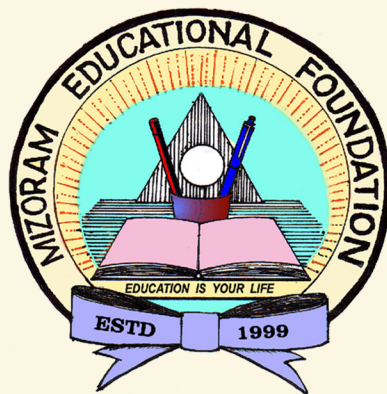


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From the Desk of the Chief Editor

Options for Promotion under CAS for College and University Teachers

The good news for some college and university teachers is that the University Grants Commission (UGC) has once again extended the grace period for promotion under Career Advancement Scheme (CAS) for those faculty members who have already qualified or are likely to qualify till **31st December 2024** as per the UGC Regulations on Minimum Qualifications for Appointment of Teachers and other Academic Staff in Universities and Colleges and other Measures for the Maintenance of Standards in Higher Education, **2010**. A choice may be given to them either for being considered for promotions under the **2010 or 2018 Regulations**.

The UGC maintains quality and standards of teachers of higher education institutions through regulations prepared from time to time for these purposes. The regulations being in use are the UGC Regulations on Minimum Qualifications for Appointment of Teachers and Other Academic Staff in Universities and Colleges and Measures for the Maintenance of Standards in Higher Education, 2018 and the subsequent amendments. The criteria for promotions under CAS laid down under these Regulations became effective from 18th July, 2018, the date of notification of these Regulations. However, to avoid hardship to those faculty members who had already qualified or were likely to qualify shortly under the regulations 2010, a provision was made for a choice to be given to them, for being considered for promotions under the UGC Regulations, 2010. This option could be exercised only within three years (2018 to 2021) from the date of notification of the Regulations 2018.

The relaxation in the requirements of Academic Performance Indicators (API) based Performance Based Appraisal System (PBAS) up to the date of notification of the UGC Regulations 2018 for the promotion from one Academic Level/Grade Pay to another under CAS as provided in UGC Regulations on Minimum Qualifications for Appointment of Teachers and other Academic Staff in Universities and Colleges and Measures for the Maintenance of Standards in Higher Education 2010 and its amendments, was defined as under :

- i. Exemption from scoring under Category I, as defined in Appendix III of said above mentioned UGC Regulations on Minimum Qualifications for Appointment of Teachers and other Academic Staff in Universities and Colleges and Measures for the Maintenance of Standards in Higher Education 2010 and its amendments including University Grants Commission (Minimum Qualifications for Appointment of Teachers and other Academic Staff in Universities and Colleges and Measures for the Maintenance of Standards in Higher Education) (4th Amendment), Regulations, 2016, for faculty and other equivalent cadre positions.

- ii. Scoring in Category II and Category III for faculty and other equivalent cadre positions shall be as provided for in the UGC Regulations on Minimum Qualifications for Appointment of Teachers and other Academic Staff in Universities and Colleges and Measures for the Maintenance of Standards in Higher Education 2010 with the following combined minimum API score requirement for Category II and Category III taken together.

The relaxation period was over by 18th July, 2018, that is, the date of notification of the UGC Regulations 2018. However, the subsequent amendments to the Regulations extended the relaxation period. The 3rd Amendment made in 2023 to the said UGC Regulations 2018 brought about changes in clause 6.3 of the said regulations. The amendment referred to, provided a choice to be given to those faculty members who had already qualified or were likely to qualify within six months (till 17th January, 2019) as per the UGC Regulations 2010, for being considered for promotions under the 2010 or 2018 Regulations. This option could be exercised only up to **31st December 2023** and the date of eligibility should be retained as the date of promotion. On the date of submission of the application, the candidate should have fulfilled all eligibility criteria required for promotion.

The UGC recently came out with another amendment to the Regulations 2018, that is, the 4th Amendment 2024 which came into force on 6th June, 2024, that is, the date of their publication in the Official Gazette. This amendment now substitutes the provision prescribed under Clause 6.3 in the 3rd amendment regulations 2023. The 4th Amendment 2024 reads:

*The criteria for promotions under Career Advancement Scheme laid down under these Regulations shall be effective from the date of notification of these Regulations. However, to avoid hardship to those faculty members who have already qualified or are likely to qualify till **31st December 2024** as per the UGC Regulations on Minimum Qualifications for Appointment of Teachers and other Academic staff in Universities and Colleges and other Measures for the Maintenance of Standards in Higher Education, **2010**, a choice may be given to them either for being considered for promotions under the **2010 or 2018 Regulations**. The date of eligibility shall be retained as the date of promotion. On the date of submission of the application, the candidate should fulfill all eligibility criteria required for promotion.*

A chance is now given again to those faculty members who could not get the promotions in time but have now qualified or are likely to qualify for the promotions **till 31st December, 2024**. The concerned teachers need to examine themselves and see which regulations, 2010 or 2018 would be more suitable for their assessment and consideration for promotions. Accordingly, they should prepare their applications based on the chosen regulations, ensure their fulfillment of the eligibility criteria and then submit the applications. In this way, the options provided by the UGC may be benefited by them.

Lalhmasai Chuaungo
Chief Editor

Mathematics Anxiety among Secondary School Students in Aizawl City in Relation to Their Gender and Types of Schools

C. Lalsangpuii*
Lynda Zohmingliani**

Abstract

Mathematic is a subject of vital interest for any kind of endeavour. Its understanding has been linked positively with a number of abilities in individuals. Therefore, regardless of the kind of profession a person is likely to take up, an understanding of mathematics will go a long way in smooth conduction of a number of activities. Yet, it has also been found that, may be because of its abstract nature, a number of students have often shown dismal results in mathematics (based on examination results). With these thoughts in mind, the present study was conducted to measure the mathematics anxiety among secondary school students in Aizawl City in relation to their gender and types of schools. Descriptive survey method has been employed in which stratified random sampling has been adopted to collect a sample of 176 secondary school students. Mathematics Anxiety Scale developed by the investigator was used for collecting data. The result revealed that there was a significant difference in the mathematics anxiety of secondary school students in Aizawl City on the basis of both genders, i.e., between male and female and on the basis of types of schools i.e., Government, Government Aided and Private schools. Furthermore, it was found that there was a significant difference in the mathematics anxiety between Government schools and Government Aided secondary school students, as well as between secondary school students of Government and Private schools. However, there was no significant difference in the mathematics anxiety between students in Government Aided schools and Private schools.

Keywords: *Mathematics Anxiety, Gender, Types of schools*

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Introduction

Learning of mathematics is crucial as it has a wide range of application in our everyday lives. Mathematics aims to comprehend and explain the fundamental properties and principles that govern the world around us. It is a great concern for the government that mathematics subject is studied with clarity and measures have been taken over the history of time. In India, the new National Education Policy, NEP 2020 introduced innovative ideas in addressing issues such as rote learning, emphasizing quantitative growth rather than qualitative growth, and a lack of conceptual clarity. Students should develop strong foundational skills in language and mathematics. NEP 2020 strongly advocated the fostering of mathematical creativity in learners.

Given the nationwide emphasis on the importance of attaining excellence in mathematics and how it connects to success in various aspects of life, it is possible that students are subjected to tremendous pressure. If this pressure is not managed appropriately or productively, it may lead to anxiety among students. Such anxiety is detrimental, as it affects their academic performance and can even negatively impact the future of students and overall outlook on life.

Cambridge dictionary defined anxiety as an uncomfortable feeling of nervousness or worry about something that is happening or might happen in the future (Cambridge dictionary, n.d.). It is a psychological reaction to stress or unwanted situations that may affect the normal functioning of a person. Likewise, mathematics anxiety can simply be explained as a negative reaction towards mathematics, a feeling of tension a person has when encountered with any kind of mathematics related activity.

It describes worry or fear of performing mathematics calculations. A person with mathematics anxiety may feel panicked at the thought of working with numbers, which makes it even harder to think. Its symptoms are the same as other types of anxiety. They may include worry, panic, tense muscles, increased heart rate, sweaty palms, light-headedness, etc (West, 2022). Richardson and Suinn defined mathematics anxiety as feelings that involves tension and anxiety that interfere with the manipulation of numbers and the solving of mathematical problems in a wide variety of ordinary life and academic situations (Richardson & Suinn, 1972, as cited in Suinn & Winston, 2003, p.1).

Rationale

Secondary stage of education is a crucial age for students as it is a stage that greatly determines their future, both in career as well as overall perspectives in life. The level of interest or anxiety in any subject can have a lasting impact on how an individual student deals with problems in life. As mathematics was found to have the least pass percentage level at this stage, it was chosen as the main subject to study. Students must be made to understand

the level of interest they have in mathematics, and also the level of anxiety they have as it can affect their future in the long run. The new found result could enable stakeholders to take necessary measures to tackle the issue.

Furthermore, various research findings have found that gender and types of school matters when it comes to mathematics anxiety. Such research has not been conducted in Aizawl and the investigator found the need to conduct the study to find out how gender and types of schools relate to mathematics anxiety among secondary school students of Aizawl City.

Literature Review

The Reviews of the related literature are discussed in chronological order as below:

Studies conducted on mathematical anxiety, gender and types of schools

Srivastava and Imam (2016) conducted a study on mathematics anxiety among secondary school students in relation to personal and school related factors, in which 1000 secondary school students were taken as sample. Mathematics anxiety scale (MAS), An Intuitional Background Assessment Questionnaire and A Personal Background Questionnaire were used as a tool. The data was analysed using computation of means and standard deviation, computation of standard error and use of t-test and f-test for measuring the significant of the difference between the means. It was found that there exists significant difference between male and female students in their anxiety in mathematics. It was also found that there exists significant difference among the types of schools and math anxiety, the result clearly showing that students of private school have lowest mathematics anxiety scores than the other three groups (government, Semi government, Muslim minority).

Sangral and Kumar (2023) studied Mathematical anxiety among secondary school students in relation to their gender, locality and types of schools. It was found that there is a significant difference in mathematical anxiety among the secondary school students with regard to their gender, i.e., between male and female. It is found there is a significant difference in the numerical anxiety of secondary school students with regard to their locality (rural & urban). The study also found that there is no significant difference in the mathematical anxieties of secondary school students with regard to their types of schools, i.e., although the mean score is larger among private school students more than government schools, concluding that the numerical anxiety of government and private secondary school students were found to have no significant difference.

Studies conducted on Mathematical Anxiety and types of schools

Mandal and Saha (2019) conducted a study on mathematics anxiety and prevention strategies with an attempt to improve mathematics performance of secondary school students

in West Bengal. Government and private schools from Kolkata and South 24 parganas district in the West Bengal were randomly selected where mathematics anxiety was measured using a standardized instrument whereas, students' mathematics performance was collected from the progressive report of the schools. It was found that there are significant differences in mathematics anxiety and performance in mathematics on gender and types of schools but there is no significant difference between habitat in mathematics anxiety and performance in mathematics.

Manikandan, Nair and Ajith (2022) in their study 'Math Phobia among School Students: A Comparative Design' found that level of Math Phobia/Mathematical Anxiety among the Private High School students were significantly higher than the Government High school students. The study was conducted among a total sample of 60 high school students. A Descriptive Comparative design was used to conduct the study and data analysis was done using Descriptive and Inferential statistics. The comparisons of the mean Mathematical Anxiety scores among the Government and Private High School students were done using the 'Student t test'. The computed 't value' at 3.27** (df=58) was statistically significant at $p < 0.01$.

Studies conducted on Mathematical Anxiety and gender

Yadav and Singh (2018) conducted a study to find out the relationship between achievement in Mathematics and Mathematics anxiety among secondary school students. Mathematics achievement as a cause for Mathematics anxiety and vice-versa was studied to find out the reciprocal relationship between Mathematics achievement and Mathematics anxiety. 374 students (302 male and 72 female students) were taken as samples in which self-constructed tools, Mathematics anxiety scale and Mathematics Performance Test, were applied to collect data. It was found that the relationship between achievement in Mathematics and Mathematics anxiety is negative and significant at 0.05 level of significance. It was also found that there was significant difference in mathematics anxiety between high and low achievers, and between high and low anxious students. It was also noted that that was no difference in Mathematics anxiety between male and female students.

Kumar and Srivastava (2021) conducted a study on Mathematics Anxiety and its effect on a set of independent variables (gender, school board, fathers' qualification, mothers' qualification and with respect to their types of family) of secondary school students in Pune. Survey method was adapted and the tool used for the data collection was Mathematics Anxiety Scale (MAS) developed by Dr. (Mrs.) SadiaMahmood and Dr. (Mrs.) Tahira Khatoon. 195 secondary school students were drawn randomly from two schools. Mean, standard deviation and a 't' test was used for statistical analysis. It was found that there was no significant difference in Mathematics Anxiety of students with respect to their gender, school board, fathers' qualification and with respect to their types of family. It was also found that

students whose mothers' qualification is above intermediate were having high Mathematics Anxiety in comparison to those whose mothers' qualification is intermediate and below intermediate.

Objectives of the study

1. To compare the mathematics anxiety of secondary school students in Aizawl City on the basis of gender.
2. To compare the mathematics anxiety of secondary school students in Aizawl City on the basis of types of schools.

Research hypotheses

1. There is a significant difference in the mathematics anxiety of secondary school students in Aizawl City on the basis of gender.
2. There is a significant difference in the mathematics anxiety of secondary school students in Aizawl City on the basis of types of schools.

Methodology

In the present study, the investigator employed Descriptive Survey Method.

Population

The population of the present study comprised of all secondary school students in Aizawl City.

Sample

The sample constitutes 176 secondary school students in Aizawl City. Stratified Random Sampling was employed by the investigator where Government, Government Aided and Private secondary schools were the main strata and samples were randomly collected from there.

Table 1***Profile of secondary school students in Aizawl City***

Groups		No. of secondary school students	
Gender	Male	73	176
	Female	103	
Types of schools	Government	67	176
	Government Aided	59	
	Private	50	

Table 1 shows that out of the 176 secondary school students in Aizawl City, who are taken as sample for the present study, 73 are male and the rest 103 are female. 67 students are enrolled in Government schools, 59 in Government Aided and 50 are enrolled in Private schools.

Tool

For this study, Mathematics Anxiety Scale developed by the investigator was used for collection of data, which is a standardized tool to measure the mathematics anxiety of secondary school students. This scale is divided into three major dimensions: Cognitive dimension, Emotional dimension and Behavioral dimension of Mathematics anxiety. A total of 38 items are distributed in these dimensions. The scale is a five-point scale, which includes *Strongly Agree, Agree, Undecided, Disagree and Strongly Disagree*.

Statistical techniques used

Data was analysed with the help of descriptive statistics like mean and standard deviation along with parametric statistics like t-test and ANOVA.

Delimitation

Due to limitations in time and cost, the present study was delimited to secondary school students studying Class 10.

Data analysis and interpretation

The data collected were analysed and interpreted in accordance with the objectives as follows:

Objective No.1: To compare the mathematics anxiety of secondary school students in Aizawl City on the basis of gender.

To compare the mathematics anxiety of secondary school students with respect to their gender, students are categorized into male and female. The hypothesis which stated that ‘There is a significant difference in the mathematics anxiety of secondary school students in Aizawl City on the basis of gender’ was converted into a null hypothesis which states that, ‘There is no significant difference in the mathematics anxiety of secondary school students in Aizawl City on the basis of gender’.

To test this null hypothesis, a t-test was conducted and comparison was made between male and female. The Mean and the Standard Deviation were also calculated and t-test was used to test the Mean difference, the detail of which is shown in the following table.

Table 2
Comparison of mathematics anxiety between male and female secondary school students in Aizawl City.

Gender	No. of Students	Mean	Standard Deviation	SED	t-value	df	Significance level
Male	73	105.55	24.61	4.07	2.74	169	Significant at 0.05
Female	103	116.71	29.2				

Table 2 shows the comparison of mathematics anxiety between male and female secondary school students in Aizawl City.

The calculated t-value was found to be 2.74 with its degrees of freedom 169, which is larger to the critical value at 0.05 level of significance.

So, the null hypothesis, ‘There is no significant difference in the mathematics anxiety of secondary school students in Aizawl City on the basis of gender’ is rejected.

Therefore, there is a significant difference between male and female secondary school students in Aizawl City. The finding is in favour of female secondary school students showing larger mean score compared to male.

Objective No.2: To compare the mathematics anxiety of secondary school students in Aizawl City on the basis of types of schools.

In order to compare the mathematics anxiety of secondary school students in Aizawl City on the basis of types of school, the hypothesis which stated that ‘There is a significant difference in the mathematics anxiety of secondary school students in Aizawl City on the basis of types of schools’ was converted into a null hypothesis which states that, ‘There is no significant difference in the mathematics anxiety of secondary school students in Aizawl City on the basis of types of schools.’

To test this null hypothesis, ANOVA was used and comparison was made between secondary school students who are currently attending Government, Government Aided and Private type of schools.

Table 3

Comparison of mathematics anxiety of secondary school students in Aizawl City on the basis of types of schools

Source of variance	df	Sum of Squares	Mean Square	F-ratio	Significance
Between sets	2	15773.99	7886.99	11.36	Significant at 0.01
Within sets	173	120104.9	694.25		

The above table shows that the calculated F-ratio is 11.36 which is greater than the critical value 4.71 at 0.01 level of significance. So, the null hypothesis, 'There is no significant difference in the mathematics anxiety of secondary school students in Aizawl City on the basis of types of schools' is rejected.

Since the result indicated that there exists significant difference in mathematics anxiety on the basis of types of schools, t-test was further used to compare the difference between Government, Government Aided and Private schools.

Table 4

Comparison of mathematics anxiety between secondary school students in Government school and Government Aided schools.

Types of schools	No. of Students	Mean	Standard Deviation	SED	t-value	df	Significance
Government	67	100.96	24.97	4.77	2.86	124	Significant at 0.01
Government Aided	59	114.61	28.25				

From the above table, the mean score of students in Government school is 100.96 and the standard deviation is 24.97, while the mean and standard deviation of students studying in Government Aided is 114.61 and 28.25 respectively. The calculated t-value is 2.86 which is greater than the critical value at the required level of significance at 0.01 level i.e. 2.62.

Therefore, there is a significant difference in the mathematics anxiety between secondary school students of Government schools and Government Aided schools.

Table 5

Comparison of mathematics anxiety between secondary school students in Government aided school and Private type of school.

Types of schools	No. of Students	Mean	Standard Deviation	SED	t-value	df	Significance
Government Aided	59	114.61	28.25	5.19	1.81	107	Not significant
Private	50	124	25.83				

Table 5 shows the comparison of mathematics anxiety between students in Government Aided schools and Private schools in Aizawl City.

The calculated t-value was found to be 1.81 with its degrees of freedom 107, which is smaller than the critical value at the required levels of significance. Therefore, there is no significant difference in the mathematics anxiety between students in Government aided schools and Private schools in Aizawl City.

The mean score of students in Private schools is larger showing higher anxiety than of Government aided schools, however the deviation is higher in Government aided as compared to Private schools.

Table 6

Comparison of mathematics anxiety between secondary school students in Government schools and Private type of schools

TYPES OF SCHOOLS	No. of Students	Mean	Standard Deviation	SED	t-value	df	Significance
Government	67	100.96	24.97	4.84	4.76	115	Significant at 0.01
Private	50	124	25.83				

From the above table, the mean score of students in Government schools is 100.96 and standard deviation is 24.97, while the mean and standard deviation of students studying in Private schools is 124 and 25.83 respectively. The calculated t-value is 4.76 which is greater than the critical value at the required level of significance at 0.01 level i.e. 2.62.

Therefore, there is a significant difference in the mathematics anxiety between secondary school students of Government and Private schools. The finding is in favour of Government schools with larger mean scores showing higher anxiety as compared to Private schools.

Findings

1. There is a significant difference in the mathematics anxiety of secondary school students in Aizawl City on the basis of gender, i.e., between male and female.
2. There is a significant difference in the mathematics anxiety of secondary school students in Aizawl City on the basis of types of schools.
 - There is a significant difference in the mathematics anxiety between secondary school students of Government schools and Government Aided type of schools.
 - There is no significant difference in the mathematics anxiety between students in Government aided schools and Private schools.
 - There is a significant difference in the mathematics anxiety between secondary school students of Government and Private schools

Conclusion

As found in the study, while no significant differences lay in mathematics anxiety between schools that rely on the government funding, regardless of the kind and amount received, there was a significant difference when government managed schools and privately managed schools were compared with the latter having a more positive result. This shows that management does play a crucial role in students' anxiety and eventually affecting their academic performance. Since mathematics anxiety significantly impacts the academic performance and confidence of students, it is imperative that this problem is taken care of. Addressing this issue may involve diagnosing anxiety of students and creating supportive learning environments, implementing anxiety-reducing techniques, and encouraging growth mindset. Educators can integrate engaging, real-world applications of mathematics so as to make the subject more relatable and less intimidating.

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

H. Lalrinawma*
Sian Lalthhandami**
Lalremsangi***

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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A Study on Cognitive Style among B.Ed and M.Ed Students in Mizoram

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Abstract:

This study explored and compared the cognitive styles of Bachelor of Education (B.Ed) and Master of Education (M.Ed) students in Mizoram, India. Cognitive style, which refers to an individual's preferred way of processing information, plays a significant role in learning and teaching. The research employed a census method with a total population of 332 students from different teacher education institutions in Mizoram. The results indicated majority of the students have split cognitive style. Maximum number of the students had medium level of cognitive style followed by high level of cognitive style and minimum of the students possessed low level of cognitive style. It was also found that there was a significant difference between the cognitive styles of B.Ed and M. Ed students. No difference was found in the cognitive styles of male and female B.Ed and M.Ed students. These findings revealed the diversity in cognitive styles among student teachers and understanding these differences can enhance teacher education programs and contribute to more effective and personalized educational strategies in Mizoram.

Key words: Cognitive Styles, B. Ed, M. Ed, Teacher Education Programmes

Introduction

Cognitive style refers to the preferred way an individual processes information, influencing their perception, thinking, problem-solving, learning, and memory. Messick (1984) defines cognitive styles as fixed attitudes, inclinations, or ingrained behaviours that identify an individual's regular way of seeing, recalling, reasoning, and solving problems.

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Cognitive style is conceived as one of the aspects of psychological differentiation. Psychological differentiation refers to different mode of perceiving, judging and appraising things to which people are exposed to under different conditions. The notion of cognitive style has been defined as self-evident modes of functioning which the individual shows in his perceptual and intellectual activities. It is conceptualized as stable attitude or habitual strategy which determines a person's typical modes of perceiving, remembering and problem-solving. There are several types of cognitive functioning among which field dependence and field independence are well known. A field dependent individual is found to be passive and less competent in analytical functioning having greater social orientation. He has poor impulsive control and undifferentiated self-concept. He is more socially sensitive. On the other hand, a field independent individual is found to be more active and competent in analytical functioning having less social orientation. He is less impulsive and socially sensitive. Mahlios (1981) found that teacher and student's relationship is based on the cognitive style adopted by both the teachers and students. The classroom interaction between the teachers and students is influence by the cognitive style of the students. This indicated that the cognitive style adopted by the students is greatly influence by the teaching-learning process.

Recognizing cognitive styles helps future educators in B.Ed and M.Ed programs to become reflective practitioners who can adapt their teaching strategies to diverse learners. This understanding promotes a more inclusive and effective educational environment, although it is important to avoid overgeneralization and consider the fluid and context-dependent nature of cognitive styles, as well as cultural influences.

Rationale

The study on the cognitive styles of B.Ed and M.Ed students is crucial in order to understand and address the diverse learning needs of future educators. By exploring how these students process information and learn best, educators can tailor teaching methods and develop curricula that cater to individual preferences, enhancing educational effectiveness. This understanding leads to improved teaching competence, as future teachers become equipped with strategies to manage diverse classroom behaviours and implement varied instructional methods. Additionally, insights from cognitive style research inform the design of inclusive and adaptive educational programs, fostering reflective practice and continuous professional development among M.Ed students. This study also contributes in finding out the level of cognitive style among students-teachers as well as student- teacher educators. Ultimately, by recognizing and accommodating cognitive diversity, educational institutions can better prepare teachers to create supportive and effective learning environments for all students.

Review of Related Literature

Krishna (2015) conducted a study on cognitive styles of student teachers in relation to their social and emotional intelligence. The study revealed that out of the total of 600 student teachers, 163 student teachers were having low systematic style, 297 student teachers were having moderate systematic style, 140 high systematic style. Thus it can be inferred that nearly half (49.5%) of the sample belongs to the moderate systematic style, while 27.2% were low systematic style, where as 23.3% belonged to high owing distribution of student teachers.

Nirmala (1996) conducted a study on cognitive styles and learning styles a comparative study of delinquents and non-delinquents. The study found that the delinquent girls and non - delinquent girls did not differ significantly in their cognitive styles of functioning. Delinquents show field dependent style of cognitive functioning.

Methodology

For the present study, census methods involving survey on various Teacher Education Institutions in Mizoram was used to find the cognitive style of B.Ed and M.Ed students.

Population

All the students from teacher education Institutions from Mizoram constituted the population for this study. As there are four institutions viz. Institute of Advanced Studies in Education (IASE), Department of Education, MZU, DIET Aizawl and DIET Lunglei, running the Bachelor of Education (B.Ed) Programme and two institutions viz. Institute of Advanced Studies in Education (IASE), Department of Education, MZU for the Master of Education (M.Ed) programme, all the students in these institutions were selected for population and hence, selection of sample is not necessary for investigation.

Tool

For the present study, Cognitive Style Inventory developed by Dr. Praveen Kumar Jha (English Version), National Psychological Corporation, Agra was used.

Statistical technique used

Data collected were analysed with the help of statistical techniques namely Mean, standard deviation, and t-test.

Objectives:

1. To examine the cognitive style of B. Ed and M. Ed students.

2. To compare the cognitive style of B. Ed and M. Ed students.
3. To compare the cognitive style of male and female B. Ed students.
4. To compare the cognitive style of male and female M. Ed students.

Data analysis and interpretation

Objective No. 1: To examine the cognitive style of B. Ed and M. Ed students.

Results of analysis of the cognitive styles of B. Ed and M. Ed students are presented in the following table:

Table No 1

Cognitive Styles of B.Ed and M.Ed Students

Sl. No	Cognitive Styles	N	Percentage
1	Systematic Style	23	6.92%
2	Intuitive Style	3	0.90%
3	Integrated Style	71	21.39%
4	Undifferentiated Style	71	21.39%
5	Split Style	164	49.40%
	Total	332	100

Table No 1 shows that the students have different styles of cognition. The maximum score is made by students with split cognitive style of 164 with a percentage of 49.40. The integrated style and undifferentiated style are exhibited by 71 students each with a percentage of 21.39. The number of students with systematic style is of 23 in number with a percentage of 6.92 and finally students with intuitive style is only 3 with a percentage of 0.9.

The cognitive style can also be classified on the basis of the score obtained. Based on the norms calculated, students who scored 73.5 and above are considered as having high level of cognitive style. The scores obtained by students from 65 to 73 are treated as having medium level of cognitive style and finally, students who scored 64.5 and below are considered as having low level of cognitive style. The number and percentage of the level of cognitive styles are presented in the following tables.

Table No 2

Level of Cognitive Styles of Students

Sl. No	Level of Cognitive Styles	N	%	MEAN	SD
1	High	86	25.9	77.21	3.32
2	Average	170	51.2	68.82	2.47
3	Low	76	22.9	59.05	5.83
	Total	332	100		

A glance at the table 2 highlighted the cognitive style of B. Ed and M. Ed students. Out of the total population of 332 students, 86 (25.90%) have a high level of cognitive style. 170 (51.20%) have medium level of cognitive style. Lastly, 76 (22.9%) of students have low level of cognitive style. The mean score of high cognitive style is 77.21 with a standard deviation of 3.32. Medium level mean score is 68.82 with a standard deviation of 2.47 and low level mean score is 59.05 with a standard deviation of 5.83.

Table No 3
Level of Cognitive Style of B. Ed and M. Ed Students

Edn	Level of Cognitive Styles	N	%	MEAN	SD
B. Ed	High	56	22.22	68.24	7.29
	Average	132	52.38		
	Low	64	25.4		
M. Ed	High	30	37.5	70.38	7.29
	Average	38	47.5		
	Low	12	15		

Table No. 3 reveals the level of cognitive styles of B.Ed and M.Ed students. There are 56 (22.22%) students in B.Ed with high level cognitive style, 132 (52.38%) have medium level of cognitive style and 64 (25.40%) have low level of cognitive style. Among the M.Ed students, 30 (37.5%) had high level cognitive style, 38 (47.5%) had medium level and 12 (15%) had low level. The mean scores of students are 68.24 in B. Ed and 70.38 in M. Ed with a similar standard deviation of 7.29.

Objective 2: To compare the level of cognitive style of B. Ed and M. Ed students.

Results of the comparison of the level of cognitive style of B. Ed and M. Ed students are shown in the following tables:

Table No. 4
Comparison of the Cognitive Style of B. Ed and M. Ed Students

Edn	N	Mean	SD	df	t-value	Level of significance
B. Ed	252	68.22	7.29	330	2.3	0.05
M. Ed	80	70.38	7.29			

Table No 4 reveals that the mean scores of B. Ed and M. Ed are 68.22 and 70.38 with a similar standard deviation of 7.29. The degrees of freedom being 330 with a t-value of 2.30 which is significant at 0.05 level. Therefore, the hypothesis being 'there is no significant difference between B. Ed and M. Ed students in their level of cognitive style' is rejected. Hence, it can be said that there is significant difference in their cognitive style.

Objective 3: To compare the cognitive style of male and female B. Ed students.

To compare cognitive style of male and female B. Ed students, the mean difference between the two groups was tested using t- test. The following table shows the comparison of male and female B. Ed students towards their cognitive style.

Table No.5**Comparison of the cognitive style of male and female B. Ed Students**

CSI	N	Mean	SD	t value	Level of Significance
B.Ed. Male	87	68.39	7.7	0.263	N.S
B.Ed. Female	165	68.13	7.09		

Table 5 indicates that B.Ed male students have a mean score of 68.39 and a standard deviation of 7.70, whereas B.Ed female students have a mean score of 68.13 and a standard deviation of 7.09. The computed t-value is 0.263, which is below the critical value needed for significance.

This suggests that male and female B.Ed students do not differ significantly in their cognitive styles. However, it is noted that the mean score of male students is slightly higher than that of female students.

This finding implies that gender is not a significant factor in differentiating cognitive style.

Objective No. 4: To compare the cognitive style of male and female M. Ed students.

To compare cognitive style of male and female M. Ed students, the mean difference between the two groups was tested using t- test. The following table shows the comparison of male and female M. Ed students towards their cognitive style.

Table No. 6**Comparison of the cognitive style of male and female M. Ed Students**

CSI	N	Mean	SD	t value	Level of Significance
M.Ed. Male	26	71.59	7	1.034	N.S
M.Ed. Female	54	69.79	7.42		

The table shows that for M.Ed male students (totalling 26), the mean score is 71.59 with a standard deviation of 7.00. For M.Ed female students (totalling 54), the mean score is 69.79 with a standard deviation of 7.42. The calculated t-value is 1.034, which is below the critical value required for significance.

This indicates that male and female M.Ed students do not significantly differ in their cognitive styles. Although the mean score of male students is slightly higher than that of

female students, the finding suggests that gender is not a significant factor in differentiating cognitive style among M.Ed students.

Findings

Out of the total population of 332 students, it was found that maximum number of students have split cognitive style followed by similar number of students having integrated and undifferentiated cognitive style. The least number of students have intuitive style followed by students with systematic cognitive style. Based on the scores obtained by students, maximum number of the students have medium level of cognitive style followed by high level of cognitive style and minimum of the students possess low level of cognitive style. It was also found that there was a difference between cognitive styles of B.Ed and M.Ed students. Male and female B.Ed students and male and female M.Ed students do not differ in their cognitive style which concluded that there is no significant difference between them.

Conclusion

It can be concluded that cognitive styles are distinct from individual intelligence, but they may affect personality development and how individuals learn and apply information. So, it is very important to know and study about cognitive styles of students for quality education especially in teacher education institutes.

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Technological, Pedagogical and Content Knowledge (TPACK): Technological Integration and Teaching Effectiveness

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Abstract

Technological Pedagogical Content Knowledge (TPACK) was first introduced by Punya Mishra and Matthew J. Koehler of Michigan State University in 2006. This framework identifies three domains of knowledge needed to successfully integrate educational technology: Content Knowledge (CK), Pedagogical Knowledge (PK), Technological Knowledge (TK). Each domain also intersects with the other domains. The knowledge, skills, and abilities developed where all three domains overlap and integrate cohesively is referred to as TPACK and forms the basis for effective technology integration. TPACK serves as a useful conceptual framework for thinking, analyzing, and evaluating what teachers must know to integrate technology into teaching, but ultimately it must be understood as a framework for ways in which teachers might best develop this integrated knowledge. TPACK is a technical framework of collective and composite knowledge required for teachers teaching practices in the classrooms with technology integration.

Keywords: *Technological, Pedagogical and Content Knowledge, Technological integration, Teaching effectiveness.*

Introduction

Technology has become an increasingly important part of students' lives beyond school, and even within the classroom it can also help increase their understanding of complex concepts or encourage collaboration among peers. Because of these benefits, current educational practice suggests that teachers implement some form of technology in their classrooms – but many teachers face difficulties in doing so. Cost, access, and time often form considerable

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barriers to classroom implementation, but another obstacle is a lack of knowledge regarding how technology can best be used to benefit students across diverse subject matter.

What is the TPACK Framework?

TPACK stands for Technological Pedagogical Content Knowledge. It is a theory that was developed to explain the set of knowledge that teachers need to teach their students a subject, teach effectively, and use technology.

Technological Pedagogical Content Knowledge (TPACK) was introduced to the educational research field as a conceptual framework for understanding teacher knowledge that is required for technology integration. TPACK evolved from Shulman's (1986) theory of pedagogical content knowledge (PCK) and focuses on the need for teachers to skilfully demonstrate their ability to integrate technology within the constructs of content and pedagogical domains. TPACK can be perceived as a teacher's intuitive understanding for teaching subject-specific content with appropriate pedagogical methods and selected technologies. It is well understood that teaching is a complex cognitive activity that requires teachers to draw upon several types of knowledge (Koehler & Mishra, 2009). TPACK serves as a useful conceptual framework for thinking, analyzing, and evaluating what teachers must know to integrate technology into teaching, but ultimately it must be understood as a framework for ways in which teachers might best develop this integrated knowledge. To date, researchers have stressed the importance of teachers having a solid conceptual understanding of the interactions that occurs among technology, pedagogy, and content when planning instruction. This framework provides a critical perspective with which to view technology integration in classroom settings.

Historical Context

The most recognized version of the TPACK framework was conceptualized and first reported in 2005 by Matthew Koehler and Punya Mishra, who were both faculty at Michigan State University. This was not a completely original construct as scholars since 1998 had discussed how to better understand and explain how educators should conceptualize the role of technology in education. It was becoming clear that an emphasis on technology (and the educational possibilities it engendered) was not adequate to explain what was happening in actual educational settings; adding technology into an educational process did not lead to change. In particular, it was recognized that teachers needed to understand the relationships between users, technologies, and practices, including how technologies can support the teaching and learning of educational concepts. Later work added the importance of context to the mix.

As previously mentioned, Koehler and Mishra built the TPACK framework by extending Shulman's (1986, 1987) Pedagogical Content Knowledge framework to include technology

(Koehler & Mishra, 2005). Other scholars had proposed similar ideas, but it was Mishra and Koehler's (2006) description and representation of TPACK, with minor tweaks over the next few years, that became widely adopted.

After its initial introduction, TPACK scholarship was expanded through two handbooks (AACTE Committee on Innovation and Technology, 2008; Herring et al., 2016), a monthly newsletter, journal articles, conference presentations, and other publications. The newsletter and a bibliography of TPACK scholarship can be found at tpack.org. To illustrate the impact of TPACK, prior to 2021 there had been 1418 articles, 318 chapters in books, 28 books, and 438 dissertations that used it as a conceptual framework to guide their work. More important has been the impact of TPACK on practice, with schools and colleges of education across the world incorporating the TPACK framework in teacher professional development and teacher education.

The Conceptual Framework

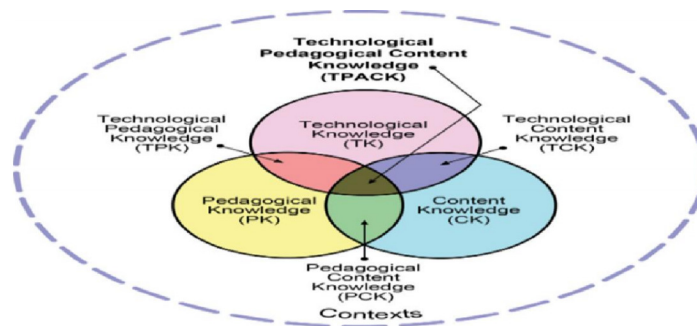


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The TPACK framework was first introduced by Mishra and Koehler (2006). The framework builds on Shulman's (1986, 1987) Pedagogical Content Knowledge (PCK)—the idea that teacher knowledge is more than mere knowledge of content and of general pedagogical principles. Shulman suggested that teachers possess a special form of knowledge that has to do with processes and techniques for transforming content in ways that are pedagogically viable. The TPACK framework extended PCK to include technological knowledge as being an important component of the kinds of knowledge teachers need to possess, and similar to PCK, TPACK is conceived as being more than individual pieces of knowledge.

Technological Pedagogical Content Knowledge Framework

The understanding of fundamental elements is what technological knowledge (TK), pedagogical knowledge (PK), and content knowledge (CK). TPACK facilitates teachers in

making technology selections and incorporating them into the teaching and learning process by taking into account the pedagogical components and the nature of the content. Thus, TPACK includes the following portions or elements:

Components or Elements of TPACK

Content Knowledge (CK): Content knowledge (CK) is teachers' knowledge about the subject matter to be learned or taught. The content to be covered in middle school science or history is different from the content to be covered in an undergraduate course on art appreciation or a graduate seminar on astrophysics.

This describes teachers' own knowledge of the subject matter. CK may include knowledge of concepts, theories, evidence, and organizational frameworks within a particular subject matter; it may also include the field's best practices and established approaches to communicating this information to students

Pedagogical Knowledge (PK): It provides a definition of the methods, techniques, and approaches employed in teaching and learning so that teachers are aware of them. Pedagogical knowledge can be applied in more focused contexts, such as lesson planning, assessment, and the understanding of students' learning preferences/styles, classroom management skills in addition to covering the aims, principles, and purposes of education.

Technological Knowledge (TK): Technological Knowledge (TK) – This describes teachers' knowledge of, and ability to use, various technologies, technological tools, and associated resources. TK concerns understanding edtech, considering its possibilities for a specific subject area or classroom, learning to recognize when it will assist or impede learning, and continually learning and adapting to new technology offerings.

Pedagogical Content Knowledge (PCK): This describes teachers' knowledge regarding foundational areas of teaching and learning, including curricula development, student assessment, and reporting results. PCK focuses on promoting learning and on tracing the links among pedagogy and its supportive practices (curriculum, assessment, etc.), and much like CK, will also differ according to grade level and subject matter. In all cases, though, PCK seeks to improve teaching practices by creating stronger connections between the content and the pedagogy used to communicate it.

Technological Content Knowledge (TCK): This describes teachers' understanding of how technology and content can both influence and push against each other. TCK involves understanding how the subject matter can be communicated via different edtech offerings, and considering which specific edtech tools might be best suited for specific subject matters or classrooms.

Technological Pedagogical Knowledge (TPK): This describes teachers' understanding of how particular technologies can change both the teaching and learning experiences by introducing new pedagogical affordances and constraints. Another aspect of TPK concerns understanding how such tools can be deployed alongside pedagogy in ways that are appropriate to the discipline and the development of the lesson at hand.

Technological Pedagogical Content Knowledge (TPACK): A growing body of knowledge called TPACK goes beyond the three "core" components (content, pedagogy, and technology). Technological pedagogical content knowledge is an understanding that is the result of interactions between content, pedagogy, and technological knowledge. TPACK strengthens deeply skilled and highly relevant teaching with technology, which is distinct from individual knowledge of any of the three principles (Mishra & Koehler, 2009)

TPACK is the end result of these various combinations and interests, drawing from them – and from the three larger underlying areas of content, pedagogy, and technology – in order to create an effective basis for teaching using educational technology. In order for teachers to make effective use of the TPACK framework, they should be open to certain key ideas, including:

1. concepts from the content being taught can be represented using technology,
2. pedagogical techniques can communicate content in different ways using technology,
3. different content concepts require different skill levels from students, and edtech can help address some of these requirements,
4. students come into the classroom with different backgrounds – including prior educational experience and exposure to technology – and lessons utilizing edtech should account for this possibility,
5. educational technology can be used in tandem with students' existing knowledge, helping them either strengthen prior epistemologies or develop new ones.

Because it considers the different types of knowledge needed and how teachers themselves could cultivate this knowledge, the TPACK framework thus becomes a productive way to consider how teachers could integrate educational technology into the classroom. Then too, TPACK can also serve as a measurement of instructor knowledge, potentially impacting both training and professional development offerings for teachers at all levels of experience. Finally, the TPACK framework is useful for the ways in which it explicates the types of knowledge most needed in order to make technology integration successful in the classroom. Teachers need not even be familiar with the entire TPACK framework as such in order to benefit from it: they simply need to understand that instructional practices are best shaped by content-driven, pedagogically-sound, and technologically-forward thinking knowledge.

Applications: TPACK in the Classroom

Implementing meaningful technology within any classroom can be a daunting task. Thorough evaluation of a tech-based tool that seamlessly integrates into a predetermined curriculum must be justifiable and provide an elevated learning experience without feeling cumbersome or irrelevant (Earle, 2002).

Selecting Technology: In order to integrate technology into the classroom, it is important to remember that less can be more. Rather than attempting to incorporate a new and innovative technology that claims to tick off all of the items on your tech-tool wish list, it is advisable to use tried and tested technologies that have proven payoffs. From a teacher's perspective, using an easy to learn and intuitive technology is key to success. Aside from learning and mastering the technology themselves, they must consider their students' diverse needs, accommodations, and affordances. Using a tool like TEDED is an efficient way to include multimedia, assessment, and customization in order to heighten student engagement. The platform is easily accessible and does not include fees thereby being accessible to all educators and learners.

Keeping technology as a separate knowledge set causes problems, but when we understand the framework of TPACK, we can integrate technology into the content and pedagogy of our classrooms. The integration will help our students learn more effectively. Mishra and Koehler suggest that TPACK should guide curriculum development and teacher education. To apply TPACK to our classrooms now, it should change the way we plan our daily lessons. First, by planning process where we first choose the learning outcomes that we will be working on that day or during that class session. The learning outcomes are the content. The second step is choosing an activity type. The activity type is the pedagogy or how are the students going to learn the content. Finally, we can choose technologies that will support the activity type and aid the students in learning. For this, our instructional planning should include each part of the TPACK framework and allow us to create and develop the overlapping knowledge to make the best learning environment for our students. The simplest idea at play in TPACK is that a person who is a world-renowned expert in a subject might not be a great teacher because they lack the pedagogical knowledge to make the subject accessible and understandable. To be a great teacher, we have to combine our knowledge of the subject with our knowledge of how to teach. With the increasing focus on technology, we need to also learn how to combine technology with our content and pedagogy to create an effective learning environment.

Examples:

A language teacher chooses to conduct an interactive teaching-learning session for teaching articles using her pedagogical knowledge (PK). She selects to use an

interactive whiteboard and applies her pedagogy content knowledge (PCK), technology knowledge (TK), and technology content knowledge to generate statements that are grammatically incorrect (TCK). She motivates her students to bring out the mistakes and uses her knowledge of the subject to help them construct appropriate statements (CK). She divides her class into small groups and provides computer systems to each group. She does formative evaluation and notes the grades as the groups discuss, reach an understanding, and rectify the grammatically incorrect sentences on their computers that are connected to the computer.

Recommendations for educational institutions on the use of TPACK

As it is considered a serious problem to see technology, pedagogy, and content differently from each other, teachers have to improve themselves in the fields of technology, pedagogy, and content in order to have a successful professional career. In teaching and learning process, it is important not only how teachers teach (pedagogy) and what they teach (content), but it is also important which materials (technology) they use while teaching. A teacher who can navigate between these interactions acts as an expert who is different than only a subject matter, pedagogy, or teaching expert. Instead of being treated content knowledge and pedagogical knowledge as separated domains of teacher knowledge bases, they should be considered to have mutual relationships with each other (Shulman, 1987).

It is important to recognize that the TPACK model represents an ideal scenario. In order to meet this ideal or come close to achieving this within a classroom, the standards for integration have to be attainable. Incorporating technologies that are inexpensive or free to the user, as well as ones that are intuitive and easy to learn, are the cornerstone of successful integration of tech-tools within the classroom. It is important for educators to vet and evaluate technology-based tools before implementing them into their classroom to ensure that learning is optimized through the use of technology rather than simply acting as a hollow expectation.

Simply adding technology or ICT as a required subject in schools and teacher preparation programs did not result in better teaching. In order to effectively integrate technology in the classroom, teachers must combine TPACK competencies for the particular subject matter to be taught. Because they help future teachers and prepare them to become techno-pedagogues, the TPACK competences are now critically important for teacher-educators and teachers. Therefore, possibilities for teachers to gain practical and pedagogical skills through the use of current technology during their teaching-learning process should be made available.

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Artificial Intelligence and its Global Intercept: Issues and Challenges

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Abstract

Artificial intelligence has changed the very concept of information technology. The way we communicate and gather information is totally different from people some years ago. Infact,our thoughts, actions, and behaviours are all guided by Artificial intelligence. It has opened up opportunities that seemed impossible just a few years back. Industry, agriculture, medicines, education have been totally revolutionized and finance and economy has been enhanced. But, as no good things come without certain issues and challenges AI also has certain ethical, moral, and economic concern that needs to be addressed. The question of accountability and the threat of superseding humans in thought and action must be explored. Turing question “Can Machine think?” poses a serious concern which needs to be explored and addressed with genuine concern. The present article is based on the issues of AI and its social intercept on various aspects of human life. It examines the prospect of Artificial intelligence in the 21st century by reviewing different articles and tries to understand its challenges.

Keywords: Artificial Intelligence, Social, Intercept and Challenges

Introduction

Artificial intelligence has occupied a vital place in today’s social scenario by securing its position in academics as well as in other professional field. It seems normal to us to communicate with Siri and google or to interact or ask questions to chat bots. (Vázquez-Cano,2021). Smart technologies have revolutionized our life and workplace from business to social life, from health to education, it not only interacts and helps us to perform better but it is also emerging as the “next disruptive innovation” (Lawler and Rushby, 2013). It is the

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main driving force behind the fourth industrial revolution and it is believed to be the game changer of education. AI has been defined differently by different writers according to its interdisciplinary nature and to confine it with a single definition would not do justice to the term as the premise of AI keeps on changing. Its adaptive and customized characteristic has led it to fit it in different discipline. AI was defined as “making a machine behave in ways that would be called intelligent if a human were so behaving” (McCarthy et al., in 1955). The history of AI can be traced back to philosophy, fiction and imagination where Poets and philosophers used “mechanical Tripods” and “Mechanical man” as metaphors to describe human. Instances of mechanical reasoning devices, calculating machines to mechanized arithmetic, Mechanical animals and dolls and statues filled with nuggets of knowledge etc gave evidence enough to prove that humans were preparing the way for an intelligent system that would enhance and augment the task of human. Even Science fiction have been using intelligent machine to show that impossible task can be done by non-human. (Buchanan, 2005).

Before knowing the prospect of AI in the 21st century we must understand the global trend of AI. Digital economy and society index 2020 (DESI) while monitoring the European countries confirmed that the most significant digital transformation is noted in Ireland followed by Netherlands, Malta and Spain. (Felice et al., 2022). However The International Digital economy and Society Index (I-DESI) highlighted that although the EU countries surpasses other countries in digital skills yet lag far behind in digitization of public services leading to below average performance as compared to USA, Japan, Canada, South Korea and China. (Para et al 2021.). The digital economy and society index 2022 (ESO, 2022) reports that while member states are making progress in their digital transformation digital transformation in business and finance remains low. Digital skills, innovative services and their applications need to be geared up to meet the desired goals. India secures the 44th rank in the World digital competitiveness rankings 2019 as the country has made tremendous progress with regard to knowledge and future readiness to adopt and explore digital technologies. (The economic times). There is no doubt that countries are adopting individual national plans beyond their specific policies for the development of AI which has become a central theme. Alongside China, USA, Japan, South Korea and Canada even India has adopted a national policy on AI (Felice et al, 2022). In 2018, NITI Ayog released the national strategy on artificial intelligence focussing mainly on the mantra of “AI for all”. The strategy also ensures the safe and responsible use of AI and focusses on identifying principles for designing, deploying and developing of AI for maximizing its benefits and mitigating its risk. It stresses on the seven principles of “safety and reliability”, “inclusivity and non-discrimination”, “equality, privacy and security”, “transparency, accountability and protection”, and “re enforcement of positive human values”. (NITI Ayog 2022). Artificial intelligence has played a vital role on all productive, economic and social factors but studies show that medical, financial and manufacturing sector have had greater impact so far.

Artificial Intelligence in Medical and Health Sector

AI in medical sector has a vast potential. It is used from the diagnostic phase to giving personalized care to patients, from predicting and preventing diseases and epidemics to analysing the clinical history of patients. AI does it all. (Piccialli et al, 2021. Bhargava and Bansal, 2021). Large data discovery and analysis of data to understand the clinical history of patients have worked as a boon in medical science. AI has the potential of making a good medical practitioner a great medical practitioner. It not only provides a second pair of reliable eyes to them but also provides accurate and reliable data to take prompt decision. (Chakraborty, 2020) personalised treatment to patients and the prompt and tireless responses of virtual assistants and virtual nurses to help ease the patients are all the boons of AI. Cognitive system like IBM Watson helps in taking prompt decision by inter relating the patients' medical history with history of medical literature and IBM's Watson for oncology is a perfect example of providing diagnostic and treatment options for various forms of cancer. (Chakraborty, 2020). Covid 19 saw AI at its peak from detecting to diagnosing the disease, from monitoring to treating patients, from contact tracing to projecting mortality cases, from developing drugs and vaccines to preventing diseases and last but not the least reducing the work load of health workers. (Vaishya, 2020) The Automatic deep neural network technology was used for the prediction of patients with deteriorated risk of corona virus. (Shamout et al, 2021). India too is accelerating its implementation of AI in medical sector through certain flagship programs like Ayushman Bharat, Forus health, 3 Nethra and certain other e-health projects.

Researchers point out that AI plays the role of both a reliable diagnosis and an accurate prognosis.

Artificial Intelligence in Manufacturing Sector

AI technologies are viewed as the crucial drivers in manufacturing sector. according to a report of The World Economic Forum (WEF) AI has the potential of having a positive impact on the economy and industrial automation of a country. As per its study, more than 20% of existing jobs in the United Kingdom is directly impacted by AI driven technologies (Vinuesa et al., 2020) and in developing countries like India and China, the overall impact of AI assessed is more than 26% in the manufacturing sector. In India, by the end of 2022, 1.33 million jobs were expected to be created through the manufacturing sector. (Sharma et al, 2022). The economic times confirms the growth of employment to 36.9% in March 2023 from 36.6% in December 2022 (Sharma, 2023) The manufacturing sector is one of the most promising sectors in India for implementing AI technologies. (Jaiswal, Arun, & Varma, 2021) they are accelerating their economic growth with the 'Make in India' policy, A flagship program of the Indian government for promoting local products. (NITI Aayog, 2018). As

per the report of NITI Ayog AI can bring huge opportunities and economic growth which can boost India's annual growth rate by 1.3 percentage points by 2035 (Charabarty, 2020). The report also claims that India could provide a perfect playground for enterprises and industries globally to develop "scalable solution" and this solved in India models could push India forward in **Artificial** Intelligence as a service (AIaaS). Also, the government is targeting the contribution of manufacturing output to 25% of GDP by 2025 (Rizvi et al, 2021). With its national manufacturing policy India stands as the largest manufacturing nation with the objective of creating 100 jobs and holding the sixth position in the world.

Artificial Intelligence in Finance Sector

AI technologies like neural networks and fuzzy logics are used for "stock prediction, sales forecasting and market segmentation problems". (Tiwari et al 2020). AI has the potential of dealing with big data, and this attribute of AI makes it highly relevant in financial services as finance services deals with big and diverse data which are delivered worldwide, Global bank for example deals with millions of equity exchange and international transaction, and it is only AI which can handle such big data. (Veloso, 2021) India has also implemented certain IT policies to upgrade banking and finance, "Chat automation, fraud detection technique and virtual assistant" are some of the AI based application used in the banking sector in India (Mallalai and Gopalakrishnan, 2020). India with a population of 1.3 billion is a promising market for fintech and over the last three years it has grown tremendously. Over half a billion of dollars flows for investments and start-ups in India. To support AI startups financially and to spread awareness of AI National AI market place (NAIM) and Data Market (Chowdhury, 2020) place have been established. Apart from start-ups and investment, the corporate sectors and government regulatory bodies have come up with certain innovative solutions for easy finance like the UPI- Universal payment interface.

Artificial Intelligence in Education

Artificial intelligence opens up new possibilities to augment human capabilities in teaching and learning. It is accelerating at a tremendous pace overhauling the traditional method of teaching and learning. Intelligent and interactive tutoring sectors create smart content to promote interactivity. Content technologies inc (CTI) customizes educational content. Microsoft's help in predicting drop outs and Pearson's write to learn software uses NLP technology to provide personalized feedback to students to improve their writing skills (Chowdhury, 2020). Education no longer remains only a human endeavour rather it has become a technological solution with intelligent tutoring system, natural language processing system, machine learning, deep learning, learning analytics etc enhancing teaching and learning (Popenicini and Kerr, 2017). Devices like IBM's super computer Watson are available the whole 365 days to advice students on academic issues in Deakin university, Australia (Deakin university 2014),

Cobots (colleague robots) are used to perform routine task like spelling and pronunciation. (Chen and Chen,2020). Similarly other web based and on-line education platform adapt intelligent behaviour to adjust according to the learner's behaviour in order to provide enriched experiences to the learner. (Devedzic, 2004. Chassignol et al 2018. Kahraman et al, 2010, Peredo, 2011). AI is not just used in teaching and learning but also in administration and assessment. The digitalization of educational resources, gamification, and personalized learning experiences, are some of the many opportunities where AI can be applied to education (Zhai et al 2021.)

Scope of Artificial Intelligence in Education

Utility of AI for the learners

1. It can provide personalized learning.
2. It can provide intelligent support system and collaborative learning.
3. It can provide virtual learning environment.
4. It can provide flexible learning pace and environment.

Utility of AI for the teachers

1. Provides autonomy from routine and mundane task.
2. Develop research skills among teachers.
3. Helpful in gaining technological literacy and upgrading technological skills.
4. Develops management skills and team work attitude as they would be working both with human colleagues and AI assistants (Lukin, 2016)

Challenges with Artificial Intelligence

AI though a promising field has many technological issues that needs to be addressed with utmost sincerity. Challenges like data quality, data privacy, insufficient knowledge of cognitive technology, lack of a skilled workforce, Expensive technology etc reduces the implementation of Artificial intelligence in public sector (Sharma, 2022). Challenges in AI can be seen in almost all the public sectors like health, Finance, Transport etc. Coding AI to take the right decision is becoming a mammoth's task. An autonomous vehicle might not take the right decision when choosing between two situations whether driving the car on a wall or crashing it over the passers-by or whether putting risk of pedestrians lives and saving the passengers or vice versa. Coding it to take altruistic decision might lead to a loss to the automobile companies and to the buyers (Perc, 2019). Social bots which are automated communicators on social media perform many harmful actions like proving mis information, intensifying argument, committing scams and exploiting the stock market. (Hajli, 2022). Some of the major challenges of AI in Education (Haderer and Ciolaca 2022)

- Development of an inclusive public policy on AI.
- Producing techno savvy teachers who could use AI skilfully for sustainable solutions.
- Transparency and ethics in data collection, data utilization and data dissemination.

Legal and Ethical issues with AI: Holding responsibility is the foremost legal issue. Who to hold responsible for an unavoidable accident, the technology, the manufacturer or the owner of the vehicle. The legal issue runs deeper with the situation when the technology is capable of taking its own decision, against the will of its creator. The system that is made to work through instructions suddenly taking an unpredictable move is beyond any legal premises. The questions like

1. which actions are permissible from legal point of view?
2. Who is to be held responsible?
3. What are the legal principles for a particular choice? (Karliuk, 2018).

Privacy and transparency are the major ethical issues regarding AI. Maintaining integrity while collecting, preserving, analysing and dissipating data has become a matter of concern in today's world. (Felice, 2022).

Conclusion

In conclusion it can be said that AI is just a means to reach to an end. It is a man-made machine that simulates human brain and although it has been there for decades its potential has gained momentum recently and it has also opened up a great future prospect. But along with all the good things AI has come up with some risks. It is high time that we talk of these risks and prepare our next generation for an AI integrated world. Global policies need to be strengthened to create space for both humans and AI so that a cordial co-existence takes place. Regulatory norms and laws need to be defined appropriately and ethical codes should form an important part of political agenda. Debates and discussions on privacy, ethics, security, accountability and appropriate use of technology should be conducted at global level so that the future generation becomes aware and sensitized to the use of technology.

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Gaps in Implementation of Mental Health and Wellness Programs in Schools

Saurabh Kumar*
Yashoda Sharma**

Abstract

Mental Health is the key concern in present scenario especially in the post COVID -19 pandemic era. Mental Health refers to emotional, psychological, and social well-being of an individual. This affects our way of thinking, feeling, and acting. Schools are large providers of mental health services for children and adolescents. A key factor in creating a caring and supportive atmosphere for students is the Mental Health and Wellness Program in schools. The program seeks to improve kids' academic performance and mental health by raising awareness, providing early intervention, and teaching critical coping skills. By fostering an environment where mental health concerns are openly discussed and de-stigmatized, it helps schools foster a culture where each student's holistic development is given first priority. The government also takes the mental health and general wellbeing of school-age children very seriously. The government has taken numerous initiatives in this area under the MANODARPAN Initiative of the Ministry of Education. What are the gaps in the implementation of mental health and wellness programs at the school level, though? In light of the context, the present study was conducted out to identify the gaps in the in Implementation of Mental Health and Wellness Programs in Schools.

Key Words: Metal health, Mental health and wellness programme, MANODARPAN

Introduction

Mental Health is the key concern in present scenario especially in the post COVID -19 pandemic eras. Mental Health refers to emotional, psychological, and social well-being of an individual. This affects our way of thinking, feeling, and acting. Our relationship with

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others, how we manage stress, and how we make decisions are all influenced by it. Maintaining excellent mental health is crucial for the duration of one's life, from infancy to maturity.

Mental health is defined as a "state of well-being in which every individual realizes his or her own potential, copes with the normal stresses of life, works productively and fruitfully, and is able to make a contribution to her or his community" (WHO, 2005). Since mental health is a critical aspect of children's and adolescents' overall development and well-being, it is becoming increasingly important globally.

Because of globalization and technology breakthroughs, the socio-cultural and economic paradigms are changing quickly in the modern period. Life has become more competitive, faster, and more complicated as a result of our social and economic progress. The effects of this swift transition are still felt by today's youth. This has increased the pressure on the kids to perform well in order to meet the demands of a globalized society and get ready for the future. Their mental and behavioral issues are a result of this. The behavioral and mental health issues that school-age children face have drawn the attention of psychologists, parents, educators, and the general public. It is believed that children's behavioral issues at school impede both the teaching and learning process for the students. Most of the time, these issues with children go unnoticed and unaddressed, and occasionally the severity of these issues and their overall effect on the child's development worsen.

In the last twenty years, there has been a global surge in mental health issues affecting children and adolescents, which has led to a major rise in impairment. The development of children and young adults is significantly hampered by mental health issues, which also lead to issues with social and academic achievement, poor school adjustment, and diminished focus. Mental health problems are also linked to early dropout rates, suspensions, and attendance at school. In order to promote emotional and social well-being, the WHO's Global School Health Initiative (WHO, 2000) stressed the significance of concentrating on and improving the psycho-social environment in schools.

When students arrive at school, their mental health does not leave the building. The groundwork and framework for offering mental health services in schools in a way that safeguards student wellbeing, fosters learning, lowers stigma, and expands access have been laid by decades of research and experience. In an ideal multitiered support system, mental health services help students, their families, teachers, community members, and society at large.

Schools have a major role in providing children and adolescents with mental health care. Schools assist in identifying and intervening early on in mental health concerns among kids through curriculum, teacher counselors, and mental health and wellness initiatives. Furthermore, it promotes discussions about mental health stigma, provides psychological support and referral services to students. Children are counselled by schools and receive

structured feedback on their academic and co-curricular activities as a way to promote their intellectual wellbeing. It motivates students to redress their mistakes, overcome weaknesses, and work towards improvement.

NCERT issues various guidelines to schools for early identification of mental health problems in students. It also runs various in-service and pre-service programs for trained teachers in identifying early signs in students for attachment issues, separation anxiety. School refusal, communication issues, and depressive states, conduct related issues, excessive use of internet, intellectual disabilities and learning disabilities.

In order to promote holistic development, the National Education Policy - 2020 places a strong emphasis on the mental health and wellbeing of pupils. Additionally, it instills in students values and life skills that support their development, self-preservation, and long-term progress. It was stated that children who are malnourished or ill cannot learn at their best. Therefore, healthy meals, the addition of qualified social workers and counselors, as well as community involvement, will all contribute to addressing children's nutrition and health, including their mental health (NEP 2020).

The government also takes the mental health and general wellbeing of school-age children very seriously. The government has taken numerous initiatives in this area under the MANODARPAN Initiative of the Ministry of Education. What are the gaps in the implementation of mental health and wellness programs at the school level, though? Realizing the scenario researcher carried out the study to identify the gaps in the in Implementation of Mental Health and Wellness Programs in Schools.

Objective

To Study the Gaps in the Implementation of Mental Health and Wellness Programs in Schools.

Method

Descriptive Survey Method was used for the study.

Sample

The sample of the study consists of school teachers working as PRT, TGT, PGT, Head Masters (HM) and Assistant Head Masters (AHM), Counsellors and Others including NGO Members/Managers/Administrators etc. The sample of the study consists of school teachers working as PRT, TGT, PGT, Head Masters (HM) and Assistant Head Masters (AHM), Counsellors and other members (NGO Members/Managers/Administrators etc.). The Data consisted of 21 TGTs, 21 PGTs, 05 PRTs, 18 Counsellors, 3 Teacher Counsellors, 7 Head

Masters or Assistant Head- Masters and 8 other stakeholders of school education, Total overall 83 respondents responded to the study.

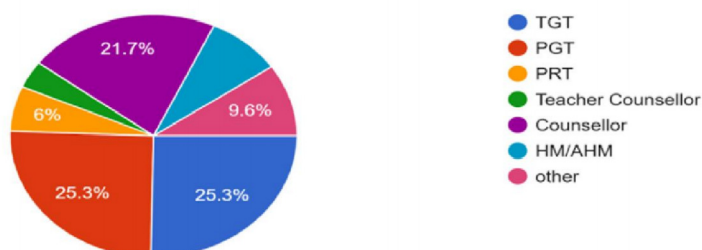
Table 1 Sample of the Study

S.No.	Type of respondents (Sample)	Number	Percentage
1	Trained Graduate Teacher(TGT)	21	25.3
2	Post Graduate Teacher (PGT)	21	25.3
3	Primary Teacher	5	6.02
4	Counsellors	18	21.67
5	Teacher Counsellors	3	3.61
6	Head Masters/Assistant Head Masters	7	8.43
7	Others (NGO Members/Managers/Administrators etc.)	8	9.64
	Total	83	

The demography of the sample can be seen in the following diagrams-

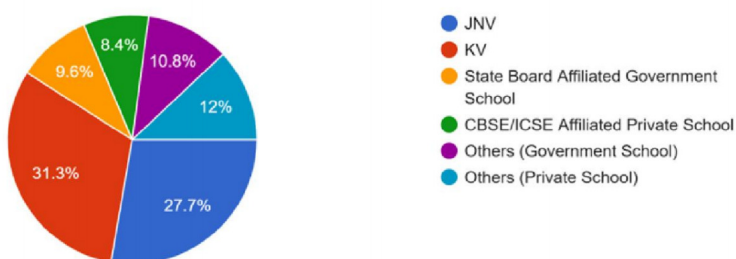
1. Designation wise Respondents:

83 responses



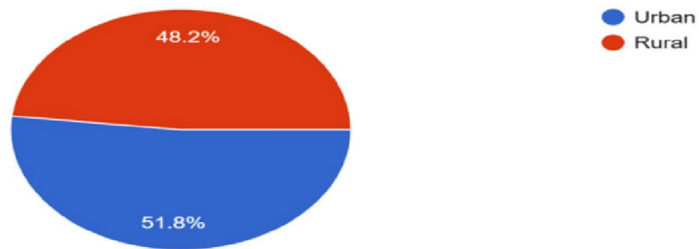
2. School wise Respondents:

83 responses



3. Location wise Respondents:

83 responses



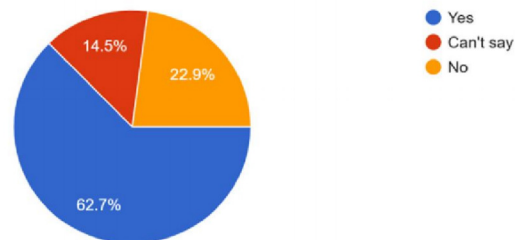
Tool

A questionnaire was prepared and developed by the researcher to collect the data from the sample regarding gaps in the Implementation of Mental Health and Wellness Programs in Schools. It was sent in the form of Google form and sent through WhatsApp groups and emails to the schools and respondents.

Analysis and Findings of the Study

Item 1: *Mental Health and Wellness Programme is properly implemented in the school.*

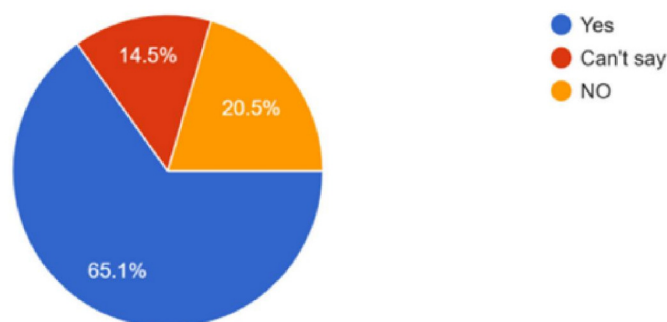
83 responses



It can be seen from the above pie chart that majority of stake holders i.e. 62.7% opined 'Yes' that Mental Health and Wellness Programme is properly implemented in the school and 22.9 % said 'No' about it while 14.5% didn't say anything about the statement.

Item 2: The school administration/management is actively participating in the implementation of the Mental Health and Wellness Programme for the school

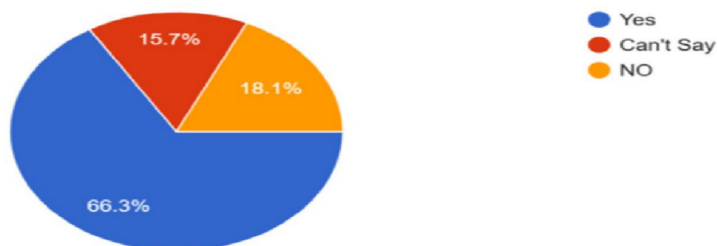
83 responses



It is clear from the above pie chart that the majority of the stake holders i.e. 65.1% opined 'Yes' that the school administration/management is actively participating in the implementation of the Mental Health and Wellness Programme for the school and 20.5 % said 'No' about it while 14.5% didn't say anything about the statement.

Item3.Support provided by the School Administration/Management in the implementation of Mental Health and Wellness Programme in the school.

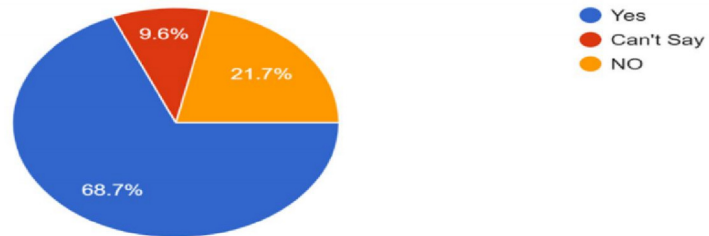
83 responses



It can be seen from the above pie chart that the maximum no. of stakeholders i.e. 66.3% thought that support is provided by the School Administration/Management in the implementation of Mental Health and Wellness Programme in the school. However, 18.1% disagreed with the statement, and 15.7% had no opinion.

Item 4: School Teachers are aware about the Mental Health and Wellness Programme

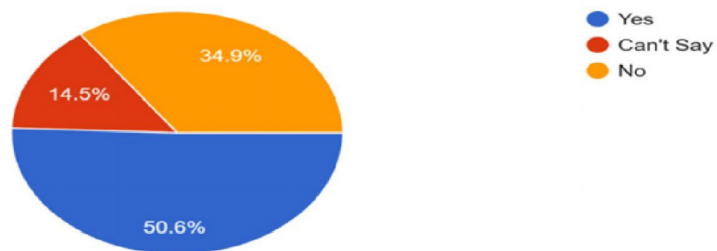
83 responses



It can be visualized from the above pie chart that majority of stake holders i.e. 68.7% opined 'Yes' that School Teachers are aware about the Mental Health and Wellness Programme and 21.7% said 'No' about it while 9.6% didn't say anything about the statement.

Item 5: Did any Orientation provided to teachers of the school about implementation of Mental Health and Wellness Programme?

83 responses



It can be seen from the above pie chart that approximately half of the stakeholders i.e. 50.6% admitted that orientation provided to the teachers of the school about implementation of Mental Health and Wellness Programme and 34.9% said that no orientation provided to teachers of the school about implementation of Mental Health and Wellness Programme while 14.5% didn't say anything about the statement.

Item 6: What are the Gaps in implementation of Mental Health and Wellness Programme in schools?

Major Gaps identified by the stakeholders is shown the table 2.0 with percentage of opinion.

Table 2 : Gaps in implementation of the Mental Health and Wellness Programme in schools

<i>S.No.</i>	<i>Gap Areas</i>	<i>Percentage</i>
1	Overloaded Curriculum	53.00%
2	More Emphasis on Academics	44.60%
3	No time slots for such activities	43.40%
4	Lack of Parents Support	41.00%
5	Teachers are not oriented	38.60%
6	Lacking Awareness at Management/ Admiration level	37.30%
7	Lack of Trained Counsellor/s in schools	36.10%
8	Lack of resources	33.70%
9	No Proper work role for counsellor	32.50%
10	Lack of Team work	26.50%
11	Traditional Taboos	27.70%
12	Lack of Funds/Budget	25.30%

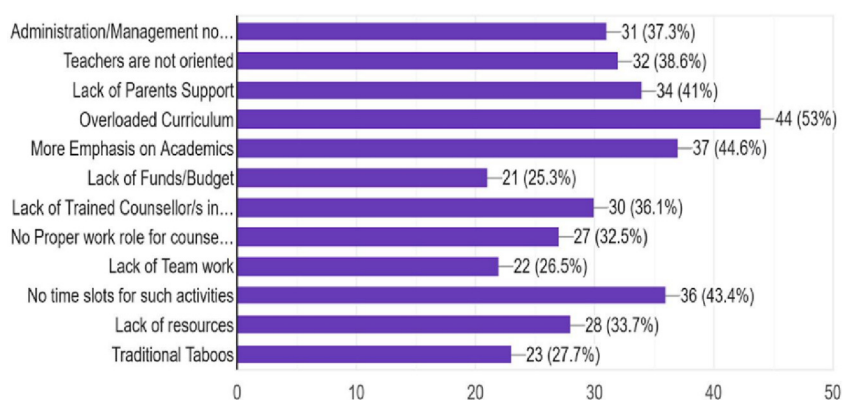
Diagram:Percentage of identified Gaps in implementation of the Mental Health and Wellness Programme in schools

Table 2 shows that more than half (53%) of the stake holders opined that over loaded curriculum is the major challenge for the proper implementation of the mental health and wellness programme in schools, 44.6% stakeholders reflected that more emphasis on academics is also creating a gap in implementation. 43.4% stakeholders responded that there is no time slots for such activities in regular time table. 41% stake holders opined that lack of parental support is also big factor in creating Gaps in implementation of the Mental

Health and Wellness Programme in schools. Lacking of formal orientation of all the teachers about the programme and related activities is also identified gap by 38.6% stakeholders. lacking Awareness at Management / Admiration level, Lack of Trained Counsellor/s in schools, No Proper work role for counsellors, Lack of resources, Lack of Team work, Traditional Taboos, Lack of Funds/Budget are the identified areas/factors creating gaps in the implementation of the Mental Health and Wellness Programme in schools.

Challenges in implementation of Mental Health and Wellness Programme in schools: Stake holders reported following challenges in the implementation of the mental health and well programme in schools-

- Higher authorities not providing a proper plan and period.
- More attention in academics.
- Rigidness of the management, taking mental health issues not seriously.
- Proper Students orientation and participation: When students are also properly oriented that mental health and wellness is very much required for their all-round development and they can freely share their mental health issues with teachers, counselors and even with Principal also.
- Lack of awareness about mental health.
- Absence of fair regulatory body to check activities
- Illiteracy of Parents & lack of knowledge in rural areas
- Not considering mental health a priority. Lack of human unity.
- Not have proper plan in timetable of the schools
- Principal's training and taking initiative to improve the system.
- Lack of self-motivation in teachers due to lake of training and orientation.
- There is not any stage wise plan and implementation strategy.
- No Separate budget for such activities.
- Lacking frequent communication between parent, child, teacher and management.
- Not the part of regular curriculum
- Shortage of time
- Counsellor responsibility not clear
- Acknowledgement of school Counsellor is not as same as other PRT, TGT, PGT ...in Most of the schools, it is just like a Job positions.
- Negative attitude towards mental health
- Tribal Schools are active in extreme remote areas and geographical location becomes hindrance in accessing to online platforms.
- Mental wellbeing is not considered important to be healthy and to create healthy environment for all. Other factors are given more attention.
- It is really difficult to identify mental cases because of unavailability of mental health assessment tools

7.0 Conclusion: The importance of mental health and well-being has been acknowledged by the school education system more and more in the post-COVID-19 period. This change is clear from the fact that most stakeholders now recognize how well mental health and wellness programs are implemented in schools and how proactive school administrations have been in supporting them. The majority of teachers are aware of these programs and actively take part in associated events. Still, there are a number of major obstacles to overcome. These include inadequate parental support, an overburdened curriculum, a focus on academics above everything else, restricted budget, a dearth of counselors with the necessary training, ambiguous counselor responsibilities, and a lack of teamwork. Closing these gaps is essential to students' overall development and the success of school-based mental health initiatives.

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Construction of an Achievement Test for Students at Collegiate Level

Lalhruaitluangi*
Nitu Kaur**

Abstract

In the present study an achievement test has been constructed and standardized for the purpose of measuring the achievement of first year collegiate students having the subject of Education either as their core course. The achievement test aims to assess their understanding of psychological construct of 'Learning'. The purpose of constructing achievement test was made in accordance to pre-test post-test quasi experimental design of study. The choice of 'learning' construct was made after ensuring the commonality of the topics covered in class XII Education Syllabi, MBSE (Mizoram Board of Secondary Education) and B.A. 1st semester Syllabi of Education, Mizoram University. The test can also be used with higher secondary students towards their completion of higher secondary syllabus who are studying Education subject in the stream of Arts. The content validity of the scale was initially established as per the procedure. The difficulty value and discriminatory index of each item in the initial draft of test was calculated by trial of the test on a small sample of collegiate students of B.A. programme having Education either as their major or minor course. After the item analysis the final test consists of 45 multiple choice questions with 11 items at knowledge level, 18 items at understanding level and 16 items at application level. The reliability of the test was found to be very high using both split-half and KR-20 method. Finally, the norms of the test were established on a set of 200 collegiate students studying Education as core course in different semesters of B.A. programme offered at Mizoram University, Aizawl, Mizoram.

Keywords: Construction, Achievement Test, Students, Collegiate Level

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Importance of Achievement Test

Achievement tests are of tremendous importance in the field of education. This purposeful activity is often referred to as Achievement Testing which is any procedure or instrument that is used to measure an examinee's attainment of knowledge or skills (Gregory, 2004). Achievement testing is any measurement process or instrument whose purpose is to estimate an examinee's degree of attainment of specified knowledge or skills (Elliott, 2017). It helps in assessing the learners' competency in a particular area of study. The school system across the globe makes a vigorous use of them in determining if there is any gap between the intended and achieved curriculum and if the curriculum has achieved its learning outcomes. It was in the Fifth International Psychology Congress in Rome, Italy, in 1905, Sante de Sanctis (1862–1935), an Italian doctor, psychologist and psychiatrist, and Binet, in collaboration with Simon, presented the first intelligence tests to the international scientific community (Teive et al., 2017). In partnership with Stanford University, the Stanford-Binet Intelligence test was released in 1916 as a descendant of the Binet-Simon scale (Wilson, 2011). The intelligence test was popularly known as IQ test gave way to the origin of achievement tests in school system throughout the United States realizing the reproducible nature of tests (Poll Everywhere Blog, March 26, 2024). In recent years, there has been increasing emphasis on use of group achievement testing such as Stanford Achievement Tests (Sturner, 2009). The achievement testing has turned out to be a regular exercise in assessment and evaluation of students of different levels of education.

Need of the Present Study

In the present study an achievement test has been constructed and standardized for the purpose of measuring the achievement of collegiate students in their understanding of psychological construct of 'Learning'. Hence the collegiate students of 1st year having the subject of Education either as their major or minor course were sample of the study. The purpose of measuring achievement test was made in accordance to pre-test post-test quasi experimental design of study. The constructed Achievement Test on Education Subject at collegiate level is based on the content of the module based on 'Learning' topic, also constructed by researchers. The researchers used the achievement test specifically for measuring accomplishment of students at a point of time, finding difficulties faced by students and assessing the understanding specifically to the topic.

Objective of the Study

Based on the requirement of the study following is the objective of the study:

- To construct and standardize an achievement test on a selected topic of Education Subject for the first year Education core students at collegiate level

Procedure of Construction of the Achievement test

For the construction of test following steps were utilized:

- i) **Planning and Designing the test:** For proper planning of the test the investigators made a decision on to whom the achievement test will be done how achievement of students will be measured. The purpose of the test was to measure the achievement of education core students at first year level. Designing of the test also included objectives of the test, content of the test, nature of the test, number of items, type of items, length of test, weightage to objectives and content allotment of time and scoring scheme. The test was planned on the Educational Psychology paper of collegiate level. It was decided that a time limit of 1 hour shall be fixed for test. The format of question was kept as Multiple-Choice Questions (MCQs) where there was only one correct answer out of the four given options. The blue print of the test was designed based on the three cognitive domains of learning namely the Knowledge, Understanding and Application level.
- ii) **Preparation of the test:** The test was then prepared on the 'Learning' Unit of the Educational Psychology paper. The test was meant for all the 1st Semester of B.A. (Education) students. A total of 93 MCQ type questions were made wherein 25 questions were from knowledge level, 31 questions were from understanding level and 37 questions were made on application level.
- iii) **Content Validation of the test:** The test was subjected to content validation by experts of educational psychology using Google forms wherein they were asked to mark the items as Highly Appropriate or Appropriate or Inappropriate. Based on experts' suggestion certain items were modified and discarded from the first draft of the test.
- iv) **Administration of the Test as the First tryout:** The test was tried out on a small sample of students of 1st, 3rd and 5th semester of B.A. (Education). The results of the test were subjected to Item analysis on the basis of difficulty value and discriminatory index of each item.
- v) **Preparing final form of test:** The final form of test was prepared after discarding items on the basis of their difficulty value and discriminatory index.
- vi) **Establishing Reliability of Test:** The test was finally tested for its reliability. As Kuder Richardson 20 (KR 20) formula is the most ideal for of reliability test for the MCQ type items it was employed to find the reliability. Also, the split half method was employed for testing the reliability. The whole test was divided into two halves by segregating odd and even items.

Further Spearman -Brown Prophecy formula of $2r/(1+r)$ was employed to convert the reliability of half test to whole test.

- vii) Establishing Norms of the Test: both the standard scores of stanines and percentile were calculated on a larger sample to establish the two norms for the constructed achievement test.
- viii) For the construction of the present test for collegiate level, it was initially ensured that the topics covered were also part of class XII Education Syllabi with which the students are well acquainted with. For that purpose, Unit 4 of Education syllabi, Class XII, MBSE (Mizoram Board of Secondary Education), 2020 was referred during item construction which was found comparatively similar content wise to B.A. 1st semester Syllabi of Education, MZU, 2020. It was found almost all topics were matching hence suitable for pre-posttest format of experimentation. Table 1 presents the comparison between the two contents.

Table 1
Content Comparison of B.A. 1st Semester Syllabi of Education & Class XII, MBSE, Education Syllabi

Content of B.A. 1 st semester Syllabi of Education, MZU	Content of Class XII Education Syllabi (Unit 4)
• Meaning and Nature of Learning	• Learning
• Theories of Learning and their educational implications	• Concept of Learning.
➤ Trial and Error theory of learning	• Theories of Learning- Trial and Error; Conditioning;
➤ Pavlov's Classical Conditioning	• Insight and their educational Implications.
➤ Skinner's Operant Conditioning	• Laws of Learning.
➤ Kohler's Insightful Learning	• Factors affecting learning.
• Thorndike's Law of Learning	• Types of learning.
• Factors affecting Learning	

Ideally for the construction of the achievement test three distinct phases are followed which are identification of instructional objectives based on Bloom's Taxonomy, preparing design and blue print of test and writing the items/ questions of test.

Based on the content provided in Table 1 instructional objectives were prepared. The test comprises of questions from knowledge (K), understanding (U) and application (A) levels of cognitive domain of Bloom's taxonomy. Bloom's Taxonomy is a powerful tool which provides a framework for breaking down complex cognitive tasks (Davis, 2009). If learning objectives are designed with Bloom's taxonomy in mind, then those objectives can be used to construct test ensuring alignment between instruction and assessment and providing validity to evaluation of students' knowledge and skills (Hall, 2015). The constructed test was proposed to comprise of 20 questions from each of the K, U and A level. However, in the first draft of the test more than 20 questions at each level were made. The first draft comprised of 25 items of K level, 31 items of U level and 37 items of A level which was validated for its content by sixteen (16) experts who rated the items as Highly Appropriate or Appropriate or Inappropriate. The second draft based on experts' validity comprised of

20 items each under K, U and A level of cognition. was tested for finding the difficulty and discriminatory indices.

Scoring Procedure

The initial draft of achievement test comprised of 60 items. Each item is a multiple-choice question with 1 correct response and 3 incorrect responses. Hence the respondent can get a score of either '0' or '1' on each item. Each item carried 1 mark for correct response.

The Item Analysis Procedure

The item analysis was done on 57 college students 1st, 3rd and 5th semester of BA(Education). The sampled students were grouped into three groups comprising of top 27% of high scorers as upper group (15 students) and 27% of bottom scorers as lower group (15 students) and remaining middle 46% (27 students) comprised of middle group.

The difficulty value (DV) is percentage of sample in the high and low performing group who answered the item correctly. Popular consensus suggests that the best approach is to aim for a mix of difficulties. That is, a few very difficult, some difficult, some moderately difficult, and a few easy. However, the level of difficulty should be consistent with the degree of difficulty of the concepts being assessed (Tobin). The criteria for classification of the DV are as follows: $DV < 30$ (too difficult items), DV between 30- 70% (acceptable/average items), $DV > 70\%$ (too easy items) and DV between 50-60% (excellent/ideal items) (Kumar et al., 2021). On the other hand, the discriminatory power/index (DI) is the ability of an item to differentiate between groups of higher and lower abilities and ranges between 0 and 1. Generally $DI < 0.20$ is considered poor, between 0.21–0.24 acceptable, between 0.25–0.34 (good) and $DI \geq 0.35$ is excellent (Date et al., 2019). The formula used to find difficulty level is $DL = \frac{Ru + RI}{Nu + NI}$ and that of discriminatory power $\frac{Ru - RI}{Nu - NI}$, where, Ru = The number sample in the upper group who responded correctly, RI = The number sample in the lower group who responded correctly, Nu = Number of samples in the upper group, NI = Number of samples in the lower group.

Based on calculation of difficulty value (between 0.25-0.75) and discriminatory power (0.2 and above) 15 items were rejected viz. 9 items were rejected from knowledge level, 2 from understanding and 4 from application level. Hence after the item analysis the final test consists of 45 multiple choice questions with a blue print of 11 items at knowledge level, 18 items at understanding level and 16 items at application level. For the purpose of scoring each item followed up with 4 options to choose from, where 3 are incorrect and 1 is correct. Each question carries maximum of 1 mark. Hence the maximum score for the final draft of test is '45' and minimum '0'. Table 2 shows the result of item analysis.

Table 2
Result of Item Analysis

Serial No.	Item No.	Difficulty Index (0.25-0.75)	Discriminatory Power (0.2 and above)	Status of Item Retention/Rejection
Knowledge Level Items				
1	1	0.65	0.07	<i>Rejected</i>
2	2	0.81	0.33	<i>Rejected</i>
3	3	0.58	0.67	Retained
4	4	0.44	0.27	Retained
5	5	0.29	0.33	Retained
6	6	0.75	0.33	Retained
7	7	0.37	0.47	Retained
8	8	0.42	0.27	Retained
9	9	0.84	1.07	<i>Rejected</i>
10	10	0.88	0.93	<i>Rejected</i>
11	11	0.86	1	<i>Rejected</i>
12	12	0.7	0.87	Retained
13	13	0.26	0.13	<i>Rejected</i>
14	14	0.24	0.2	<i>Rejected</i>
15	15	0.77	1.13	<i>Rejected</i>
16	16	0.39	0.33	Retained
17	17	0.47	0.33	Retained
18	18	0.82	0.27	<i>Rejected</i>
19	19	0.59	0.47	Retained
20	20	0.65	0.33	Retained
Understanding Level Items				
21	21	0.67	0.67	Retained
22	22	0.32	0.53	Retained
23	23	0.28	0.4	Retained
24	24	0.63	-0.07	<i>Rejected</i>
25	25	0.58	0.33	Retained
26	26	0.14	-0.07	<i>Rejected</i>
27	27	0.53	0.6	Retained
28	28	0.42	0.47	Retained
29	29	0.63	0.6	Retained

30	30	0.25	0.53	Retained
31	31	0.4	0.67	Retained
32	32	0.65	0.73	Retained
33	33	0.32	0.4	Retained
34	34	0.26	0.4	Retained
35	35	0.35	0.33	Retained
36	36	0.29	0.2	Retained
37	37	0.46	0.27	Retained
38	38	0.4	0.4	Retained
39	39	0.37	0.33	Retained
40	40	0.26	0.33	Retained
Application Level Items				
41	41	0.58	0.6	Retained
42	42	0.33	0.2	Retained
43	43	0.68	0.33	Retained
44	44	0.37	0.67	Retained
45	45	0.53	0.67	Retained
46	46	0.49	0.6	Retained
47	47	0.58	0.67	Retained
48	48	0.42	0.4	Retained
49	49	0.79	0.53	Retained
50	50	0.46	0.6	Retained
51	51	0.54	0.6	Retained
52	52	0.23	-0.07	<i>Rejected</i>
53	53	0.61	0.33	Retained
54	54	0.44	0.6	Retained
55	55	0.07	-0.07	<i>Rejected</i>
56	56	0.39	0.33	Retained
57	57	0.54	0.27	Retained
58	58	0.29	0.07	<i>Rejected</i>
59	59	0.4	0.6	Retained
60	60	0.28	0.07	<i>Rejected</i>

Validity of Test

The first draft of the test was given to 16 experts all belonging to the field of Education. The final draft of the test was content validated again by 7 experts.

Reliability of the Test

The Split-half Method of reliability test was used dividing the whole achievement test was into odd and even parts. The test was administered on a sample of 100 students of college. Using Spearman-Brown formula the reliability was found to be 0.85, showing a very significant reliability. The KR-20 reliability for internal consistency of test was determined and it was found to be 0.82, which is highly reliable index for test reliability.

Norms of the Test

For the norms of the test the test scores of 200 students were converted to percentile and stanine scores score. Following Table 3.15 describes the Norms of the test derived from sample of 200 college students.

Table 2
Norms of the Achievement Test

Stanine Scores	Norms	Percentile	Norms
01-Mar	Below Average	Below 25 th Percentile	Below Average
04-Jun	Average	Between 25 th & 75 th Percentile	Average
07-Sep	Above Average	Above 75 th percentile	Above Average

Conclusion

The constructed achievement test is solely based on Mizo collegiate level students and serves as a very good tool to classify the competency of students in 'Learning' construct in Education subject specifically at collegiate entry level. The achievement test is found to assess students at three primary and lower level of Bloom's taxonomy of cognitive domain i.e. knowledge, understanding and application. The design of achievement tests varies depending on the use of the test and whether the inference from examinees' scores is intended to be about an absolute or relative level of mastery of specific knowledge and skills (Elliott, 2017). The present test is a meant for a norm-reference testing in that regard and is useful in understanding the entry level understanding of B.A. (Education) students.

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