enough importance to internship of pre-service mathematics teachers:

Selma: ...My mentor teacher did not care about anything. I just don't know if it's just me. The communication he had with me was just "hello", "welcome". That is all...

Buket: ...So I do not remember talking to our university instructor (the mentor academician) about my internship. Sometimes, he asked us if we went to the internship schools that is all...

The majority of the participants (8 participants) stated that they had the opportunity to meet with their mentor academicians once or twice during the internship process, and that these interviews were conducted due to information or paperwork about the internship process. They stated that their mentor academicians never visited the internship schools and were not involved in their application lessons:

Selma: ...We met once at the beginning of the semester with our university instructor (the mentor academician). Normally we had one hour of internship lesson per week. We were not doing that lesson. He told us what to do at the beginning of the semester. He never came to our internship school to check us out. Normally mentor academicians are actually coming the internship school from time to time, whether we continue or not. He did not do it either. He gave our note and our internship were over...

Şeyma stated that she had never met with her mentor academicians during the internship process:

Şeyma: ...I never remember my mentor university instructor. I do not know who was interested with us in the internship process. We only had a counselor. He was concerned with most of our things, but we did not have a dialog with him about my internship. I do not remember which academicians was interested in us during the internship. I asked my friend but he did not remember our advisor too...

In general, the participants defined the most important expectations of mentor academicians from pre-service mathematics teachers as “going to internship school regularly” and “paying attention to the documentation” and “paying attention to appearance”:

Selma: ...The thing that our university instructor (the mentor academician) gave the most importance was that we were not absent. He wanted us to take care of our clothes while going to the internship school. He was a relaxed person. At the beginning of the semester, he said, "everybody will get 100 score from this internship lesson, will pass with AA (the highest passing grade), be comfortable but do not be absent"...

Mahmut: ...I mean I have a memory that I cannot forget, but it may not have a remarkable memory. As I said, he was a person who attached great importance to documentation. When I forgot to hand over the internship report, I saw that this is the only thing that gives importance. Once I forgot, he called me on the first day of the Eid. I was very surprised to call for such a thing on the day of Eid...

Regarding the approach of the mentor mathematics teachers to themselves, the participants in general stated that the mentor mathematics teachers act in the sense of easing pre-service teachers' responsibilities and facilitating their work by allowing them to do absenteeism and reducing the number of internship activities:

Musa: ...As I said, our internship teacher allowed us to do our practice lessons once in 3 weeks or once a month. This made our job much easier...

However, in the interviews, one participant (Buket) emphasized that this approach of the mentor teachers was harmful for pre-service teachers' professional development. Buket shared her belief that this approach of the mentor teachers negatively affect the pre-service teachers' internship motivation:

Buket: ...But when they [the mentor teachers] told us "you came today, if you want you may not come for two or three weeks", the internship was much more difficult for us. Because we are already willing to be absent as students. Of course, all students' heads work the same. However, of course you realize that this is not a good thing after you start your profession, unfortunately...

In the interviews, the majority of the participants (8 teachers) defined the most important expectation of the mentor teachers from pre-service teachers' as "not to make waves". These participants stated that mentor teachers refrained from giving pre-service teachers responsibilities that would disrupt their own teaching routines. They stated that mentor teachers engaged pre-service teachers in non-teaching tasks such as "keeping students busy" or "entering students' scores into the e-school system":

Niyazi: ...They (the mentor teachers) had expectations such as entering student scores into the e-school system and keeping students busy when they did not come school or were tired in a lesson. Otherwise, they had no purpose or effort to teach pre-service teachers' something...

Musa: ...Let us not interfere with the lesson, how can I say, not break the flow of lesson. If a student made a mistake or wrong, let us not intervene as I said. Our internship teacher loved us, valued us, but as I said, he did not allow us to intervene with the lesson...

The Qualifies that Mentors Must Have

The participants believe that mentor mathematics teachers and academicians who will work with pre-service middle school mathematics teachers in the internship process should have the following three basic qualities: (i) voluntary participation, (ii) professional competence, and (iii) positive character traits.

Voluntary Participation: This criterion was the only criterion emphasized by all participants for both the mentor mathematics teachers and academicians. The participants stated that volunteering should be taken into consideration when determining mentors of pre-service middle school mathematics teachers:

Selma: ...So if this job is money based, everyone wants to do it. But if it is voluntary, people who really want to touch people's lives will do this job...

Musa: ...First of all, there must be trainers who will take care of this job [of mentor]. Otherwise, everyone is doing this work on paper. At the beginning of the year, he/she distributes the students [pre-service teachers] to the internship schools. But I think we have seen many lessons in 4 years, the most important was the internship lesson. And there must be someone who can conduct it (internship lesson) right. He/she should want to do it. He/she should guide the students from the beginning of the year, and follow them...

Professional Competence: During the interviews, half of the participants (6 participants) stated that the academicians out of the field of mathematics education (pre-service elementary classroom teachers' education, pre-service science teachers' education etc.) were assigned in internship training of pre-service mathematics teachers. These participants stated that they could not make any professional sharing with these academicians who are not competent in the field of mathematics education. They emphasized the necessity to choose mentor academicians who are experts in mathematics education.

Elif: My internship consultant (mentor academician) was a lecturer from the physics department at the university. He was our physic teacher, not my own field. That is why we did not have much in common, frankly. Apart from teaching physics lessons, we have not been able to establish a connection with him. He behaved coldly towards us. He did not talk to us in any way, except for the exam periods. I think that the mentors should be from the same field as the teacher candidates they work with...

The participants believe that the mentor academicians who have worked as a mathematics teacher in the past can better understand the difficulties faced by the pre-service mathematics teachers during the internship process and guide them better:

Reyhan: ...Perhaps [mentor] academicians would understand us better if they first worked as a mathematics teacher and later worked at the university. They says, for example, you will do it like this with a smart board. But, for example, in some schools, there is no normal board, no chalk, we see such bad situations, we live. The things that are taught in the university, the ones in theory, may not be in practice. Maybe they would better understand us if they had come from us...

In addition, the participants stated that the mentor mathematics teachers should have a series of competencies regarding the mathematics teaching. Participants have identified the following 5 competence areas for mathematics teachers who will mentor pre-service middle school mathematics teachers.

- Using of mathematics teaching materials-activities effectively (6 participants)
- Using different teaching methods and techniques effectively (4 participants)
- Lesson planning (2 participants)
- Classroom management (3 participants)
- Effective communication (2 participants)

Among these competencies, the most emphasized competency was “using mathematics teaching materials-activities effectively”. The participants emphasized the importance of teaching the abstract mathematical concepts by embodying them with activities and materials, and stated that the competence of the internship teacher in this field are critical for the professional development of pre-service mathematics teachers:

Reyhan: ...I think they (the mentor mathematics teachers) should be proficient in teaching mathematical subjects by embodying them. Because of the lack of time, we are not able to teach like this at the moment, but it is very important to embody especially in mathematics. Preparing materials in this way, teaching mathematics with games or activities, first of all, making students love mathematics, and giving students a positive perspective. These skills should be kept in the forefront when determining mentor mathematics teachers...

In addition, the participants shared their belief that the mentor mathematics teachers should be competent in internship activities. They emphasized the necessity of the mentor mathematics teachers to be trained before the internship process about the activities to be carried out during the process:

Musa: ...In order to avoid negative situations, the mentor mathematics teachers can also be trained about what to do in the process. A few days of training can be given. I think they should be educated...

They stated that the novice mentor mathematics teachers had negative effects on themselves and that they could not get rid of these effects for a long time:

Şeyma: He was a teacher for 4 years or so. I guess he was around 30 years old. He once said me “teach the lesson” in the classroom. Suddenly I got on the board. We were three friends but he told me. I got on the board, I was going to teach that lesson, but I did not know how to teach it. I was already excited. I came up against the children. He said “you can ask the kids to take notes”, you don't know how much authority you are given. He said “you are the teacher of this lesson now”, but you don't know if you can ask the children to take notes. You do not know if his order is broken or not. I had a hesitation about that. Teachers must be get ready for their lessons beforehand. I was talking in the lesson, I was teaching something, but the words were stuck in my throat. One of the children even said, “How will you be a teacher?”. I was so sorry when I heard this. Then he (the mentor mathematics teacher) intervened. He said that “your teacher did not know which topic to teach, so he was a little excited”. He recovered a bit, but he should not have dropped me in that position in the classroom. He should have told me the subject I was going to teach. He had to give time to prepare for the lesson. After this incident, we did not have much conversation anyway...

Positive character traits: The participants stated that mathematics teachers and academicians who will be assigned as mentor should have some personality traits in addition to the above-mentioned professional competencies. These traits are presented in separate titles in the table below (Table 3):

Table 3. The character traits that mentors should have

Academicians	Mathematics Teachers
– Being an effective communicator (7 participants)	– Being open to development-innovation (8 participants)
– Being a collaborator (5 participants)	– Being a good sharer (5 participants)
– Being motivating-guiding (4 participants)	– Being dynamic-energetic (4 participants)
	– Being an effective communicator (4 participants)
	– Being tolerant (3 participants)
	– Being motivating-guiding (3 participants)
	– Being self-confident (3 participants)
	– Paying attention to appearance (3 participants)
	– Being solution oriented (3 participants)
	– Being a collaborator (2 participants)

Among the character traits that the participants defined for the mentor academicians, the most emphasized trait was “being an effective communicator”. The participants specified that the mentor academicians, who they defined as ego owners, behaved very coldly towards pre-service teachers and had difficulty in communicating with them during the internship process. They shared their beliefs that the mentor academicians should take a sincere and tolerate approach to pre-service mathematics teachers:

Mehmet: ...While determining the mentor academicians, it would be more useful to choose a lecturer who understands students and can communicate effectively with them rather than a professor who is knowledgeable but behave coldly towards to students. Because as far as we can see, there is a different mentality within universities. As if, you cannot get close professors easily. There are many capricious and big-ego professors. It is enough for me that my mentor is a friendly lecturer rather than a professor...

The feature that the participants emphasize most about the mentor mathematics teachers was “being open to development-innovation”. In general, the participants stated that the mentor mathematics teachers exhibit traditional teaching practices focused on direct instruction while teaching mathematics lessons, and do not use of the concrete teaching materials and technological opportunities available in their classrooms:

Buket: ...He liked to continue with old [teaching] methods. There was a smart board but he could not use it much. She was not an effective teacher in terms of using material. She continued to teach mathematics in the old teaching methods...

Sedat: ...So he was using the [teaching] materials little. He used the classical teaching method more....

They expressed their belief that mentor mathematics teachers should be active mathematics teachers who can be a model for pre-service mathematics teacher with successful projects that try to keep up with the innovations in mathematics education. They proposed that school principals' views could be taken into account to identify mentor mathematics teachers with these characteristics:

Niyazi: ...I think that mentor teachers should be chosen among the teachers who are contemporary, follow innovations, strive to self-development and who can be role models to pre-service teachers...

Selma: ...This mission (mentoring) can be assigned to teachers who have carried out successful projects. Because a passive teacher who was not involved in a project does not contribute to anyone in any way...

Cennet: ...I think mentor teachers should be chosen from among the teachers who have exceeded ten years in the profession. Successful teachers should also be chosen. Of course, these teachers are better known by the school principals. Therefore, the opinions of school principals can be taken while determining mentors...

Conclusion, Discussion and Recommendations

In this study, in accordance with the current studies (Boz & Boz, 2006; Eraslan, 2008; Erhan-Kurt, 2016; Gökteş & Şad, 2014; Hacıömeroğlu, 2013; Kiraz & Yıldırım, 2007; Özmen, 2008), it was concluded that the participants have very negative experiences and perceptions towards the mentor mathematics teachers and academicians. Perhaps the most remarkable of these negative perceptions, as observed in the study by Hacıömeroğlu (2013), is the belief that the mentor mathematics teachers and academicians do not contribute to the development of mathematics teaching skills of pre-service middle school mathematics teachers. The participants believe that mentor teachers can only contribute to teacher candidates in terms of general competencies for the teaching profession, such as classroom management, effective communication and tolerance. Unfortunately, a significant part of these learning stems from negative experiences:

Buket: ...I may have learned not to be so inconsistent in the classroom...

These negative experiences are deeply engraved in the minds of pre-service teachers, who are the most dynamic practitioners of mathematics education reform attempts, as unforgettable memories:

Selma: ...My mentor teacher was a complete fiasco. The student profile in the classroom was problematic, but he was speaking in a way that would not suit a teacher. For example, I never forget that he said to a student who could not solve a problem in the lesson: "You are a waste of oxygen in the classroom!"...

It is possible that these unforgettable negative memories acquired by the participant mathematics teachers during the internship have negative reflections on the mathematics classes they serve. These negative memories from the internship process are likely to have negative reflections on the mathematics lessons of the participant teachers. Moreover, these negative memories may negatively affect the behaviors they will exhibit against pre-service mathematics teachers in the role of mentor teacher they will undertake in the coming years. Therefore, these findings indicate that mentor mathematics teachers and academicians in Turkey may have a negative effect on students' mathematics achievement.

Another negative perception observed in this study regarding mentors is the belief that mentor mathematics teachers and academicians do not value internship and pre-service teachers. The participants believe that the internship trainers act in the sense of "passing over" during the internship process. They defined the most important expectations of the mentors as "the teacher candidate does not cause any problems and does not disturb the order". According to them, the mentor academicians gives importance to the internship reports and the mentor teachers to keep the teaching routines intact. They believe that they can comfortably communicate with mentor teachers whom they define as "warm-hearted" while they can communicate with the academicians they define as "ego owner" with difficulty. However, their communication with mentor teachers is on daily topics (sports, university life, etc.) rather than mathematics education. These findings are in line with the findings of the studies conducted by Hacıömeroğlu (2013), Erhan-Kurt (2016), Eraslan (2008) and Bardak (2015) emphasizing the lack of communication and effort of the mentors.

In order to achieve the aims of internship education process, it is very important to establish an effective communication and sharing environment for teaching mathematics among all elements (pre-service teachers, mathematics teachers, and academicians) of this process. If the mentor mathematics teachers allow the pre-service teachers to freely evaluate and criticize their mathematics teaching activities in and out of the classroom, they will contribute to not only pre-service mathematics teachers but also the development of their own professional knowledge and skills. Mentor academicians should be able to be included in this shared learning environment between mentor teachers and pre-service teachers with the extensive knowledge of mathematics education, be able to offer support them and improve their own learning. Therefore, it is of great importance for the success of the internship education of pre-service mathematics teachers that the mentors are individuals who have deep knowledge and experience in mathematics education, are collaborative and open to criticism, discussion, and change. These were defined by the participant teachers as the characteristics that the mentors should have.

One of the most striking findings of this research was that the participants defined their mentor teachers as "helpful" because they relieved their workloads during the internship process and reduced their responsibilities (for example, ignoring their absenteeism). There is only one teacher candidate who expressed

her discomfort from this “passing over” approach of the mentor teachers. This is an alarming finding for the success of the reform initiatives in the field of mathematics education in Turkey. Because this inaccurate perception of mathematics teacher candidates regarding mentor teachers will negatively affect the efficiency of their internship motivation and effort and therefore their professional development. This perception of the pre-service mathematics teachers needs to be changed.

One of the reasons for this inaccurate perception may have been that the pre-service mathematics teachers did not understand the importance of internship education enough. Therefore, the mentor mathematics teachers and academicians have an important role to change this perception. Mentors can discuss the importance and requirements of internship education with pre service mathematics teachers. Through these discussions, it can be ensured that mentors and pre-service mathematics teachers create common expectations in line with the objectives of the reform. Another important reason for this inaccurate perception may be the excessive workload and stress caused by internship workings and KPSS (Public Personnel Selection Exam used in teacher appointments) preparations corresponding to the same process. In order for teacher candidates to focus more on internship studies, internship education can be implemented by spreading it to the undergraduate process and extending its duration.

Despite all these negative experiences and perceptions, the participant teachers define mentor mathematics teacher and academicians, especially mentor mathematics teachers, as one of the most important factors in the professional development of mathematics teacher candidates. For this reason, they believe that education managers should be very careful in the selection of mentor, in parallel with the participants of the research conducted by Göktaş and Şad (2014) and Kiraz and Yıldırım (2007). They think that mathematics teachers and academicians who will be assigned in the internship education that they defined as a “challenging” task should be chosen from among those who have a passion for this task. The participants stated that the mentor teachers, who continue to teach mathematics with out-of-date methods, should be removed from the internship system and that innovative mathematics teachers, which may be suitable models for teacher candidates, should be included in the system.

In considering these suggestions of the participant mathematics teachers, through the collaboration of YÖK (Council of Higher Education) and MEB (Ministry of Education) first of all, the mathematics educators (academics and mathematics teachers) who are willing for this “challenging” task can be determined. These volunteer educators can be included in a series of training programs focused on mathematics education reform and internship program in order to increase their mentoring competencies. In order to encourage these competent internship trainers to collaborate, appropriate working environments can be created on a provincial basis. By providing appropriate working environments, these competent internship trainers can be encouraged to work collaboratively. The knowledge and practices that competent mathematics educators will produce together in these shared environments will contribute significantly to the professional development of pre-service mathematics teachers, who are the youngest and most dynamic practitioners of reform.

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References

- Avalos, B. (2011). Teacher professional development in teaching and teacher education over ten years. *Teaching and Teacher Education*, 27(1), 10-20.
- Baki, A. (2001). Bilişim teknolojisi ışığı altında matematik eğitiminin değerlendirilmesi. *Millî Eğitim Dergisi*, 149(1), 26-31.
- Bardak, Ç. (2015). Öğretmen eğitim programının uygulama boyutuna yönelik öğretmen görüşlerinin incelenmesi Doğu Akdeniz Üniversitesi]. Gazimağusa, Kuzey Kıbrıs.
- Boz, N., & Boz, Y. (2006). Do prospective teachers get enough experience in school placements? *Journal of Education for Teaching*, 32(4), 353-368.
- Creswell, J. W. (2007). *Qualitative inquiry and research design: Choosing among five approaches* (2nd ed.). Sage.
- Day, C., Elliot, B., & Kington, A. (2005). Reform, standards and teacher identity: Challenges of sustaining commitment. *Teaching and Teacher Education*, 21(5), 563-577.
- Demir, M. K., Şahin, Ç., & Arcagök, S. Sınıf öğretmeni adaylarının okul deneyimi derslerine ilişkin tutumlarının değerlendirilmesi. *Dicle Üniversitesi Ziya Gökalp Eğitim Fakültesi Dergisi*, 25, 136-156.
- Demircan, C. (2007). Okul deneyimi II dersine yönelik öğrenci görüşlerinin incelenmesi (Mersin Üniversitesi Örneği). *Mersin Üniversitesi Eğitim Fakültesi Dergisi*, 3(2), 119-132.
- Donche, V., Vanhoof, J., & Van Petegem, P. (2003). Beliefs about Learning Environments: How Do Student Teachers Think, Reflect and Act Concerning Self Regulated and Cooperative Learning in Flanders (Belgium)? AERA, Seattle, WA.

- Endedijk, M. D., Vermunt, J. D., Verloop, N., & Brekelmans, M. (2012). The nature of student teachers' regulation of learning in teacher education. *British Journal of Educational Psychology*, 82(3), 469-491.
- Eraslan, A. (2008). Fakülte-okul işbirliği programı: Matematik öğretmen adaylarının okul uygulama dersi üzerine görüşleri. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi*, 34(34), 95-105.
- Erhan-Kurt, G. (2016). Matematik öğretmen adaylarının okul deneyimi dersine yönelik beklentileri nelerdir? *Eğitim ve Öğretim Araştırmaları Dergisi*, 5(3), 279-289.
- Ersoy, Y. (2005). Teknoloji destekli matematik eğitimine-öğretimine bakışlar-I: Fen lisesi matematik öğretmenlerinin görüşlerinden kesitler. *TOJET: The Turkish On Line Journal of Educational Technology*.
- Feiman-Nemser, S. (2001). From preparation to practice: Designing a continuum to strengthen and sustain teaching. *Teachers College Record*, 103(6), 1013-1055.
- Göktaş, Ö., & Şad, S. N. (2014). Okul deneyimi ve öğretmenlik uygulaması dersi uygulama öğretmenlerinin seçim süreci: ölçütler, sorunlar ve öneriler. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi*, 29(4), 115-128.
- Güneş, G. (2008). *Yeni ilköğretim matematik dersi öğretim programının öğretme öğrenme ortamına yansımaları [Reflection on new primary school mathematics curriculum on the teaching and learning environment]* [The University of Karadeniz Technical]. Trabzon, Turkey.
- Hacıomeröglü, G. (2013). The field experiences of student teachers and effective mathematics teaching in Turkey. *Australian Journal of Teacher Education*, 38(2), 132-142.
- Karakuş, M., & Yeşilpınar, M. (2013). İlköğretim altıncı sınıf matematik dersinde uygulanan etkinliklerin ve ölçme-değerlendirme sürecinin incelenmesi: Bir durum çalışması [An analysis of activities and measurement-evaluation process in a sixth grade math lesson: A case study]. *Pegem Journal of Education and Instruction*, 3(1), 35-54.
- Kıldan, A. O., İbret, B. Ü., Pektaş, M., Aydınözü, D., İncikabı, L., & Reçepoğlu, E. (2013). Evaluating views of teacher trainees on teacher training process in Turkey. *Australian Journal of Teacher Education*, 38(2), 51-68.
- Kiraz, E., & Yıldırım, S. (2007). Enthusiasm vs. experience in mentoring: A comparison of Turkish novice and experienced teachers in fulfilling supervisory roles. *Asia Pacific Education Review*, 8(2), 250-260.
- Kremer-Hayon, L., & Tillema, H. (1999). Self-regulated learning in the context of teacher education. *Teaching and Teacher Education*, 15(5), 507-522.
- Milli Eğitim Bakanlığı. (2012). *Eğitimde FATİH Projesi*. <http://fatihprojesi.meb.gov.tr/>
- Milli Eğitim Bakanlığı. (2018, 11.08.2018). *Uygulama öğrencilerinin Millî Eğitim Bakanlığına bağlı eğitim öğretim kurumlarında yapacakları öğretmenlik uygulamasına ilişkin yönerge*. Author. https://oygm.meb.gov.tr/meb_iys_dosyalar/2018_06/25172143_YYnerge.pdf
- Milli Eğitim Bakanlığı [Ministry of Education]. (2005). *İlköğretim matematik dersi (6-8. sınıflar) öğretim programı [Middle-school mathematics curriculum (grades 6-8)]*. Author.
- Milli Eğitim Bakanlığı [Ministry of Education]. (2013). *Ortaokul (5, 6, 7 ve 8. sınıflar) matematik dersi öğretim programı [Middle-school (grades 5, 6, 7 and 8) mathematics curriculum]*. Author.
- Milli Eğitim Bakanlığı [Ministry of Education]. (2018). *Matematik dersi öğretim programı (ilkokul ve ortaokul 1, 2, 3, 4, 5, 6, 7 ve 8. sınıflar) [Mathematics curriculum (primary and middle school 1, 2, 3, 4, 5, 6, 7 and 8 grades)]*. Author.
- Moustakas, C. (1994). *Phenomenological research methods*. Sage.
- Mullis, I. V. S., Martin, M. O., Foy, P., & Arora, A. (2012). *TIMSS 2011: International results in mathematics*. Boston College.
- Mullis, I. V. S., Martin, M. O., Foy, P., & Hooper, M. (2016). *TIMSS 2015: International results in mathematics*. Boston College. <http://timssandpirls.bc.edu/timss2015/international-results/wp-content/uploads/filebase/full%20pdfs/T15-International-Results-in-Mathematics.pdf>
- Olson, J. F., Martin, M. O., Mullis, I. V. S., & Arora, A. (2008). *TIMSS 2007: Technical report*. Boston College.
- Oosterheert, I. E., & Vermunt, J. D. (2001). Individual differences in learning to teach: Relating cognition, regulation and affect. *Learning and Instruction*, 11(2), 133-156.
- Ören, F. Ş., Sevinç, Ö. S., & Erdoğan, E. (2009). Öğretmen adaylarının okul deneyimi derslerine yönelik tutumlarının ve görüşlerinin değerlendirilmesi. *Kuram ve Uygulamada Eğitim Yönetimi Dergisi*, 15(2), 217-246.
- Özkılıç, R., Bilgin, A., & Kartal, H. (2008). Öğretmenlik uygulaması dersinin öğretmen adaylarının görüşlerine göre değerlendirilmesi. *İlköğretim Online*, 7(3), 726-737.
- Özmen, H. (2008). Okul deneyimi-I ve okul deneyimi-II derslerine ilişkin öğretmen adaylarının görüşleri. *Ondokuz Mayıs Üniversitesi Eğitim Fakültesi Dergisi*, 25, 25-37.
- Temizöz, Y., & Koca, S. A. Ö. (2010). Matematik öğretmenlerinin kullandıkları öğretim yöntemleri ve buluş yoluyla öğrenme yaklaşımı konusundaki görüşleri. *Eğitim ve Bilim*, 33(149), 89-103.

- Turgut, M., Yılmaz, S., & Firuzan, A. R. (2008). Okul deneyimi uygulama sürecinin değerlendirilmesi üzerine bir araştırma. *Bilim, Eğitim ve Düşünce Dergisi*, 8(2), 1-26.
- Uçar, Z. T., & Demirsoy, N. H. (2010). Eski-yeni ikilemi: matematik öğretmenlerinin matematiksel inançları ve uygulamaları. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi*, 39(39), 321-332.
- Yükseköğretim Kurumu. (1998). *Fakülte-okul işbirliği*. Author.