

## **A Study on the Detemination of Secondary School Mathematic Teachers' Views on Alternative Assesment**

Hasan Hüseyin Aksu

Department of Elementary Education, Faculty of Education, Giresun University, Turkey

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**Abstract:** The nature of assessment techniques has undergone a number of changes and these changes have naturally affected not only education itself but teaching as well. In addition to traditional methods, teachers are also encouraged to use such new methods of assessment as formative, performance, self, peer, alternative and portfolio assessments. So, the development of alternative assessment techniques indicates how well and smoothly education systems in the developed world work. The aim of this study is to establish the secondary school mathematic teachers' views on alternative assessment. The participants were composed of ten mathematic teachers employed in Class 6 from a randomly-selected sample of public schools in Kirsehir. Survey method was used as a means of data collection or gathering. It is certainly true that the respondents were extremely sincere during the process of answering the interviewer's questions. The results showed that teachers had negative attitudes toward the changes in the new assessment system in the program because of their traditional thoughts and fixations. It was concluded in the study that in-service training courses which aimed to make teachers familiar with the changes in the new program were insufficient. As a result, students were not provided with an opportunity of alternative assessment, self -assessment and peer-assessment.

**Key words:** Measurement • Assessment • Alternative • Mathematics • Teachers' views and education

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### **INTRODUCTION**

Not in any period of time is high the number of people who ignore or do not appreciate the value of mathematics. Because of the efficiency or dominant use of science-based technology in our contemporary age of information, the value of mathematics is an unquestionable matter. It is almost impossible for any one of you to lead an efficient life in a society unless he knows much about such simple mathematical operations as counting, addition, subtraction, division, and multiplication [1]. Mathematic teaching is known to occupy an important place in an educational system. In primary and secondary education, the aim of mathematic teaching is not only to provide students with the mathematical culture desired but also to improve the ability of mathematical thinking besides the mathematical skills wanted [2]. Hence, students come to understand the importance of mathematics and begin to use mathematics as a means of communication. In addition, mathematics helps students improve their skill of problem-solving and solve the problems they are likely to face in daily life.

Mathematic education is a systematic and gradual process, of which measurement and assessment form the last stage. Educational and instructional activities or operations aim to improve students' success. Measurement and assessment, a part of such activities, is of great importance in terms of increasing success in teaching.

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**Corresponding Author :** Dr. Hasan Hüseyin Aksu, Department of Elementary Education, Faculty of Education, Giresun University, Turkey

In our country, activities for measurement and assessment are carried out in parallel with Bloom's Taxonomy. Recently developed educational programmes are based on such approaches or theories as structuralistic learning, multiplied cognition or cooperative thinking and the development of scientific skills through project-based learning. Consequently, new approaches to measurement and assessment should be developed and practiced. Evaluation is an activity that should be done to support the process of students' learning [3]. Teachers are expected to employ new measurement and assessment techniques rather than conventional ones. The determination of whether or not teachers are acquainted enough with new measurement and assessment techniques is of high importance with respect to mathematical success. Such examinations or tests as multiple choice test, fill-in the blank tests, true-false test, matching test in addition to classical test with few open-ended questions are usually given in the conventional approach to measurement and assessment techniques. It is, however, known that such examinations or tests remain insufficient in the assessment of such informative and affective behaviors as critical thinking, problem-solving, discovering, ability to work in or with a group, developing a positive attitude to mathematics, and an interest in mathematics [4].

Testing and written examinations are frequently used techniques of assessment in traditional teaching or instruction. Such a technique of assessment suggests that students be successful as a result of memorization of the knowledge or information required. Students who are forced to learn any thing only through memorization are quite likely to forget quickly the knowledge they try to learn. In addition, they might ignore the reason behind the knowledge and its coherency. The acquisition of knowledge and its continuity in mind is of great importance with respect to learning. The techniques used for the evaluation or assessment of the knowledge gained ought to help students structure their knowledge and make it lasting. In other words, the traditional way of assessment remains to be insufficient in structuring the knowledge and keeping it permanent. In addition, it does not provide satisfactory information about the knowledge gained by students for teachers, students, and students' families. This means that multi-sided alternative techniques of assessment should be emphasized.

A gradually increasing tendency to alternative techniques of assessment has been observed not only in developed countries but in our country as well. Alternative assessment is a student-centered evaluation. Alternative learning helps students get motivated, understand how to learn, judge how efficient what they learn is besides helping teachers and students alike make a decision on what to learn. It also enables teachers, the student himself and his peers to observe what the student does during the process.

The Ministry of National Education taking into consideration the trend of change in education developed a new programme and put it into practice in the academic year of 2005-2006. In the new teaching programme are included a great number of changes and innovations as compared to the old one. New teaching programmes give priority to the perception of assessment based on the learning process in the practices of measurement and assessment. The new programmes require the application of such alternative assessment techniques as the assessment of performance and project, the assessment of the student himself and his peers and portfolio. Moreover, the measurement and assessment activities or practices ought to be carried out in such a way as to be directed not only to the determination and elimination of the students' shortcomings but also to the measurement of top-level cognitive learning (analyses, synthesis, and assessment) and the simultaneous assessment of development in terms of cognitive, affective, and psychomotor dimension. The case requires classical examinations, multiple-choice tests, question-answer examinations as well as such contemporary approaches of assessment as debate, project, group work, portfolio and the evaluation of the student himself and his peers [5].

Today the techniques of measurement and assessment which are prevalently used or wanted to be used are written examinations and multiple-choice tests. This is a product-oriented assessment. Students' development in the process ought to be evaluated because the development in the process affects students' behaviors at cognitive, affective, and psychomotor levels. Teachers, therefore, should employ alternative techniques during the educational and instructional process rather than such traditional techniques as multiple-choice tests and written examinations in order to make a process-oriented assessment. The aim of this study is to establish the secondary school mathematic teachers' views on alternative assessment.

## **METHODS**

The purpose of this study was to determine the secondary school mathematic teachers' views on alternative assessment methods. A number of interviews were held with mathematic teachers in Class 6 who use these alternative assessment methods to gather the data. Teachers' perspectives and understanding of the new assessment methods were investigated.

**Participants:** In this study, the participants were composed of ten mathematic teachers employed in Class 6 from a randomly-selected sample of public schools in Kirsehir. The respondents stated that they preferred new alternative assessment methods for evaluation, which have newly been offered to be used in the 2006-2007 school year. It is certainly true that the respondents were extremely sincere during the process of answering the interviewer's questions.

**Procedure:** Used in this research, the interview questions about the new alternative assessment method were developed by the researcher based on a review of literature. The questionnaire consisted of fifteen questions reflecting teachers' perspectives or concerns about this new assessment method. A sample of the questionnaire was also added at the end of this study.

**Data Analyses:** The interview data were analyzed as follows: First, the teachers' responses previously recorded during the interview were each listened and written on a piece of paper. All the responses the participants gave were coded, listed, and grouped. Second, after a further reading of these responses, the data obtained were grouped in such a way as to put similar views in one category or theme. Finally, following the revision of the themes and their rearrangement under the more general themes came out a number of such meaningful concepts as:

- Teachers' perspectives and concerns about the new assessment methods
- The differences between traditional assessment methods and alternate assessment methods
- The evaluation of in-service training courses for the new programme
- The determination of alternate assessment methods
- The applicability of alternate assessment methods
- The difficulties faced during the application of alternate assessment methods
- The benefits of alternate assessment tools
- Personal development as a result of the employment of alternate assessment method
- The contribution of using alternate assessment methods in the new programme to professional development.

## **RESULTS**

The overall results of this investigation indicate teachers' negative perceptions of this alternate assessment method. The majority of the teachers stated that the existing examination system caused a number of difficulties in the application of this alternate assessment method. Another factor that may have caused these teachers to assume a negative attitude toward this method is that they lack satisfactory knowledge of alternative assessment itself as well as of its correct application. About the alternate assessment methods, a significant number of the teachers (4 teachers) said that these alternate methods had multiple directions in terms of the measurement of cognitive, emotional and psycho-motor skills. Most of the teachers (3 teachers) expressed that students could be evaluated in groups as well as individually through these alternate methods.

In this method are a lot of forms of assessment in addition to satisfactorily detailed surveys for students about whether the subject-matter is understood or not.

It was found in this study that a significant number of teachers (6 teachers) used performance assessment for their students' evaluation, most of them (5 teachers) also assigned their students project or homework, other teachers (2 teachers) used portfolio assessment in evaluation, one of the teachers used students' self assessment and that another teacher used group assessment for students.

It was also found that one teacher said that by keeping mathematics journals, students were able to know what they had been doing in class and that another teacher also used problem solving method for assessment.

There is a need to promote the learning of skills and competences that cannot be tested by particularly traditional techniques. This study indicated that the alternate assessment methods were very different from the traditional ones. Although most of the teachers stated there existed such a difference, one teacher revealed his objection to the existence of such a difference saying that it was only a change in the name.

The study also indicated that the majority of the teachers interviewed -four teachers- were not in the opinion that their participation in in-service training courses did not provide any concrete benefit for them. However, a significant number of teachers -seven teachers- showed a tendency to attending in-service training courses provided that such courses are organized. One teacher, on the other hand, pointed out that he wanted to attend in-service training courses as long as lecturers were knowledgeable enough and such courses were organized by the Ministry of Education. And also one other teacher said, "Yes, I attended a one-week course in Yalova with my colleagues, but we did not at all take any advantage of it because the course was not so well-organized and the lecturers involved were not so creative and inquisitive enough. The lecturers seemed not to take the course so seriously since they made their presentation by simply putting the CDs on the computer." All the course participants except for one participant only expressed their discontentment with the course in Yalova.

Five teachers stated that they tried to develop their professional skills by reading only guide books and other sources related to the system. And even one teacher expressed that guide books arrived towards the end of the teaching term. One other teacher said, "If guide books had been provided for us at the end of last year, we would have had a chance to look through them and hence it would have made a lot of contributions to our personal and professional development as well." Two of the teachers said that they disregarded guide books and resources. This disinterest of theirs hampered their personal and professional development. Another teacher pointed out he could not reach any sources about assessment methods. One last teacher expressed he tried to promote his personal and professional development merely through CDs and the Internet search.

As for the qualification of new assessment methods, two of the teachers expressed their satisfaction with the adequacy of these methods, while others found them highly insufficient. One teacher mentioned that an assessment method should be developed in such a way as to fit each subject or course. He also emphasized that different assessment methods should be used in Mathematics, Turkish, or in Social Sciences.

As for the applicability of these new assessment methods, two teachers stated that teachers preferred conventional assessment methods to the alternative ones due to their fixations.

They also expressed alternate assessment methods were at a very basic level and story-based. One of them said alternate assessment methods were so simplified that they aimed to teach basic things to students. It is, therefore, unreasonable to apply alternate assessment methods in high-level classes.

As for the difficulties which appeared during the application and/or the employment of new assessment methods, the majority of the teachers -six teachers- involved in this study pointed out that new assessment methods take a lot of time, so its application seems to be highly difficult within the time allowed. Namely, since classes are overcrowded, it seems almost impossible for a teacher to assess students' performance assignments, homework and projects. One other reason for the failure of the application of new assessment methods is the abundance of subject-matters and activities. Therefore, some teachers tend to prefer group assessment to individual assessment due to the limited time allocated.

The majority of the teachers -five teachers- said that they had difficulty applying new assessment methods due to their illiteracy of these methods and their inability to give up their habits of conventional assessment methods. In addition,

they did not seem to have a tendency to getting informed of new assessment methods because they did not want to make any sacrifices to learn about them. They also emphasized that the testing methodology of traditional educational system stood out as a menace or obstacle to the application of these new methods. Some teachers also stated that traditional educational system encouraged students to memorize the knowledge provided, so it was not easy to destroy such a habit of memorization in one fell swoop.

Some teachers argued that both teachers and students experienced difficulty in the availability of materials necessary for the application of alternate measurement and assessment methods. They also stated that the teaching materials available at school were very old or obsolete and that the availability of new materials developed for new alternate assessment methods was possible at a much later time than it was supposed to be. Such adversities naturally create unfavorable effects on the application of alternate assessment methods. Some teachers suggested that the application of alternate assessment methods imposed additional financial and effort-demanding burden not only on students but on teachers as well. Moreover, some other teachers stated that it was too heavy for students to carry their portfolios to school and they were likely to lose them any time. One teacher argued that as students were assigned performance work and a project for each school subject and this imposed too much burden on students, they tended to get others to do these performance work and projects instead of doing them on their own.

Some teachers pointed out that performance and project homework confused their students. Some other teachers -two teachers- also stated that it was going to be a problem for them to copy and deliver the materials used for alternate assessment methods to students.

Most teachers said that they had trouble grading the forms since they were not well informed of grading. In addition, two teachers stated that they were faced with the complaints of students' parents about the extremeness of performance-based and project assignments imposed by these alternate methods, the employment of the same assessment methods for all the students regardless of their cognitive learning level and the inability of students to acquire more knowledge due to the extreme time spent on the performance-based and project assignments required by alternate assessment methods. Some parents even proposed replacing new alternate assessment methods with the traditional ones with the hope that their children would learn more through conventional methods.

Two of the teachers stated that Turkey was not satisfactorily prepared beforehand for the application of new assessment methods. One of the teachers said that the application of alternate assessment methods in Turkey seemed to be highly difficult due to unfavorable physical conditions Turkish schools were in and that school textbooks should be richer than they are now in order for alternate assessment methods to be smoothly conducted in the new programme.

As for the benefits of these new assessment materials, two teachers expressed that the employment of new assessment methods increased students' active participation in class, kept them extremely motivated and enabled them to acquire knowledge targeted much better on their own. Some teachers also stated that the new system was student-centered and had many various forms. One teacher said it was a well-prepared programme and there existed questions for every student's ability in alternate assessment methods. Another teacher stated that these methods increased students' levels of self-awareness and that they also developed teachers and students' manual abilities. He also added that these alternate assessment methods ensured the permanency of knowledge. Teachers' perceptions of these new assessment methods indicated that these methods helped teachers to observe their students' progress and know much of their students. One teacher said that these alternate methods were very useful for teachers, but it was not easy to say the same for students and that they provided teachers with an idea about students' position and their levels of progress.

The majority of the teachers expressed that they favored new alternate assessment methods because of their positive and beneficial contributions to professional development. One teacher pointed out that new alternate assessment methods used in math teaching created favorable changes in students as regards the usage of mathematics in real life. He also added that the student did not have difficulty understanding problems, but he experienced difficulties in developing the resources presented on his own since he was quite used to gaining theoretical knowledge solely through the memorization of school

textbooks in the past. Three teachers also said that new alternate assessment methods encouraged students to be extremely inquisitive instilling a sort of self-confidence in them. Some of the teachers mentioned pedagogical benefits of the new assessment system to their professional development.

Some of the teachers said that teaching math through these new alternate assessment methods increased students' success and the number of students in class who began to get enjoyment out of math classes went up. They also pointed out that these methods enabled teachers to make close observations on their students through their portfolios. A few of teachers (two of them) said that these methods were not beneficial to students because they did not gain detailed knowledge through these methods. Even one teacher stated that these methods were useless because most of the students' portfolios did not serve any purpose.

In conclusion, it is commonly believed that it will be useful for both teachers and students if they get acquainted with new standards of this assessment system in the new teaching programme. It seems that it will take teachers some time to fully understand and apply these new methods. This study revealed that teachers had negative attitudes toward the changes in the new teaching programme because of their traditional thoughts and fixations. Hence, an in-service training course should be re-arranged for teachers in order to make them familiar with the changes in the new programme. In addition, students should also be involved in the process of assessment, providing students with an opportunity of self-assessment and peer-assessment.

## **DISCUSSION**

The aim of mathematic instruction is to guide students to the ways of knowledge acquisition and how to make use of the knowledge acquired as well as to provide students with science process skills (SMS) and mathematic knowledge. In order for such goals to be achieved, new methods aiming to promote students' in-class performance and keeps them more active have been developed as an alternative to the classical teaching and educational ones. Through classical testing techniques such as written examination, it is not easy to test whether or not the knowledge provided by such classical methods have been acquired by students. Hence, alternative assessment system was developed. To improve the practices of alternative assessment in the classroom, it is important to understand teachers' perspectives about alternative assessment because teachers' beliefs directly influence their implementation of alternative assessment in their classroom [6]. Overall results of this investigation indicate teachers' negative perceptions. There might be a number of reasons for teachers' negative perceptions. One reason is that alternative assessment system used in the new programme has made teachers very annoyed due to its time-taking implementation. One other reason for teachers' negative attitude to alternative assessment system is its shortcomings. Another important reason for teachers' negative perception about the new assessment is their poor awareness of alternative assessment system. A number of other reasons for such a negative attitude might be as follows: Teachers have yet to receive enough in-service training for alternative assessment system. Students are inexperienced in the usage of alternative assessment system. Teachers prefer classical assessment system because they find it much easier than the new ones. Çepni *et al.* [7] point out that teachers prefer to employ traditional assessment methods, for they were trained through conventional educational methods, their classes are very crowded, and the system of university examination has an adverse effect on the school curriculum and the measurement and assessment methods employed in classes [8]. Teachers seem to be fairly conservative and hence are not open to new changes. An investigation Kim carried out in 2006 indicated that teachers expressed less positive perspective about their practices related to alternative assessment system and noted few benefits of the alternative assessment system for teachers and students [9].

The benefits of alternate assessments are well documented. However, some teachers are hesitant to implement them in their classrooms. Commonly, this is because these teachers feel they don't know enough about how to fairly assess a student's performance. Another reason for reluctance in using alternate assessments may be their previous experiences with them when the execution was unsuccessful or the results were inconclusive [10].

This study should be extended with a broader sample. A more qualitative research is needed for teachers' current practices related to this new system. So, teachers' perspectives in other schools can also be explored. Student' parents should be informed about this assessment system and their perspectives should be taken into account for better improvement.

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## **ATTACHMENT: A Questionnaire**

1. What do you think of the understanding and methods of new assessment system coming by the new teaching programme?
2. To you, what are the differences between traditional assessment methods and new ones?
3. Have you ever attend any in-service training course about the new assessment techniques (portfolios, journal, self-assessment, performans assessment) in the new teaching programme? How do you evaluate this?
4. What studies have you done about the new assessment techniques to develop yourself (research, investigation, literature review, interview)?
5. Do you think that it is enough to use new assessment techniques? What else can be done to determine the success of teaching?
6. Would you like to attend for any in-service training course or seminar if there is any?
7. At what level do you think of the understanding and techniques of the new assessment that can be applicable in mathematics classes?
8. Which of this new assessment techniques and at what level have you used them for your purpose in your classes so far?
9. What difficulties have you seen when applying this new assessment techniques in your classes or courses?
10. Do you think this new assessment techniques make teachers' work more difficult?

11. What important benefits can you provide by using this new assessment techniques with your students from the mathematics education point?
12. What kind of knowledge and abilities do you need to successfully use new assessment techniques in mathematics courses? What have you done to do these?
13. As a mathematics teacher, do you think of the benefit of using new assessment techniques to your professional development? Why?
14. Can the materials that students put in their portfolios among this new assessment techniques contribute to your professional development? How?
15. If we accept the new programme as a beginning, what kind of change do you have regarding your understanding of previous and present teacher, qualifications, learning, teaching, your view of school and mathematics education?