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Research Article

Preservice Mathematics Teachers' Performances in Teaching Activities[1]

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Abstract:

In this study, it was tried to determine teaching activities that elementary preservice mathematics teachers exhibited in a micro teaching session. Preservice teachers are required to prepare and later present a sample micro teaching session. First of all, they were advised to freely select a topic (or an attainment) of their own intention within 5-8 middle school mathematics subjects. Then, every one of them planned their own special session. While they were planning the sessions, they were advised to take into account of all perspectives and practices of the theoretical subjects covered via the course of Special Teaching Methods 1 and the experiences that they gained during the other courses of the mathematics teacher education program. After that, each one performed tasks in the classroom environment related to their own planning. No intervention was made to the preservice mathematics teachers by the lecturer during the sessions. After each session, the remaining candidates and the lecturer made critique about the candidate's performance. The study was conducted with 50 preservice teachers who take Special Teaching Methods II course. A systematic observation form has been prepared and used for data collection. Descriptive analysis and content analysis based on observations were used as mixed methods in the study. Findings show that preservice mathematics teachers have some misconceptions regarding the lectured subject, besides the deficiencies and mistakes in the course planning and performance.

Keywords: Teacher education, instruction activities, preservice mathematics teachers, mathematics education

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INTRODUCTION

There have been rapid developments in the world in many areas such as science, technology, economy, social, et al., and these developments continuously transform the qualities of the individuals needed by societies. This certainly requires innovation and changes in mathematics education. In our age, mathematics is considered crucial, as it has provided nearly all of the science with resource and has played an important role in the development of societies (Aksu, 2008). Also in Turkey, many changes have been experienced and teaching programs have been conducted in the field of mathematics education. In the year 2005, the mathematics education program has been established with a new approach. Changing only the teaching program, however, is not sufficient to improve the quality of the activities on teaching and education (Çanakçı, 2008). For, besides the reforms that are made, it is required that the individuals who will be the operators of those reforms have positive beliefs, and show no resistance to innovation and change (Battista, 1994). It is important thus, that teachers, the operators of the reforms on teaching and education, refresh themselves and keep up with the changing conditions. The quality of the education given in the institutions that train the teachers who play a key role in the actualization of the reforms play a crucial role (Battista, 1994; Rogers and Steele, 2016). Faculties of education aim to train the teachers as individuals having knowledge on the field, the knowledge on teaching of the field, and general culture (Baki, 2010). The pedagogic knowledge on the field, suggested by Shulman (1986), is tried to be given in the period of teaching education, before entering professional life. In this context, The Council of Higher Education (CoHE) in Turkey has brought together the teacher candidate and the student, around the subject to be taught, and extended the period of preservice practices, to combine the theory with the practice, in the year 1998 (Baki, 2010). The research, however, show that the preservice practices exercised in schools were not sufficient for the teachers to gain competence (Büyükgöze Kavas and Bugay, 2009; Arslan and Özpınar, 2008; Eraslan, 2008; Köroğlu, Başer and Yavuz, 2000). It was expressed that the preservice activites had not reached their goal, due to reasons such as the operating teacher not having sufficient time for attending to individual preservice mathematics teachers, preservice mathematics teachers not having active involvement in in-class activities, and the faculty members having problems on auditing (Eraslan, 2008). It has thus been suggested by the researches that it was necessary to concentrate on applied courses, for the teachers to respond the needs regarding field education (Eraslan, 2009; Toluk Uçar, 2011; Köroğlu, Başer and Yavuz, 2000).

In the faculties of education, preservice mathematics teachers are taught the courses of special teaching methods I-II, in the scope of pedagogical field knowledge to improve their professional knowledge and abilities. In the scope of the course, they have to be able to learn the students' knowledge of syllabus, their areas and subareas of learning, how they comprehend, the special teaching methods on the subject, to design materials and learning activities particular for that subject, and the skill to evaluate the students (Baki, 2010). Earlier research appears to have been made on the structural changes on faculties of education,

student opinions, and the content of those (Arslan and Özpınar, 2008; Baki, 2010; Devecioğlu and Akdeniz, 2016; Umay, 2001; Eraslan, 2008; Eraslan, 2009). How the preservice mathematics teachers, as teachers of the future, apply their knowledge on the field and of teaching of the field have been points of interests for this study. In this context, the question of "What are the teaching activities of preservice mathematics teachers, in a micro teaching session?" has been tried to be addressed.

Purpose of Study

The purpose of this study is to determine the teaching activities, exhibited by elementary preservice mathematics teachers in a micro teaching session.

METHOD

This study had been carried out in 2015-2016 academic year, in the course of special teaching methods II of the faculty of education of a public university. The course was divided in two parts as theory and application. In the theoretical part, the first researcher provided the participants with general information on field teaching. In the latter, application part of the course, it was requested from participants that they compose and present a course plan regarding an attainment of their preferance. During this teaching activity, they were asked to consider themselves as teachers of the respective classes, and the remaining participants were asked to act like students of the class for which the attainment was for, and thus the creation of a simulation environment was tried. The students were asked to exhibit in class, the attitude they expected from middle school students. The classroom environment which is tried to be produced was observed by the first and the third author of this study through participatory observation. The study, in this sense, was designed as mixed method, and the data obtained via systematic observation forms was tried to be evaluated both quantitatively and qualitatively.

The Sample

Focus group of the study consists of 50 participants that take the course. The focus group was formed by the method of purposive sampling. Purposive sampling is the kind of sampling in which the researcher selects the focus group most appropriate to the purpose of the study, with his/her own judgement (Balcı, 2006). Accordingly, the participants were the students who had taken the course of Special Teaching Methods I.

Data Collection

In the study, observation forms were composed for the purpose of detecting the behaviours of elementary preservice mathematics teachers in micro teaching sessions. The form consists of the activities a teacher theoretically can exhibit during the session. Behaviours not included in the observation form but emerged during the lecture were also appended to the form. The possible activities were considered in 4 situations: 3: Very good

2: Good 1:Insufficient 0: The behaviour was not exhibited. Additionally, the researchers took notes during the lectures of the participants, and tried to determine showing up misconceptions about the lectured topic.

Analysis of the Data

In the study in which descriptive analysis was used, the observation form was analyzed with rubric evaluation, and the data obtained from observation notes were subjected to content analysis by the researchers.

RESULTS AND FINDINGS

Table 1
Teaching Activities Exhibited by Teacher Candidates

Exhibited Behaviour	*f*	%
Informing of pre-attainments	50	100
Informing of atteinments and abilities	50	100
Compliance with the treatment steps	50	100
Illustration of concepts	50	100
Regarding to the duration	50	100
Relating with the field of learning	49	98
Emphasizing important points	49	98
Employing the examples and activities in the textbook	49	98
Giving feedback	49	98
Making reminders	48	96
Attention on involvement in the lecture	48	96
Employing alternative activities and examples	48	96
Utilizing proper methods	48	96
Association	48	96
Introduction to lecture and greeting	47	94
Paying attention to the use of the symbols	47	94
Evaluating properly	46	92
Emphasis on the textbook	45	90
The use of tools and instruments	45	90
Closing and greeting	39	78
Giving and controling assignments	36	72
Utilization of technology	20	40
Constructing problems	0	0
Paying attention to the steps to solving problems	0	0

According to the data obtained from the studies, the behaviours of utitization of technology, closing and greeting, and giving and controling assignments were the ones least

exhibited by elementary preservice mathematics teachers. It has been determined that the preservice teachers never exhibited the beahviours of constructing problems, solving problems and complying with problem solution steps. The beahviours of informing of attainments and abilities, compliance with the treatment steps, making reminders about the subject, designing and practicing activities about the subject, introduction to lecture and greeting, informing of pre-attainments, and illustration of concepts were their most exhibited teaching activities. Additionally, it was seen that all of the preservice teachers informed of pre-attainments, attainments and abilities, and complied with the treatment steps. All of the teacher candidates were observed in lecturing to generally utilize powerpoint presentations, to not experience problem in class management, to lecture with more of a teacher oriented approach, and to design a cooperative learning environment. It has also been revealed that the preservice teachers, regarding the field knowledge, had some misconceptions regarding the relations between quadrilaterals and between prisms, the concepts of unknown and variable, and modeling of operations with fractions.

CONCLUSION

In the study, it was aimed that in-class teaching activities of elementary preservice mathematics teachers were determined. It has been concluded that the preservice teachers had exhibited behaviours of informing of attainments and abilities, compliance with treatment steps of the subject, making reminders about the subject, designing and executing relevant activities, introduction to lecture and greeting, informing of pre-attainments, and illustrating concepts, at the most. The least exhibited behaviours were determined to be utilizing technology, greeting in closure, giving assingnments and controling them. In addition, it was seen that the preservice teachers never exhibited the behaviours of constructing problems, solving problems, and complying with solution steps. Therefore, it is not possible to say that the preservice teachers are professionally sufficient in exhibiting expected behaviours in class. It was also seen that they were self-confident in utilization of new technology, yet they did not have the opportunities to practice it, in actual classroom environment. This result supports the conclusion of Arslan and Özpınar (2008). In their study, it is stated that the teacher candidates did not have the opportunity to utilize technology. As reasons of these obtained results, it is possible to suggest the education system that they came from, and that they were not in an actual classroom environment.

RECOMMENDATIONS

Increasing the number of applied courses in faculties of education has been suggested by many researchers (Erarslan, 2008; Erarslan, 2009; Köroğlu, Başer and Yavuz, 2000; Toluk Uçar, 2011). In the light of this study's results, it can be suggested the practices which provide teachers to think reflectively to be more concentrated on, and the practices that combine pedagogical field knowledge with innovations on technology to be included, in faculties of education. In addition, if it is considered that the most crucial abilities that are

aimed to be obtained via curriculum include the ability to solve problems, the courses that involve production of problems, the application of problem solving steps into actual life, and original problems, may be added in elementary mathematics education programs.

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