Evaluating Teachers' Perspectives on the Class X Mathematics Textbook: A Study of the Mizoram Board of School Education

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***Abstract*— This study examines secondary school mathematics teachers' perceptions of the MBSE Class X Mathematics textbook in Mizoram, India, using a quantitative survey of 40 teachers in Aizawl City. Results show 82.5% rely heavily on the textbook, though usage varies—50% for concept explanation and 25% for exercises. While 72.5% believe it aids learning, 20% doubt its effectiveness in fostering critical thinking. Only 40% agree the textbook covers essential basics, and 57.5% acknowledge real-life examples, though 30% find them inadequate. The bilingual format (English-Mizo) is praised by 72.5%, but 25% critique Mizo explanations. Exercises align with cognitive levels (82.5%), but project-based activities are scarce (22.5%). The study suggests updates to enhance content relevance, critical thinking, and real-world applications.**

***Index Terms*— Bilingual, Mathematics textbook, Mizoram, Secondary education, Teacher perception.**

I. INTRODUCTION

In the digital age, educators and learners have access to diverse learning materials, yet textbooks remain a core teaching resource globally (Glasnovic Gracin, 2018; Kul et al., 2018). Studies show mathematics textbooks dominate classroom instruction, accounting for up to 95% of teaching time (Benavot & Jere, 2016; Fan et al., 2013). Historically influential—from Euclid's *Elements* to ancient Chinese mathematical texts—textbooks continue to shape education (Merzbach & Boyer, 2011).

In Mizoram, India, the education system emphasizes reasoning and real-world application, aligning with NEP 2020's focus on critical thinking. However, textbook effectiveness depends on teachers' perceptions, as they bridge policy and classroom practice (McDuffie et al., 2018). Without well-structured resources, learning outcomes may suffer.

This study examines Mizoram's secondary school mathematics teachers' views on the Class X textbook, assessing its content, exercises, activities, and visual design. By analyzing educators' feedback, the research aims to guide improvements, ensuring the textbook supports MBSE curriculum goals effectively.

II. LITERATURE REVIEW

Okyere and Larbi (2019) investigated on "Senior high school mathematics teachers' perception and use of assessment in the classroom". The study examined into the perspectives and approaches of math teachers in senior high school regarding classroom evaluation. This research used a mixed methods design. Sixty-two math teachers were chosen from the chosen schools to take part in the study. In order to collect data, a questionnaire was used. The study's findings showed that math teachers had a favorable opinion of classroom assessments because the majority of them cited assessment as a means of guiding instruction. Only a small percentage of teachers, nevertheless, continued to view assessments negatively.

Divrik and Pilten (2019) conducted a study on "Analysis of Primary School Teachers' Metaphorical Perceptions of Math Textbooks". In consequence of the research, it has been determined that 68.33% of primary school teachers had negative perceptions and 31.67% of them had positive perceptions related to math textbooks. This finding indicates that most elementary school teachers find math textbook expressions difficult, tedious, and exhausting. It was also stated that there are not enough examples,

activities and problems in the textbooks.

Samat and Rosli (2020) studied a research titled "Exploring Teachers' Perceptions of Primary School Mathematics Textbook". The research sought to identify the Mathematics teachers' perception of the activities and exercises aspects in selected Mathematics textbookA questionnaire was used to gather data from 35 primary school math teachers who consented to participate in the study. Descriptive analysis was used to examine the data, and the findings indicated that the average perception of math teachers is high overall.

Nemrawi et al. (2022) studied on topic "The Evaluation of Mathematics Textbooks from the Perspective of Mathematics Teachers in Jordan". A survey was completed by a sample of 127 math teachers in Jordan who use the new textbooks. There were thirty-seven items and five domains in the questionnaire. The findings indicate that teachers have a modest level of satisfaction with the new textbooks, and that teachers' satisfaction varies statistically significantly by gender (male versus female), favoring male teachers. Additionally, the findings demonstrate a statistically significant difference in teachers' satisfaction with their experience, favoring those with more and moderate experience.

III. OBJECTIVES OF THE STUDY

1. To analyse the perception of Mathematics teachers on Usage level of class X Mathematics textbook prescribed by Mizoram Board of School Education.
2. To study the perception of Mathematics teachers on Content aspect of class X Mathematics textbook prescribed by Mizoram Board of School Education
3. To examine the perception of Mathematics teachers on Exercise aspect of class X Mathematics textbook prescribed by Mizoram Board of School Education.

IV. METHODOLOGY

4.1Research Design

The study was conducted using a quantitative research approach. The survey method is used to provide teachers' perceptions of mathematics textbooks.

4.2 Sample

This often leads to confusion because equations do not balance dimensionally. If you must use mixed units, clearly state the units for each quantity in an equation.

4.3 Instrument and Procedures

The questionnaire instruments used were developed by the researcher in adaptation with questioner develop by Samat and Rosli (2020), the questionnaire on perception of high school Mathematics teachers towards Mathematics textbooks consisted of items framed on the basis of the objectives of the study.

It posed inquiries about the textbooks' content, exercises, and usage level. Data on perception of high school Mathematics teachers towards Mathematics textbooks was collected by distributing questionnaire through Google form to sample teachers from different schools in Aizawl City area.

V. FINDINGS AND DISCUSSION

5.1 Perception of teachers on Usage level of class X Mathematics textbook.

Table i, reveals that 82.5% of teachers use the textbook in every teaching session, underscoring its centrality in classroom instruction. This finding aligns with Remillard's (2005) research, which identifies textbooks as the dominant resource in mathematics education, particularly in systems where supplementary materials are scarce. The heavy reliance on textbooks also mirrors Chiappetta & Fillman's (2007) findings that teachers in centralized education systems depend heavily on prescribed materials. The absence of "Strongly Disagree" responses further reinforces the textbook's indispensability.

However, variations exist in how teachers employ the textbook as 50% use it primarily for concept explanation, while 25% rely on it mainly for exercises and activities. A notable 22.5% remain undecided on its role in concept delivery, suggesting that some educators supplement textbook explanations with additional resources.

Table i : Perception of teachers on usage level of class X Mathematics textbook

Sl. No.	Items	*5	*4	*3	*2	*1
1	In every teaching and learning sessions, I use Mathematics textbook.	13 (32.5)	20 (50)	2 (5)	5 (12.5)	0
2	I utilize Mathematics Textbook to explain the concept only.	2 (5)	18 (45)	9 (22.5)	10 (25)	1 (2.5)
3	I make use the Textbook only for exercises and activities.	1 (2.5)	21 (52.5)	8 (20)	9 (22.5)	1 (2.5)
4	For every skill that students need to understand, I employ mathematics textbook.	3 (7.5)	21 (52.5)	4 (10)	11 (27.5)	1 (2.5)
5	Use of mathematics textbook encourages students to learn more.	8 (20)	21 (52.5)	6 (15)	5 (12.5)	0
6	Students' understanding of concept is improved when mathematics textbooks is used.	7 (17.5)	23 (57.5)	4 (10)	6 (15)	0
7	Students' thinking can be improved by use of mathematics textbook.	4 (10)	23 (57.5)	5 (12.5)	7 (17.5)	1 (2.5)
8	The use of Mathematics Textbook can improve students' skills to solve both routine and non-routine problems.	5 (12.5)	23 (57.5)	7 (17.5)	5 (12.5)	0

Note. *5=Strongly Agree, *4=Agree, *3= Undecided, *2= Disagree, *1= Strongly Disagree, *Number in Parenthesis represent percentage

While 72.5% of teachers believe the textbook encourages student learning, 20% express skepticism about its effectiveness in fostering critical thinking. This dichotomy reflects Boaler's (2016) critique that traditional textbooks often emphasize procedural fluency over conceptual depth, limiting opportunities for analytical reasoning.

Research by Fan and Zhu (2000) indicates that teachers in high-performing education systems use textbooks flexibly, integrating them with digital tools and collaborative tasks. In contrast, Mizoram's heavy reliance on the textbook suggests a need for professional development programs that train teachers in blended learning strategies.

5.2 Perception of teachers on Content aspect of class X Mathematics textbook.

The lack of updated, contextually relevant content aligns with Valverde et al. (2002), who found that textbooks in developing regions often lag behind technological advancements.

From Table ii, only 40% of teachers agree that the textbook covers all essential mathematical basics, while 32.5% disagree, indicating gaps in foundational content. This aligns with Mullis et al. (2016), whose study found that textbooks in developing regions often lack comprehensive topic coverage, leading to reliance on external materials.

57.5% acknowledge the inclusion of real-life examples, but 30% find them insufficient or irrelevant. Only 35% believe the textbook incorporates modern innovations (e.g., data science, algorithmic thinking), highlighting a disconnect from contemporary mathematical demands.

Table ii : Perception of teachers on content aspect of class X Mathematics textbook

Sl. No.	Items	*5	*4	*3	*2	*1
1	Mathematics Textbook covers all the basics that students need to learn.	1 (2.5)	15 (37.5)	11 (27.5)	13 (32.5)	0
2	The content in the textbook includes all important mathematics topics.	2 (5)	13 (32.5)	9 (22.5)	15 (37.5)	1 (2.5)
3	The content comprises many real-life examples in the textbook.	0	23 (57.5)	5 (12.5)	9 (22.5)	3 (7.5)
4	The content includes the latest innovations in real-life.	2 (5)	12 (30)	12 (30)	14 (35)	0
5	The contents are related and sequential in presenting math concepts.	0	25 (62.5)	10 (25)	5 (12.5)	0
6	The content takes into account the interests and needs of students.	0	22 (55)	12 (30)	6 (15)	0
7	The textbook content explains the concept precisely and clearly.	0	27 (67.5)	7 (17.5)	6 (15)	0
8	The content of the textbook encourages self-learning.	2 (50	22 (55)	7 (17.5)	9 (22.5)	0
9	The bi-lingual (English & Mizo) natures motivate students to learn.	7 (17.5)	22 (55)	8 (20)	3 (7.5)	0
10	The content explained in Mizo language includes all the basics that students need.	7 (17.5)	12 (30)	11 (27.5)	9 (22.5)	1 (2.5)

Note. *5=Strongly Agree, *4=Agree, *3= Undecided, *2= Disagree, *1= Strongly Disagree, *Number in Parenthesis represent percentage

The bilingual (English and Mizo) format receives strong approval (72.5%), supporting Cummins' (2000) argument that multilingual education enhances comprehension and inclusivity. However, 25% of teachers critique the Mizo explanations, citing inconsistencies in terminology and pedagogical clarity.

Studies in Kerala and Nepal (UNESCO, 2021) demonstrate that localized textbooks improve learning outcomes when translations are pedagogically sound. Mizoram's textbook could benefit from similar refinements, such as glossaries for standardized terminology and teacher feedback panels to review vernacular content.

5.3 Perception of teachers on exercise aspect of class X Mathematics textbook.

From the Table iii, an overwhelming 82.5% of teachers agree that exercises match students' cognitive levels, reinforcing Vygotsky's theory of scaffolding. However, 7.5% report clarity issues, suggesting some questions may be ambiguously phrased.

75% affirm that exercises promote collaboration, aligning with Johnson and Johnson's (1999) research on cooperative learning. 67.5% believe exercises enhance reasoning skills, though 25% remain undecided, indicating variability in task design.

Only 22.5% agree that the textbook includes problem based learning activities, while 52.5% disagree, a significant shortfall given Thomas' (2000) evidence that problem based learning deepens conceptual understanding. High-performing systems like Japan and Estonia, emphasize open-ended

problems and investigative tasks, which are sparse in M

maximize its effectiveness and better prepare

Table iii: Perception of teachers on exercise aspectl of class X Mathematics textbook

Sl. No.	Items	*5	*4	*3	*2	*1
1	The textbook exercises are corresponding with students' cognitive levels.	0	33 (82.5)	4 (10)	3 (7.5)	0
2	The textbook questions and exercises are clear and easy to understand.	1 (2.5)	29 (72.5)	7 (17.5)	2 (5)	1 (2.5)
3	Student-centered instruction and questions are used in the textbook.	1 (2.5)	28 (70)	7 (17.5)	4 (10)	0
4	The exercises in the textbook motivate and inspire students to learn.	0	25 (62.5)	8 (20)	7 (17.5)	0
5	Exercises can be completed during the learning session by Students.	1 (2.5)	20 (50)	4 (10)	13 (32.5)	2 (5)
6	The exercise questions enhance the reasoning ability of the student.	0	27 (67.5)	10 (25)	3 (7.5)	0
7	Exercise questions encourage students to collaborate.	0	30 (75)	7 (17.5)	3 (7.5)	0
8	The textbook exercise includes Project - based activities.	1 (2.5)	8 (20)	10 (25)	19 (47.5)	2 (5)

Note. *5=Strongly Agree, *4=Agree, *3= Undecided, *2= Disagree, *1= Strongly Disagree, *Number in Parenthesis represent percentage

V. CONCLUSION

The study highlights the pivotal role of the Class X Mathematics textbook in Mizoram's secondary education system, with a majority of teachers relying on it for daily instruction. However, the findings reveal significant areas for improvement.

The textbook's content lacks comprehensive coverage of foundational topics and modern innovations, while its exercises, though cognitively appropriate, could benefit from more project-based and collaborative tasks to enhance student engagement and reasoning skills.

The bilingual format is a strength, but inconsistencies in Mizo translations need addressing to ensure clarity and pedagogical effectiveness. To align with the goals of the National Education Policy (NEP) 2020, the textbook should incorporate more real-life applications and critical thinking exercises. In summary, while the textbook remains a cornerstone of mathematics education in Mizoram, targeted revisions and teacher training are essential to

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