Research Article

Topic: Grade as a Motivation for Learning Mathematics

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Abstract
This paper presents theoretical and pedagogical considerations as well as the basic results of research on the evaluation and assessment of student achievements in mathematics. The research was carried out in class and subject classes. The paper is based on the hypothesis that descriptive assessment is more successful and increases students' motivation for mathematics as a science. The aim of the paper is to investigate, analyze and interpret the attitudes of students and teachers about descriptive and numerical assessment. The problem of this paper is which type of evaluation has a greater influence on students' motivation towards mathematics. Analytical, theoretical and deductive methods were used in the work. Research techniques for proving the views of this work are a survey. As for the instruments, we made distinctions about the attitudes of students and teachers. The paper ends with a concluding discussion of the problem.

Keywords: Mathematics, Grade, Student, Teacher, Motivation

1. Introduction

The term assessment refers to the procedure by which, according to established regulations, the educational work of students, their development and their level of achievement are determined. Established regulations are rules in the form of instructions or regulations prescribed by school authorities that teachers must adhere to. Student evaluation is one of the most delicate components of the educational process, which largely determines the quality of education, criteria and standards. Assessment has its own social and anthropological characteristics of human work, which throughout history has changed and adapted in accordance with time and conditions, from the aspect of technical procedures, function and purpose of assessment. Criticism of traditional evaluation is based on one-sidedness, that is, only knowledge is evaluated, the curriculum is evaluated and not the student, the teacher plays the main role, which is considered to be outdated in modern practice.

Therefore, the assessment can be divided into two models, descriptive and numerical. Numerical grading is quantitative grading. The very name of the model says that the student's activities and achieved results are evaluated with numbers, that is, numerical scales. Descriptive evaluation is a verbal evaluation of the outcomes of educational work using descriptor words and an assessment scale for those outcomes in order to identify the initial stage, subsequent steps, identification of possible difficulties and planning of measures to overcome these difficulties. Unlike numerical assessment, this assessment follows student progress and is therefore analytical. When evaluating, care must be taken of:

1. Assessmentmust **beconstant and continuous**, because any feedback for the student means successfully completed work that creates a sense of satisfaction and a desire for advancement in the student.

2. The evaluation **must be realistic,** it must reflect the level of acquired knowledge, skills, habits and abilities of the child, his will and interest in work, independence and dedication in work, activity of thought processes, conditions of his life and work.

3. The grade **should be commented on immediately** so that the student would be clear in which he had more and less success.

4. The grade must be **objective**, and its objectivity depends on the requirements.

5. Assessment must be **individualized**. Students are different from each other and not everyone achieves the same results despite their efforts.

6. The grade emphasizes **what the student is successful in,** but it must also emphasize what the student could be more successful in with greater effort. The grade must not talk about

failure, because it causes unpleasant emotions in children.

The purpose of the assessment is:
- Providing feedback on student progress (new planning).
- Providing feedback to students.
- Student motivation
- Ensuring records of student progress.
- Expression of current achievements.
- Assessment of student readiness for future learning.
- Evidence of teacher and school effectiveness.

The rating factors are:
▪ Teacher (evaluator, person who evaluates)
▪ Student (person being evaluated)
▪ Teaching content (what is assessed, knowledge, achievements, skills, habits, practical operations)
▪ Grading system (numerical, descriptive, verbal and similar)
Different teachers may have different assessment criteria and value demonstrated knowledge differently. Teachers can make subjective judgments. Among teachers of the same school or of different schools and regions, there is a large difference in basic knowledge about educational outcomes. Dressing criteria can be pre-defined, clearly defined, transparent, uniform, practically demonstrated. The criteria for evaluating the success of students in the subject are: **the type, scope and level of acquired knowledge, skills and abilities in relation to those prescribed by the curriculum for the subject, class, educational profile**, or type of school...

The level of knowledge, skills and abilities is determined depending on the quality of the acquired content: **the complexity of acquired knowledge, skills and abilities; degree of comprehension and understanding of the adopted content and ability to apply it [1]. Disadvantages of ratings** – their weak diagnostic and prognostic value. Grades are not valid indicators of knowledge, nor do they enable a more reliable prediction of student success. in the search for the causes of poor assessment of knowledge, researchers focus on studying the shortcomings of school assessment caused by environmental factors, factors that depend on the teacher as a measuring instrument and factors related to his method of examination and assessment.

For a measurement to be correct, its result must be solely determined by the size or development of the oline being measured. The measuring instrument must not have any influence on the measurement result. That is why every good measuring instrument must have certain metric properties: accuracy, objectivity, reliability and sensitivity. The grade on the exam would have to be determined only by knowledge or at least by the student's answers, and the teacher as a measuring instrument should not influence the value of the grade at all. But in practice it is almost the other way around... "the grade depends more on the evaluator than on the student's answer, so for the student it is more important who examines him than how well he knows the subject" (Bujas, Z.: Knowledge tests and the possibility of their use in school practice , own edition, Zagreb, 1943.)

Research aimed at determining the objectivity, reliability, sensitivity and validity of teachers as measuring instruments in the evaluation of school written assignments proves that teachers are weak measuring instruments [2, 3].

Research Problem-Evaluation and evaluation of student achievements in mathematics teaching. This problem is certainly several tens of years old, because since that time many researchers have studied it and tried to solve it. What has led numerous researchers to deal with this problem is the fact that the previous assessment had many shortcomings. Deficiencies were mostly pointed out by the students and their parents, and the comment was often heard in society that behind certain grades there is no knowledge that adequately evaluates them. All of the above indicated the fact that during evaluation there is a discrepancy between the evaluation and student knowledge and the equivalent preparation of students for their further education..

When it comes to our school, current problems during evaluation are:
- tea▪chers' lack of knowledge of assessment issues,
- the absence of specific criteria for teachers to adhere to, and for this reason each teacher has his own way of evaluation,
- assessment during the school year is not continuous, so it is evident that at the end of the semester and at the end of the school year more intensive assessment is carried out, which puts a lot of (unnecessary) pressure on the students,
- non-transparency of grading, very low grades in certain subjects that are not accompanied by an explanation

The aforementioned problems are the cause of frequent conflicts between teachers and students, because for some teachers, low grades serve to establish discipline, which should never happen[4].

Limitation Of The Problem: Although the stated problem is visibly expressed in the municipality of Sapna, where the basic research was carried out, we can claim with partial certainty that the problem is widespread in the territory of other municipalities and the schools located in them. Namely, due to the unique curriculum for the territory of the Canton of Tuzla, other schools apply similar or the same standards when evaluating students. Therefore, taking into account that there is a unique plan and program at the level of the Federation and the State of BiH through the Federal Ministry of Education, the problem has been extended to the territory of Bosnia and Herzegovina.

The Theoretical Importance of The Problem: The study of the educational consequences of the role of the school and the teacher in the way of monitoring and evaluating students should illuminate and contribute to the consideration of the role of the school and the teacher, and their influence on the way of improving the process of monitoring and evaluating the student's achievements.

The Practical Significance of The Research Problem: The research consists in the fact that it is of immediate importance for the school and for the teachers who, based on the results of the research, and with their work, will be able to contribute to the development of methods, monitoring and evaluation of students.

The Social Significance of this research is reflected in the attempt to determine the role of the school and teachers in developing a system of recording, monitoring and checking students.

2. Research

Aim of The Research: Starting from the observed and stated problem, the aim of this paper is to investigate, critically analyze and interpret the attitudes of students and teachers about descriptive and numerical assessment, achievements and work of students.

Scientific Goal of The Research: Research from a scientific aspect aims to indicate the influence of student assessment as a motivation for learning mathematics. Through this research, it is possible to establish specific factors that influence the evaluation of student achievements, which may not be present in other schools. The scientific goal of the research is to obtain relevant data that will help to improve the current situation. This research will help us not to lack data that are scientifically relevant, and refer to the influence of the evaluation of the student's knowledge, which produces a positive and negative reaction, that is, good and bad motivation.

Research Tasks: The needs of each research dictate the setting of specific tasks in each paper, so that the research does not deviate from the topic and so that each paper limited by certain tasks has its value precisely within the framework of these tasks and the requirements set by them.

The tasks of this work are as follows:
• Determine whether knowledge is the most important component of student evaluation in mathematics classes;
• Examine whether teachers give more importance to descriptive assessment than to numerical assessment;
• Determine whether descriptive assessment suits students better and whether it is in line with the education reform that has affected Bosnia and Herzegovina;
• Find out whether descriptive or numerical evaluation has a greater motivational value;
• Interpret which form of checking and why teachers use it more often in mathematics lessons

Research Hypotheses:
Main Hypothesis: The Grade Affects Students' Motivation Towards Mathematics.
H1: Teachers have positive experiences with descriptive assessment, which is increasingly used in the educational process, in addition to numerical assessment.

H2: Teachers give more importance to descriptive assessment than to numerical assessment.

H3: The numerical grade had a greater motivational value;
Research Population: The population in this research consisted of elementary school students in the municipalities of Sapna and Zvornik. The research was conducted in the month of September 2015, in the "Sapna" Elementary School in Sapna, and in the "Desanka Maksimović" Elementary School in Križevići,

Zvornik Municipality. The survey was conducted on a sample of 50 teachers and 240 students (II and III grades - 120 students and VI and VII grades - 120 students).

Technique Methods And Research Instruments:
Basic analytical and synthetic methods will be applied in the research. These are analysis, abstraction, deduction, generalization, synthesis, concretization and induction.

Emphasis will be placed on the analysis, because the elements that influence the assessment of the student's knowledge must be separated individually, and the influence on these elements in this case is the element of the teacher who gives the assessment based on his own conclusions, but also respecting the pedagogical standards on the evaluation and assessment of the student's achievement and synthesis because the essential elements must be seen together in order to gain insight into the whole [5].

Hypothetical-DeductiveMethod:-According to its characteristics, the hypothetical-deductive method has a higher degree of applicability than other general-scientific methods, it is at the basis of all of them and with them in relations of cooperation and permeation. We apply this method in research in order to form a postulated basis for recording various experiences gained by communicating with the same objects of social reality. Repeated many times in the same and various situations, it is compared and the identity of the essence of the subject is established. We apply the hypothetico-deductive method during sensory and non-sensory observation.

Statistical Method: - Reasons for applying this method arise from the fact that there are many documents of different forms and content and competent subjects. All this implies certain counting - quantification and quantitative statements. The concrete application of this method is done through the creation of specific research instruments and processing plans.

Modeling Method:- We will use this method in order to more easily explain the models of descriptive and numerical evaluation, i.e. by modal representation of the evaluation structure. A model will be formed that will indicate the connection between the researched phenomenon and society, that is, the student's achievement.

Comparative Method: - This method will compare the current state of assessment methods in the two municipalities of Sapna and Zvornik with the average number in other cities. It is a comparison of the same phenomenon in a different area [6].

The methods of data collection, which we will use, require the creation of instruments with which it will be possible to realize what we determined in the draft of the scientific idea. The following data collection methods are used in this research:

• **Analysis (content) of documents**
• **Testing**

Organization and flow of research: - The research on

the evaluation and assessment of student achievements in mathematics was carried out in the academic year 2015/2016. year, in the period from September 15, 2015 to April 23, 2016. First, a visit to schools and interviews with principals, pedagogues and teachers took place, and then it was agreed to conduct a survey of students and teachers. The students completed the survey during one school hour, and the teachers completed the survey during the Active class and subject teaching session.

3. Research Results

3.1. Attitudes of 2nd and 3rd Grade Students in Classroom Teaching and Sixth and Seventh Grade Students in Subject Teaching

1. I Like The Descriptive Assessment That Assesses My Knowledge.

The second and third grade:

Descriptive assessment is applied in primary school from the first to the third grade and in this way the place of each individual student on the value scale is determined, i.e. the quality and quantity of the student's knowledge, skills and habits, his commitment, activity in class, interest in learning, etc. The first question aims to determine whether students like the descriptive assessment that currently assesses their knowledge. The respondents gave the following answers:
Out of 120 respondents, 89 respondents (81.67%) declared that they like the descriptive assessment that currently assesses their knowledge, 8 respondents (6.67%) declared that they do not like the descriptive assessment that currently assesses their

knowledge knowledge, and 14 respondents (11.66%) declared that they sometimes like the descriptive assessment that currently assesses their knowledge.

The sixth and seventh grade:

I Like The Numerical Rating That Evaluates My Knowledge.
We have been using a five-point scale for eighty years. The numbers on that scale are specified with descriptive adjectives: (1) insufficient, (2) sufficient, (3) good, (4) very good, (5) excellent. Descriptive adjectives that are attached to a numerical grade tell about what kind of knowledge is expected with that grade. Primary school is compulsory school. It is one link in the chain called lifelong learning. It is also known that it is not enough to acquire basic knowledge at school, if important abilities and personality qualities are not acquired in addition. At school, it is important to acquire skills (independent learning, searching for information, selection and serving of information, problem solving, collaborative qualities). Here again we have to take into account individual differences in the child.

With the first question, we wanted to find out whether the respondents liked the numerical rating used to evaluate their knowledge.

They gave the following answers:
Out of a total of 120 respondents, 98 (81.66%) answered that they liked the numerical evaluation, only 2 (1.67%) respondents said that they did not like the numerical evaluation, and 20 (16.67%) respondents answered that sometimes they like a numerical grade that evaluates their knowledge.

Class	I like the descriptive - numerical rating	I don't like the descriptive - numerical rating	Sometimes I like a descriptive - numerical rating
Second	49	3	5
Third	40	5	2
Sixth	50	1	12
Seventh	48	1	8

Table 1: The Attitude of 2nd, 3rd, 6th and 7th Grade Students about Liking Descriptive and Numerical Assessment.
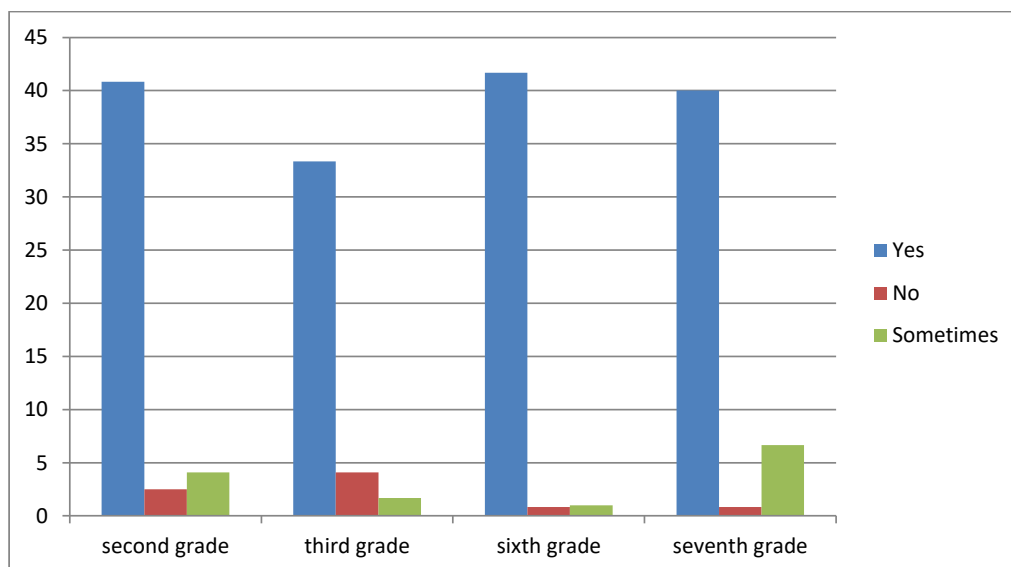
Graph 1: Students' Attitudes About Liking Descriptive and Numerical Assessment

Second and Third Grade

From the graphic representation, it can be seen that the majority of respondents like descriptive assessment, which currently evaluates their knowledge, only 6.67% of respondents declared that they do not like descriptive assessment, and 11.66% of respondents declared that they sometimes like descriptive assessment. a grade that currently assesses their knowledge. Here it is shown that a numerical rating has little motivational value.

Sixth and Seventh Grade

Analyzing the answers to the first question, it was determined that as many as 81.66% of the respondents declared that they liked the numerical assessment, 1.67% of the respondents said that they did not like such an assessment, and 16.67% of the respondents declared that they liked it. sometimes he likes a numerical rating that evaluates the knowledge of the sense of smell. Here we give preference to numerical evaluation.

2. I Would Prefer To Get A Numerical Rating Instead of A Descriptive Rating.
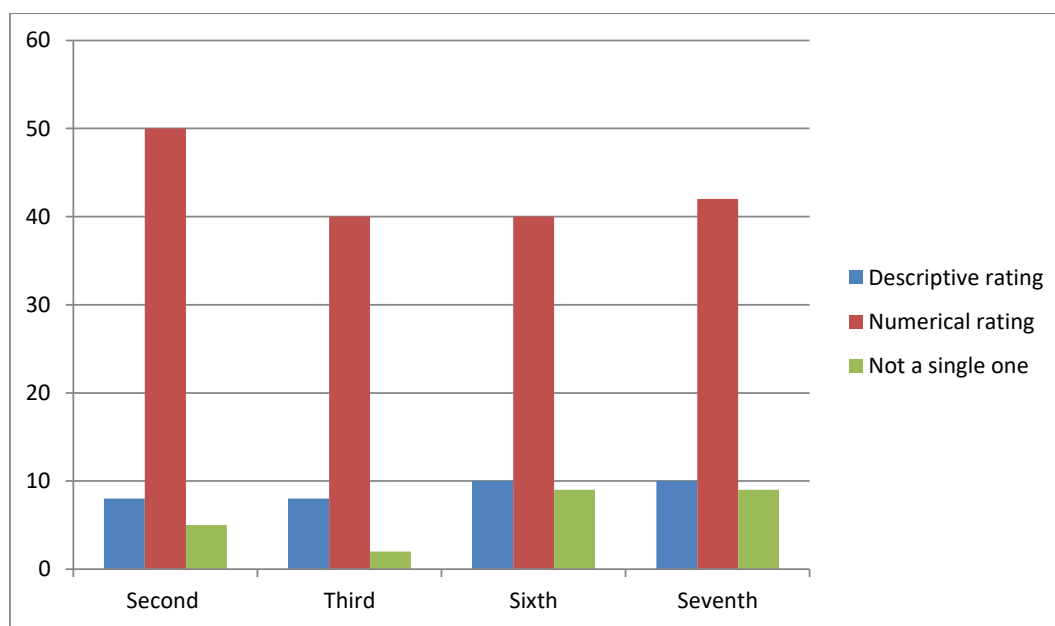
Second and Third Grade

Assessment is the assignment of a certain grade for the student's results, i.e. it is any activity by which the student's success is judged.

We received the following answers to this claim:
Out of 120 respondents, 90 (75%) stated that they would prefer to receive a numerical rating instead of a descriptive rating, 16 of them (13.34) stated that they would not like to receive a numerical rating instead of a descriptive rating, and 14 respondents (11, 66%) would sometimes like to receive a numerical rating instead of a descriptive rating.

Sixth and Seventh Grade

In the descriptive evaluation, we try to express in words the concrete knowledge and abilities that the student acquired, then the knowledge and abilities that he should have acquired, but did not, the developed skills, the conditions in which he acquired certain knowledge and abilities, with what effort he managed to achieve it, with what interest and attention, and the overall behavior that followed the student's behavior and student's learning during the school year.

If we have decided to express in words the student's activities and the conditions in which they take place, then it should be consistent and simple.

We received the following answers to this claim:
Out of 120 respondents, 20 of them (16.66%) said that they liked it more when they received a descriptive rating instead of a numerical rating, as many as 82 (68.34%) of the respondents did not like it, and 18 (15%) of the respondents liked it. Only sometimes.

Class	I would like a descriptive rating	I would like a numerical rating	I wouldn't like either
Second	8	50	5
Third	8	40	2
Sixth	10	40	9
Seventh	10	42	9

Table 2: The Attitude of Students of Grades 2, 3, 6 and 7 On Descriptive and Numerical Assessment.

Graph 2: Students' Attitudes About Descriptive and Numerical Assessment

Second and Third Grade
From the above chart, it can be seen that the majority of respondents would prefer to receive a numerical rating instead of a descriptive rating, while 13.34% of them would not like it, and 11.66% of them would sometimes prefer a numerical rating instead of a descriptive rating..

Sixth and Seventh Grade
From the graph shown, it can be seen that the vast majority of respondents, even 68.34% of them, did not like when they received a descriptive assessment, while only 16.66% of them liked a descriptive assessment, and 15% of respondents sometimes liked it when they received a descriptive assessment instead of a numerical assessment.

3.2. Teachers' Attitudes About Student Assessment
The third group of questions examines the attitude of teachers of nine-year education towards the evaluation and assessment of student achievements in mathematics classes.

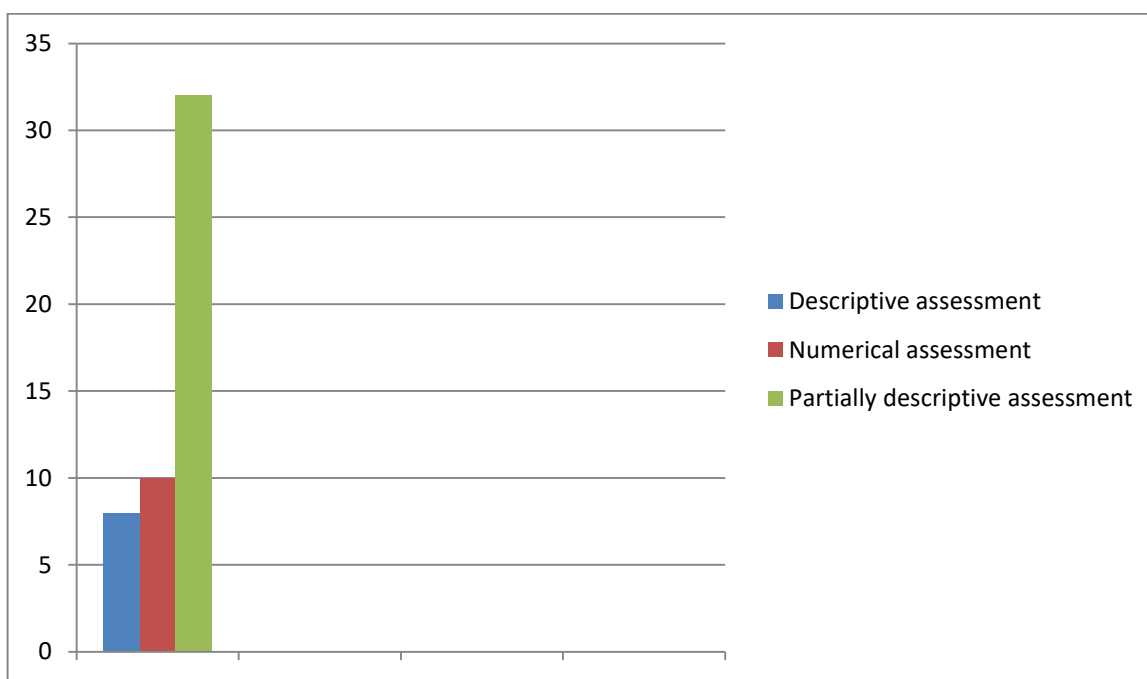## 1. Descriptive Assessment Best Suits Modern Upbringing and Education
With the first question, we wanted to determine whether descriptive assessment best suits modern upbringing and education.

The respondents answered the following:
Out of a total of 50 respondents, only 8 (16%) respondents answered yes to the above question, 10 (20%) of them disagree, 32 (64%) respondents believe that descriptive assessment partly corresponds to modern education.

Number of examined teachers	For descriptive assessment	For numerical assessment	Partially for descriptive assessment
50	8	10	32

Table 3: Teachers' Views on Descriptive Assessment

Graph 3: Teachers' Views on Descriptive Assessment of Students

From the above graph, it is evident that teachers believe that descriptive assessment only partially corresponds to modern upbringing and education, 16% of them believe that it does, and 20% of the respondents believe that descriptive assessment does not correspond to modern education..
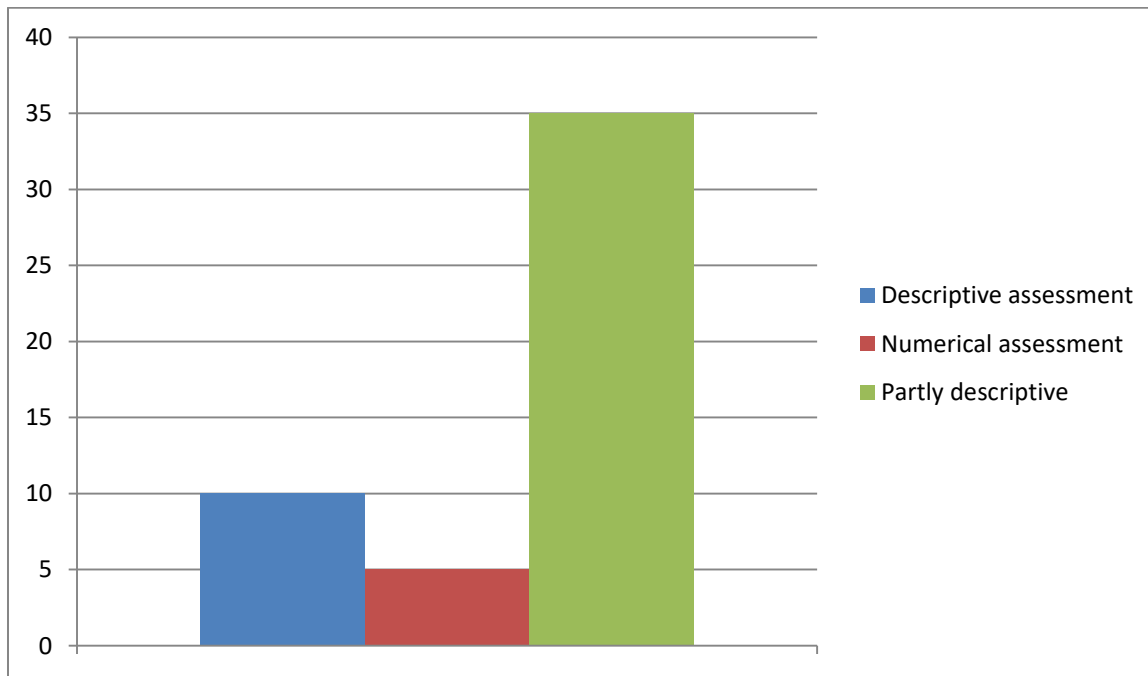
2. Descriptive Assessment Can Determine The Level of Knowledge Acquired By Students
The respondents answered this question in the following way:
Out of a total of 50 respondents, 10 (20%) answered yes, only 5 (10%) respondents answered no, and most respondents, 35 (70%) believe that descriptive assessment can only partially determine the level of knowledge acquired by students.

Number of teachers examined	For descriptive assessment	For numerical assessment	Partially for descriptive assessment
50	10	5	35

Graph 4: The Level of Students' Knowledge Acquisition During The Descriptive Assessment

Graph 4: The Level of Students' Knowledge Acquisition During The Descriptive Assessment

above graph clearly shows us that the majority of teachers, 70% of them believe that descriptive assessment can only partially determine the level of knowledge acquisition by students, while 20% of respondents believe that descriptive assessment can fully determine the level of knowledge acquisition by students, and 10% of respondents declared that it is not possible..
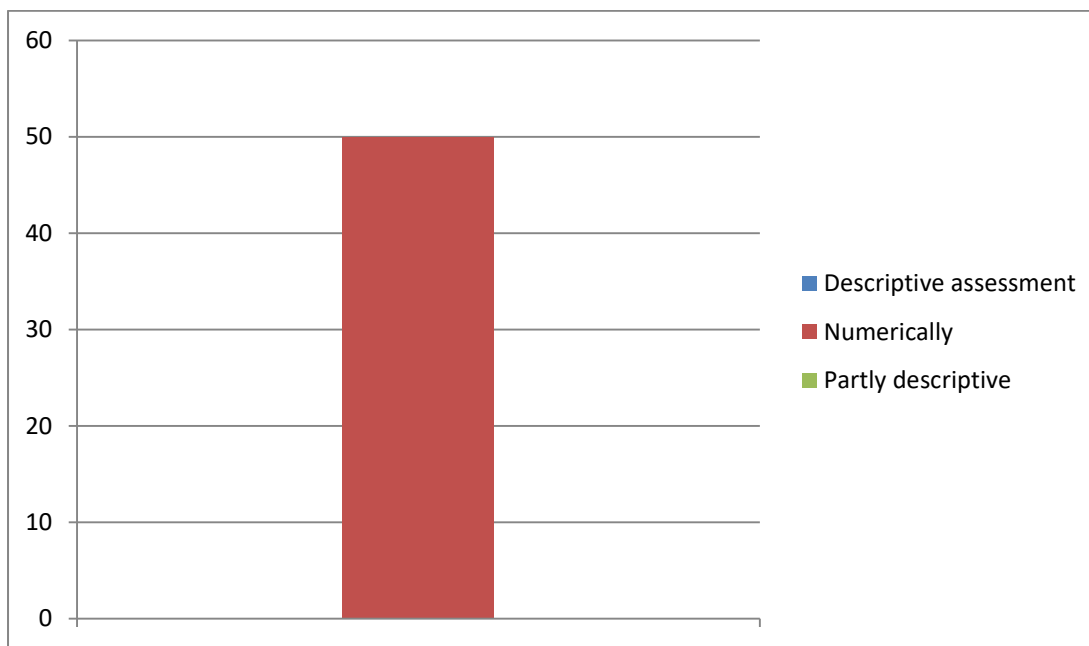
3. Numerical Assessment in The First Triad Would Have A Greater Motivational Value Than Descriptive Assessment.
With the answers to this question, the teachers expressed their clear attitude.
All 50 (100%) respondents believe that numerical evaluation in the first triad would have a greater motivational value than descriptive evaluation.

Number of teachers examined	For descriptive assessment	For numerical assessment	Partially for descriptive assessment
50	0	50	0

Table 5: Teachers' Views on The Value Of Numerical Grades

Graph 5: Level of Students' Knowledge Acquisition During Descriptive Assessment

All respondents, 100% of them, are convinced that numerical evaluation in the first triad would have a greater motivational value than descriptive evaluation.

4. Concluding Considerations

On the basis of the conducted research, and on the basis of the analysis of the data and facts that we have come to in this work, we can conclude that teachers/teachers still partially believe that descriptive assessment corresponds to modern upbringing and education. Teachers want to keep up with the times and are ready to accept what modern education brings them. Given that descriptive assessment is a relatively new concept in primary education, it is quite understandable that teachers are sometimes not sure if they are applying it in the right way and there is a certain amount of fear towards descriptive assessment.

In addition to the above, it is noticeable that this method of evaluation is more ubiquitous. From the above, it should be noted that teachers do not give preference to one or the other method of assessment and do not consider that descriptive assessment is more important than numerical assessment, but apply both methods when they think it will be expedient and correct, because they pay enough attention to one and another method of assessment. It is evident from practice that when it comes to numerical and descriptive assessment, students are more motivated by numerical than descriptive assessment.

Out of a total of 50 respondents, 41 (82%) answered YES, 5 (10%) answered NO, and 35 (70%) answered MAYBE. Analyzing the respondents' answers, it was determined that the vast majority of respondents, as many as 82%, agree that the numerical evaluation should start being applied earlier, 10% of them do not agree with it, and 8% of the respondents think that numerical evaluation should perhaps be applied earlier.

It is evident from the above that teachers do not give preference to descriptive assessment, which did not confirm the second hypothesis of the work. Descriptive assessment brings a more objective picture of the student, which is why more objective knowledge tests are applied. In addition to descriptive grades, teachers believe that numerical grades could have a stronger motivational value in the first triad. With the answers to this question, the teachers expressed their clear attitude. All 50 (100%) respondents believe that numerical evaluation in the first triad would have a greater motivational value than descriptive evaluation. All respondents, 100% of them, are convinced that a numerical grade from the second grade would have a greater motivational value than descriptive grading, as was assumed by hypothesis three, which we confirmed.

From the above, we can conclude that hypothesis 1 "*Teachers have positive experiences with descriptive assessment, which is increasingly used in the educational process, in addition to numerical assessment"*, was not confirmed. However, the main hypothesis that grades affect the motivation to learn mathematics has been proven.

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