A STUDY OF TEACHERS' PERSPECTIVE ON MATHEMATICS ASSESSMENT

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Abstract

This article looks at teachers` perspectives on written components of mathematics assessment with the following objectives:

- What according to a teacher is the role of written examination in a student`s learning?
- What is the role of a teacher`s perspective in developing question papers for written examination?
- What is a teacher`s perspective on his/her role in evaluation and assessment?

The article focuses on eighth grade since in the Indian context, the Right to Education (RTE) makes it compulsory for students to attend formal schooling till the age of 14. The learning that is directed in eight years of schooling is crucial in the sense of determining the skills and experiences that a child will come out with, and the only way to test this is through assessments. Maths being a compulsory subject is the right of every child up to age 14. Therefore, it is important to study how it is assessed and accounted for. The scope of the study is limited to the Central Board of Secondary Education (CBSE)–based private schools in the city of Bangalore. The methodology involves in-depth semi-structured interviews with eighth-grade mathematics teachers.

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Introduction

Formal education inevitably is for learning and growing. The aims of education put some demands on schools to develop children in the given frame, and the only way schools are able to test the knowledge that students have gained is through formal assessments. Designing curriculum without providing for a corresponding scheme of assessment is like riding on a road with no endpoint. But are assessments treated as an end product of learning in the school context or are they being considered as a medium to build upon and update your knowledge? It depends a lot on the school environment and teachers as to how the nature of assessment is set in that context. As soon as a child enters school, the idea of performance in examinations is given huge importance.

No wonder, assessments are necessary, but then it is the need of the hour to analyse what goes behind framing the pattern of examinations that ultimately form the basis for checking students` learning and knowledge and for promotion to the next class.

According to Polya (2002), we can think of two kinds of aims for school education: one, a good and narrow aim of turning out employable adults who (eventually) contribute to social and economic development; and, two, a higher aim of developing the inner resources of a growing child (NCERT, 2006). The idea of assessment to follow the higher aim mentioned above runs contrary to the idea of competition and ranking that is practised and given importance by every school these days. Therefore, it is of utmost importance to study teachers` perspectives on assessment and its impact on the process of assessment at the grass-roots level. This article aims to understand the pattern of assessment of having "written examinations" in detail.

Examinations are believed to be associated with stress and anxiety (NCF 2005), making the teaching–learning process unfruitful. The fear of assessment is widely prevalent in children, and this fear is most pervasive in students with regard to the subject of mathematics. There are varied reasons for this. The National Curriculum Framework (NCF 2005) states that most of rural children fail in mathematics and English. The notion of failing a student is based on a system of assessment where children who perform well in exams are labelled "pass" and those who do not perform well are labelled "fail". This leads to the idea of competition in class, thereby reducing education to a marker of material success and making students` learning an isolated activity that is only limited to the self. This false notion of education can be overcome by bringing different tools of assessment round the year, which

are not as individualised as written examinations. For instance, the NCF suggests tools like self-assessment, open book exams and observations by teachers. Nonetheless, we know that end-term written examinations still are the most significant component of assessment. This study looks into teachers` perspectives on this individualist part of assessment.

Due to the skewed focus in mathematics towards memorisation of facts and formulas, there is a lack of attention on the actual learning of concepts. Therefore, mathematics is generally associated with fear among students. Especially at the time of examinations, this fear and anxiety are aggravated because the nature of the maths paper is such that you either know the answer or you do not. Mathematics, in this sense, is a unique subject where there is no scope for partial answers. It is therefore essential to make some fundamental changes in the ways this subject is taught and assessed. One important tool in this regard can be thoughtful pedagogy and assessment. The way a teacher teaches and hence the way she assesses can be a great help in overcoming the fear related to mathematics. How a teacher develops a question paper, which is an important part of assessment, also needs attention.

One of the guiding principles for NCF (2005) is to "ensure that learning is shifted away from rote methods". It is believed that most children memorise the principles of mathematics just to pass an examination. Some of the suggestions that NCF puts forward include changing the typology of the question paper and therefore of assessment in a manner that it focuses on reasoning and creative ability. Our research was aimed at finding out the overall development of maths question papers in schools keeping in mind the elements of creativity and reasoning imbibed in it.

This creativity and reasoning in assessments can be a window of opportunity for the learning and unlearning experiences of both teachers and children. It can be the process through which both can reflect. But true reflection will only make sense if the examinations do not see marks as an endpoint. Moving beyond marks and giving credible feedback, as mentioned in NCF (2005), will make sense for assessments, especially written examinations. It will also enhance the teaching–learning process. For teachers, assessments are an opportunity to get acquainted with every student and know their learning progress. The NCF defines credible feedback in an exhaustive manner, but whether it is understood as well as practised by teachers is yet to be studied. It is in this context that the current research aimed to study teachers` perspectives on evaluation and related feedback.

Mathematics as a subject is based on logic and reasoning, but often what is tested in written examination remains limited to textbook principles and sums, rather than the application of concepts. Despite the improvement in pedagogy, changes in the pattern of assessment are hard to encounter. NCF (2005) proposes that the assessment of knowledge about mathematics should consist of a disposition towards mathematics, the capability to justify mathematical reasoning, and using mathematical knowledge and techniques to solve problems. This article explores the process of developing questions in examinations and whether it meets the parameters of the NCF.

Literature Review

The following literature review situates the scope of the research. It draws upon current literature and research related to assessment and evaluation in general. We first look at theories and reports related to assessment schemes, and then delve deep into its practice and identifying teachers` role in assessment. In some cases, the research reported is not specific to mathematics because of the scarcity of content-specific research.

As pointed by Eckstein and Noah (1993), the history of assessment can be traced to the process of "selection" to fulfil the requirement of trained people to maintain the process of communication and to maintain large bureaucracies through written examinations. The entire process of choosing effectively, involving categorising children as bright or dull by their teachers, was a very prominent part in assessment history (Wood 1986). Education and therefore assessment became the means to acquire "certificates" and social status among the emerging middle class.

In the earlier 1900s, "psychometric tools", as mentioned by Romberg (1987), were the first of their kind for the testing movement to compare scores on specific objectives in a group. The idea was to distinguish individuals on the basis of their intelligence, where intelligence was seen as akin to skin colour, which cannot be changed. Psychometric tools garnered much critique. Goldstein (1993) pointed out that the limitation of the psychometric approach was that in measuring the attribute of an individual, it assumed that attributes were fixed. This resulted in putting a child in a similar group of other individuals in school, which was disadvantageous with regard to the growth and learning of the child. Gipps (1999), in her paper criticising psychometric theory, said that the shift in practice and philosophy in assessment has given a new perspective to the assessment field. She argued that we could use psychometric tests not to compare individuals with each other but to identify the weakness of an individual and give him/her educational aid for

the same. The following are some of the key recommendations that have been made regarding assessment: Romberg (1987) suggested that assessment needed more development in the relevant form of achievement measures rather than just "objectifying" individuals. Wood (1986) said that educational measurement should be concerned with the achievement of individuals in themselves, and should be designed to measure competence and not intelligence.

The culture of assessment even today is somehow deeply rooted in past practices. The idea of assessing students in a group under same conditions with same questions and then ranking them is a common practice in schools in India even today. There is, therefore, a need to examine the roots of mathematics assessment in psychometric properties.

Present forms of assessment have a historical legacy, so it is important to know the role, purpose and functions of assessment in present times. This purpose and functions of assessment as stated in various official documents demand a teacher to comprehend this in its entirety. Before coming to a teacher`s role in assessment, let us first see what is stated in written documents.

Listing various purposes of assessment, the NCF (2005) document states that the aim of education is to build citizens for a meaningful and productive life, and that assessment plays a pivotal role by providing credible feedback in the process. Assessment also helps in judging the quality of students` achievements and serves as a tool to revise teaching–learning materials and processes. Since assessment evaluates the capabilities of learners, it in a way helps in the review of stage-specific objectives too. It can also lead to identifying the needs of remediation. However, these purposes in the area of mathematics somehow fail. Methods of assessment in mathematics are crude, which lead to a sense of fear and failure among students. The purpose of assessment in this subject, as stated in the maths position paper by NCERT (2006), should be mathematisation of a child`s thought processes. To achieve this purpose, it calls for a basic change in the methods of assessment. Through our research, we have tried to understand teachers` perspectives behind such crude mathematics assessment.

Coming to the functions of assessment, Gipps (1999) has presented that it is driven by social and cultural forces. Considering the idea of competition, assessment for her is a powerful device as it acts as a performance indicator to rank and grade individuals, schools and even countries. To explain further, Keeves (1994) argues that assessment is used to control and drive curriculum and that the main driving force behind this is to gear up countries` economic

status. Gipps (1999) also mentions that assessment, by having common curricula and standards for the selection process, is considered to be an equitable tool for a selection process, but it is also an important way to exert power over the educational system and individual lives. To support this, Pal (1993) briefs on how the power of assessment is hindering individual lives. The thinking process of an individual is hindered because of the constant pressure from parents and teachers to prepare for exams. The result is that a child ends up memorising concepts from guides and textbooks. Social forces like power in the context of the teacher–student relationship play an important role in the classroom setting as well as in assessments. Gipps (1999) sees this teacher and student relationship as a power structure and says that it has always been hierarchical. The assessment relationship between them is one of judgement and surveillance. It is therefore important to acknowledge the complexity of interactions between teachers, students and assessments.

Gipps (1999) recommends that if we seriously consider bringing students into some ownership of the assessment process, then we can bring the virtue of self-evaluation in them. NCF (2005) also says that self-evaluation enables children to understand and focus on their mistakes and learn from these mistakes better. It is one of the best ways of finding out whether competencies are being developed in students as even very young children are able to give correct assessments of what they can or cannot do well. Such an ownership on the part of children will lead to a reconstruction of the teacher–student relationship. It is, however, important to see how a teacher understands this relationship from her viewpoint and how much is she willing to invest in this relationship with children through assessment. To make the child a part of the assessment process is no easy task for teachers. It requires him/her to see assessment from a wholly different perspective and purpose, which is not conventional. Therefore, it is crucial to understand how teachers` perspectives play an important role in the formulation of assessment and the agenda behind it.

A teacher`s role is not just to prepare and conduct an assessment but also to make the final evaluation. It includes collecting, analysing and interpreting responses. It depends on a teacher to decide how much authentic a response is. He/she may get the response in various forms from students, depending on the type of question and the expectation from the answers. Khoury and Behr (1982) observed that when students are given a conventional mathematical representation of problems, then only a limited response to their mathematical thinking and performance is measured. It is necessary from the teachers` eye to know the methods of analysis and the ways of interpreting students`

responses. Not much work has been done to see how information from the responses is interpreted to check the level of ability of the student, i.e., what a student knows and what he/she does not know. In the end, one needs to ask whether these assessments are valid for the results that they are getting and the interpretations that they are holding.

Finally, when it comes to teachers` involvement in the process, it requires us to see a teacher in the larger context of his/her duties. With all the other ancillary jobs that he/she is supposed to do in addition to teaching, evaluation is often considered as just one another job by him/her, and therefore to ease this part of the job, they make use of textbooks (Teaching Learning Material) extensively in the scheme of evaluation. Very often, the only thing that is in proximity to a teacher is a textbook, and hence it ends up becoming the embodiment of all aspects of classroom practices, including evaluation. Questions at the end of textbook chapters are used in evaluation to ease the job. Pal (1993) also points to the prominence of the use of textbooks in making question papers. He raises the question, if textbooks are used so extensively in developing content for question papers, then are the textbooks comprehensive enough? He goes to argue that syllabus and textbook planners do not take a child`s ability into consideration while developing the material, thereby making it incomprehensive. To fill this gap, assessment becomes the only way through which teachers can actually come to know a child`s ability and test it. Assessment in this sense is a reflection of the syllabus, pedagogy and evaluation scheme. But if teachers only rely on textbooks to assess children, then how a child`s actual ability can be known needs greater enquiry. Apart from the lack of comprehensiveness in textbooks, NCF (2005) has also pointed out that the conceptualisation of textbooks and pedagogic practices lacks the due importance that should be given to a child`s community and local environment. Ferguson et al. (2013) confirm that a child is best able to learn from his/her immediate environment. Their conclusion calls for a holistic, multidisciplinary and multilevel approach to investigate the impacts of the physical environment on child and adolescent development. Our study has tried to find out how much the presence of textbooks impacts teachers` perspectives in the formulation of assessment.

Key Findings of the Study

Significance of the written part: The Central Board of Secondary Education (CBSE) guidelines make it compulsory for all schools to follow a pattern of assessment in mathematics that is heavily tilted towards the written component.

Purpose: Assessments hold a significant role in promoting students to the next class by grading and marking them. But this does not mean that the process of grading and marking is the same in all schools. Through our research, we tried studying this pattern and observed how different types of schools shape the idea of written assessment among teachers. Therefore, even if the end role of assessment in mathematics is the same, the process varies from school to school. For private-aided schools, the idea is to pass students; in private schools, the emphasis is on checking student`s knowledge of mathematics and identifying dull/bright students; in private high-income schools, the idea is to fulfil the process of assessment in the written part more because of an institutional requirement.

Responses and teachers` judgement: We found that most mathematics teachers view the answers of children in the form of a process, i.e., they do not just look at the final answers while checking but all the steps involved in arriving at the final answers. The probable reason for this is the nature of mathematics. One can possibly arrive at the answers through different methods (processes) and teachers need to give marks on the basis of the steps involved. On the other hand, children can use methods that are wrong and yet arrive at the correct answers. Therefore, it becomes important as a mathematics teacher to take into account the entire solution while marking.

Administration of assessment: Almost all teachers believed that the role of teachers should be limited while administering tests when children are writing their responses. This is to maintain the decorum of the exam hall and the nature of the written assessment. But there were few differences found in teachers` views based on the type of school. We found that a teacher`s role in administration is dependent on his/her views on assessment. For example, teachers in private-aided schools had the primary agenda of passing the students, and therefore their role in administration was lenient, involving giving hints in class and during exams to children who are not able to write. But that was only when students asked for it. Because of the setting of exam, fear becomes an important aspect to be studied separately.

Fear and teacher`s role: None of the teachers agreed that they are responsible for the stress and fear related to mathematics exams. They hold the system, elders and peers responsible for the same. Therefore, teachers see their role in assessment as overcoming this created fear, which they believe they are not responsible for in the first instance.

Purpose and analysis of responses: Teachers` perspectives on assessment may vary, but the institutional requirement of ranking and grading is not to

be compromised at all. In this sense, teachers hold very little autonomy in changing the nature of written assessments, which focuses on ranking. But what a teacher can do is not to discriminate students based on the competition and the ranks they hold, thereby, making all students stand equal in his/her eyes. This, we observed through our research, is largely dependent on the type of school that teacher is placed in. For example, a teacher in a private-aided school may try to pass students to the next class, but he/she never discusses grades/marks and gives special importance to children with higher ranks.

Different forms of assessment and the role of students: Whether different forms of assessment, apart from the written format exams, are given a thought in mathematics is again based on the type of school that teachers are in. Some alternative forms of assessment that teachers come up with are observations, group work and mental maths. Nonetheless, teachers do not enjoy autonomy in putting these into practice. Students are not involved in the process of assessment actively, and they are just held responsible for writing papers and getting marks in return. Hence, there is no complex interaction between students, teachers and assessment. With students, the interaction is limited. Fear remains prominent, with increasing dependence on the written format exams in mathematics, which demands the end result to be accurate.

Teacher dynamics, formulation and content framework: In the framing of written exams, how much of outside knowledge (apart from the textbooks) is imbibed also depends on the type of school. Private high-income schools have resources to afford reference and guide books, and they can therefore frame papers with a higher proportion of questions coming from these sources. In the case of private-aided schools, questions come largely from National Council of Educational Research and Training (NCERT) books, and because there is usually just one teacher of mathematics, there is no discussion on what questions to ask or not. In private high-income schools, teachers discuss and frame question banks with important questions (both from NCERT and reference books).

Forms of analysis: Credible feedback, as defined by NCF (2005), is not truly understood in the same spirit by teachers, and there is no training that is given to teachers to better comprehend the assessment process. Hence, students often receive only marks for whatever they write. Whether qualitative feedback is given or not is again dependent on the type of school. With private-aided schools, qualitative feedback is possible because students are fewer in number and teachers know almost all students personally. In other

schools, this is not possible because of the load of work a teacher has and the number of students in class.

Interpretation: None of the teachers agreed on generalising marks and explicitly labelling a child as dull or bright. But the way in which teachers frame questions in private schools makes it evident that marks were used as a criteria to label students. For instance, in private schools, 3-mark questions were used to distinguish between dull and bright students. The entire rationale for asking HOTS questions, outside of the textbooks, is not to increase the capability of a child to think critically but to see who can attempt it correctly (in private schools). This may not be the case with schools like private-aided ones where the focus is on passing the students.

Forms of reporting: All the teachers believed in identifying parents as an important stakeholder in the process of assessment. But only private-aided schools believed in involving parents in the regular learning of the child and not just during assessments. Private schools believed in involving parents only at the time of parent–teacher meetings, where they could get to know about the result of their children. If such is the role of parents, then it is evident why fear is associated with assessment.

Purpose of eighth standard mathematics exam: With different skills and marks associated with mathematics exams, it is doubtful that the promise of building specific skills among students who pass the eighth standard exams through mathematics will be achieved. With schools like private-aided ones, the focus is on passing students, and hence no student ends up achieving the specific skills stated in the Right to Education (RTE) Act. The entire idea of standards and passing marks stands against the strict skills that RTE wants to achieve till the eighth standard. In simple words, students scoring 35, 50 or 90 are all promoted to the ninth standard, and they all have different skills related to mathematics. Therefore, in practice, there is no universal aim to be achieved through maths, even though it is present on paper.

The authority and autonomy of teachers, which is determined by the type of school, frames their ideas of assessment. Constraints on autonomy can make a teacher`s progressive ideas on maths assessment regressive by putting limitations on her very role. A teacher has to abide by all these constraints, and then frame papers, check papers and give feedback. We observed that none of the concepts in assessment can be studied in isolation from each other, and perhaps there is a need for more concepts to understand teachers` views on assessment, one of them being the “type of school”. To present a more comprehensive view on assessment, the relationship between concepts

needs to be redefined and further research conducted to explore possible interconnections.

Our literature review gave us a lens to look into different concepts. On the one hand, we have looked at the objective of the current examination assessment pattern from the perspective of the NCF (2005) and the mathematics position paper by NCERT (2006) and, on the other, what teachers understand about the aims and objectives of mathematics and how they imbibe it. From our study, we figured out that the current assessment idea is to provide pass or fail "certificates" to children and to differentiate them on the basis of being "dull" or "bright". The objective of building certain kinds of skills by teaching mathematics to children till eighth grade, as laid down in RTE and NCF, is not getting fulfilled because the entire idea is to just pass or fail students. The standards laid down are not being met because students scoring anything above 33 marks are getting promoted to ninth grade. So there is no difference between scoring 90 or 40. The extension of ownership in the assessment process to students through the development of self-evaluation, which the literature talks about, is also not happening in the present context. It has been argued that this can be implemented by bringing reforms in the education system, but teachers are unable to do anything because of their lack of autonomy and authority in framing question papers, analysing responses and bringing in other kinds of assessment (group work, observation, etc.).

The research findings have made us infer that the role of assessment depends on the type of school, the perspective of the teacher making the assessment, and the autonomy and authority given to students by the school. The idea of bringing reforms in assessment can come only through teachers. These reforms can help students to fulfil the universal aim of education and facilitate the mathematisation of children`s thought process. In the present scenario, if a child is scoring say 75 out of 100 and is getting promoted to the next grade, the leftover 25 marks that he/she could not score in the previous class due to lack of knowledge, those concepts are not made clear to him/her. Remedial classes just help students to pass the previous class and are not meant for promoting the mathematising of their thought processes.

Analysis

The current research was done with the intent of getting teachers` views on assessment. For the same, six teachers from three schools were chosen as respondents. Many variables like gender, age, experience and background were considered to study the differences in their views but none of these had

an impact on their views. After data collection, we realised that differences in teachers` views related to assessment were closely connected to the type of the school they were teaching in. We studied three types of school: private aided, regular CBSE private school and private school with children from high-income groups. We observed that the idea of end-term examinations depended a lot on how much authority and autonomy a teacher had related to assessment, which in turn depended on the type of the school they were in.

Following is the data analysis based on the type of the schools we observed:

Point of difference	Pvt. Aided	Pvt. School	Pvt. High-Income school
Assessment for students	To maintain attentiveness, giving sufficient exposure and discouraging rote learning throughout the year.	End-term exams are conducted with the intent to judge the mathematics knowledge of the child. Focus on marks is important not to compare students but to assess the knowledge that they have.	Teachers see written examinations as something that is helpful to children, but it is more of an institutional requirement.
Why written exams?	So that students can pass easily and score whatever is needed to get promoted to the next class.	To serve as a valid proof of knowledge to parents and elders.	To fulfil the institutional requirements. Teachers believe in conducting assessment in various forms but are restricted.

Process of development	Single teacher frames and approves the question paper.	All teachers frame the question papers in isolation and then one paper gets approved by the head of the department of mathematics.	Teachers sit together to develop a question bank, which has all the important questions, and then on the basis of question bank, the paper gets developed by one teacher. The roles keep shifting among teachers.
Selection of questions	Mostly from NCERT so that students can pass the exams.	From NCERT for dull students plus guide books like R D Sharma, R S Agarwal are used to make questions for bright students.	Use of extra material and guide books is extensive in developing question banks since the school has ample resources and manpower.
Sequencing	4-mark questions are asked first so that students get time to think peacefully. Towards the end, students should solve 1-mark questions, which are easy and can be done when the time available is less.	1 mark first and then 2, 3 and 4. 3-mark questions are the most difficult and generally include HOTS questions, which are used to differentiate between dull and bright students based on their ability to solve.	1 mark first and then 2, 3 and 4 follow. The questions also involve concepts that are useful for ninth standard mathematics. E.g., linear equations and geometry.

Marking responses	It is based on steps involved. They do it pretty leniently so that students can pass the exams. E.g., they ignore basic and silly mistakes and do not cut marks for the same.	Teachers follow step-wise marking based on value points involved. But some of the 3-mark questions have more than 3 steps, in which case answer keys are developed.	Marks are based on the exact steps involved. It is followed very strictly, and if the process is wrong, then also half or one marks is given for the correct answer.
Analysis and feedback	Question-based feedback plus general feedback is given at the end of the answer sheet. Feedback is given to motivate children, pointing out both their strengths and weaknesses.	Since the number of students is more, no question-based feedback is given. Teachers try to write down the weakness of students wherever required. They check all the 1-mark questions first and then the 2-mark ones so that their task of checking becomes easy. Focus on one paper is not given. They, however, give general and verbal feedback.	They believe in giving general qualitative feedback.

Communication to parents	Parents are included time to time to enhance students` learning and not just called for when their child is scoring badly.	Parents` are seen as an important stakeholder to be involved in PTMs and other instances when their child is not scoring well.	They see parents as sharing equal responsibility for children`s learning. This, they think, will help them in reducing their work. They believe that teachers cannot solely take responsibility of the child.
Assessment for a teacher`s role	They see assessment for a teacher in terms of having a grip on concepts.	They do not see any learning coming from the assessment of teachers. They believe that every class is different, with a mixture of dull and bright students, so a teacher cannot be judged on the basis of students` scores.	They see their role in assessment in terms of fulfilling the institutional requirement and not as part of pedagogy.
Teacher`s role in administration	They believe that teachers` role in examinations is to give hints and not cut marks for silly mistakes.	They believe their role in administration is to pacify the fear of children related to mathematics. This fear according to them comes from the experience of primary school.	They believe that the role of teacher while administrating should not be discriminatory, and if she is giving hints, she should give it to all the students.

Forms of assessment	They think group work is possible with one bright child in every group and mental maths is must for them.	They do not see observation and other forms of assessment to be helpful in assessing students because their main idea is to classify the students into bright and dull categories, based on the marks coming from the written component.	They think that other forms of assessment like group work and observation should be there. But since there is no guideline in the system about the same, they do not practise it.
Post-assessment help	Apart from revision classes, they believe in providing highly personalised feedback and personal attention to children. They do not believe in discouraging children by labelling them dull and bright. For the overall understanding of the child, they keep a check on the performance of other subjects as well.	They believe in conducting remedial classes with small groups of children and giving extra worksheets. If nothing works out, then they try to find a child`s other interest areas and work on it.	They conduct diagnostic tests with all the children before the year begins to check the previous year`s knowledge of the child. For better results, they also provide worksheets every Friday.

After having clarity and distinguishing the schools based on various interview questions, we tried answering our three main research questions. These research questions, as the analysis shows, had three answers based on the type of school.

1. What is the role of the end-term examination in the overall assessment pattern?

Private-aided school: The idea of assessment is child centric, where it is seen as a means to enhance the learning of the child throughout the year. End-term assessment is seen from the perspective of maintaining the attentiveness of children, given sufficient exposure to them and discouraging rote learning.

Private school: Assessment is seen as not catering to every child as children have different interest areas. Given the different capabilities of students, marks are not seen as a measure of comparison and ranking but to judge the learning curve of children. In simple words, assessment is to judge subject-specific knowledge only and not overall capabilities.

Private high-income school: Assessment is what the system and curriculum demands. Hence, the role of the end-term written exam in the overall assessment is determined by the system. Teachers see assessment as an open process that includes written, oral and observation components, but it gets restricted in practice because of the system`s guidelines. Therefore, in their understanding, written exams can only check the progression of children throughout the year.

2. How are question papers for the end-term examination developed/ formulated by teachers?

Private-aided school: Question papers are developed in such a manner that students can pass the examination without much stress. Therefore, the questions are selected more or less from the NCERT textbooks. The 4-mark questions are put at the beginning so that children can score the passing marks by solving questions with greater weightage and can think in a better manner at the start. The whole idea is to not make exams a stressful event, which is why the teacher gives hints in class about the questions that will be asked in the exams. With low resources and high work pressure for a single teacher of mathematics, it is evident that not much thinking goes into framing question papers.

Private school: Question papers in private schools are made keeping in mind the difficulty level and skills that teachers want to check through exams. The 1-mark questions are asked first and then 2, 3 and 4 marks follow. Out of this, the 3-mark questions are the most difficult, which are used as a parameter to judge between bright and dull students. We also saw that most of the HOTS questions, which are outside of textbooks, were in the section of 3-mark questions. Some of the 3-mark questions had more than four steps and were lengthier than the 4-mark questions. Also, teachers accepted that marks are assigned based on the value points (steps) involved in solving, but in actual

question papers, the value points are more than the marks assigned to a question.

Private high-income school: Question papers are developed in such a manner that all the useful concepts that will get repeated in the ninth grade are paid special attention, for instance, the sections of geometry and linear equations. The 1-mark questions are asked at the beginning and the 4-mark questions at the end, which are the most difficult ones. We encountered teachers using references apart from textbooks rigorously, which shows that much thinking went behind framing papers. Marks are assigned based on the exact value points (steps) involved. Due to the availability of resources (human resources) and an equal distribution of work amongst teachers, more healthy discussions and serious time are devoted to the end-term exams. This was evident as all the subject teachers sit together and develop question banks, which guide them in framing papers.

3. What is a teacher`s perspective on his/her role in evaluation and assessment?

Private-aided school: In the private-aided school, since there was only one teacher for mathematics, she was highly involved in the assessment process. She saw assessment for a teacher in terms of having a grip on concepts. Her autonomy was well reflected in the framing of question papers, checking answer sheets, involving parents, administrating tests, etc. Her perspective on the teacher`s role in examination included giving hints in the exams, not cutting marks for silly mistakes, giving qualitative feedback (for general plus specific questions), to make children aware of their weaknesses, motivating them to score better, giving personal attention if needed, arranging special classes, checking their performance in other subjects and, most importantly, not discriminating between children by labelling them on the basis of their marks. She believed in building relationships with the students by treating them all equally. For her, the role of parents should be very active in the learning of the children and not just limited to being aware of negative performance in PTMs. The teacher`s role in assessment is not restricted to written end-term exams but also involves practising team learning, observations, group assessments (with one smart child in the group), mental maths, etc.

Private school: Being a private school with three teachers for five sections, the teachers had less autonomy in terms of framing question papers, involving parents, administrating tests, etc. They believed their role was to pacify the fear in children for mathematics, which according to them is linked to the primary school teachers. The teachers saw their role post assessment as

providing remedial classes in small groups of students, giving worksheets to weak students and encouraging them to reflect on their other interest areas. On the other hand, they had the authority to inform parents on the negative performance of their children through PTMs. Apart from this, they checked the papers strictly on the basis of the answer keys, gave general and verbal feedback in order to point weaknesses, and analysed responses to figure out the average performance of the class. Since they classified students as weak and bright based on their marks, they did not see class observations as a valid means to assess students. With this intent in mind, they did not consider the students` evaluation scheme as a means to provide feedback on their own teaching.

Private high-income school: The teachers saw their role as adhering by the guidelines provided by the system in framing question papers, checking answer sheets and making/discussing answer keys in various possible ways. They believed that the role of teachers was to not be discriminatory in administrating a test. Therefore, they thought that if any hints are given, these should be given to the whole class. They saw parents as sharing equal responsibility of the children with them, believing that parents` involvement in knowing about the performances of their children would result in reducing teachers` workload. The teachers gave qualitative feedback to the students so that they could work on their weaknesses. They saw their role in assessment as fulfilling more of an institutional requirement than as a feedback on their pedagogy. They believed written examinations to be better as they did not have sufficient time for any other form of assessment like observations and group work. This scarcity of time and the hectic task of checking the answer sheets pressurises them to not place the child at the centre while checking papers. This was evident as they do not check the answer sheet of one student at a go and prefer to ease their task by checking the answer sheets question-wise. They also see their role in terms of taking forward concepts of the eighth grade to the ninth by organising a diagnostic test at the beginning of the year and giving worksheets on concepts that students are weak in. Since the system plays a crucial part in their process of evaluating children, they do not practise reforms in the assessment process even though they have given it a thought.

Research Limitations and Future Scope

Due to a lack of time, the research did not involve observation of pedagogy. We have, therefore, not been able to make linkages between pedagogy and assessment. This is an area that requires further research. The use of

interviews as a tool for research can be biased and teachers may not give their genuine perception about a topic. The use of other methods like focus group discussions and surveys can be valuable.

The time in which the research was conducted was a crucial and stressful period for both teachers and students as it was the examination period in the month of March. Teachers` full availability was a big constraint in itself. Access to different kind of schools apart from CBSE ones, for instance, schools from state boards and international boards, would have helped enrich this research, which can be explored in the future.

This study calls for further research on the fear amongst children based on the process of assessment from teachers` viewpoints, especially related to the subject of mathematics. The current study involved only private schools of three kinds. Considering the diversity in India, more private and government schools can be studied to understand not just inter-differences but also intra-differences among schools.

Interviews and analysis of question papers is just one way of collecting data. Further research in this area can be done by observing pedagogy in the classroom and analysing its relationship with assessment. Also, apart from the analysis of the use of NCERT textbooks in making question papers, deeper analysis can be done through other guide and reference books since teachers take a significant proportion of questions from these sources.

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