

Analysis of Social Science Board Examination Question Papers in Mizoram Based on Revised Bloom's Taxonomy

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Abstract

The research examines Class X Social Science Board Examination question papers from the Mizoram Board of School Education (MBSE) over seven years (2018-2024) using Revised Bloom's Taxonomy. Employing a mixed methods approach, which includes both qualitative and quantitative analyses, the study revealed a predominant focus on lower-order thinking skills (LOTS) within the question papers, with "Remember" questions being the most frequent (57.38%) followed by "Understand" questions (30.11%). Higher-order thinking skills (HOTS) such as "Analyze" (8.52%), "Evaluate" (0.56%), and "Create" (0.85%), were significantly underrepresented. Additionally, the analysis of the knowledge dimension indicated a high occurrence of Factual Knowledge (57.38%) compared to Conceptual Knowledge (30.11%), Procedural Knowledge (1.98%), and an absence of Meta-Cognitive Knowledge. The study emphasized the need for a balanced approach in question paper design, advocating for increased inclusion of HOTS to meet the demands of 21st-century education. Recommendations include implementing training programs for educators on the application of Revised Bloom's Taxonomy to enhance the cognitive and knowledge dimensions tested in examinations, thereby fostering critical thinking, problem-solving, and creativity among students

Keywords: *Analysis, Social Science, Board Examination Question Papers, Revised Bloom's Taxonomy.*

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Introduction

Assessment, in all its different forms, has consistently been a crucial component of the teaching and learning process, facilitating the interaction between teachers and students within the classroom. Assessment has been classified into formative and summative types based on their utilization and how the results are being used. Formative assessment, also known as assessment for learning, is used during the teaching and learning process to give immediate feedback and address any necessary improvements, as well as to evaluate student progress, it typically occurred in the classroom setting. Conversely, summative assessment, also known as assessment of learning, occurs at the end of the course or program through external exams and tests to assess student achievement levels and evaluate the course's effectiveness (Tekyiwa&Sekyi, 2016).

Driven by the needs and demands of 21st Century, schools worldwide have recognized the importance of fostering critical thinking, problem-solving abilities, and creativity instead of focusing solely on traditional memorization and rote learning. NEP (2020) also suggested moving away from basic memorization towards promoting critical thinking skills. Highlighting the need for transitioning from focusing on mere rote memorization to one that is more formative, promotes learning and development of the higher-order thinking skills (HOTS).

Nevertheless, by using Revised Bloom's Taxonomy as a reference point, several studies have found that traditional education continues to prioritize lower-order thinking skills (LOTS) (Mishra & Kotecha, 2015). Examination questions are still found to be testing the remembering and recall skills of the students, rather than testing the creativity, critical thinking and problem-solving skills.

Bloom's Taxonomy

In 1956, Benjamin Bloom and his colleagues Max Englehart, Edward Furst, Walter Hill, and David Krathwohl published the "Taxonomy of Educational Objectives," also referred to as Bloom's Taxonomy, which has emerged as a widely recognized and frequently utilized resource for educators worldwide. This hierarchical structure of taxonomy categorizes learning objectives based on complexity and remains a widely utilized framework in the field of education today. It consists of three learning domains:

- 1) Cognitive Domain
- 2) Affective Domain
- 3) Psychomotor Domain

Revised Bloom's Taxonomy

The Original taxonomy was later revised by Anderson and Krathwohlin 2001. The revised taxonomy was built on a two-dimensional framework that incorporated cognitive process and knowledge dimension.

The cognitive process dimension consists of six levels of thinking skills:

- i. Remember: The ability to recall or retrieve learned information.
- ii. Understand: The ability to comprehend the actual meaning and concept of information or the ability to construct a meaning from information.
- iii. Apply: The ability to apply or carry out the previously learned knowledge in a real life situation.
- iv. Analyze: The ability to break down materials into its constituent parts and understand the organizational structure.
- v. Evaluate: The ability to make judgments about the values of the learned information or materials.
- vi. Create: The ability to combine elements to create a functional whole, or to reorganize existing elements into a new pattern or structure

The knowledge dimension is the foundation for the six cognitive processes and is divided into four types of knowledge:

- i. Factual knowledge: The fundamental elements that students must understand in order to get acquainted with a discipline or solve problems.
- ii. Conceptual knowledge: The interrelationships among the basic elements within a larger structure that enable them to function together
- iii. Procedural knowledge: How to perform something, inquiry methods, and criteria for using skills, algorithms, techniques, and methods.
- iv. Meta cognitive knowledge: Knowledge of cognition in general, as well as awareness and understanding of one's own cognition.

Lower Order Thinking Skills(LOTS)

Lower-Order Thinking Skills (LOTS) require the students to simply recall facts and information from their long-term memory without any modification or alteration. The cognitive skill or level that is directly linked with LOTS in the Revised Bloom's Taxonomy is the 'Remember' level.

Middle Order Thinking Skills(MOTS)

Middle-Order Thinking Skills (MOTS) refer to the skill related to understanding the information and the ability to apply the learnt skill or knowledge in a given situation. 'Understand' and 'Apply' from the cognitive dimensions of Revised Bloom's Taxonomy is considered to fall under MOTS category.

Higher Order Thinking Skills

Higher-Order Thinking Skills (HOTS) is considered to be the highest level in the cognitive skills. It requires the students to break down information and determine how they function in a structure or as a whole. It is the ability to evaluate information or materials based on certain standards and criteria, and the ability to create or devise a new product or theory. The cognitive skill to 'Analyze', 'Evaluate', and 'Create' all fall under the realm of HOTS.

Rationale of the Study

Examination in general occupies an important space in the field the education. It not only determined the contents of education but also the method of teaching. When the examination questions mostly assess the lower-order thinking skills (LOTS) of the students, the teaching process in return, will be automatically based on developing the lower-order thinking skills (LOTS) of the students. Similarly, if the examination questions concentrated more on testing the higher-order thinking skills (HOTS) of the students, the teaching process will then automatically steer towards developing the higher-order thinking skills of the students. Therefore, question items included in the examination must follow a strict principle that will ensure the development of a wide spectrum of cognitive skills of the students.

Keeping in mind the importance of examination questions for the overall development of the students as well as the overall educational system, the investigator has taken up this study in order to find out the quality and level of questions that are asked in the Social Science question papers of HSLC examinations conducted by the Mizoram Board of School Education.

Statement of the Problem

The problem is stated as 'Analysis of Social Science Board Examination Question Papers in Mizoram based on Revised Bloom's Taxonomy'.

Objectives of the Study

Following are the objectives formulated for the purpose of the study:

- 1) To analyze Class-X Social Science board examination question papers of MBSE based on the cognitive process dimensions of the Revised Bloom's Taxonomy
- 2) To analyze Class-X Social Science board examination question papers of MBSE based on the knowledge dimensions of the Revised Bloom's Taxonomy
- 3) To analyze the distribution of Class-X Social Science board examination question papers of MBSE at the Lower, Middle and Higher Order Thinking Skills

Operational Definition of Key Terms

1. **Analysis:** It refers to the in-depth analysis of Class-X Social Science board examination question papers conducted by MBSE based on the cognitive process and knowledge dimensions of the Revised Bloom's Taxonomy.
2. **Social Science:** Social Science is the branch of science that deals with the study of people, society and their relationship with each other. In the context of this study, it includes History, Polity, Economics, Geography and Disaster Management.
3. **Board Examination Question Papers:** For the purpose of the study, it refers to the Class X Board exam question papers conducted by MBSE within a span of seven academic years i.e., 2018-2024.
4. **Revised Bloom's Taxonomy:** It is the categorisation of educational objectives revised by Anderson and Krathwohl in 2001. It includes both cognitive dimensions as well as knowledge dimensions. It is the most widely used tool for analysing the educational objectives as well as question or test items.

Methodology

Method of Study: The study employed a mixed methods research design adopting a combination of qualitative and quantitative methods for collection and analysis of data

Population : This study covers all the Class X Social Science Board Examination question papers conducted by MBSE over a span of seven consecutive years, i.e., 2018-2024.

Tools for Data Analysis: A Revised Bloom's Taxonomy Analytical tool constructed by the investigator was used to analyze the question papers. The analytical tool consists of examples, keywords and action verbs for different level of cognitive and knowledge dimension.

Findings

1) **Analysis of Class-X Social Science board examination question papers conducted by MBSE based on the cognitive process dimensions of Revised Bloom's Taxonomy:**

Descriptive analysis of the distribution of questions in Class-X Social Science board examination question papers conducted by MBSE based on the cognitive process dimensions of Revised Bloom's Taxonomy are shown in Table No.1.

Table 1

Distribution of questions in Class-X Social Science board examination question papers of MBSE based on the cognitive process dimensions of Revised Bloom's Taxonomy

LEVEL	2018	2019	2020	2021	2022	2023	2024	Total (N=352)
Remember	56%	58%	60%	60%	57.60%	54.90%	57.10%	57.38%
Understand	34%	28%	30%	24%	30.70%	37.20%	26.50%	30.11%
Apply	2%	2%	2%	2%	1.90%	1.90%	4%	1.98%
Analyze	6%	12%	6%	10%	9.60%	5.80%	10.20%	8.52%
Evaluate	2%	0%	2%	0%	0%	0%	0%	0.56%
Create	0%	0%	0%	4%	0%	0%	2%	0.85%

Table 1 shows the distribution of questions in Class-X Social Science board examination question papers conducted by MBSE based on the cognitive process dimensions of Revised Bloom's Taxonomy from year 2018-24.

Remembering questions were observed to be highest percentage (60%) in 2020 and 2021, followed by 2019 (58%), 2022 (57.6%), 2024 (57.1%), 2019 (58%) and lastly 2018 (56%).

Understand level questions were found to be highest in 2023 (37.2%), followed by 2018 (34%), 2022 (30.7%), 2020 (30%), 2019 (28%), 2024 (26.5%) and 2021 (24%).

Apply level questions were found to be highest in 2024 (4%), followed by 2018, 2019, 2020, 2021 (all 2%), and 2022, 2023 (both 1.9%).

Analyze level question were found to be highest in 2019 (12%), followed by 2024 (10.2%), 2021 (10%), 2022 (9.6%). The same percentage of 6% were found in 2018 and 2020, and the least occurrence of analyze level questions was found in 2023 (5.8%).

Evaluate level questions were only found in 2018 and 2019 (both 2%). Similarly, Create level questions were found to be of highest occurrence in 2021 (4%), followed by 2024 (2%), with no occurrence in other years.

2) Analysis of Class-X Social Science board examination question papers conducted by MBSE based on the Knowledge dimensions of Revised Bloom's Taxonomy:

Descriptive analysis of the distribution of questions in Class-X Social Science board examination question papers conducted by MBSE based on the knowledge dimensions of Revised Bloom's Taxonomy within a span of seven academic years i.e., 2018-24 are shown in Table No.2

Table 2

Distribution of questions in Class-X Social Science board examination question papers of MBSE based on the knowledge dimensions of Revised Bloom's Taxonomy

LEVEL	2018	2019	2020	2021	2022	2023	2024	Total (N=352)
Factual Knowledge	58%	60%	63.20%	62%	59.61%	54.90%	59.18%	57.38%
Conceptual Knowledge	42%	40%	36.70%	38%	40.38%	43.13%	36.73%	30.11%
Procedural Knowledge	0%	0%	2.04%	0%	0%	1.96%	4.08%	0.56%
Meta-cognitive Knowledge	0%	0%	0%	0%	0%	0%	0%	0%

Table 2 shows the distribution of questions in Class-X Social Science board examination question papers conducted by MBSE based on the knowledge dimensions of Revised Bloom's Taxonomy from year 2018-24.

Factual knowledge were found the highest occurrence in 2020 (63.2%), followed by 2021 (62%), 2019 (60%), 2022 (59.90%), 2024 (59.18%), 2018 (58%) and the least occurrence of factual knowledge was found in 2023 (54.90%).

Regarding the conceptual knowledge questions, the highest occurrence were found in 2023 (43.13%), followed by 2018 (42%), 2022 (40.38%), 2019 (40%), 2021 (38%), and the least occurrence were found in 2020 and 2024 (both 36.7%).

Procedural knowledge related questions were only found in 2020, 2023, 2024. The highest occurrence was found in 2024 (4.08%), followed by 2020 (2.04%) and the least was found in (1.96%). However, there are no meta-cognitive knowledge to be found in all years

3) Distribution of Class X Social Science board examination question papers conducted by MBSE at the Lower, Middle and Higher Order Thinking Skills

Descriptive analysis of the distribution of questions in Class-X Social Science board examination question papers conducted by MBSE at the Lower, Middle and Higher Order Thinking Skills are as shown in Table No.3

Table 3

Distribution of Social Science board examination question papers at the Lower, Middle and Higher Order Thinking Skills

LEVELS	2018	2019	2020	2021	2022	2023	2024	Total (N=352)
LOTS	56%	58%	60%	60%	57.60%	54.90%	57.10%	57.38%
MOTS	36%	30%	32%	32%	32.60%	39.10%	30.5	32.09%
HOTS	8%	12%	8%	14%	9.60%	5.80%	12.2	9.93%

Table No.3 reveals that LOTS questions were found to of highest occurrence in both 2020 and 2021 (both 60%), followed by 2019 (58%), 2022 (57.6%), 2024 (57.1%), 2019 (58%), 2018 (56%), with the least occurrence in 2023 (54.9%).

Regarding questions pertaining to MOTS, the highest occurrence was found in 2023 (39.1%), followed by 2018 (36%), 2022 (32.6%), 2020 and 2021 (both 32%), 2024 (30.5%) and the least occurrence was found in 2019 (30%).

HOTS questions were found to be of highest occurrence in 2021 (14%), followed by 2024 (12.2%), 2019 (12%), 2022 (9.6%), 2018 and 2020 (both 8%), and the least occurrence was found in 2023 (5.8%).

Discussion

The study revealed that majority of Class X Social Science board examination questions tend to tests the lower-order thinking skills (LOTS) of the students in Mizoram. Large proportion of the questions were remembering level questions, followed by understand level questions. Analyze level questions stood third followed by apply level questions. Create and evaluation level questions were little to non with an occurrence rate of 0.56% and 0.85% respectively.

57.38% the questions test the factual knowledge of the students, followed by conceptual knowledge at 30.11% occurrence rate. 0.56% of the questions were of procedural level questions while no questions pertaining to testing the meta-cognitive knowledge of the students were to be found.

More than half of the questions (57.38%) were LOTS questions, which drastically declined when it comes to MOTS questions at 32.09% occurrence rate. HOTS questions were the least to be found with only 9.93% of the questions from 2018-24 testing the HOTS of the students through the Social Science examination question papers of the HSLC examination.

Further, no uniform progression was observed in the cognitive dimensions or the knowledge dimensions in the social science board question papers through the years from 2018-24. Similarly, no uniform progression was observed regarding the lower, middle and higher-order thinking skills throughout the time period.

Suggestions

- 1) The findings revealed a high level of occurrence of LOTS questions in the Class X social science board examination question papers of MBSE, which should be improved by including more MOTS and HOTS questions and strived towards a more balanced questions focusing on all the levels of cognition.

- 2) Proper training programs and workshops regarding the application of Revised Bloom's Taxonomy in question paper setting and classroom teaching in general, should be held.

Conclusion

The revelation of the high domination by LOTS questions with little occurrence of HOTS questions provided an insightful information regarding the cognitive levels of Class X social science board examination questions prescribed by MBSE in Mizoram. In order to cater to the needs and demands of the 21st century world, we must teach our students not only basic factual knowledge, but also critical thinking skills, problem solving skills and creativity which could be done by stimulating their higher-order thinking skills (HOTS). Question paper setters, teachers, educators and curriculum planners needs to be aware of the effectiveness, efficiency, and the application of Revised Bloom's Taxonomy in fostering the HOTS of students through teaching and assessment.

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