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Six Hat Thinking Technique in Program Evaluation: The Evaluation of the Quality of Mathematics Teacher Training Program in Turkey*

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ABSTRACT

In this research, the aim was to get the primary school mathematics teacher training program evaluated by the prospective teachers by using the six hat thinking technique. In this study, phenomenology, which is a qualitative research design, was used. The participants of the study consisted of 18 senior university students who are prospective teachers and were chosen considering their experiences in the program. The data were collected by means of a written form on which the prospective teachers expressed their ideas about the program under each hat. The data collected were subject to content analysis. Result of the research show that the opinions of prospective teachers' on the quality of the mathematics teacher training program were gathered under the following themes: the curriculum, teaching staff, educational environment and their occupation. In conclusion, prospective teachers have positive and negative opinions about quality of mathematics teacher training program. Aspects of the curriculum were emphasized by the prospective teachers in all the themes that emerged.

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Keywords:
Quality, mathematics teacher training program, program evaluation, prospective mathematics teacher, six thinking hats technique

Introduction

Improvements in science and technology had a direct impact on the field of education as they had on every other field. These worldwide developments have reshaped the educational systems. The importance of education, which played a very significant role in societies' advancements and developments from past to present, in order to keep up with these improvements, has gained even more significance. Considering the fact that the main purpose of the education is to serve the students, who are the most important stakeholders, and to provide their being educated as contemporary individuals who are capable of keeping up with these improvements and changes (Simsek, 2009); it can be clearly seen that the prerequisite for the realization of qualified education is: applied programs' being qualified, efficient and sufficient (Demirhan-Yuksel, 2011). In parallel with all these, it was decided to go through a reconstruction in teacher training programs which have an important impact on education. (The Council of Higher Education in Turkey [CHE], 2007).

Especially today, when the notion of quality in education gained importance, the configuration of the teacher training programs according to the quality standards, and these programs' training teachers, who are suitable to meet the needs of our era, has been gaining importance with regards to the improvement of the educational system. Besides this, it is necessary to question all components of the teacher training system in a continuous evaluation process and to improve them continuously in order to train the teachers in the

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quality and quantity required today and in the future (Atanur-Baskan, Aydin, & Madden, 2006). The most important feature of this system, which puts the notion of learner in the center, should be the student and the student's expectations from a qualified education (Demirhan- Yuksel, 2011). Therefore, considering the fact that prospective teachers are some of the people who can witness the quality standards best as one of the internal stakeholders of the teacher training programs. Prospective teachers' opinions on this matter are crucial for the durability of this training programs' applicability. Especially in recent years, international exams showed that sufficient achievements have not been obtained in the field of mathematics education in Turkey. Even though there has been an effort to do some evaluation and reconstruction in primary school and secondary school levels education, as a consequence of findings of national and international research studies, there has been no sign of an evaluation study on the mathematics teacher training programs. In this context, it is considered that an evaluation of the current program's quality would become a crucial source for the reconstructions in the field of mathematics education and teacher training.

The Notion of Quality and Quality in Education

The notion of quality, which is defined in the literature of management as "perfection" (Peters & Waterman, 1982), "conformance to requirements" (Crossby, 1979), "fitness for use" (Juran, 1998) and "to meet the customer's expectations" (Parasuraman, Zeithaml & Berry, 1985) is directly related to the field of education (Erisen, 2001). If it is considered that the main stakeholders of education are the students; quality in education is understood as reaching perfection, consistency, conformance to conditions, the change or improvement of a student or a teacher with the activities which helps them gain knowledge and value (Harvey, Green, Burrows, 1993).

Recently, with the importance given to teacher training, the efforts of developing standards in order to increase the quality of teacher training have accelerated (Erisen, 2001; Yanpar-Yelken, Celikkaleli, & Capri, 2007; CHE, 1999; 2007). The standards, which state the criteria and a designed performance level to be met for the programs to be successful (Worthen, Sanders, & Fitzpatrick, 2004), is a main principle used in evaluation by experts. Developing standards for teacher training provides a basis for creating the content of the teacher training programs and making them stronger, besides helping the impacts of the global developments to be reflected on the teacher training programs (Tas, 2014).

When the studies done in the recent years are reviewed, it is seen that the quality of higher education programs are evaluated (Devebakan, Kocdor, Musal & Gunel, 2003; Donald & Denison, 2001; Guzel, 2006; Kaya & Engin, 2007; Ozcalik, 2007; Sakarya, 2006; Watty, 2006; Yenen & Gozlu, 2003); quality standards of teacher training programs are formed (Erisen, 2001; Ok, 1991; Tas, 2004; Yanpar-Yelken et al, 2007) and the quality standards that were formed were evaluated according to instructors' (Bayulken, 1999; Tas, 2004), experts' (Oser, 1998), prospective teachers' (Bayulken, 1999; Erisen, 2001; Ok, 1991; Williams & Alawiye, 2001; Tas, 2004; Yanpar-Yelken, 2009) and in-service teachers' (Bayulken, 1999; DeRousse, 2000; Tas, 2004) opinions. Besides, in literature there are also studies which examine the satisfaction level of prospective teachers on the training programs they have been attending (Arslantas, 2011; Ceylan & Demirkaya, 2006; Ozcakir-Sumen & Caglayan, 2013; Sahin, 2009; Sara & Kocabas, 2012; Tatli et al, 2011) and on the teaching staff (Kumral, 2009; Ozdemir & Uzel, 2010; Parpala & Lindblom-Ylanne, 2007; Sen & Erisen, 2002).

When these studies are reviewed, it was seen that generally, the majority of these were quantitative studies which were built on data that were collected with the help of questionnaires. On the other hand, the number of qualitative studies is determined to be limited. It was also seen that the data for qualitative studies were collected by means of semi-structured interviews or written expressions of opinions requested from the participants. However, in order to evaluate a program, it is necessary to look at it from different perspectives.

Six Thinking Hats Technique and Its Employability in Program Evaluation

Thinking skills possess an important place among the main required qualifications for today's people. Fundamental skills, which are expected from a qualified person, such as analyzing events with regards to cause and effect relations, versatile thinking, having a critical point of view and creative thinking (Taspinar, 2014) are also important in terms of program evaluation activities as they are in many fields.

Six thinking hats technique, which was founded by Edward De Bono in the beginning of the 1980's, is used in the teaching-learning process with the purpose of improving the thinking skill, and it consists of the combination of the source of opinion and side opinions. The task of this technique is to help individuals with important decisions, conclusions and judgements (de Bono, 2009). With this technique, it is aimed to have a versatile thinking by looking at an issue from different perspectives and separating emotions from logic, and creativity from knowledge by doing so. The wide-range thinking hat involves six hats in six different colors. Each hat is defined with six different characters and suitable roles for these characters. The important thing here is the ability of the individual to play the roles represented by each color (Ayaz-Can & Semerci, 2007). The opinions which are represented by the colors can be summarized as follows (de Bono, 2009):

White hat: White is representative of objectivity. It is about facts and numbers. It helps us to recognize the facts about an issue by being based on the information that is explicit, quantitative and research oriented. Red hat: It is to look at an issue with reactions, emotions, and instincts instead of a rationalist point of view.

Black hat: It is the hat of logical negativism, pessimism, warning and negative judgement. It brings a critical and pessimistic point of view upon matters. Risks of the subject, and the problems/criticisms it will bring in the future are expressed.

Yellow hat: It is logical positivism. It searches for the valuable and beneficial things and provides them with logical support. The positive sides of matters are expressed with an optimistic viewpoint. Green hat: It is the hat of creativity, alternatives, and change. New ideas are produced. Blue hat: It is the hat of control. It organizes thinking activities. It draws conclusions by analyzing the opinions which were obtained.

In this way, with this technique, it is provided that the individual express his/her opinions by directing his/her attention from one point to another, he/she looks at the events from different point of views and unfolds every aspect of the event (Ayaz-Can & Semerci, 2007). For this reason, six thinking hats technique (de Bono, 2009), which enables us to look at a problem or an issue from many different point of views, to think systematically and to make right decisions, establishes an appropriate ground for prospective teachers to express their opinions on the quality of the teacher training program. Therefore, it is beneficial to discuss the employability of the six thinking hats technique in program evaluation.

The purpose of this research is to help prospective primary school mathematics teachers to evaluate the training program, of which they are also the stakeholders, by using the six thinking hats technique. In this context, we seek an answer for this question: What are the opinions of prospective mathematics teachers on the quality of the training program when the six thinking hats technique is used?

It is hoped that this study, which is the very first in the literature in terms of prospective teachers' evaluating the quality of the teacher training program by using the six thinking hats technique, will enlighten the way for further studies on the subject.

Methodology

This research is a qualitative research which is based on the interpretivist paradigm, which enables a phenomenon to be reviewed from the participants' perspectives (Merriam, 2009). In this research, that aims to find out the opinions of prospective mathematics teachers on the quality of training programs by using the six hat thinking technique, the phenomenology design, which provides an opportunity for defining the interpretation of the research participants' experiences about a notion or a phenomenon (Creswell, 2013; McMillan, 2008), is used. Thus, the understanding of the real nature of the experiences, which represents different meanings to different people, is ensured (van Manen, 1990).

Participants

In order for participants to be easily accessible (Glesne, 2011), these participants were chosen among prospective teachers who had been attending a Primary School Mathematics Teaching bachelor's program in the academic year of 2013-2014, in a university based in Istanbul, from which the permissions for conducting the research was taken. Creswell (2013) stated in his phenomenology researches that a group which has experienced every aspect of a phenomenon is the appropriate sample. In this sense, the participants of this research are consisted of 5 male, 13 female, 18 prospective teachers in total, who were in their senior years in the university, and who were chosen according to the purpose (Patton, 2002) while considering the fact that

they have more experiences in the program since they are in their senior years. Ages of the participants varied between 21 and 25 (M=23). For ethical reasons, real names of the participants are not involved in this research, and the participants are referred as "P1, P2, P3…".

Data Collection Tool

The interviews were seen as the sole data collection tools in phenomenology researches until recently, however, it is now possible to collect data with several different tools today, such as written expression of experiences, biographies, autobiographies and journals (Langdridge, 2007). In this research, the data were collected with the help of a form which was developed by Erisen (2001) and which includes information of certain standards for the indicators of quality in a training program. In order for prospective teachers to easily compare the standards on the form and the quality of the training program that is applied to them, the six thinking hats technique was implemented and the participants were asked to express their opinions towards each hat, in writing. Also, in the form, the prospective teachers were informed that when they put the white hat on, they need to state the common views, and the information in literature on the quality of the program; when they put the red hat on, they need to approach the matter emotionally and express their values and attitudes towards it; when they put the black hat on, without considering their own emotions, they need to consider the problems and limitations of their program's quality; when they put the yellow hat on, they need to express the positive sides of their program; and when they put the green hat on they need to state their opinions towards coming up with new ideas to improve the quality of their program. In order to analyze the data and draw conclusions from the data, the blue hat is put on by the researchers. Also, to support the data collected, and to enable its verifiability, an observation has been done by one of the researchers without any participants; and some informal interviews with the participants have also been used.

Data Collection

Before the data collection tool was applied, the participants had been informed that statements which could reveal their real identities were not going to be used and that pseudonyms were going to be used instead of their real names. Also, the participants were told that they could withdraw from the research at any point, and they were not under any kind of pressure on this matter. In order for prospective teachers to participate the research in a more informed way, they were given a two-hour tutorial session by one of the researchers on the six thinking hats technique. While determining the duration of this tutorial session, whether the prospective teachers had any information about the technique was determined and taken into account. Then, the data collection tool was applied to the prospective teachers and they were given a sufficient amount of time. The data collected from the research is stored in places which are accessible only by the primary researcher.

Data Analysis

In this research, "content analysis method" is used with the purpose of classifying the data collected from the opinions expressed by the prospective teachers on the quality of the teacher training program, and drawing conclusions from these. The main idea of content analysis is to reduce the words (units) in a research paper to a lesser number of themes. The purpose of establishing these themes is to present the participants' opinions on the program's quality in a more detailed way under each hat. Besides, these established themes come in useful to see the consistencies and the contradictions among statements (Glesne, 2011; Merriam, 2009). In this sense, the collected data were subjected to content analysis, and there were themes and subthemes established in relation to each hat.

Moreover, for the reliability of the research, an expert review is also used. In this process, while the themes were established by the researchers; three experts, who had a command of qualitative research methodology, instructed at higher education level, and who were independent from the research, were consulted. It was seen that the researches and the experts had a consensus over the established themes. The reliability of the study was calculated with the formula (Reliability = # of agreements / total # of agreements and disagreements) suggested by Miles and Huberman (1994) and a 95% accommodation was provided. This percentage was considered sufficient for the reliability of the research.

Limitations of the Research

One of the limitations of this research is caused by the fact that the research data was collected only by the forms in which the prospective teachers expressed their opinions. The observations done with the nonparticipants and the informal interviews conducted with the participants were considered to be helpful for providing verifiability for the research.

Findings

The summary of the findings from the opinions of prospective mathematics teachers on the quality of the program applied to them is given in Table 1. The themes and subthemes regarding the prospective teachers' opinions under related hats, and the prospective teachers under the themes can be seen in the table.

Table 1. Prospective teachers' opinions on the quality of the mathematics teacher training program, of which they are also the stakeholders, by using the six thinking hats technique

Hats	Themes	Prospective Teachers
White Hat	**Occupational Information**	
	• An essential field	P2, P3, P6, P9, P10, P12, P17
	• Public Personnel Selection Exam in Turkey (PPSE) as an obstacle	P1, P11, P13, P15, P16
	Information about the curriculum	
	• Content of the curriculum	P4, P5, P7, P8, P11, P14, P18
 Red Hat	**Feelings towards the teaching staff**	
	• Affection	P2, P3, P7, P8, P10, P13, P14, P16, P18
	• Considering as incompetent	P1, P8, P13, P16, P17, P18
	Feelings towards the curriculum	
	• Considering as inadequate	P5, P6, P11, P12, P13, P15, P16, P17
	Feelings towards the occupation	
	• Affection	P1, P2, P4, P9, P10, P16
	Feelings towards the educational environment	
	• Affection for the campus	P2, P6, P7
	• Finding social activities inadequate	P7, P14, P15
 Black Hat	**Negativity towards the curriculum**	
	• Inadequacy of the teaching practice courses	P1, P2, P3, P4, P8, P11, P13, P14, P15, P17, P18
	• Courses being theoretical	P2, P3, P4, P5, P6, P9, P11, P18
	• Not being PPSE oriented	P7, P18
	Negativity towards the educational environment	
	• Lack of equipment	P3, P5, P6, P7, P8, P10
	• Finding social activities inadequate	P3, P7, P11
 Yellow Hat	**Positive opinions towards the teaching staff**	
	• Guide	P1, P2, P3, P4, P5, P6, P9, P14, P15, P16, P17
	• Competent in his/her field	P4, P7, P8, P9, P11, P12, P14, P16, P18
	Positive opinions towards the educational environment	
	• Physical conditions of the university	P4, PA6, P10, P13, P14
	• Social activities	P7, P9, P10, P13
	• Library	P1, P2, P4, P6
 Green Hat	**New ideas about the curriculum**	
	• About the teaching practice course	P6, P7, P8, P9, P10, P11, P13, P14, P15
	• About the Mathematics teaching courses	P1, P2, P4, P7, P8, P10, P11, P14, P17
	New ideas about the educational environment	
	• About the social activities	P1, P2, P3, P5, P8, P9, P13, P14, P15
	New ideas about the teaching staff	
	• About competency in field	P8, P13, P16, P18
	New ideas about the occupation	
	• About employment	P1, P4, P7

Findings about the White Hat

Findings about the white hat, under which the participants stated the common views and facts from the literature, are gathered under two themes: (1) Occupational information (2) Information about the curriculum.

Theme 1: Occupational information. The opinions of the prospective teachers towards the occupation were about the need for this teacher training program and the PPSE (Public Personnel Selection Examination in Turkey) exam, which they see as an obstacle. In this sense, this theme is approached within two subthemes: "the need" and "PPSE as an obstacle".

The need. According to some of the prospective teachers, it is inevitable to learn mathematics which exists everywhere in daily life. Therefore, it is essential to train people who will teach this field, in other words it is essential to have teacher training programs for mathematics education. P2 explains this situation as "…there is mathematics everywhere in nature. Therefore teaching and learning mathematics is necessary, as always…", whereas P17 says "…we use mathematics everywhere. It is the language of the nature after all. Therefore, this field will always be needed…".

PPSE as an obstacle. Some of the prospective teachers stated that PPSE, which is an exam for joining the teaching occupation, is an obstacle to perform mathematics teaching. The prospective teachers mentioned high number of teachers who could not be assigned to schools in Turkey, also expressed that the graduates of mathematics education programs get higher scores from PPSE compared to the graduates of other teaching programs. For instance, prospective teacher P13 expressed his/her opinion as "…even though lots of assignments are done in this field, as far as I know from my environment, and as far as I can follow the news, there are too many unassigned teachers. This exam is a great obstacle for mathematics teachers…". Similarly, P11 expresses his/her opinion as "…it is a program that faces the obstacle of PPSE, as all of the other programs do. As a matter of fact, you have to get a higher score in this field…".

Theme 2: Information about the curriculum. Since the opinions of the prospective teachers towards the curriculum were about the content of the curriculum, these themes were approached under the subtheme of "content".

Content. Some of the prospective teachers mentioned about the density of the: field, education (educational sciences) and practical courses in the curriculum of mathematics teaching program. For instance, while P5 expresses his/her opinion as "…it is generally a program which is mostly theoretical, and in which there are lots of mathematics field courses besides educational sciences courses…", P18 expresses his/her opinion as "…it has a curriculum where the teaching practice is done in the senior year, and in which there are mathematics courses and educational sciences courses…".

Findings about the Red Hat

Findings from the prospective mathematics teachers' opinions under the red hat are gathered around 4 themes: (1) Feelings towards the teaching staff, (2) Feelings towards the curriculum, (3) Feelings towards the occupation, (4) Feelings towards the educational environment.

Theme 1: Feelings towards the teaching staff. The majority of the prospective teachers underlined the "teaching staff" factor in their opinions, which they stated under the red hat. The prospective teachers were able to approach the "teaching staff" with both positive and negative feelings. For this reason, this theme is approached under two subthemes as "affection" and "considering as incompetent".

Affection. Some of the prospective teachers mentioned the affection they felt for the teaching staff, as they stated that they see their teaching staff as their role models. For instance, P7 expresses this situation as follows:

> *I am very pleased with my teachers at school. They always helped me and I got positive responses. It was very nice to have a teacher to help me whenever I had complications with the courses or a problem in my private life. As a matter of fact, I am very glad to have teachers who even encourage me to get a master's degree.*

Similarly, P8 explains this situation as "I have teachers whom I love, willingly listen to, see as a role model and start imitating throughout the time". In addition to these, P10 underlines the fact that the affection he/she had for his/her teachers increased his/her affection for the occupation by saying "I am very glad to have teachers who made me love the occupation even more".

Considering as incompetent. Some of the prospective teachers showed reactions indicating that they see the teaching staff as incompetent in their fields. According to them, this also causes them not to be adequately trained in the field. For instance, P8 explains this situation as follows:

> *I believe that some of the teaching staffs are far away from teaching. This reduces the quality of teaching. Thus, people who are not professionally competent are trained. Even though we are almost about to graduate, I think we lack a lot*.

Similarly, P18 says "we have teachers who do not allow us to question anything, who gives lectures in a routinized way and even more who cannot even teach." to show his/her reaction to this issue.

Theme 2: Feelings towards the curriculum. One of the factors which were focused by the prospective teachers under the red hat was the primary school mathematics teaching program's curriculum. The prospective teachers' feelings towards the curriculum are approached under the subtheme of "considering as inadequate".

Considering as inadequate. The prospective teachers, who have negative feelings towards the curriculum, see the existence of unnecessary courses and the lack of class hours for important courses as the main reasons for their negativity. The prospective teachers especially emphasize that there are too many mathematics field courses and these are not beneficial courses for their future teaching careers, and therefore, the curriculum does not meet their needs. Furthermore, they feel that they will not graduate from the university with the adequate skills and knowledge; since the courses related to mathematics teaching and teaching practice are limited in number. P5 expresses his/her opinions about the curriculum as follows:

> *When I graduate as a teacher, I will only attain adequate qualifications with my own efforts. If I consider that our quantitative courses were too theoretical, and the verbal lessons were limited in practicality, I cannot say that my expectations at the beginning were met.*

On the other hand, P11, who thinks that this situation makes it harder for them to simplify the subjects for their students' level during the internships, explains this issue as:

> *I think the curriculum is inadequate. I cannot tell you that the mathematics courses here please me professionally. Many mathematics courses I have taken are not only useless for the internship but also make it harder for me to meet my students' level.*

Similarly, it can be seen from his/her statement: "during my 4 years of education, I only had 3 courses which helped me with teaching kids at primary school level", that P13 has common problems with other prospective teachers.

Theme 3: Feelings towards the occupation. Under the red hat, most of the prospective teachers mentioned the affection they had towards the occupation. Therefore, their feelings towards the occupation are approached under the subtheme of "affection".

Affection. While some of the prospective teachers pointed out that they wanted to become mathematics teachers since their childhoods, some of them stated that they started to like this occupation after they started studying in this program. P1 and P9 described this occupation as "…my childhood dream…", while some of the other participants emphasize that being together with students, especially in the teaching practice classes, played an important role to help them like this occupation. P2, one of the prospective teachers, who started to like the occupation later, explains this situation as "Even though I did not want to become a teacher in the beginning, being together with the students and teaching them lessons made me get warmer to this profession".

Theme 4: Feelings towards the educational environment. The participants had positive and negative feelings towards the educational environment. Therefore, their opinions were approached under two subthemes such as "Affection for the campus" and "Finding social activities inadequate".

Affection for campus. Three of the prospective teachers mentioned that they liked their campus both for its location and the facilities that it has for them to use. While P6 says "I like our university campus. It has everything a student or the teaching staff may need…", P2 describes the campus as "an environment in which he/she feels safe".

Finding social activities inadequate. Three of the prospective teachers who expressed their feelings towards the environment think that the university's social activities are inadequate. According to them, the teachers should be socialized and the education should not be limited to attending the classes. P15 says:

> *Even though we have lots of classes about education at school, there is almost no social activity. Teachers should be socialized. Every person has a social branch that he/she is good at. The social activities should start from the freshman year of the university.*

Similarly P14 expresses his/her opinions towards the inadequacy of the university's social activities as "since there is no social activity, there is no other reason than my courses or my lecturers to make me committed to the school".

Findings about the Black Hat

Findings about the black hat, under which the prospective teachers approach the issues with a logical negativity, were gathered around two themes: (1) Negativity towards the curriculum, (2) Negativity towards the educational environment.

Theme 1: Negativity towards the curriculum. All of the prospective teachers mentioned the curriculum factor while they were expressing their negativities under the black hat. Their negativity towards the curriculum is approached under 3 subthemes such as "inadequacy of the teaching practice course", "courses being theoretical", "not being PPSE oriented".

Inadequacy of the teaching practice courses. Some of the prospective teachers considered the classroom hours of the teaching practice courses as inadequate since it is the only course with an intensive focus on practice in their mathematics teaching program. According to them, only having this course at their senior year is not enough to get them prepared for performing the profession. P15 explains this negativity as follows:

> *Only having an internship at the senior year of a teacher training program is not adequate to become a teacher. Because, to teach them as an inexperienced teacher when you graduate, is nothing more than playing with their lives.*

Similarly, P1 says "…I find the teaching practice course incredibly inadequate. Unfortunately, I will graduate by only teaching one or two lessons…" on the same matter.

Courses being theoretical. According to some of the prospective teachers, one of the negativities of the curriculum is that the courses are too theoretical. The prospective teachers, who find especially the courses related to the mathematics field theoretical; since they do not believe that they will use these courses in their careers, find these courses unnecessary to learn. While one of these prospective teachers, P2 says "…we are not going to teach these lessons to the students, but we still learn them…", P11 says "The lectures are too intense and theoretical for primary school mathematics teaching. We are having a hard time lowering our levels to meet the students' during teaching practice…".

Not being PPSE oriented. P7 and P18 point out a different negativity of the curriculum by expressing their opinions on the curriculum not being PPSE oriented. P7 says "…four years of education did not help me with PPSE. I will go back to square one, and start studying from there…". Also, P18 says "…There is less emphasis on the courses which are PPSE oriented…".

Theme 2. Negativity towards the educational environment. The negativity of prospective teachers towards the educational environment is approached under two subthemes as "lack of equipment" and "finding social activities inadequate".

Lack of equipment. Some of the prospective teachers underlined the lack of equipment under the black hat. According to them, not only they lack equipment in the classrooms but also the equipment they have gets no maintenance. P6 explains this situation as "…the equipment we use in the classroom does not get a

regular maintenance…", and P7 says "…we lack material. The overhead projectors in the classrooms are not working…".

Finding social activities inadequate. Three of the participants find the social activities of the university inadequate. In parallel with the expressed negativity towards the educational environment under the red hat, these negativities expressed by different prospective teachers, make the prospective teachers feel that they are not at a university. According to these participants, social activities motivate the students and therefore they are essential. P7, one of the prospective teachers, expresses his/her opinions as "…I find the activities at school inadequate, I feel like I do not study at a university but at a high school…", while P3 says "there isn't any social activities to motivate the students".

Findings about the Yellow Hat

Findings about the yellow hat, under which the participants expressed their opinions with logical positivity, were gathered around two themes: (1) Positive opinions towards the teaching staff, (2) Positive opinions towards the educational environment.

Theme 1: Positive opinions towards the teaching staff. The majority of the prospective teachers expressed their positive opinions for some members of the teaching staff. The positive opinions towards the teaching staff are approached under two subthemes such as "guide" and "competent in his/her field".

Guide. Most of the prospective teachers emphasize the fact that some of the teaching staff act as guides towards them, as one of the positive sides of the program. According to the prospective teachers, they can get help from the teaching staff in any matter, and the teaching staff can successfully guide them. P5 points this situation out by saying "…I have a positive relationship with the teaching staff. In case of trouble, I can consult them at any time of the day, and get help from them…", while P6 says "…The teaching staff always help the students eagerly…".

Competent in his/her field. Half of the participants find some of the teaching staff competent in their fields and express their positive opinions towards the situation. P14, states that the teaching staff are also competent in their fields, along with being good guides for the students, by saying "…some of the teachers are really my role models. The way they teach, the way they address the students, their friendliness, their communication skills and help is the proof that he/she will always be a teacher to remember…".

Theme 2: Positive opinions towards the educational environment. The positive opinions of the participants towards the educational environment are gathered under three subthemes: "the physical conditions of the university", "social activities", "library".

The physical conditions of the university. Some of the prospective teachers have positive opinions about the location of the university campus and the good physical conditions. These prospective teachers especially base their positive opinions on the physical conditions of the classrooms, the existence of course-related equipment, and the accessibility of this equipment. P10 expresses his/her opinions on the subject as "…the university's architectural design, the size of the classrooms, the heating of the buildings are qualified enough to provide the continuity of the teaching-learning process…", while P4 adds "…the environment of the university, materials, and the classrooms were all supplementary for our learning…". Moreover, for some of the participants, the location of the university also has an important role. For instance, according to P6, "the fact that the university is built on somewhere with unpolluted air" and according to P13 "the fact that it is far away from the center and located in a quiet place" are considered as good qualifications.

Social activities. In contradiction to the negative opinions expressed under the black hat by some of the prospective teachers, some of the participants expressed positive opinions about their university's social activities. One of these participants, P10, expresses his/her gladness: "…the students, can do the things they always wanted to do that they have dreamt of but had no chance to do, thanks to the student clubs at the university…" ,while P13 expresses his/hers as "the existence of seminars, which we got certificates from, have affected us in a positive way".

Library. Four of the participants had positive opinions about "the university library's richness". P6 expresses his/her opinions about this matter as "…its library is quite rich, it is possible to reach national or

international sources of any kind…", and P2 says that "…the library is rich. With the help of the librarians and the databases provided, we can get access to any subject we want to study…".

Findings about the Green Hat

The findings about the green hat, under which the participants express their opinions on the teacher training program by producing new ideas, are gathered under four themes: (1) New ideas about the curriculum, (2) New ideas about the educational environment, (3) New ideas about the teaching staff, and (4) New ideas about the occupation.

Theme 1: New ideas about the curriculum. One of the factors which was emphasized under other hats, the curriculum factor, was also emphasized under the green hat by the majority of the prospective teachers. The prospective teachers presented ideas for the solution of the problems of the curriculum that they had stated under the black and red hats. These ideas about improving the quality of their program is approached under two subthemes as "About the teaching practice course" and "About the Mathematics teaching courses".

About the teaching practice course. Half of the prospective teachers presented their ideas on extending the amount of time spent on the teaching practice course since they believe the amount of time spared for teaching practice is not adequate for their training. P15, one of the most sensitive participants towards the curriculum, presents his/her suggestions for the teaching practice course as follows:

> *The teaching practice course is very inadequate. I think the internship should start from the freshman year. When we become teachers after four years of education, we should start teaching as experienced teachers. Or the teachers should not start teaching right after they graduate. They should be interns for two years.*

In parallel with this, P11 suggests:

> *In the curriculum, more than the theoretical classes, the number of the classes like teaching practice in which the students can gain experiences should be increased. Beginning from the freshman year, practices like the internship should take an important place. The number of the theoretical classes should be decreased, and the number of learner-centered classes should be increased.*

About the mathematics teaching courses. Some of the prospective teachers see the curriculum as a theoretical program with lots of mathematics field classes. Therefore, they argue that primary school mathematics teaching classes should cover more space in their curriculum, since those are going to be more useful in their future careers. P14 explains this situation as "…there should be more focus on approaching the subjects in primary school and middle school mathematics curricula in our own curriculum…" while P10 expresses his/her opinions on the same issue as "…the classes which would help us to meet the level of the primary school students should come to forefront since we are going to teach at the primary school level…".

Theme 2: New ideas about the educational environment. Since the suggestions of the prospective teachers were about the social activities of the university, this theme is approached under the subtheme of "social activities".

Social activities. Some of the prospective teachers emphasized the need of activating the students of the primary school mathematics teaching program. Thus, the students will be more active in the educational environment. P9 expresses his/her opinion as "…Mathematics clubs should be established and there should be exchanges of ideas…". P13 also says that "…the number of events and club activities which would be beneficial for the students should be increased and the students should be activated…".

Theme 3: New ideas about the teaching staff. Since the ideas suggested by the prospective teachers were about the competency of the teaching staff, this theme was approached under the theme of "competent in field".

Competent in field. Four of the participants, believe that one of the important factors which would improve the quality of the training program is the teaching staff. P18 explains this situation as "…the improvement of the quality of the department, depends on the existence of young lecturers who are

competent in their field…". Similarly, P8 states that teaching staff with a "well-developed educator identity" should exist in the university.

Theme 4: New ideas about the occupation. The ideas suggested by the prospective teachers about the occupation was related to the employment, therefore their ideas about the occupation were approached under the subtheme of "About employment".

About employment. Three of the prospective teachers suggested new ideas about the assignments of the teachers. According to those three, the employment rate of this occupation is also one of the factors that would increase the quality of this program. While P4, one of those three participants, expresses his/her suggestion as "…teachers should be given opportunities to perform their professions in Turkey. Employment opportunities should be given to us, mathematics teachers, with a better system…"; P1 argues that "PPSE assignments should be done more frequently".

Discussion and Conclusions

In this research, the purpose was to have prospective mathematics teachers evaluate the teacher training program, of which they are the participants, by using the six thinking hats technique. In the research, by using the six thinking hats technique for evaluating a program in the literature, it was tried to help prospective teachers evaluate the program from different perspectives. The blue hat was put on by the researchers with the purpose of analyzing the data and drawing conclusions from those. In this sense, the findings about the blue hat are represented in this section.

The findings from the research showed that the prospective teachers had both positive and negative opinions about the quality of the primary school mathematics teaching program. The opinions of the prospective students on the quality of the teacher training program were generally gathered under the themes of curriculum, teaching staff, educational environment and occupation.

One of the findings of this research; is that the curriculum is an important factor which affects the quality of the program. One of the main issues which were emphasized by the prospective teachers, was the curriculum of the primary school mathematics education program, which is inadequate and does not serve its purpose according to these participants.

According to the prospective teachers, having only one term of teaching practice in their senior years is not enough for them to get prepared for the profession. In their point of view, this course should be more extensive and should cover all four years of their university education. Similar results had also shown themselves in previous studies (Eraslan, 2009; Gomleksiz et al., 2006; Mehmetlioglu & Haser, 2013; Yanpar-Yelken et al., 2007).

On the other hand, while the prospective teachers find most of their classes highly theoretical, they do not believe that these classes are useful for their future careers. While they especially criticize the number of mathematics field courses in their curriculum, they also indicate that they find it really hard to simplify their teaching according to the level of their students in primary schools. Therefore, the prospective teachers suggest that, instead of these highly theoretical classes, there should be more emphasis on courses about primary school mathematics teaching. As Stylianides and Stylianides (2006) argue, mathematics which will be presented to the prospected teachers during their university education should be related to the terms which they will use while they perform their professions. In a similar way, according to Yigit and Akdeniz's (2004) research findings, prospective teachers feel like they are studying at the faculty of Science and Literature, and they do not believe that these courses will be very useful for their future careers. Similar results have also shown themselves in other researches (Basturk, 2009; Sarac, 2006).

Furthermore, some of the prospective teachers argue that PPSE is not a suitable exam to select qualified teachers to be assigned, and that they are not getting prepared for this exam during their teacher training period. Similar results have also shown themselves in other researches (Atay & Sonmez, 2013; Eraslan, 2004; Karatas & Gules, 2013; Sezgin & Duran, 2011).

Moreover, the results of this research show that there is a great emphasis on the teaching staff in the opinions of most of the prospective teachers regarding the issue of the training program's quality. As Ozdemir and Uzel (2009) suggests, prospective teachers expect the teaching staff to be competent in their

fields, to become role models for themselves and to have positive relations with the students. The result of this research coincides with the results of other researches (Parpala & Lindblom-Ylanne, 2007; Sen & Erisen, 2002; Yanpar-Yelken et al., 2007).

Another conclusion drawn from this research is that social activities also play an important role in prospective teachers' opinions about the quality of the training program. At the end of the research, it was concluded that, while most of the prospective teachers' opinion was the social activities in their university were adequate, the opinion of some prospective teachers' was otherwise. As it can be seen from Demirhan-Yuksel's (2009) research findings, one of the things that the students expect from a university of good quality is to have an environment prepared for them; to spend their spare time out of the classes and to improve themselves, and for planning activities in a way that meets their expectations. Also, in this research, similar opinions were expressed by the participants, and the results of other researches also support the findings of this one (Demirhan-Yuksel, 2009; Ozcakir-Sumen & Caglayan, 2013; Yanpar-Yelken et al., 2007; Yanpar-Yelken, 2009).

It was also concluded from this research that the prospective teachers have positive and negative opinions towards the physical environment of the university. Another qualification that the prospective teachers expect from a university of good quality is the classrooms, in which they take courses, to have the appropriate construction and hardware to meet their needs. Also it is very important for the prospective teachers to have a campus with sufficient qualifications, since a campus plays an important part in the university life. This result coincides with the results of other researches (Erisen, 2001; Demirhan-Yuksel, 2009; Yanpar-Yelken et al., 2007). In addition to these, some of the participants also stated that the university is rich and that they consider wealth as an indicator of good quality. The results of previous researches have also shown similarities (Erisen, 2001; Ozcakir-Sumen & Caglayan, 2013; Yanpar-Yelken et al. 2007).

To conclude, as Nichols (2006) points out, six thinking hats technique provides opportunities to review a problem or an issue from many different perspectives. Also in this research, six thinking hats technique was very affective in terms of reviewing the prospective teachers' opinions on quality of the training program from many different viewpoints.

Suggestions

The evaluation of the quality of training programs is a very important subject for the improvement of teacher training programs and for the improvement of their efficiency. In this sense, in the lights of the results of this study, some suggestions may be made for institutions that train teachers. The quality standards for teacher training should always be supervised and improved.

Before giving their last forms to the standards, which were prepared by the related commissions, the teachers who will be directly affected by the application should be consulted. The classroom time of teaching practice course in the teacher training programs' curriculum should be revised, and a new amount of time should be determined according to the prospective teachers', teaching staffs' opinions, and the results of the researches done on this matter.

Moreover, the mathematics courses in the curriculum of primary school mathematics teacher training program should be revised and it should be ensured that the prospective teachers take classes which are focused on how to teach mathematics.

In the light of the findings of this research, suggestions for further research can also be made. This research, in which the six thinking hats technique was used by prospective mathematics teachers to evaluate their training program, has provided opportunities for the prospective teachers to express their opinions by approaching the matter from many different points of views. A further research on this issue may use the six thinking hats technique to unfold teaching staffs' opinions and views on the same matter. It is possible to use the six thinking hats technique to evaluate different teacher training programs for different fields, and the curriculum for all levels of education for further research purposes. Moreover, by integrating this technique to the program evaluation models which already exist in the literature, the stakeholders and also the program evaluation experts can be helped to gain a different perspective towards program evaluation.

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