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The aim of this study was to examine mathematics teachers' concerns about the sixth grade curriculum that was launched in Turkey in 2006. As a data collection tool, the Stages of Concern Questionnaire (SoCQ), based on the Concerns Based Adoption Model (CBAM), was administered twice (at the beginning and the end of the instructional year) to 110 teachers who were using the new mathematics curriculum for the first time. The same teachers were also asked to provide an open-ended statement in order to obtain qualitative data. The data were analyzed separately to highlight changes in the teachers' concerns about the 6th grade curriculum. According to the results, the teachers were mainly concerned about becoming sufficiently informed about the program; organization and timing issues; inadequate school conditions and students' backgrounds. They were also concerned about the new instructional materials, although the intensity of their concerns changed over time.

Keywords: change, concerns, mathematics teachers, curriculum

INTRODUCTION

In the process of integration into the European Union, Turkey is required to fulfill fundamental changes in its national education system, as well as in other fields. Accordingly, a series of reforms have been undertaken in order to meet the educational objectives of the EU. In particular, an initiative launched in 2005 has been aimed at preparing Turkey's younger citizens for success in today's international community (Aksit, 2007). As a result of this legislation, new elementary curriculum programs in Turkish language studies, mathematics, life sciences, science and technology, and social studies have been developed by the Ministry of Education-Board of Education and Discipline (MoNE-BOED). These were first piloted in 120 public schools in 9 cities in the 2004-2005 academic years and then

revised and implemented on a national level beginning in September, 2005. In preparing the new curricula, national and international research in mathematics, the mathematics curricula of developing countries, and past experiences in mathematics education in Turkey were taken into account (MONE, 2004). The new elementary (grades 1-5) curriculum has been in effect throughout the country since the 2005-2006 instructional year. At that time, the MoNE-BOED agreed to develop a new elementary (6-8) mathematics curriculum. Accordingly, after carrying out pilot studies, the revised 6th grade mathematics curriculum was tested in 2005-2006, and then implemented nationally in the 2006-2007 instructional year. One of the distinctive features of this student-centered curriculum is the preparation of an integrated set of course materials, consisting of a textbook, student practice book and teacher guide, for the first time.

Some of the main objectives of the reform to the mathematics curriculum include:

- reducing the amount of content and number of concepts;
- arranging the units thematically;

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State of the literature

- The related research has illustrated that instructional reform often takes longer to achieve than anticipated by the planners.
- Recent literature deals with the process and the barriers involved in the implementation of curricular change. However, few studies have been conducted on individual or institutional concerns about curricular reform.
- Concern Based Adoption Model (CBAM) is a widely applied theoretical and methodological tool for studying the educational change process; it shows educational leaders how the individuals most affected by change react to the implementation of the innovations.

Contribution of this paper to the literature

- The findings revealed that the 6th grade teachers had numerous concerns about the new curriculum, and these concerns differentiated over time.
- The teachers had maximum scores in the information stage for both semesters. In their SoCQ results, the secondary concern of the teachers involved the personal impact of the curriculum. From their open-ended responses, the teachers' management concerns rose sharply in the second semester, especially with respect to lack of time for implementation and for the application of the activities.
- According to the results, the teachers expressed more positive opinions about the curriculum than negative, and their positive beliefs doubled in the second semester. These results highlighted the teachers' positive approach and adaptation to the new curriculum.
- Regarding the concern about textbooks, teachers were especially complained about the distribution of the topics; the conflict between the information in the book and the exercise questions; the intensity of the curriculum; and the inapplicable activities in the textbook.

- *developing nine core competencies across the curriculum;*
- *moving from a teacher-centered didactic model to a student-centered constructivist model;*
- *monitoring student progress through formative assessment in an effort to move away from traditional assessment of recall and to introduce authentic assessment (MONE, 2005).*

The new 6-8th grade mathematics curriculum consists of five learning fields: numbers, geometry, measurement, probability and statistics, and algebra. Learning fields are selected to provide a connection between the concept and skills related to that field and

the main subject. Conceptual knowledge, rather than procedural knowledge, is emphasized, and concepts are presented to help students create abstractions from concrete models. Activities are designed for both individual and group work, and they are mainly carried out using the student workbook. In addition, a teacher guide was developed as an aid for instructors. Another important focal point of the new program is connecting mathematics subjects to other disciplines such as social studies and natural science (MONE, 2005). In addition, the program advocates motivating students to discuss, inquire and be curious about what is going on in their surrounding environment, including family, school and society. The program also suggests that student-centered classroom environments need to be designed in order to increase students' active participation in their own learning. Furthermore, as Koc, Isiksal, and Bulut (2007) explain, "the curriculum believes in and supports extracurricular activities as a critical aspect of student learning"(p.35).

The curricular reform has also radically changed the teachers' role. Under previous programs, the teacher was identified as the sole decision maker, information provider and authority in the classroom; in effect, instructors were at the center of the teaching and learning process. On the contrary, the new program gives teachers the responsibility of designing an appropriate learning environment and guiding students through the activities, rather than directly imposing information on them (Baki, 2006). In many cases, these concepts are new to classroom instructors and constitute a certain level of change. Therefore, the revised curriculum and current instructional materials oblige teachers to assume a new approach to teaching and to view themselves in a new role. However, adapting to these circumstances, understanding what the curricular reforms require of them and responding appropriately may not be an easy task for teachers at the beginning. As Rogan and Grayson (2003) point out, while legislative documents often contain visionary and educationally sound ideas, implementing these often proves to be slower and more difficult than anticipated, as the process of change may present certain difficulties for teachers. The related research has illustrated that instructional reform often takes longer to achieve than anticipated by planners (Friel & Gann, 1993; Fullan & Miles, 1992; Guskey, 1986; Hall & Hord, 2006). Furthermore, the results that emerge may not match the policy-makers' intentions. Recent literature deals with the process and the barriers involved in the implementation of curricular change (Bukova-Guzel & Alkan, 2005; Bulut, 2007; Macnab, 2003; Orrill & Anthony, 2003; Yilmaz, 2006). For instance, Orrill and Anthony (2003) identified the following obstacles to the successful implementation of the new curriculum: a) concern over teachers' vision about their roles and

beliefs about what their job should be; b) lack of materials needed to enact the curriculum; c) lack of teacher's technical skills and content knowledge; and d) factors inherent in the newness of any change. Likewise, Yılmaz (2006) examined Turkish teachers' opinions about the new 5th grade curriculum and found that they experienced difficulty in finding materials for activities and lack of other resources; furthermore, they expressed that the weekly class hours were insufficient.

The research also demonstrates that teachers are likely to alter their approach to instruction only if they fully understand the new methods, believe these to be important, and perceive the rewards of change to benefit both themselves and their students (Guskey, 1986; Thompson, 1992). Because the meaning and importance that a teacher attaches to the innovation shapes his/her reaction to the change and the possible related problems, Prawat (1991) argues that teachers are in the position of either promoting or hindering curricular reform. Therefore, in all efforts to facilitate reform, it becomes important to address teachers' beliefs, feelings, and concerns (Clarke, 1994; Friel & Gann, 1993; Hall & Hord, 1987) and to develop a clear picture of their concerns both at the beginning and during the application of the reformed curriculum (Fullan, 1999).

The Concerns Based Adoption Model (CBAM) is an instrument commonly used in educational research to evaluate innovations. In particular, the study of concerns has attracted a great deal of interest in the recent decades as a result of the presumed link between the successful implementation of educational change and the nature of individual concerns (Christou, Eliophotou-Menon, & Philippou, 2004; Crawford, Chamblee, & Rowlett, 1998; Gray, 2005; Leung, 2008; Walen & Williams, 2000). Examining the literature, the majority of the research carried out using the CBAM model was focused on individuals' concerns about technology usage (Atkins & Vasu, 2000; Chamblee & Slough, 2002; Gershner & Snider, 2001; Rakes & Casey, 2002; Yuliang & Huang, 2005). However, few studies have been conducted on individual or institutional concerns about curricular reform (Christou et al., 2004; Marsh, 1987; Van den Berg et al., 2000). Among these studies, only Christou et al. (2004) have examined the concerns of primary school teachers in Cyprus in relation to the recent implementation of a new mathematics curriculum and the use of new mathematics textbooks. Authors used the Stages of Concerns Questionnaire (SoCQ) to collect data from 655 teachers who had a varying degree of involvement with innovation and diverse teaching experience. According to the findings, the concerns of these teachers largely focused on the task stage of the CBAM model; significant differences were found in the concerns of teachers across years of teaching experience

but not across years of implementation. Although the research of Christou et al. (2004) has some similarities with the present study, in that it focused on mathematics teachers' concerns for curriculum integration, the current study is unique in that it targeted only sixth grade teachers who were using the mathematics curriculum for the first time, comparing their concerns from the beginning until the end of the year using both quantitative and qualitative techniques.

Accordingly, the aim of this study is to describe and compare mathematics teachers' first year concerns about the new 6th grade curriculum. Here, we define the term "concerns" as "the composite representation of the feelings, preoccupation, thought, and consideration given to a new program" (Hall & Hord, 2006). With this objective, study was designed to answer the following research question:

"What concerns do sixth grade mathematics teachers have about the new curriculum and how did their concerns change over a one-year period?"

Theoretical Framework: Concern Based Adoption Model

Hall's (1979) Concern Based Adoption Model, or CBAM, constituted the theoretical basis of this study. The CBAM, was developed from Fuller's model in the early 1970's and has since been widely applied to the implementation of educational innovations in general (Newhouse, 2001). The CBAM is an instrument that educational leaders use to evaluate innovations; it shows them how the individuals most affected by change react to the implementation of these innovations (Hall & Hord, 2006). The model is based on the principle that change is a process and not an event. This means that everyone connected with assisting educators to learn new instructional practices or improving principal leadership need to think about change as a series of actions and processes spread over a long period of time.

CBAM is a widely applied theoretical and methodological tool for studying the educational change process. The model includes three key tools used to collect relevant data: Stages of Concerns (SoC), Levels of Use (LoU), and Innovation Configurations (IC). The SoC focuses upon teachers' feelings as they become involved in implementing an innovation. It uses a standard set of stages to describe teachers' concerns about the innovation. Holloway (2003) gives a brief description of each stage as follows.

Unconcerned: Indicates little concern about or involvement with the innovation and have no interest in taking any action.

Informational: Interested in learning more details about the change.

Personal: Uncertain about the demands of the innovation and wants to know how the change might affect him/her.

Management: *Concerned about how the change will be managed in practice.*

Consequence: *Interested in the impact on students or the school.*

Collaboration: *Interested in working with colleagues to make the change effective.*

Refocusing: *Begins refining the innovation to improve student learning results.*

These stages have major implications for professional development. First, they point out the importance of attending to what people are thinking and addressing the questions they are asking when they are asking them. Second, this model suggests the importance of paying attention to implementation for several years. We know that management concerns can last at least a year, especially when teachers are implementing a school years' worth of new curricula, and also when new approaches to teaching require practice and each topic brings new surprises. Finally, with all the demands on teachers, it is often the case that once their practice becomes routine, they never have the time and space to focus on whether and in what ways students are learning. This often requires some organizational priority-setting, as well as stimulating interest and concern about specific student learning outcomes (NAS, 2005).

Stages of Concern can also be applied to groups of educators who are learning to use the same innovation. The formal procedure to determine the stages of concern includes a 35-question survey. This diagnostic tool can be used to create a profile for the group. Not everyone will express the same concerns at the same time, but major areas can be identified and addressed for the group (Hall & Hord, 2006).

METHODOLOGY

Research Design

This study is a descriptive study, as it aims to present the existing situation as it is. A mixed-method approach consisting of both quantitative and qualitative techniques was employed. A mixed-method research design is a procedure for collecting, analyzing and mixing both quantitative and qualitative research and methods in a single study to understand a research problem (Greene, 2007). Greene, Greene, Caracelli, & Graham (1989) and Giannakaki (2005) present five reasons for carrying out a mixed methods study. These include triangulation, complementarity, development, initiation and expansion. In this study, we used a mixed method design for the complementarity purpose, since qualitative and quantitative methods are used to measure overlapping but also different facets of a phenomenon, yielding an enriched, elaborated understanding of that phenomenon. We collected both

data sets concurrently on two different occasions from the sample in order to obtain a better, more comprehensive understanding of the educational phenomena by looking at the similarities and differences between the two data sets.

Creswell (2003) defines three ways to design a mixed study: merging or converging the two data sets by actually bringing them together; connecting the two data sets by having one build on the other; or embedding one data set within the other so that one type of data provides support for the other. Based on the aim of the current study, the connecting approach to mixed method design was chosen here, since the research focus was to connect quantitative and qualitative data and examine complex phenomena such as the reactions, thoughts and beliefs of teachers who are confronted with a new curriculum.

Participants

Probability sampling techniques are primarily used in quantitatively-oriented studies and involve "selecting a relatively large number of units from a population, or from specific subgroups of a population, in a random manner where the probability of inclusion for every member of the population is determinable" (Tashakkori & Teddlie, 2003, p. 713). Probability samples aim to achieve representativeness, which is the degree to which the sample accurately represents the entire population. There are three basic types of probability sampling: random, stratified and cluster sampling. In this study, we used stratified sampling. This sampling method entails dividing the population into subgroups such that each unit belongs to a single stratum (e.g., low income, medium income, high income) and then selecting units from those strata (Teddlie & Yu, 2007).

In this study, in order to represent the entire population, we decided to select cities from the 7 geographical regions in Turkey. In choosing the targeted cities in these different regions, the socio-economic development index was taken into account (Dincer & Ozaslan, 2004). Two cities were selected from first and second development level in each region. From each of the 14 cities, 10 schools were chosen. The researcher then sent the SoCQ to the 6th grade mathematics teachers working in these schools at the beginning of the 2006 fall semester. Before the semester started, those teachers had been given only three days of workshop training concerning the reformed curriculum. A total of 190 teachers completed the form. Later, toward the end of the 2006-2007 spring semester, the survey was sent to the same schools again. A total of 125 forms were received by the researcher. After matching the forms according to the schools and the respondents, the authors eliminated those that had not been completed by the same teachers who responded

initially. Finally, 110 forms filled out by the same mathematics teachers were left. Thus, the data were collected twice, at the beginning and at the end of the 2006-2007 instructional year, from the same participants during the first year of implementation of the 6th grade mathematics curriculum.

Data Collection Tools

There are three methods of assessing concerns: one-legged interview, open-ended concern statement and Stages of Concerns Questionnaire (SoCQ). In this study, we used the SoCQ and open-ended statements to measure teachers' concerns. We could not use one-legged interviews, because conducting these requires seeing the teachers regularly and speaking to them in a short period of time. Therefore, as our participants were selected from different parts of Turkey, collecting the interview data would not be possible.

Since the development of the CBAM model, this questionnaire has been utilized in curriculum reform efforts across disciplines, in science, technology, social studies, mathematics and writing (ERIC Search). The SoCQ describes the affective dimension of change, and many regard it as the most helpful tool for teachers' professional development purposes. Therefore, the literature indicates that the SoCQ is an appropriate instrument in determining teachers' concerns related to an innovation, and the result of the questionnaire can be used in designing appropriate staff development that addresses students' needs (Leung, 2008). The SoCQ consists of 35 statements to which the participants are asked to respond. Respondents mark each item on a 0-7 Likert scale according how true the item seems to them at the present time. High numbers indicate high concern; low numbers indicate low concern; and 0 indicates very low concern or complete irrelevance. Respondents typically need around 15 minutes to finish the questionnaire, which also has a small section to gather personal information from the teachers such as age, gender, job experience, university of graduation, and the school and city in which they currently work. In this way, the researcher guaranteed that the same teachers replied to the questionnaire during the two applications by comparing their personal information.

A more formal way to assess an individual's level of concern involves asking teachers to respond to an open-ended question. The question can be asked at the beginning of training, at the end, or both. Before and after training, teachers can be asked a question such as "What concerns you about the program?" As Hall and Hord (2006) point out, one strength of the open-ended statement is that "the descriptions are in the respondent's own words" (p. 68). In this study, we posed the open-ended question "When do you think about the new curriculum, and what concerns do you

have in using it?" Following the 35 questionnaire items, the participants were given a half-page of space to explain their thoughts and concerns about the mathematics curriculum.

Validity and Reliability of SoCQ

For the purposes of this study, since the original language of the SoCQ is English, the questionnaire was translated into Turkish. A central concern of every translation is to produce the cultural equivalent of an instrument or an instrument that has the same connotative meaning as the original instrument. This means that not only proper linguistic translation of an instrument is important, but also its cultural translation (McGorry, 2000). In this study, two bilingual academicians independently translated the questionnaire from the original language (English) to the target language (Turkish). Then, two other individuals independently translated the instrument back to the original language. The researcher had two versions of the instrument in the original language and compared them for any inconsistencies, mistranslations, variations in meaning, cultural gaps and/or lost words or phrases. If any differences were found, the researcher consulted with the translators to find out why this occurred and/or how the instrument could be revised. To satisfy the content validity, the translated questionnaire was distributed to fifteen field specialists. In addition, the instrument was presented for the suggestions of twenty-five elementary teachers, most of whom were teaching mathematics. The academicians and teachers were asked to read the questionnaire items and determine if there were any incoherencies in meaning or grammar. After the feedback was obtained, necessary changes were made and the final version of the questionnaire completed.

In the 2005-2006 instructional year, a total of 205 elementary teachers were selected as the sample for the pilot study. The printed questionnaires were distributed to the teachers, and 190 of them were used to determine the structural validity and reliability of the SoCQ. Firstly, the structural concept validity of SoCQ was analyzed by factor analysis. The KMO coefficient of SoCQ was found to be .845, and the Barlett test was observed to be significant. As a result of the factor analysis, three factor structures were found, and SoCQ explains 63% of the total variance. This result aligned with the limitations of SoCQ expressed by George, Hall and Stiegelbauer (2006). The authors indicated that when the questionnaire is applied to the sample of first time users of an innovation, it is very likely that the results will be concentrating on two or three factors and not distinguishing the other stages. In interpretation of the item total correlations, items having a value of .45 are accepted to be sufficient (BuyukOzturk, 2004), and

factor loadings of the all items found above .45. The reliability of SoCQ was tested with Cronbach Alpha by using the SPSS 13.0 statistical packet program. The alpha reliability coefficient of SoCQ was found (Alpha = .87). The obtained data relating to validity and reliability showed that SoCQ can reliably be used in order to measure the mathematics teachers' concerns.

Data Analysis

Questionnaire: Scoring the questionnaire requires calculating raw scores for each of the seven stages; locating the percentile score for each scale in a table; and plotting the results on the chart. Here, data analysis was conducting using an Excel program developed by George, Hall and Stiegelbauer (2006) for scoring SoCQ data and producing group or individual profiles.

Open-ended Statements: After collecting the responses to the open ended question and matching them according to the teachers' personal information, we had a total of 110 papers completed by the same teachers at two different times. Since we aimed to look for the differences in the teachers' concerns, we analyzed the papers separately based on the application time.

In the analysis of the qualitative data, the concerns of the in-service teachers were analyzed with the guidance of "A Manual for Assessing Open-Ended Statements of Concern about an Innovation," by Newlove and Hall (1998). At the beginning, the teachers' sentences were read and it was determined whether they were related to the self (stage 0-stage 1-stage 2); task (stage 3) or impact (stage 4-stage 5-stage 6) aspects of SoCQ. Then, the statements were reread and Hall's stages of concerns (such as Personal, Collaboration etc...) were related to each sentence. After the answers for each concern stage were combined, four main themes (information, personal, management, consequences) were identified. However, during the analysis, the researchers identified other themes, such as concern about the substructure of schools, the new curriculum and curriculum materials; these were labeled with corresponding terms. Then the data were sorted according to those emergent themes. Under each term, the authors provide some of the teachers' statements to represent the teachers' concerns.

RESULTS

Below, the quantitative SoCQ data and the qualitative open-ended response data are presented.

Results from SoCQ

Table 1 below represents the percentile scores for each of the seven stages of concern for all participants

according to the semesters. Based on the SoCQ results, we also drew the teachers' group profile for each semester in Figure 1 in order to illustrate both the predominant concerns and the diversity of concerns within the group.

According to the Table 1 and Figure 1, the sixth grade mathematics teachers' Stage 0- Unconcerned scores were 81% and 75% for each semester. Stage 0 scores provide an indication of the degree of priority the respondent is placing on the innovation and the relative intensity of concern about it. But it does not give any information about whether the person is a user or nonuser. Thus, the high Stage 0 (81%) scores means that there are a number of other initiatives, tasks and activities that are of concern to them. In other words, teachers are aware that the program is being introduced, but they are not really interested or involved with the curriculum. However, as shown in Table 1 and Figure 1, the Stage 0 scores decreased to 75%, indicating that the teachers became more concerned about the curriculum and it was more central to their thinking. According to the participants' profiles, the mathematics teachers had the highest scores at Stage 1-Informational (91% and 90% respectively) over two semesters. Overall, the highest score at Stage 1 indicated that teachers had a general awareness of the program and were interested in learning more about it. Since informational concerns were focused on the structure and function of the innovation, the teachers wanted fundamental knowledge about what the curriculum is, what it will do, what applying it will involve and what the differences or similarities with the previous applications are. One main reason that the Stage 1 scores were sustained at high levels for the second semester could be that math teachers were not provided with any in-service training about the revised curriculum during the first year. Teachers were given only three days of workshop training just before the beginning of the school year in September, 2006. Some of the teachers mentioned this issue while answering the open-ended question at the end of the SoCQ.

With respect to Table 1 and Figure 1, our teachers had the second highest score at Stage 2-Personal (85% and 83%), indicating that they are also uncertain about the demands of the program, their adequacy to meet those demands and their role within the program. In short, the teachers were most concern about the status, rewards and other effects the curriculum might have on them. One explanation for the teachers' having lower personal concerns than informational concerns may be that they had a positive attitude toward the curriculum but were afraid of the personal repercussions that the program might bring.

Table 1. Percentile scores of teachers' concerns for two semesters

Stages of Concerns	0 Unconcerned	1 Information	2 Personal	3 Management	4 Consequence	5 Collaboration	6 Refocusing
First Semester	81%	91%	85 %	77 %	38 %	76 %	73 %
Second Semester	75 %	90 %	83 %	80 %	38 %	72 %	65 %

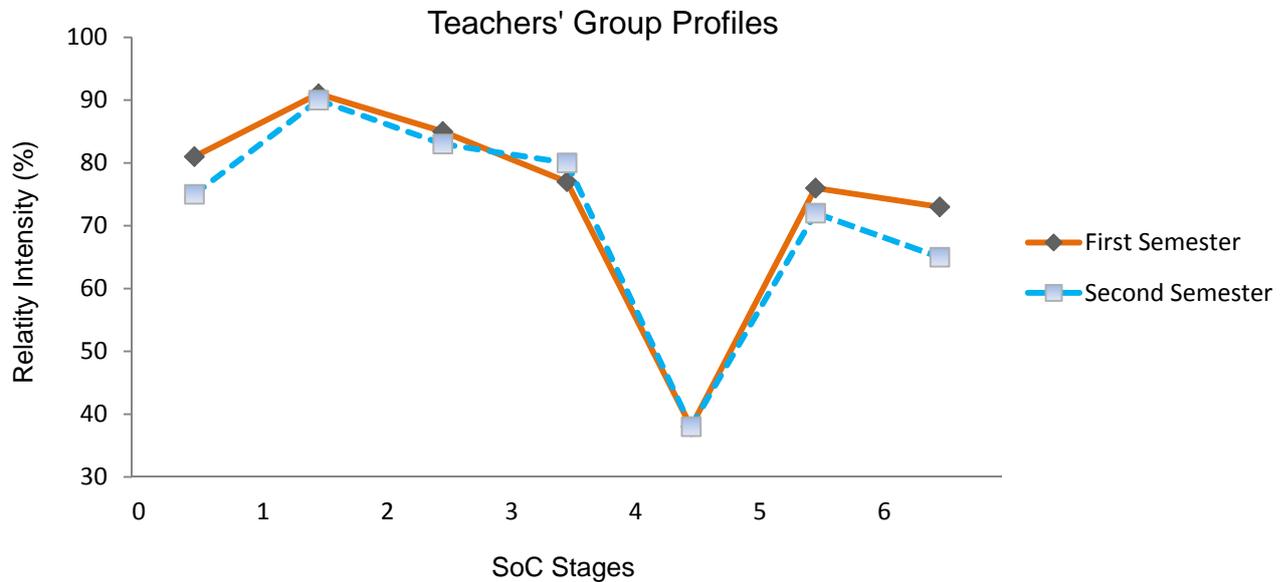


Figure 1. Group profiles of sixth grade mathematics teachers' concerns

When we look at the teachers' concern profile in Figure 1 in the second semester, their personal concerns were slightly reduced, from 85% to 83%. Furthermore, they had a second maximum score at Stage 3-Management with 80%. Namely, the teachers had two maximum scores, at Stage 1-Informational and Stage 3-Management, in the second semester. The increase of teachers' management concerns from 77% to 80% indicated that they had some problems related to the organization, time and scheduling of the curriculum. In essence, a high level of management concerns indicates teachers' uncertainty about how to apply the curriculum in class, how to plan the course and how to use the instructional materials effectively. In sum, the teachers did not know how to balance reaching all of the curricular goals within the allocated time. The primary reason for seeing more management concerns in the second semester is that by the end of the year, the teachers realized that they had limited time left to complete the curriculum content, which caused them to feel stressed.

As indicated in Table 1 and Figure 1, the minimum score obtained from the questionnaire results emerged at Stage 4-Consequences, with 38% percent for two semesters. This low score signals that teachers were not

focused on the curriculum's impact on students; the evaluation of student outcomes, including performance and competencies; and the changes needed to improve student outcomes. Although teachers' scores from Stage 5-Collaboration are not very high (76% and 72%) compared to their scores for stages 1-3, to some degree, the teachers were concern about coordinating and working with their colleagues in order to implement the curricular reform effectively. However, their Stage 5 concerns were lower in the second semester.

The decrease in teachers' Stage 6-Refocusing concerns (from 73% to 65%) over the two semesters indicates that teachers did not give thought to exploring the potential for broader benefits of the curriculum, including the possibility of major changes or replacement with an alternative. If there had been a tailing up on refocusing, this might indicate resistance, especially if the individual was attempting to learn and implement other school initiatives. However, the tailing down at this stage demonstrates that the teachers did not have any ideas about to change the curriculum on a larger scale. Furthermore, the decrease in Stage 6-Refocusing scores in the second semester told us that the teachers had become more adapted to the

curriculum and its expectations and were continuing to follow the required course content in the classroom.

Results from the Open-ended Statement

In this section, we present the main themes separately by classifying the data results obtained from the first (2006-2007 fall) and second (2006-2007 spring) semester.

Information

At the beginning of the semester, the 6th grade teachers were mostly concerned that they did not have enough information about the new curriculum. They especially emphasized the need for extensive in-service education, because they believed that they had not received enough counseling and in-service training prior to the program. The areas where teachers want to be informed included the effects of the program on the Secondary Education Exam (SEE) and the changes made to the SEE. They also wanted to learn about the evaluation techniques for 8th graders, since those students had been taught according to the previous program. The relevance and quality of the SEE questions were also of concern. Most of the teachers did not know what changes would be made to the previous exam system. Another matter of concern for the teachers was their lack of alternative assessment and evaluation techniques. They were mainly troubled about assessing project and performance homework, as well as evaluation of portfolios and student forms. Some of the statements made by the teachers that represent their concerns are provided below:

"We are wondering how students are evaluated in the 8th grade. Has the Middle School Exam been removed?"

"We could not adapt to the curriculum, since we did not receive enough information."

"We want to be informed about project and performance homework, and we also need guidance on the use of evaluation forms."

At the end of the second semester, the teachers made fewer statements concerning their opinions about getting information compared to the first semester. Although some of the teachers' opinions involved the Secondary Education Exam system, they were actually concerned about the contradiction between the current exam system and the program. Quotes from some of the 6th grade teachers' sentences pertaining to their concerns about information at the end of the second semester are provided here:

"Teachers can be informed about the program via the Internet."

"I think that in-service education should be continued throughout the instructional year with the guidance of a specialist. Three to five days of training is not enough."

"I want to know why we need the new program. If they want us to adopt the program, we must be told about the deficiencies of the previous program"

Personal

Since this theme addresses the potential concerns of teachers about their qualifications, the expectations of the curriculum from them, and their role in the program, few statements were made in relation to this concern in either semester. Some of the teachers' opinions are presented below.

"The curriculum expects a lot from teachers and places a burden on our shoulders."

"Even if we try to conduct our teaching by using mostly the suggestions of new curriculum, we couldn't easily give up the practices and pedagogy of the old program."

"I do concern about making some mistakes by trying and misleading."

Organization

Among the concerns of 6th grade teachers, organization was the most frequently mentioned in both semesters. During the first semester, the teachers were mainly concerned about the lack of time for implementing the new program. They mentioned the number of activities and the problem of timing in their application. For this reason, they suggested increasing the weekly mathematics class hours, as represented below:

"The weekly class hours must be increased; there must be a minimum of six hours."

"The math course hours are not enough."

In the second semester, the teachers' concerns about these themes were almost doubled. During the process of reform, they were concerned about the lack of time for implementation and believed that they would not be able to finish the curriculum on time. They complained about the number of activities and difficulty in applying them in the allotted class time. As in the first semester, the teachers recommended an increase in the scheduled math class hours. In addition, the teachers remarked on the number of different kinds of evaluation forms and their usage as an organization-related concern in the second semester. Below are some of the statements made in the second semester representing these concerns:

"I am concerned about finishing the curriculum on time."

"We're loading too much information on students in a short period of time."

"I am struggling to catch up with the topics."

"We're spending too much time on the activities, and the application of the activities in class is difficult."

"Four hours is not sufficient in a week."

Substructure of Schools and Consequences

Besides the information, personal and organization concerns, the 6th grade teachers clarified some inadequacies in institutional substructure and problems arising from students that negatively affected implementation of the new curriculum. The participants expressed their concerns about crowded classes and the lack of instructional materials evenly across both semesters. Some of the teachers also mentioned insufficient substructure of schools for the implementation of the program. The teachers' concerns with respect to the substructure are presented below.

"Students taught with the previous curriculum seemed to struggle to adapt to the new curriculum."

"Classroom size needs to be decreased."

I do not think there are enough materials to use."

On the other hand, the teachers' concerns about students' ability and background doubled from the first semester to the end of second semester. In other words, over time, the teachers came to believe that their students were not capable enough to carry out to the new curriculum's requirements. Additionally, in the second semester, the teachers expressed that schools should have dedicated mathematics classrooms in order to provide the required concrete materials. Lastly, apart from these themes, the teachers remarked on the effects of the students' socioeconomic conditions, the schools' geographic location and technological possibilities as additional concerns in the curriculum implementation process in the second semester. Some of the teachers' direct quotes about their concerns with respect to substructure made in the second semester are presented below.

"Students do not have adequate level to carry out; they do not comprehend some topics."

"Mathematics classes must be design at schools."

"Curriculum implementation is inefficient at rural areas."

"For research, technological opportunities must be increased."

Concerns about the Curriculum

In their open-ended responses, the 6th grade mathematics teachers also explained their general thoughts about the new mathematics curriculum. Over both semesters, the participants expressed negative opinions only twice through their open-ended responses.

"In my opinion, the instructional process is not going to be enjoyable with this curriculum."

"The system could be successful with a smaller number of students and adequate materials."

"I certainly do not believe in the program and its implementation."

On the other hand, the teachers expressed more positive opinions than negative ideas about the program; these were doubled from the first semester to the end of the second semester. In the first semester, while teachers generally thought that the curriculum would improve in time and be used more effectively, in the second semester, they believed that the change had positive effects, especially on the students. This indicates that although teachers had some concerns about the curriculum, they believed in the program's effectiveness and its benefits for students and hoped these would increase over time. Some of their opinions are given below.

"I believe that the new curriculum will be useful, because the students will learn mathematics through discovery."

"The program will be much better in the future."

"The best thing about the program is that it includes the whole class in the learning process."

"The students don't memorize; they learn through examining and observing the facts."

Concerns about the Curricular Materials (Textbooks)

The 6th grade mathematics teachers' opinions about the textbooks were split into positive and negative aspects in the first semester. In the 2006-2007 fall semester, only one teacher expressed a positive view of the textbooks. She said that "The textbooks and exercise books prevent students from using other resources for class." However, twenty of the mathematics teachers revealed negative thoughts about the textbooks in the same semester. Some of teachers' negative ideas about the textbooks are illustrated below.

"In the textbook, there is a disconnection between the subjects taught and practice exercises."

"I am concerned about student success because of the intensive subjects in the book."

"We need test questions and extra resource books"

"I think that the textbooks and similar publications are not enough to teach the material."

"The distribution of the subjects in the books is wrong."

"I want the authorities to revise and rewrite the new textbooks."

As seen from these statements, the teachers complained about the intensive subjects in the books, the gap between the subjects and exercises, and the content of the new textbooks.

When examining the 6th grade teachers' views about the textbooks in the second semester, the participants offered more specific explanations and critiques about the new curricular materials. As the reform program became more established and the teachers had used the new materials for several months, they expressed greater concerns about the textbooks and proposed modifications to increase their effectiveness. While

twenty of the teachers had indicated negative views in the first semester, those views became more precise and were repeated by a total of ninety teachers in the second semester. Teachers mainly complained about the sequence of the topics and the lack of sufficient mathematical knowledge in the textbooks:

"The sequence of the topics must be revised again."

"There is a connection problem among the math topics in the book."

"The textbook is overly complex."

"The textbook is very superficial; the information is minimal, but the homework questions are very detailed"

"Some questions in the book are not covered in the subjects and not appropriate to the students' level."

The 6th grade teachers thought that the mathematics curriculum was overly intensive. They commented that "the topics in the book are very difficult and very intensive." They also perceived that textbooks included some mistakes and that some of the activities were not applicable:

"The textbooks should be redesigned and prepared again."

"The textbooks have mistakes and deficiencies."

"I think the textbook is insufficient."

"There are too many activities in the textbook; some must be eliminated."

"There are too many activities; some are unnecessary and meaningless."

As seen from these examples, the main focus of all of these themes supported the teachers' unhappiness about the new textbooks.

CONCLUSION AND DISCUSSION

After analyzing the data, the findings revealed that the 6th grade teachers had numerous concerns about the new curriculum, and these concerns differentiated over time. For both semesters, the SoCQ results demonstrated that the teachers' primary concerns were Informational (91% - 90%) and Personal (85% - 83%); Management (77% - 80%) and Collaboration (76% - 72%) concerns followed these. They had minimum concerns with respect to Consequences (38%) in both semesters. Rakes and Casey (2002) reported similar results in their research aiming to analyze the concerns of PK-12 teachers (n=659) toward the use of instructional technology using the Stages of Concern Questionnaire. Their findings indicated that the highest two stages of concern for their respondents reflected intense, personal, lower level concerns, along with Collaboration. The lowest stage of concern for the aggregate data indicated that the respondents had minimal to no concerns about the consequences of the use of technology.

According to the group profile results (see Figure 1), the teachers had maximum scores in the information

stage for both semesters. From their open-ended question results, especially at the beginning of the first semester, the teachers expressed the most concern about lack of information about the curriculum and stated that they needed extensive in-service training. The teachers also reported wanting to learn how to use the new assessment tools and wondering what type of changes would be made to the Secondary Education Exam. The national literature indicates similar findings in terms of this issue (GOzutok, Akgun, & Karacaoglu, 2005; Yasar, Gultekin, Turkan, Yıldız, & Girmen, 2005). Yasar et al. (2005) conducted a study with 97 elementary teachers who participated in in-service training for the program and found that teachers did not have enough knowledge about the philosophy of the program or the content, aim, teaching-learning process and assessment-evaluation part of the program. GOzutok et al. (2005) also revealed that primary school teachers considered the two week in-service training on the curriculum to be insufficient and too short.

In their SoCQ results, the secondary concern of the teachers involved the personal impact of the curriculum. Baki and Gokcek's (2007) study also supported these results, reporting that elementary teachers' first year concerns about the curriculum intensified at the information and personal stages. At the personal stage, a teacher may be concerned about how the innovation will affect him or her personally. Educators might wonder what new skills and knowledge will be required of them and whether they will be able to learn those new skills. They may wonder whether the materials they need will be available or whether students might react negatively to new forms of instruction and disrupt classroom discipline. For these reasons, teachers' personal concerns were high in both semesters. On the other hand, in their open-ended responses, the teachers made few comments about their personal concerns. Considering the difficulty of criticizing oneself as a person, it is reasonable to expect that the teachers would not write much about their personal qualifications. However, some teachers did comment that they had not given up their previous experiences, teaching practices and roles. Similar results were found in Rodriguez's (2000) case study with a practicing teacher who was using a reform-oriented curriculum for the first time. This study indicated that teachers' learning creates tensions and dilemmas resulting from specific conflicts (decision making about the focus of lessons between their evolving, reform-oriented understanding and traditional approaches to which they are accustomed).

Following information and personal concerns, another issue where teachers had the most concern involved the organization of the curriculum over the two semesters. As seen from Table 1, the teachers' organization concerns increased slightly by the end of

the second semester. On the other hand, from their open-ended responses, the teachers' management concerns rose sharply in the second semester, especially with respect to lack of time for implementation and for the application of the activities. Because of timing concerns, the teachers indicated a need for more math class hours in the following year. In terms of organization problems, Kupcu and Kardes (2007) applied a survey to a total of 125 sixth grade teachers and concluded that organization was the most important problem for the curriculum implementation. These findings support our results. In Leung (2008)'s study regarding how Project Learning has been integrated into curriculum activities in schools, the participants were also worried about self-concerns and task concerns, and they highlighted the importance of the organization of various activities for lifelong learning and developing the students' general skills.

Figure 1 indicated a second peak in the Collaboration stage for the two semesters, while there was a slight decline for the scores at the end of year (from 76 % to 72%). These findings demonstrate that the two weeks of in-service training did not satisfy teachers' needs for the implementation process, and this situation lead them to be concerned about collaborating with their colleagues. Can (2005) revealed teachers' need for collaboration in his study with 235 teachers, administrators and inspectors. He concluded that teachers failed to create an environment where they could share their knowledge and experiences. Similarly, Cetinkaya's (2012) work with 6th grade mathematics teachers showed that the concerns of teachers mainly concentrated on the collaboration and informational stages. He utilized a Turkish version of the Stages of Concern Questionnaire (SoCQ) by adapting it from Gokcek (2008) and applied the questionnaire to 306 in-service mathematics teachers working in Ankara. The researcher found that even though the reformed curriculum had been in effect for some time, the teachers did not seem to have the opportunities or resources to acquire comprehensive information about the content and application of the reformed curriculum. Other scholars have affirmed the importance of teachers' conversations and collaboration in the reform process (Schifter & Fosnot, 1993; Weissglass, 1991). Clearly, assistance is essential if teachers are to reform their teaching, and that assistance needs to involve more than imposed prescriptions (Walen & Williams, 2000).

Another concern evidenced by the teachers' written statements was the substructure opportunities in their schools. In both semesters, the 6th grade teachers complained that the program had been implemented without taking into account the appropriate substructure in schools; therefore, a lack of concrete materials for doing activities, crowded classes, and lack of students' background created an obstacle. To reduce these

concerns, the teachers recommended creating a special mathematics classroom in their responses in the second semester. They also requested materials for activities before the beginning of the semester, as well as a decrease in the number of students in classes. Accordingly, before and during the curriculum application process, establishing the needed substructure and removing the obstacles to implementation may open the way for teachers to apply the program appropriately. Yasar et al. (2005) and Korkmaz (2006) reported similar findings in their research. In their work with elementary teachers, they concluded that the number of students in classes and lack of appropriate materials hindered the curriculum implementation. Bulut's (2007) analysis of the newly developed elementary school mathematics curriculum also supports our findings. The author found the unsuitability of activities for crowded classrooms, a lack of infrastructure in schools and unavailability of mathematics books to be some of the weaknesses of the newly developed curriculum from the perspective of teachers.

Contrary to the concerns outlined above, the participants gave some clues about their thoughts on the new curriculum in their written responses. According to the results, the teachers expressed more positive opinions about the curriculum than negative, and their positive beliefs doubled in the second semester. These results highlighted the teachers' positive approach and adaptation to the new curriculum. They believed that the program would be beneficial for students and that it will be applied more effectively in the future. Other research also points to the positive aspects of the program (Bulut, 2007; Ozdas, Tanışlı, Kose, & Kılıç, 2005; Temiz, 2005) as being student centered; having positive reflections on students, teachers and parents; promoting learning by doing and living; encouraging teachers to develop themselves; being suitable to students' development level; setting clear goals, content, and teaching-learning process.

Teachers vary greatly in their acceptance of or resistance to new curriculum materials (Remillard & Bryans, 2004), use of suggested topics and activities (Barr & Sadow, 1989; Freeman & Porter, 1989; Stodolsky, 1988), and engagement with materials over time (Heaton, 1994; Peterson, 1990). In classrooms across the country, curriculum materials are important and can be influential resources for teachers. Mathematics curriculum materials, in particular, are potentially influential, given the challenging nature of mathematics instruction espoused under recent reform efforts (Castro, 2006). According to our findings, the teachers criticized the new curriculum textbooks, which differ from the previous materials in a number of ways. Although the teachers' concerns in the first semester were only about the sequence of the topics and the

content of the textbooks in general, these concerns increased in the second semester after they had spent more time with the textbooks. The teachers were especially concerned about the distribution of the topics; the conflict between the information in the book and the exercise questions; the intensity of the curriculum; and the unnecessary and inapplicable activities in the textbook. In their study, Orrill and Anthony (2003) found that middle school teachers did not know where the textbooks were going and struggled to see the big picture because of the newness of the curriculum. In particular, the nature of a spiraling curriculum left teachers wondering whether their students were getting everything they needed. Furthermore, a 2006 survey of the Beijing pilot project schools examined the implementation of the new curriculum with regards to the teaching of Chinese and Maths. The authors revealed that the new textbooks lacked cohesion and had many gaps in the topics, forcing teachers to use bridging materials. This increased teacher workload and stress, as well as student homework, undermining the goal of lightening students' burdens (Dello-lacovo, 2009). These results coincide with our 6th grade teachers concerns about the new textbooks and their struggles with the curriculum.

IMPLICATIONS

Our research results emphasize the importance of teacher concerns in educational reform. To facilitate teachers' clear understanding and development of constructive meaning of the new curricular reforms, the following suggestions can be made for teachers and educators interested in curriculum implementation.

As teachers' concerns about getting the necessary information about the program were high throughout the year, it is important to provide in-service training and follow-up support for teachers in the first year of the innovation. According to the findings of the study, in addition to the continuity of the in-service programs and giving information about the curriculum's structure and philosophy, placing a concrete course application at the allocated time, explaining the role of teachers in class, and informing teachers about how to make student assessment in detail should be significant points that program developers must take into consideration. Thus, in-service programs must support teachers as they implement the new methods in the classroom. A strong implementation phase is needed, as teachers work to construct new meaning in their pedagogical schemata. To remove teachers' organization concerns, the first step is to assist teachers with understanding how to plan their course in the given time. This can be done with in-service training, as well as designing the teacher guide accordingly.

In their responses, the teachers mentioned the lack of substructure and suggest strengthening the social and physical substructure in public schools. For this reason, teachers should be given adequate tools, space, opportunities and other mechanisms to construct the knowledge and meaning of the new reforms in a supportive atmosphere. Supporting schools in preparing the necessary materials for activities or sending those materials to schools beforehand through the help of the Ministry of Education will reduce the responsibility of teachers to a great degree. As mentioned by some of the respondents, establishing mathematics laboratories in each school and decorating them with the appropriate materials and tools, as well as providing computers and Internet access in those classrooms, will pave the way for students to discover mathematics and use their skills with confidence. Furthermore, school districts should invest significantly in continuous professional development, provide support structures, monitoring and evaluation, and promote a collaborative culture within schools and other learning institutions. This should ensure that teachers develop the appropriate understanding of the reform measures, as well as quickly receiving the necessary help whenever challenges arise.

Finally, although the teachers expressed generally positive opinions about the curriculum in both semesters and believed in the necessity of the change, they presented some criticism about the new textbook. To guarantee the widespread use of the textbook, the content should be consistent with the objectives of the curriculum, and the activities must be beneficial for the students and easy to understand. To achieve this goal, the determined deficiencies or mistakes in the textbook should be corrected and renewed each year according to teachers' opinions.

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