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From the Desk of the Chief Editor

The Editorial Board of Mizoram Educational Journal is proud to bring out the first issue of Volume XI. The issue has a total of nine carefully selected articles spanning various aspects of education.

In their exploration of sample size calculation methods, which is vital for the conduction of scientific research, Zairemmawia Renthlei and C. Lallawmkima tried to catalogue various methods and techniques that are utilised by academicians for calculating sample sizes in various situations and conditions. The paper has included brief discussions on Cochran's Formula, Yamane's Formula, Krejcie amd Morgan's Table Calculation Procedure, Samuel B Green's Formula as well as a brief introduction to G*Power software for sample calculations. Their study shall surely pave the way for more methodical work by researchers.

Lalremsangi and Sian Lalchhandami, in their study to assess the Mizo language competency of high school students in Aizawl city found a significant gender difference, with female students displaying higher level of language competency than male students. Additionally, students from deficit schools were found to exhibit higher level of language competency in Mizo compared to those in government schools.

An interesting study related to sex education was made by Jennifer Lalmuanzuali, Mary L. Renthlei, Francis L. R. Puia Tlau and Ramngaihzuali in their attempt to measure the attitude towards sex education among parents of middle school students in Aizawl City with respect to their gender and their occupation. Their findings showed that majority of parents have positive attitude towards sex education. The study also revealed that there are no significant differences in the attitude towards sex education among parents of middle school students with respect to gender or occupation.

An analysis of the profile of science teachers in secondary schools of Mizoram was done by H.T. Malsawmtluanga and Vanlalruatfela Hlondo focusing on their educational and professional qualifications, nature of appointment, and teaching experience across different school management types—Government, Deficit, Samagra, and purely Private. The findings highlighted significant disparities in qualifications, job security, and resources, particularly affecting Samagra and Private Schools. The study provided insights into the need for policy interventions to improve quality of science education in Mizoram.

Elcy S. Lalropeki and Lynda Zohmingliani conducted a study on integration of Information and Communication Technology (ICT) in science education at the secondary level in Mizoram. The findings mainly showed that the integration of ICT in science education in Mizoram faces challenges like inadequate infrastructure, poor funding, teacher training gaps, power issues, and resistance to change. However, ICT offers prospects such as enhanced learning, access to resources, inquiry-based learning, and bridging urban-rural gaps. The study was concluded with a recommendation for the government to address these

challenges and leverage ICT's potential which can transform education and prepare students for the digital age.

The alignment and discrepancies between the English curriculum prescribed by the Mizoram Board of School Education (MBSE) and the question designs of the High School Leaving Certificate (HSLC) and Higher Secondary School Leaving Certificate (HSSLC) examinations was examined by Lalremchhungi and Lallianzuali Fanai. This qualitative research approach indicated that while the HSLC and HSSLC examinations largely align with curriculum goals, discrepancies also exist in key areas. To make assessments more effective, the study recommended adding listening and speaking tasks, translation exercises, and structured feedback. These changes, according to the researchers, would better match the curriculum and help students in Mizoram improve their English skills.

Chalthanmawii and Kabita Kumari studied the adjustment levels of institutionalized and non-institutionalized middle school children across educational, social, and emotional domains in Mizoram. The study comprised 100 middle school students (50 institutionalized and 50 non-institutionalized) from five middle schools. The findings revealed a significant difference in the educational and emotional dimensions between the two groups. However, no significant difference was found in the social adjustment of institutionalized and non-institutionalized children.

In their study to find out the life skills awareness of undergraduate students in Aizawl city, TC Rakil Ramhmachhuani and Lalchhuanmawii collected data from a sample of 110 students (male & female) using Life Skills Awareness scale.They found that undergraduate Arts students generally possessed a moderate level of awareness regarding life skills and students from joint families had a higher level of life skills awareness compared to those from nuclear families. There was no significant difference in the life skills awareness of undergraduate Arts students with respect to gender and locality.

Bhavna Rajpoot and Vinod Kumar Kanvaria considered the double-edged role of AI—both its power to revolutionize research practices and its ethical implications in their research. By analysing AI's role in literature synthesis, research design, and scholarly communication, their paper provides a balanced perspective on its role in academia. As AI keeps evolving, its use in educational research in a responsible manner is imperative. Their findings reiterated the need to leverage the potential of AI with intellectual maturity and ethical integrity to facilitate more imaginative, equitable, and enlightened scholarship. This article is one among the increasing body of literature on the revolutionary yet responsible application of AI in mapping the future of educational research.

It is the sincere wish of the Editorial Board that these articles may throw some light into various aspects of education and enrich the minds of readers with a new thirst for more knowledge.

Lynda Zohmingliani
Chief Editor

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Choosing the Right Sample Size in Social Science Studies: A Methodological Review

Zairemmawia Renthlei*
C. Lallawmkima**

Abstract

*Sample size calculation is an integral part of social science research especially in quantitative studies. The problems of sample size determination has befuddled many researchers and has led to confusions and heated discussions as a proper theoretical understanding of the matter has often eluded researchers. The present paper is an attempt to catalogue various methods and techniques that are utilised by academicians for calculating sample sizes in various situations and conditions. The paper has included brief discussions on Cochran's Formula, Yamane's Formula, Krejcie amd Morgan's Table Calculation Procedure, Samuel B Green's Formula as well as a brief introduction to G*Power software for sample calculations. Assumptions and necessary conditions as well as applications have been highlighted wherever possible.*

Key words: *Sampling size, calculation, Cochran, Yamane, Krejcie and Morgan, Green, G*Power*

Introduction

Sample size determination is a critical aspect of social science research, influencing the validity, reliability, and generalizability of study findings. An appropriately chosen sample ensures that research conclusions accurately reflect the target population while minimizing errors and biases. Conversely, an inadequate sample size can lead to misleading interpretations, reduced statistical power, and difficulties in hypothesis testing (Cohen, 1992).

In social science research, determining the right sample size depends on multiple factors, including research design, population characteristics, statistical techniques,

*Dr. Zairemmawia Renthlei, Assistant Professor, Institute of Advanced Studies in Education;
Ph – 9774089972, email – jimzrenthlei76@gmail.com
**C. Lallawmkima, Research Scholar, Institute of Advanced Studies in Education;
Ph – 9774089972, email - lomkim08@gmail.com

and study objectives (Babbie, 2020). Researchers often rely on various methodological approaches to calculate sample size, ranging from heuristic rules to sophisticated statistical formulas. Commonly used methods include Cochran's formula (Cochran, 1977), Yamane's formula (Yamane, 1967), and Power analysis (Faul et al., 2009), each suited to different research scenarios.

Despite the availability of established sample size determination methods, many researchers face challenges in selecting the most appropriate approach for their specific study. Constraints related to time, resources, ethical considerations, and population accessibility further complicate the process (Fowler, 2013).

This methodological review aims to provide a comprehensive overview of sample size calculation techniques in social science research. It explores key theoretical concepts, statistical methods, and practical considerations, offering guidance on choosing the most suitable approach based on research objectives. By examining the strengths and limitations of various sample size determination methods, this study seeks to support researchers in making informed methodological decisions and enhancing the credibility of their research findings.

The subsequent sections will discuss the fundamental principles of sampling, factors influencing sample size selection, and an in-depth analysis of different estimation techniques applicable to social science research.

Theoretical Framework & Key Concepts

Sampling is a foundational element of research methodology in social sciences, allowing researchers to draw conclusions about a population without studying every individual (Babbie, 2020). Since studying entire populations is often impractical, sampling methods enable researchers to generalize findings while maintaining feasibility and accuracy (Cochran, 1977). The selection of an appropriate sample size is crucial for ensuring the reliability and validity of research outcomes.

Several key factors influence the determination of an adequate sample size in social science research:

1. Confidence Level and Margin of Error: Higher confidence levels (e.g., 95% or 99%) require larger sample sizes to ensure precision, whereas a larger margin of error allows for smaller sample sizes (Fowler, 2013).
2. Effect Size: The magnitude of the expected effect influences the required sample size; smaller effects demand larger samples to achieve statistical significance (Cohen, 1992).
3. Population Variability: Greater heterogeneity within a population requires a larger sample to capture its diversity adequately (Yamane, 1967).

4. Statistical Power: A study should have at least 80% power to detect true effects while minimizing the risk of Type II errors (Faul et al., 2009).
5. Sampling Method: Probability sampling techniques (e.g., stratified, cluster sampling) often require different sample size considerations than non-probability methods (Krejcie & Morgan, 1970).

Sampling Techniques and Their Impact on Sample Size

Sampling methods significantly affect the required sample size and generalizability of research findings:

- Probability Sampling: Ensures random selection and generalizability; methods include simple random sampling, stratified sampling, and cluster sampling (Cochran, 1977).
- Non-Probability Sampling: Includes convenience, quota, and purposive sampling, often requiring careful justification for sample size selection due to potential bias (Babbie, 2020).

Understanding these theoretical concepts provides a framework for selecting an appropriate sample size methodology, balancing statistical rigor with practical research constraints.

Methods for Sample Size Calculation:

A. Rule of Thumb Methods

1. 10% Rule

The 10% rule proposes that selecting a sample equivalent to 10% of the total population can serve as a practical approach to estimate population parameters, especially when conducting complex statistical calculations is not practical.

Example: Suppose a researcher is examining higher secondary commerce students in Mizoram, with a total population of 5,000 students. Applying the 10% rule would suggest a sample size of 500 students.

Although this method offers simplicity and ease of application, it may not always be efficient for large populations, as it can yield excessively large samples. In such instances, more refined sampling techniques or established guidelines—such as those developed by Cochran (1977) or Krejcie and Morgan (1970)—may provide a better balance between statistical accuracy and practical constraints.

2. Minimum Sample Size Recommendations

- Surveys: To ensure statistical reliability and generalizability of findings, it is generally advised to include a minimum of 100 to 200 respondents in survey-based research (Krejcie & Morgan, 1970).
- Experimental Research: For meaningful statistical comparisons, especially when employing inferential tests, it is recommended to have at least 30 participants in each group (Roscoe, 1975; Cohen, 1992).
- Qualitative Studies: The ideal sample size in qualitative research typically ranges from 5 to 30 participants, depending on the nature and depth of the study. Smaller samples allow for in-depth exploration and thematic saturation (Guest, Bunce, & Johnson, 2006; Creswell, 2013).
- Structural Equation Modeling (SEM): A minimum sample size of 200 is considered appropriate to ensure stability and accuracy of parameter estimates in SEM analyses (Jackson, 2003; Kline, 2015).

B. Statistical Approaches

1. Cochran's Formula (for Large/Unknown Populations):

Determining an appropriate sample size is essential in research disciplines such as social sciences, education, health, and market studies. Cochran's Formula, introduced by William G. Cochran in 1977, is a widely accepted method for calculating the minimum sample size needed to ensure data accurately represents a population, particularly when the population is large or its characteristics are not precisely known.

This formula is especially useful when estimating proportions and allows researchers to achieve a desired level of confidence and precision. Key advantages of using Cochran's formula include:

1. Statistical Validity: It ensures that the sample is representative, making the findings generalizable.
2. Reduced Sampling Error: It minimizes the likelihood of inaccuracies caused by random data fluctuations.
3. Efficient Resource Use: It prevents unnecessary data collection, saving time and cost.
4. Proportion-Based Analysis: It is ideal for studies aiming to estimate population proportions.

For Large or infinite population

Cochran's formula for determining sample size is:

$$n_0 = \frac{Z^2pq}{e^2}$$

Where:

n_0 = Required sample size (for a large or infinite population)

Z = Z-score (standard normal deviation) corresponding to the desired confidence level

p = Estimated proportion of the population that has the characteristic of interest

q = 1 - p (proportion of the population without the characteristic)

e = Margin of error (or precision level), which represents the acceptable level of sampling error

Each component in Cochran's formula has a specific role in determining the sample size:

i) Z-score (Z): Confidence Level Representation

The Z-score represents how many standard deviations a data point is from the mean in a standard normal distribution. It corresponds to the confidence level, which reflects how certain we are that our sample represents the entire population.

Common confidence levels and their corresponding Z-scores:

- 90% Confidence Level → Z=1.645
- 95% Confidence Level → Z=1.96 (most commonly used)
- 99% Confidence Level → Z==2.576

A higher confidence level results in a larger sample size.

ii) Proportion of Population (p):

Represents the expected proportion of people in the population who have a specific characteristic. If no prior information about p is available, p =0.5 (i.e. 50%), is often used because it provides the largest possible sample size, ensuring the most conservative estimate. If historical data suggests a different proportion, that value should be used.

iii) Complement of q:

Since q= 1 - p, it represents the proportion of the population that does not have the characteristic being studied.

iv) Margin of Error (e):

Also called the precision level, it represents the amount of error the researcher is willing to accept. Common choices for margin of error:

e =0.05 (5%) → Used in most social science studies.

e =0.01 (1%) → Used when high precision is needed.

(A smaller margin of error increases the required sample size.)

For Finite Population (Adjusting Cochran's Formula)

Cochran's formula assumes an infinitely large population. However, if the actual population size (N) is small or finite, an adjustment is needed using the finite population correction (FPC) formula:

$$n = \frac{n_0}{1 + \frac{n_0 - 1}{N}}$$

Where:

n = Adjusted sample size for a finite population

N = Total population size

n_0 = Initial sample size (calculated using Cochran's formula)

This correction reduces the required sample size when the population is small, preventing unnecessary data collection.

Example 1: Large Population

A researcher wants to determine the sample size needed to estimate a proportion with 95% confidence and a 5% margin of error. Since no prior data is available, the researcher assumes p=0.5

Given: Z==1.96 (95% confidence level), p=0.5, q=1−0.5= 0.5, e=0.05

Using the formula:

$$n_0 = \frac{(1.96)^2(0.5)(0.5)}{(0.05)^2}$$

$$n_0 = \frac{3.8416 \times 0.25}{0.0025}$$

$$n_0 = \frac{0.9604}{0.0025} = 384.16$$

Thus, the required sample size is 385 respondents.

Example 2: Finite Population (e.g., 1000 people)

If the total population is only 1000, we apply the finite population correction:

$$n = \frac{385}{1 + \frac{385 - 1}{1000}}$$

$$n = \frac{385}{1 + \frac{384}{1000}}$$

$$n = \frac{385}{1.384} = 278.3$$

Thus, the required sample size for a population of 1000 is 278 respondents.

Key Takeaways

1. *If the population is large (approaching infinity), use Cochran's formula directly.*
2. *For a small population, apply the finite population correction.*
3. *A higher confidence level and lower margin of error increase the required sample size.*
4. *Using p=0.5, provides the most conservative estimate but can be adjusted if prior knowledge is available.*
5. *If non-response is expected, the sample size should be increased accordingly.*

2. Yamane's Formula (for when Population Size is Known)

Yamane's formula provides a simplified approach for calculating the required sample size when the total population size (N) is known. This formula is widely used in social science research to determine an appropriate sample size while considering a margin of error.

The formula for determining sample size is:

$$n = \frac{N}{1 + Ne^2}$$

where:

n = Required sample size
N = Total population size
e = Margin of error (expressed as a decimal, e.g., 5% = 0.05)

Understanding the Formula Components:

1. Population Size (N): The total number of people in the group you are studying.
2. Margin of Error (e): The level of precision required in the estimate, typically ranging from 1% to 10%. A lower margin of error requires a larger sample size.
3. Denominator Interpretation: The term 1+Ne^2increases as N grows, ensuring that larger populations require proportionally smaller samples.

Example:

Let's assume we want to conduct a study on a population of 5000 individuals and we choose a margin of error of 5% (e =0.05).

$$n = \frac{5000}{1 + 5000(0.05)^2}$$

$$n = \frac{5000}{1 + 5000(0.0025)}$$

$$n = \frac{5000}{1 + 12.5}$$

$$n = \frac{5000}{13.5} = 370.37$$

Since sample size should be a whole number, we round up to 371 respondents.

When to Use Yamane's Formula

- *When total population size (N) is known.*
- *When a simplified method is preferred over complex statistical formulas.*
- *When a basic margin of error-based approach is sufficient.*
- *Useful for social sciences, business research, and field studies.*

Yamane's formula is a practical and straightforward approach to determining sample size when the population size is known. It enables researchers to achieve a balance between precision and practicality, ensuring a statistically valid sample for their research.

3. Krejcie and Morgan's Table

Krejcie and Morgan's Table is a widely recognized statistical tool used for determining the appropriate sample size for surveys or research studies based on a specified population size. Developed by Robert V. Krejcie and Daryle W. Morgan in their

1970 publication, "Determining Sample Size for Research Activities", in the Educational and Psychological Measurement journal, the table offers a convenient reference for researchers to ensure their sample size is sufficient for obtaining statistically significant results.

Key Concepts of Krejcie and Morgan's Table:

i) Population Size (N): This refers to the total number of individuals or units within the population under study.

ii) Sample Size (S): This represents the number of individuals or units selected from the population to participate in the study.

iii) Confidence Level: A typical confidence level of 95% is applied, meaning that, if the population were repeatedly sampled, the sample mean would fall within the confidence interval 95% of the time.

iv) Margin of Error (e): This indicates the range within which the true population parameter is expected to lie, often set at 5%, which corresponds to a 95% confidence level.

How the Table Functions:

i) Population Size (N): The table lists different population sizes in one column.

ii) Sample Size (S): In the adjacent column, the corresponding recommended sample sizes are provided.

The sample sizes in the table are calculated using a formula that takes into account the desired level of precision, confidence, and variability in the population. The formula used is:

$$n = \frac{\chi^2 \cdot N \cdot P \cdot (1 - P)}{d^2 \cdot (N - 1) + \chi^2 \cdot P \cdot (1 - P)}$$

Where:

n = required sample size

χ = chi-square value for the desired confidence level (e.g., 3.8416 for 95% confidence, corresponding to Z = 1.96)

N = population size

P = estimated population proportion (assumed to be 0.5 for maximum sample size)

d = margin of error or degree of accuracy (e.g., 0.05 for ±5%)

Practical Application

- Ease of Use: Researchers can simply look up the population size in the table and find the corresponding sample size without performing complex calculations.
- Accuracy: The table ensures that the sample size is sufficient to make reliable inferences about the population.
- Standardization: It provides a standardized method to determine sample size, promoting consistency across different studies.

Example: Imagine you are conducting a survey to understand the job satisfaction levels of employees at Higher Education Institutions (HEIs). The total number of employees at the HEIs (population size, N) is 1,200.

Using Krejcie and Morgan's Table:

- Population Size (N): Find the row in the table that corresponds to a population size of 1,200.
- Sample Size (n): Look at the recommended sample size for a population of 1,200.

According to Krejcie and Morgan's Table, for a population size of 1,200, the recommended sample size (S) is approximately 291. This is the number of employees you need to survey to obtain statistically significant results with a 95% confidence level and a margin of error of ±5%.

$$n = \frac{\chi^2 \cdot N \cdot P \cdot (1 - P)}{d^2 \cdot (N - 1) + \chi^2 \cdot P \cdot (1 - P)}$$

Parameters: N = 1,200; χ^2 ≈ 3.841 (for 95% confidence level); P = 0.5 (population proportion, for maximum variability); d =0.05 (degree of accuracy, or margin of error)

$$n = \frac{3.841 \cdot 1200 \cdot 0.5 \cdot (1 - 0.5)}{(0.05)^2 \cdot (1200 - 1) + 3.841^2 \cdot 0.5 \cdot (1 - 0.5)}$$

$$n = 291$$

4. Samuel B. Green's Formula (1991) (Sample Size in Multiple Regression)

Samuel B. Green (1991) proposed a heuristic approach to estimate the minimum required sample size for multiple regression analysis. His approach includes two different rules of thumb depending on whether the focus is on testing individual predictors or the overall model.

A. Formula for Testing Individual Predictors: When the goal is to test the significance of individual predictors, the required sample size (n) is given by:

$$n \geq 104 + k$$

B. Formula for Testing the Overall Model: If the research focuses on testing the overall model rather than individual predictors, the required sample size is:

$$n \geq 50 + 8k$$

where:

n = Required sample size

k = Number of predictors (independent variables)

Example:

Suppose a researcher is using 5 predictors in a multiple regression model (k =5).

Step 1: Calculate Sample Size for Individual Predictors

$$n \geq 104 + 5 = 109$$

Step 2: Calculate Sample Size for the Overall Model

$$n \geq 50 + 8 \times 5$$

$$n \geq 50 + 40 = 90$$

Step 3: Select the Larger Sample Size

To ensure adequate power for both tests, the researcher chooses the larger of the two values:

n = 109

Thus, the researcher should collect data from at least 109 participants.

5. G*Power Software

G*Power is a free statistical software used to determine the appropriate sample size for various statistical tests and to conduct power analysis.

Steps for Sample Size Calculation in G*Power:

1) Define Research Goals & Hypothesis:

- Identify the research question and whether the test is one-tailed or two-tailed.
- State the null (H_0) and alternative (H_1) hypotheses.

2) Select the Statistical Test:

- Choose from tests like: t-tests, ANOVA, Chi-square tests, Correlation analysis, Regression analysis, etc.
- G*Power categorizes tests based on:
  - Distribution-based approach (e.g., FFF-tests, ttt-tests)
  - Design-based approach (e.g., comparing means, correlations)

3) Choose the Type of Power Analysis: G*Power provides five types of power analysis:

- A priori: Determines the required sample size (N) before conducting the study.
- Post hoc: Calculates the statistical power given a fixed sample size.
- Compromise: Finds an optimal balance between Type I (α) and Type II (β) errors.
- Criterion: Determines the significance level (α) for a given power and sample size.
- Sensitivity: Identifies the effect size detectable with a given sample size and power.

4) Input Key Parameters:

- Effect Size (d,f,r): Determines the magnitude of the effect to detect.
- Significance Level (α): Commonly set at 0.05
- Power ($1-\beta$): Typically 0.8, meaning an 80% chance of detecting a true effect.
- Sample Allocation Ratio (N_2/N_1): Defines group sizes if comparing two groups.

5) Calculate the Sample Size: Click the "Calculate" button, and G*Power provides the required sample size.

6) Interpreting Results: The output shows:

- Computed sample size
- Achieved power
- Critical test values
- The "X-Y plot for a range of values" allows visualization of how changes in effect size, power, or α affect the required sample size.

Example: A Priori Sample Size Calculation for an Independent t-Test.

Suppose you are comparing two groups with:

- Effect size: d=0.5 (medium)
- Significance level: $\alpha=0.05$
- Power: $1-\beta=0.80$
- Equal group sizes: $N_1 = N_2$

*Steps in G*Power:*

1. Choose t-tests → Means: Two independent groups (t-test).
2. Select A Priori.
3. Input:

   Effect size d=0.5

   Significance level α=0.05

   Power $1-\beta$=0.80

   Allocation ratio N_2/N_1 =1 (equal group sizes)

   Click Calculate.

Result:

The required sample size per group: $N_1 = N_2 = 64$

Total sample size: $N_{total} = N_1 + N_2 = 128$

G*Power is an efficient tool for ensuring research studies have sufficient participants to detect meaningful effects while avoiding unnecessary large samples that waste resources.

Conclusion

The authors have attempted to compile a list of methods and techniques with a few illustrative examples for practice. This list is neither comprehensive nor complete as there are many other methods for sample size calculation. However, it is the belief of the authors that such a theoretical treatment is urgently necessary to enhance the research capabilities of educationists and other social science researchers in Mizoram and beyond. This paper may serve as a reference for future as well as current researchers and it is the hope of the authors that the scientific validity of our research will be improved in a small extent by this paper.

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Language Competency in Mizo: A study of High School students in Aizawl City

Lalremsangi*
Sian Lalchhandami**

Abstract

The study seeks to assess the Mizo language competency of high school students in Aizawl city. Mizo language competency refers to the knowledge and skills an individual possesses in the Mizo language, developed through prior learning. The research sample includes 200 students from seven (7) schools, five (5) of which are government-run and two (2) are deficit-funded. Mizo Language Competency Test for High School Students developed by the researcher was administered to the students and the data was analysed by using appropriate statistical techniques. The findings reveal that out of 200 students, 44 (22%) demonstrate low level of Mizo language competency, 123 (61.5%) show average level of competency, and 33 (16.5%) exhibit high level of competency. The study also found a significant gender difference, with female students displaying higher level of language competency than male students. Additionally, students from deficit schools exhibited higher level of language competency in Mizo compared to those in government schools.

Keywords: *Mizo language competency, high school student, Aizawl city*

Introduction:

Language plays a crucial role in education, serving as the main tool in the teaching-learning process. There are many challenges that students face in their education, and language competency can be a contributing factor that determines the success and failure of a student in their academic career. The notion of language competency was first developed in the mid -1960s by Naom Chomsky, an American linguist. Chomsky identified language competency as an idealized linguistic ability to under-

*Lalremsangi, Research Scholar, Mizoram University. Ph – 9612849113,
email: remisangi4381@gmail.com
**Dr. Sian Lalchhandami, Assistant Professor, Mizoram University
Ph – 8794835265, email- sianfanai1@gmail.com

stand and comprehend words and sentences (Belletti & Rizzi, 2003). Hence, we can simply say that language competency is the knowledge and skills of a language that a student is expected to have at their level, or we can simply put it as the ability to use language effectively in terms of the four major skills (Collins dictionary). The study on Language Competency has proven to be an important tool as it sheds light on problem areas faced by students and provides comprehensive results upon which teaching module of remediation can be developed as given by Keshavarz (2008).

Mizo Language Competency

Mizo language competency refers to the knowledge and skills an individual possesses in the Mizo language, developed through prior learning. As the dominant language spoken by the Mizo people residing in Mizoram, one of the north-eastern states of India, Mizo language plays a crucial role in preserving and promoting the cultural practices and traditions unique to its speakers. The mother tongue, whether Mizo or another language, is essential in maintaining these cultural values.

For students, the Mizo language is not only a means of communication but also a key factor in their academic success, fostering a sense of unity and harmony among its speakers. Additionally, Mizo is included in the school curriculum as one of the subjects, with its primary objectives focusing on the development of essential language skills: listening, speaking, reading, and writing. Therefore, the competency level of students in Mizo language can reflect the significance placed on teaching and learning in their mother tongue, as evidenced by the knowledge and skills they acquire. Additionally, having a good competency in mother tongue builds strong foundations for a child's cognitive development, improves communication skills, and helps them create an emotional connection with their learning environment. More importantly, children who are competent in their mother language tend to perform better academically in the long run. Besides, supporting mastery of the first language also promotes the cognitive development needed to learn a second language more easily. This means learning one language well actually aids the learning of a second language—be it English or any other language (UNICEF, 2021).

Review of Related Literature

In a study conducted by Farooque (2005), the language competency in different subjects was measured and identified, and it was found that almost every teacher working at an English medium school in Kannur district was not trained and lack adequate proficiency in the English language, which significantly affect the academic performance of the students.

Aguelo (2017) conducted a study on enhancing students' language competencies through collaborative learning. The findings show that collaborative learning activities enhance the four skills of the students. The participants consider this approach motivational as they engaged and interacted with others. This indicates that students develop their language competencies as they rely on one another while engaging in meaningful language activities.

Subha et al. (2019) in their study on the English Language Competency of the First Year Tamil Medium Engineering Students found that, based on the performance of the learners in activities such as mini presentations and group discussions, activity-based teaching was deemed appropriate for the target learners. Since the learners were from Tamil medium background, they faced challenges in using the second language. The researcher found that the level of competency of the learners was not satisfactory. They designed activities based on the competency level of the learners in the entry-test. Finally, the researcher found that activity-based teaching enhanced the performance of the learners in the exit-test. The study can be applied to improve the English language skills of students from other regional language backgrounds.

Siami and Chuaungo (2021) conducted a study on English Language Competency among Model English School Students in Aizawl City to assess the English language competency of class VII students of in Model English medium schools in Aizawl and to compare their English language competency in relation to their gender. The English language competency test, constructed by the investigators, was administered to 83 students. The statistical analysis revealed that 57% of class VII students showed unsatisfactory results in English language competency, 23% possessed an average level and only 6% showed a satisfactory level of English language competency.

Ramhlupuii et al. (2023) in their study on proficiency in Mizo language among higher secondary students in Aizawl found that most students demonstrated an average level of competency in the Mizo language. Moreover, the research revealed no significant difference in Mizo language proficiency with respect to gender. It was also discovered that students attending government schools had a higher level of proficiency in the Mizo language compared to their counterparts in private schools. In addition, it was also observed that students from science stream had a higher competency in Mizo language than students from arts and commerce streams.

Rationale of the Study

One of the primary reasons for teaching the mother tongue, or first language, as a school subject is to equip learners with proficiency and competency in their native language. This involves expanding their vocabulary and developing the four foun-

dational language skills: listening, speaking, reading, and writing. Mastery of these skills goes beyond mere fluency or correct usage; it also includes the ability to engage in eloquent communication and convey thoughts with clarity and precision. Children need to learn not only how to speak, write, and read, but also when and why to use language meaningfully. This includes developing the capacity to listen actively and appreciate others' perspectives.

As Michael Halliday (1975) observed, language is acquired through social interaction that children either observe or take part in. Cognitive development, which allows children to explore and make sense of their surroundings, is closely linked to language acquisition and communication skills as they interact with others. The importance of teaching the first language, even at the secondary school level, should not be overlooked; the development of skills in the mother tongue significantly influences students' cognitive, personal, social, and cultural identity. A strong foundation in their native language enhances students' ability to express themselves effectively, which in turn supports their academic success and achievement.

However, many students, even in secondary school, struggle to fully understand and articulate their ideas in their native language. This difficulty can hinder their academic performance in their first language and beyond. Furthermore, a review of existing literature reveals a gap in research regarding first-language competency among high school students, particularly in the Mizo language, and it would not be wrong to say that no study on language competency has been conducted done among high school students even though it which is a very important stage of schooling for learning their mother tongue. Recognizing this gap, the researcher has identified a need to assess Mizo language competency among high school students, with the following objectives:

Objectives of the Study

1. To find out the level of Mizo language competency of high school students in Aizawl city.
2. To compare Mizo language competency of high school students in Aizawl city with respect to gender.
3. To compare Mizo language competency of high school students in Aizawl city with respect to type of school management.

Null Hypotheses

1. There is no significant difference in Mizo language competency of high school male and female students in Aizawl city.

2. There is no significant difference in Mizo language competency of Deficit and Government high school students in Aizawl city.

Methodology

Research method

The study is basically a descriptive survey method as it tries to find out the Mizo language competency among high school students in Aizawl city.

Population and Sample

The target population includes all the high school students enrolled in purely government and deficit schools in Aizawl city. Sample for the study consists of 200 high school students randomly selected from seven (7) schools in Aizawl city out of which five (5) schools are purely government and two (2) schools are deficit. Out of the 200 samples, there were 96 males and 104 female students.

Table-1.
Sample Distribution

Type of School	Male	Female
Government	56	64
Deficit	40	40
Total	96	104

Tools Used

"Mizo Language Competency Test for High School Students' developed by the researcher was used for the present study. After standardizing the test, it was administered to high school students. Their scores were analysed, and the mean score was calculated to be 33.67, with a standard deviation of 6.92. Based on these results, students were grouped into three levels of competency.

Students who scored more than one standard deviation above the mean were classified as having a high level of Mizo language competency, labelled as "high competency." Those who scored less than one standard deviation below the mean were classified as having a low level of Mizo language competency, labelled as "low competency." Students whose scores fell within one standard deviation above and one standard deviation below the mean were categorized as having an average level of Mizo language competency, labelled as "average competency."

Procedure of Data Collection

The researcher sought permission from principals and headmasters of the selected schools, explaining the importance of the study being conducted. After, taking permission from the authority, the researcher then collected data from the students with an assurance that their responses would be strictly kept confidential and will be used solely for the research purpose.

Statistical Techniques Used

To analyse the data, the researcher employed various statistical methods such as percentage, mean, standard deviation and t-test.

Analysis and Interpretation

The data were analysed based on the objectives and are presented as follows:

Objective No.1: To find out the level of Mizo language competency of high school students in Aizawl city.

High school students were classified into three groups based on their level of competency in Mizo language and they are shown in the following table -2

Table-2
Level of Mizo Language Competency of High School Students in Aizawl City

Level of Competency	Number	Percentage
High competency	33	16.5%
Average competency	123	61.5%
Low competency	44	22%

The above Table 2 shows that out of 200 high school students, only 33 (16.5%) possess a high level of competency in the Mizo language. The majority of the students i.e. 123 (61.5%) demonstrate an average level of competency, while 44 (22%) students exhibit a low level of competency in the Mizo language.

Objective No.2: To compare Mizo language competency of high school students in Aizawl city with respect to gender.

The mean and standard deviation of the scores of male and female students were calculated in order to compare the level of Mizo language competency. The mean differences of these two groups were tested by applying t-test and the details are presented in the following table no 3.

Table-3
Comparison of Mizo Language Competency of High School Male and Female Students in Aizawl City

Gender	Number	Mean	SD	SED	t-value	Sig level
Male	96	31.76	7.27	0.94	3.90	0.01
Female	104	35.43	6.09			

As per table No-3, the mean score of high school male students is 31.76 and standard deviation is 7.27 respectively. Whereas, the mean score and standard deviation of high school female students is 35.43 and 6.09 respectively. The SED shown in the table is 0.94 with degrees of freedom 198, and the calculated value of "t" is 3.90.

Since the calculated "t" value is 3.90 which is greater than the critical "t" value at 0.01 level of confidence, the null hypothesis, "There is no significant difference in Mizo language competency between high school male and female students in Aizawl city" is rejected since the two groups differed significantly at 0.01 level of confidence. A comparison of their mean score shows that the mean score of female students is higher than the mean score of male students which indicates that female students have higher level of Mizo language competency.

Objective No-3. To compare Mizo language competency of high school students in Aizawl city with respect to type of school management.

The mean and standard deviation of the scores of deficit and government students were calculated in order to compare the level of Mizo language competency. The mean differences of these two groups were tested by applying t-test and the details are presented in the following table no 4.

Table-4
Comparison of Mizo Language Competency of Deficit School and Government School Students in Aizawl City

Type of school management	Number	Mean	SD	SED	t-value	Sig level
Deficit	80	35.16	6.19	0.94	4	0.01
Government	120	32.16	6.99			

A review of Table No-4 reveals that the mean score for students in deficit schools is 35.16, with a standard deviation of 6.19, while the mean score and standard deviation for students in government schools are 32.16 and 6.99, respectively. The standard error of the difference (SED) reported in the table is 0.94, with 198 degrees of freedom, and the calculated t-value is 4.

Since the calculated t-value of 4 exceeds the critical t-value at the 0.01 level of confidence, the null hypothesis stating that "There is no significant difference in Mizo language competency between Deficit and Government high school students in Aizawl city" is rejected. This indicates there existed a statistically significant difference between the two groups at the 0.01 level of confidence. A comparison of the mean scores shows that deficit school students have a higher mean score than government school students, suggesting that deficit school students possess a higher level of Mizo language competency.

Major findings and discussion:

1. From the overall findings, 33 (16.5%) demonstrate a high level of competency in the Mizo language, 123 (61.5%) possess an average level of Mizo language competency and, 44 (22%) students exhibit a low level of competency in the Mizo language.

Discussion: It was observed that the majority of students exhibit an average level of Mizo language competency, with only a few demonstrating a high level of proficiency in their mother tongue, Mizo. This finding is somewhat satisfactory, as most students fall within the average range, however; it is a notion that students would be more competent in their first language and perform well in the way they are expected to achieve at their current level. The underlying causes of this outcome are not entirely clear, but it may be influenced by the teaching styles and methods employed by the teachers, the allocation of time for Mizo subject in the time table wherein it is the only subject where they can learn and develop language skills and knowledge in their own mother tongue as the medium of instruction in high school are mainly English, and it can also be the students' own learning styles and attitude towards Mizo language where most of the adolescent these days admire English which led to the negligence of their mother tongue.

Additionally, family dynamics could be a contributing factor. Many parents today are increasingly influenced by the second language, resulting in a greater use of the second language at home. This shift may lead to a decreased emphasis on using the mother tongue, which could in turn affect students' Mizo language competency.

2. The female students are having significantly higher level of Mizo language competency than the male students.

Discussion: A plausible reason for this observation could be due to biological differences in boys and girls where girls tend to acquire languages earlier and easier than their counterparts. Furthermore, cultural norms frequently urge girls to be more communicative, emotionally expressive, and relational, fostering a favourable setting

for language development. The school context may also play a role; in classroom environments, girls are more collaborative and actively participate in discussions and question-and-answer sessions, which can further enhance their language skills.

3. Students from deficit schools possess higher level of Mizo language competency than government school students.

Discussion: Deficit schools in Mizoram are primarily managed by various religious denominations, where the administration and organization of these institutions are often conducted in a disciplined manner. The main reason behind this finding could be due to the teaching methods and techniques employed by the teachers from deficit schools. It is believed that teachers in government and deficit schools are qualified trained teacher who will clearly know the aims and objectives of teaching mother tongue or Mizo subject. Consequently, the emphasis on practical teaching strategies in the said subject, which allow more room for the students' participation likely fosters the development of students' four language skills. However, the limited application of theoretical frameworks in curriculum transaction, with a predominant focus on content explanation rather than language skill development may hinder the competency levels of student in the Mizo language. This approach could contribute to the relatively lower language competency observed among students in government schools.

Suggestions and recommendations:

1. It is suggested that training of teachers taking Mizo subject should be organized wherein the aims and objectives of teaching the subject, methods and different techniques applicable such as debate, discussion, quiz, role play etc. in the classroom setting may be re-highlighted.
2. It is recommended that MBSE as well as concerned committees may revise the existing syllabus as well as the textbooks for Mizo subject to give more emphasis on the development of the four language skills through the content and exercises in the textbook.
3. Awareness on the importance of mother tongue and the correct use of Mizo language could be given to the community.
4. Organizing language workshop by inviting resource persons and experts in Mizo language is suggested to every school so that both the teachers and students will be benefited and will foster their language competency.
5. Debate, article, essay, or any writing competition can be organized on a selected topic in the school level or inter-school level with a good prize for promoting and enhancing the Mizo language.

6. Students should be encouraged to read, listen and watch the programmes organized in Mizo language in television, newspaper, and through social media which will enhance them to have a better competency.
7. Mizo Language Club can be established in every school so as to take necessary measures for the promotion and preservation of Mizo language.
8. It is suggested to every schools that enough time should be kept for Mizo subject in the school time table. Moreover, it is also recommended to provide library period twice a month for Mizo section and that, the students can be asked to write down the salient features or the main idea on what they have read in Mizo language. This technique will surely level up the Mizo language competency of students.

Conclusion:

Based on the findings, the suggestions and recommendations provided are believed to be both applicable and practicable for all stakeholders involved in the development and preservation of the Mizo language. The Mizo language serves as the primary cultural identity for native speakers residing in Mizoram, and no one else will safeguard it on our behalf. Therefore, it is imperative that we take immediate action and contribute in any way possible to promote and sustain our language.

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Attitude Towards Sex Education: A Study among Parents of Middle School Students in Aizawl City

Jennifer Lalmuanzuali*
Mary L.Renthlei**
Francis L. R. Puia Tlau***
Ramngaihzuali****

Abstract

The primary goal of sex education is promotion of sexual and reproductive health. Provision of opportunity to develop and understand values, attitudes and insights about sexuality and developing relationship and interpersonal skills is another goal of sex education. The purpose of this study is to measure the attitude towards sex education among parents of middle school students in Aizawl City with respect to their gender and their occupation. 200 parents (100 male and 100 female parents) of middle school students in Aizawl City were included in the sample. "Attitude scale towards sex education" developed by DR (Smt.) Usha Mishra was employed. Findings show that majority of parents have positive attitude towards sex education. The study also revealed that there are no significant differences in the attitude towards sex education among parents of middle school students with respect to gender or occupation.

Keywords: *Attitude, Sex education, Middle school students.*

Introduction

Children and teens are exposed to sex every day through movies, television, advertisements, magazines, and the internet (Mandigo, 2020). Sex refers to the biological characteristics that lead to the assignment of either 'male' or 'female'.

*Jennifer Lalmuanzuali, MA (Education), Govt. Aizawl College,
email: jennifergonmei91@gmail.com
**Dr. Mary L.Renthlei, Associate Professor, Dept. of Education, Govt. Aizawl College, email: marylrenthlei@gmail.com
***Dr. Francis L. R. Puia Tlau, Assistant Professor, Dept. of Education, Govt. Aizawl College, email: Francistlau1991@gmail.com
****Ramngaihzuali, Research Scholar, Dept. of Education, Mizoram University,
email: zuali2208@gmail.com

Sexuality, on the other hand, refers to a person's capacity for sexual feelings. Sex education can be provided as part of school programs, public health campaigns, or by parents or caregivers. It is a comprehensive set of knowledge and the process of learning the emotional, physical, and social aspects of sexuality. Effective sex education should include information about puberty, menstruation, contraceptives, condoms, sexual violence prevention, sexual orientation, gender identity, and body image. Sex education equips people with the information and skills they need to make the best decisions for themselves about sex and relationships. Many parents find discussing sexuality and reproduction with their children overwhelming, but there are books available that address sexuality for different age groups (Gallao et al., 2020). The United Nations Population Fund (UNFPA) recommends comprehensive sexuality education, as it enables young people to make informed decisions about their sexuality (UNFPA, 2020).

Mandigo (2020) emphasized that "comprehensive sex education helps young people develop a positive view of sexuality and provides them with the knowledge and skills they need to make healthy decisions throughout their lives."

Parents are the primary guides for their children from birth, and they are entitled to teach them the basic sex education they need, continuing to provide accurate information as they grow. If parents are unsure or unaware of what to teach, they can seek help from books, the internet, or videos (Gallao et al., 2020). Teaching boys and girls together may foster mutual trust and empathy, though it can be uncomfortable for kids to discuss these issues in front of the opposite gender. The fundamental aim of sex education is to help children emotionally, physically, and mentally. A comprehensive knowledge base benefits not only themselves but others as well. Children need to understand the importance of their health, dignity, and respecting others. Healthy and respectful sexual relationships enhance the quality of life. There is no set age to begin sex education, as changes occur as a child grows. Therefore, starting early and continuing sex education as the child matures is the right approach.

Middle school, covering classes 5 to 8, is a critical transition period between primary and high school education. It is marked by extraordinary changes, with developmental and intellectual shifts that will not be duplicated in the child's lifetime. The peer group becomes increasingly important, while the influence of parents diminishes. There is a growing need for and ability to handle independence (Sell et al., 2021). Middle schoolers are highly sensitive and self-conscious about their bodies, leading to an increased interest in the opposite gender. Their emotions and relationships are often extreme, swinging between total elation and depression. They are academically engaged during this period and curious about the world around them.

Rationale of the Study

There have been many cases of sex related diseases around the world especially among young people. The term sex has been considered as taboo in many households across India. Due to this, there are many young boys and girls ignorant about psychological and physiological changes that take place in them as a part of growing up. When confronted with problems related to this issue, they feel hesitant to approach their parents and other adult members and they gather information through peers and the internet which often give them information that are not fully truthful. This leads to many youths believing in half truths about issues related to sex and hence, they become victims of sexual abuse and other sex related exploitations.

Due to the issues and problems caused by ignorance in sex related issues, research has been conducted on sex education in many parts of the world. This shows that extensive study of sex education is indispensable. The investigator has chosen parents of middle school students as they are the ones looking after students who are still very young and ignorant about sex and sex related issues.

The investigators have chosen the middle school among all other levels of education because middle school going period is a period of transition from childhood to adolescence. It is a period when students need to be given the right information about the environment around them so when they reach adolescence, they would be equipped with correct knowledge which will help them make correct decisions in life. It is with the hope that through this study, awareness will be given to parents of middle school students about sex education and its importance as a subject of study among their children that the present study has been chosen for extensive study.

Research Questions

1. What is the attitude towards sex education among parents of middle school students in Aizawl City?
2. What is the attitude towards sex education among parents of middle school students in Aizawl City with respect to gender?
3. Is there any difference in the attitude towards sex education among parents of middle school students in Aizawl City with respect to gender?
4. What is the attitude towards sex education among parents of middle school students in Aizawl City with respect to occupation?
5. Is there any difference in the attitude towards sex education among parents of middle school students in Aizawl City with respect to occupation?

Statement of the Problem

The problem of the present study is stated as "Attitude towards Sex Education: A Study among Parents of Middle School Students in Aizawl City".

Objectives of the Study

1. To find out the attitude towards sex education among parents of middle school students in Aizawl City.
2. To find out the attitude towards sex education among parents of middle school students in Aizawl City with respect to gender.
3. To compare the attitude towards sex education among parents of middle school students in Aizawl City with respect to gender.
4. To find out the attitude towards sex education among parents of middle school students in Aizawl City with respect to occupation.
5. To compare the attitude towards sex education among parents of middle school students in Aizawl City with respect to occupation.

Hypotheses of the Study

1. There is no significant difference in the attitude towards sex education among parents of middle school students in Aizawl City with respect to gender.
2. There is no significant difference in the attitude towards sex education among parents of middle school students in Aizawl City with respect to occupation.

Methodology

Research Approach: The present study belongs to descriptive survey method.

Population and Sample: Since the present study is concerned with the study of the attitude of parents, the population of the present study comprises of all the parents of middle school students in Aizawl City. For the present study, the sample selected consisted of 200 parents: 100 female parents and 100 male parents of middle school students in Aizawl City. The sample was selected using Simple Random Sampling technique.

Tool Used: In the present study, the investigator employed "Attitude Scale towards Sex Education" developed by Dr. (Smt.) Usha Mishra. The scale consists of 32 items in which 16 items were positive and 16 items were negative.

Data Analysis: Data is collected and analyzed both quantitatively and qualitatively. Appropriate statistical techniques like percentage, mean, standard deviations were

used for analysis of data. For comparison in terms of gender and occupation, t test was employed.

Analysis and Interpretations

1. Attitude towards Sex Education among Parents of Middle School Students in Aizawl City

Objective No. 1: *To find out the attitude towards sex education among parents of middle school students in Aizawl City.*

Table No. 1

Attitude towards Sex Education among Parents of Middle School Students in Aizawl City

Sl. No	Score Range	Stanine Grade	Interpretation	No. of Parents	%
1.	Above 129 120-129	9	Very High Attitude	80	40%
2.	110-129 100-109	8 7	High Attitude	84	42%
3.	90-99 80-89	6 5	Moderate Attitude	36	18%
4.	70-79 60-69	4 3	Low Attitude	Nil	Nil
5.	50-59 40-49	2 1	Very Low Attitude	Nil	Nil

As shown in Table no. 1, out of 200 parents in the sample, 40% of parents of middle school students have very high attitude towards sex education, 42% have high attitude towards sex education and the rest 18% have moderate attitude towards sex education. There are no parents who fall into the low and very low categories. The table shows that majority of the parents in the sample have high attitude towards sex education.

2. **Attitude towards Sex Education among Parents of Middle School Students in Aizawl City with Respect to Gender**

Objective No. 2: *To find out the attitude towards sex education among parents of middle school students in Aizawl City with respect to gender.*

Table No. 2

Attitude towards Sex Education among Parents of Middle School Students in Aizawl City with Respect to their Gender

Sl. No	Score Range	Stanine Grade	Interpretation	No. of Male	No. of Female
1.	Above 129	9	Very High Attitude	13 (13)	67 (67)
	120-129				
2.	110-129	8	High Attitude	71 (71)	13 (13)
	100-109	7			
3.	90-99	6	Moderate Attitude	16 (61)	20 (20)
	80-89	5			
4.	70-79	4	Low Attitude	Nil	Nil
	60-69	3			
5.	50-59	2	Very Low Attitude	Nil	Nil
	40-49	1			

(Figures in the parentheses indicate percentage)

Table no. 2 reveals that 67% of female parents of middle school students have very high attitude while only 13% of male parents have very high attitude towards sex education. 13% of female parents fall in the category of high attitude towards sex education and on the other hand 71% of male parents fall in this category. 20% of female parents have moderate attitude towards sex education and also 16% of male parents have moderate attitude towards sex education. From the table above, it is shown that female and male parents do not have low and very low attitude towards sex education. Majority of female parents have very high attitude towards sex education and majority of the male parents have high attitude towards sex education.

3. Comparison of Attitude towards Sex Education among Parents of Middle School Students in Aizawl City with Respect to Gender

Objective No. 3: *To compare the attitude towards sex education among parents of middle school students in Aizawl City with respect to gender.*

Table No. 3

Comparison of Attitude towards Sex Education among Parents of Middle School Students in Aizawl City with Respect to Gender

Groups	N	Mean	SD	SED	t value	Sig. Level
Male	100	108.09	9.84	1.84	0.32	NS
Female	100	108.68	9.32			

(NS – Not Significant)

Table no. 3 shows that the t value relating to the attitude towards sex education of parents of middle school students in Aizawl City with respect to their gender is not significant at both levels. Therefore, the hypothesis – "There is no significant difference in the attitude towards sex education of parents of middle school students in Aizawl City with respect to their gender" is accepted.

4. Attitude towards Sex Education among Parents of Middle School Students in Aizawl City with Respect to their Occupation

Objective No. 4: *To find out the attitude towards sex education among parents of middle school students in Aizawl City with respect to their occupation.*

Among the 200 parents in the sample, 56 are government employees and 154 are private employees.

Table No. 4

Attitude towards Sex Education among Parents of Middle School Students in Aizawl City with Respect to their Occupation

Sl. No	Score Range	Stanine Grade	Interpretation	Govt.	Private
1.	Above 129	9	Very High Attitude	2 (4.35)	22 (14.29)
	120-129				
2.	110-129	8	High Attitude	36 (78.26)	103 (66.88)
	100-109	7			
3.	90-99	6	Moderate Attitude	8 (17.39)	29 (18.83)
	80-89	5			
	70-79	4			
4.	60-69	3	Low Attitude	Nil	Nil
	50-59	2			
5.	40-49	1	Very Low Attitude	Nil	Nil

(Figures in the parentheses indicate percentage)

Table no. 4 reveals that among parents of middle school students who are government employees, 4.35% parents have very high attitude and 78.26% have high attitude and the rest 17.39% have moderate attitude towards sex education. On the other hand, among parents of middle school students who are private employees, 14.29% have very high attitude towards sex education and 66.88% have high attitude and18.83% have moderate attitude towards sex education. Here also, from the analysis of the data, it is seen that the parents of middle school students do not have low and very low attitude towards sex education with respect to their occupation. The majority of parents have favourable attitude towards sex education.

5. Comparison of Attitude towards Sex Education among Parents of Middle School Students in Aizawl City with Respect to their Occupation

Objective No. 5: *To compare the attitude towards sex education of parents of middle school students in Aizawl City with respect to occupation.*

Table No. 5

Comparison of Attitude towards Sex Education among Parents of Middle School Students in Aizawl City with Respect to their Occupation

Groups	N	Mean	SD	SED	t value	Sig. Level
Govt. Employee	56	106.70	7.91	1.61	1.21	NS
Private Employee	154	108.65	9.89			

(NS – Not Significant)

Table No. 5 shows that the t value relating to the attitude towards sex education among parents of middle school students in Aizawl City with respect to their occupation is not significant at both levels. Therefore, the hypothesis – "There is no significant difference in the attitude towards sex education of parents of middle school students in Aizawl City with respect to their occupation" is accepted. The parents of private employees have higher attitude towards sex education than the parents of government employees as the mean score of the parents of private employees of middle school students is higher than that of the parents of government employees.

Major Findings

1. Among the 200 parents in the sample, majority have favourable attitude towards sex education, i.e., 82% taking both categories of 'very high' and 'high' attitude towards sex education. There are no parents having negative attitude towards sex education.
2. Majority of female parents have 'very high' attitude towards sex education, i.e.,

67% of the total sample. Majority of male parents i.e., 71% have 'high' attitude towards sex education.

3. There is no significant difference in the attitude towards sex education of parents of middle school students in Aizawl City with respect to their gender
4. Majority of parents with respect to their occupation have favourable attitude towards sex education.
5. There is no significant difference in the attitude towards sex education of parents of middle school students in Aizawl City with respect to their occupation

Conclusion

This study is an attempt to find out parents' attitude towards sex education. The findings indicate that majority of parents in Aizawl city have positive attitude towards sex education. Current social problems relating to sex can be tackled if sex education is included in the school curriculum and the contents carefully selected by including only those that are appropriate according to students' age levels. Inculcating sex education in the young minds through formal education system can be beneficial in solving the many social problems and issues that are being faced today brought about by ignorance in sex and sex related issues. Parents' positive attitude towards sex education can play an important role in this regard.

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Analysis of the Profile of Science Teachers and Challenges in Conducting Science Practical in Secondary Schools of Mizoram

H.T. Malsawmtluanga*
Vanlalruatfela Hlondo**

Abstract

The study aimed to analyse the profile of science teachers in secondary schools of Mizoram, focusing on their educational and professional qualifications, nature of appointment, and teaching experience across different school management types—Government, Deficit, Samagra, and purely Private. The study also examined the challenges faced by science teachers in conducting science practicals, such as syllabus load, practical timetable constraints, availability of laboratory equipment, financial issues, and subject expertise. The findings highlight significant disparities in qualifications, job security, and resources, particularly affecting Samagra and Private Schools. The study provides insights into the need for policy interventions to improve quality of science education in Mizoram.

Keywords: *Profile, Challenge, Science teachers and Secondary schools*

Background of the study

Science education encompasses the teaching and learning of science for individuals across various age groups, including children, college students, and the general public. As a core subject in schools, science integrates knowledge from disciplines such as Biology, Chemistry, Physics, and Earth Sciences, as well as Mathematics, Computational Sciences, and, where applicable, Social Science and Vocational Education.

The National Curriculum Framework (NCF, 2005) emphasizes that the objectives of secondary-level science education should include engaging students in learning science as a unified discipline, equipping them with hands-on skills to design

* Mr. H. T. Malsawmtluanga, Research Scholar, Department of Education, Mizoram University; Email: hmalsawm7@gmail.com; Ph: 9862528211
** Dr. Vanlalruatfela Hlondo, Assistant Professor, Department of Education, Mizoram University; Email: ruatfela87@gmail.com; Ph: 9862726091

advanced technological modules, and encouraging them to analyze issues related to the environment and health. These objectives highlight the need for a robust science education system that not only imparts theoretical knowledge but also fosters critical thinking, problem-solving, and innovation.

Secondary school science teachers' qualifications, employment status, and the challenges faced by them in conducting practical experiments are critical factors that influence the quality of science education. In Mizoram there are different school management types viz. Government, Deficit, Samagra, and Private Schools, each with distinct standards in terms of teacher recruitment, training, and infrastructure.

The effectiveness of science teaching in Mizoram is frequently hindered by inadequate resources, financial constraints, and shortage of qualified teachers. These challenges are particularly pronounced in rural and remote areas, where schools often lack well-equipped laboratories and up-to-date teaching-learning materials. Furthermore, the disparity in teacher training status across different school management types make the issue more prominent and may lead to uneven educational outcomes. An in-depth analysis of these factors is essential to identify gaps and propose intervention that can enhance the quality of science education in the state.

Review of related literature

Braund and Driver (2005) investigated students' perceptions of practical science in primary and secondary schools, focusing on progression and continuity in learning. The study highlighted the difficulties students faced during the transition from primary to secondary education, particularly in science. Findings revealed that a significant proportion of both primary and secondary students believed practical work positively contributed to their general learning in science.

Mijung Kim and Aik-Ling Tan (2011) explored the difficulties faced by elementary pre-service teachers in teaching inquiry-based practical work. The study examined teachers' decision-making processes and internal conflicts regarding their abilities and beliefs about science teaching. The study identified multiple challenges influencing pre-service teachers' practical work. These included time constraints, inadequate materials, curriculum demands, and pedagogical assumptions. The study emphasized the importance of understanding teachers' internal negotiations regarding the role of science education and practical work in classrooms and society.

Paywand Jalal (2019) investigated challenges faced by science teachers in implementing practical work. The study assessed the availability of laboratory facilities and science materials in basic schools while also evaluating the capability of

laboratory tools. Conducted in Kurdistan Region Government (KRG) basic schools, the study involved 250 science teachers who participated through a structured questionnaire. The study indicated that most schools lacked laboratory tools, and over half of the teachers faced difficulties due to inadequate access to laboratory aids and materials, absence of science training courses, and various governmental and practical constraints. Despite these challenges, teachers expressed a strong desire to integrate practical work into their teaching process. The study highlighted differences in teachers' opinions based on years of experience and underscored the need for improvements in laboratory facilities and training.

Sevinç Nihal Yeşiloğlu and Fitnat Köseoğlu (2020) examined epistemological problems underlying pre-service chemistry teachers' aims in using practical work in school science. The findings categorized participants' aims into six themes: providing learning through discovery, verifying scientific theory, making scientific theories concrete, developing students' scientific process skills, fostering an understanding of the nature of science, and enhancing curiosity and motivation toward science. The study discussed epistemological problems associated with these aims and recommended explicit integration of epistemology into science teaching approaches and practical work methodologies.

Arnejo et al. (2021) examined students' perceptions of science laboratory functionality in Zamboanga del Sur National High School. The study sought to determine whether students viewed functional science laboratories as advantageous or disadvantageous. Results indicated that students recognized the importance of functional laboratories, though they faced difficulties in physics, biology, and chemistry experiments. STEM students seldom used laboratories for experiments but acknowledged the benefits of functional labs, especially for those pursuing medical courses in college. The study concluded that STEM students found it challenging to learn specialized subjects without laboratory facilities.

Rationale of the study

A comprehensive understanding of the profile of science teachers and the obstacles they encounter in conducting practical activities is vital for enhancing the quality of science education in Mizoram. However, the efficacy of science education is frequently undermined by inequities in teacher qualifications, insufficient infrastructure, and financial limitations. This study aims to address these challenges by investigating disparities in the academic and professional qualifications of science teachers across various school management types. The study further seeks to explore employment status and the teaching experience of science teachers as these factors play a pivotal role in delivering quality instruction. The study also aims to explore the challenges faced by science teachers in conducting practical experiments.

Zohmingliani (2011), in her doctoral research, highlighted the absence of a clear policy for science education in Mizoram, as well as the lack of a robust monitoring mechanism, particularly for evaluating science practical work. She noted that the disproportionate emphasis on theory over practical work from high school to college levels is highly detrimental. In light of these issues, the researcher is interested to investigate the status of science teachers and the challenges they face in conducting science practicals. Consequently, the present study, titled "Analysis of the Profile of Science Teachers and Challenges in conducting Science Practical in Secondary Schools of Mizoram," was undertaken.

Statement of the problem

The statement of the problem is titled as "Analysis of the Profile of Science Teachers and Challenges in conducting Science Practical in Secondary Schools of Mizoram."

Operational terms used in the study

Science Teacher Profile: Science Teacher profile in the present study refers to the educational qualifications, professional training, nature of employment, and teaching experience.

Science Practicals: Hands-on experimental activities conducted in laboratories to enhance conceptual understanding. In the present study, science practical refers to the practicals conducted at secondary stage of education

Challenges : In the present study, challenges means problems and issues faced by science teachers in conducting science experiment.

Objectives of the study

1. To analyse the profile of teachers teaching science subject in the secondary schools of Mizoram.
2. To identify the challenges faced by science teachers in conducting science practical in Mizoram

Method of the study

The present study was carried out with the intention of analysing the profiles of secondary school science teachers in Mizoram\, as well as the challenges faced by them in conducting science practicals. Hence, the researcher has employed descriptive survey for the study.

Population and sample of the study

The population of the study consisted of all Secondary Schools and Science Teachers in Mizoram. Stratified random sampling technique was employed in the present study. A total of 100 Secondary schools were selected keeping in mind the type of management. All science teachers from the selected 100 schools formed the sample of the study.

Tools used for data collection: A questionnaire was developed to study the major challenges faced by science teachers was used to collect data.

Mode of data collection and data analysis: The investigator personally visited 100 schools and took permission from the concerned authorities to collect data. After getting approval, questionnaire was administered to the science teacher after which interviews were conducted.

Analysis and interpretation

Objective No. 1: *To analyse the profile of teachers teaching science subject in the secondary schools of Mizoram*

The Profile of teachers by types of school management is presented in table no. 1.

Table No. 1 : Profile of Science Teachers

		Type of School Management								Total (N=102)	
		Government (N=47) Total		Deficit (N=8)		Samagra (N=15)		Private (N=32)			
Educational qualification	M.Sc.	18	(38.3%)	7	(87.5%)	9	(60%)	13	(40.6%)	47	(46.1%)
	B.Sc.	29	(61.7%)	1	(12.5%)	6	(40%)	15	(46.9%)	51	(50.0%)
	B.E	0	(0.0%)	0	(0.0%)	0	(0.0%)	3	(9.4%)	3	(2.9%)
	Others	0	(0.0%)	0	(0.0%)	0	(0.0%)	1	(3.1%)	1	(1.0%)
Professional Qualification	M.Ed.	1	(2.1%)	0	(0.0%)	1	(6.7%)	0	(0.0%)	2	(2.0%)
	B.Ed.	46	(97.9%)	7	(87.5%)	14	(93.3%)	11	(34.4%)	78	(76.5%)
	D.El.Ed.	0	(0.0%)	1	(12.5%)	0	(0.0%)	1	(3.1%)	2	(2.0%)
	None	0	(0.0%)	0	(0.0%)	0	(0.0%)	20	(62.5%)	20	(19.6%)

Nature of appointment	Regular	45	(95.7%)	8	(100%)	0	(0.0%)	0	(0.0%)	53	(52%)
	Con-tract	2	(4.3%)	0	(0.0%)	0	(0.0%)	0	(0.0%)	2	(2%)
	CSS	0	(0.0%)	0	(0.0%)	15	(100%)	0	(0.0%)	15	(14.7%)
	Private	0	(0.0%)	0	(0.0%)	0	(0.0%)	32	(100%)	32	(31.4%)
Teaching experience	10 yrs and below	19	(40.4%)	4	(50%)	12	(80%)	28	(87.5%)	63	(61.8%)
	11 to 20 yrs	18	(38.3%)	3	(37.5%)	3	(20%)	4	(12.5%)	28	(27.5%)
	21 yrs and above	10	(21.3%)	1	(12.5%)	0	(0.0%)	0	(0.0%)	11	(10.8%)

As shown in Table No. 4.5, the majority of science teachers hold either an M.Sc. (46.1%) or B.Sc. (50%) degree. Government schools have a larger proportion of B.Sc. degree holders (61.7%), while Deficit Schools have a higher percentage of M.Sc. holders (87.5%). In Samagra Schools, 60% of science teachers have an M.Sc. degree, while 40% hold a B.Sc. degree. Private Schools showed a more balanced distribution, with 40.6% holding an M.Sc. and 46.9% holding a B.Sc. Additionally, a small percentage of science teachers in Private Schools (9.4%) hold a B.E. (Bachelor of Engineering) degree, which is absent in other school categories. Only 1% of science teachers belong to the "Others" category i.e. Bachelor in Arts, found only in Private Schools.

A B.Ed. (Bachelor of Education) qualification is the most common professional qualification, held by 76.5% of science teachers as per norms provided by NCTE Regulation 2014. Government (97.9%), Deficit (87.5%), and Samagra Schools (93.3%) have a high proportion of science teachers with a B.Ed., whereas in Private Schools, only 34.4% have B.Ed. degree, indicating a significant gap in professional training. Only 2% of science teachers hold an M.Ed. (Master of Education), suggesting a very low rate of higher professional qualifications among science teachers. A small percentage (2%) have D.El.Ed., found only in Deficit and Private Schools. Notably, 19.6% of science teachers in Private Schools have no professional teaching qualification. This suggests that Private Schools employ a higher number of unqualified science teachers compared to other types of management.

Majority of science teachers (52%) hold regular positions, mainly in Government (95.7%) and Deficit Schools (100%). However, in Samagra Schools, no science teachers have regular appointments, with 100% under CSS (Centrally Sponsored

Scheme) they are employed with co-terminus with the scheme. In Private Schools, all science teachers (100%) fall under private appointments. Only 2% of science teachers are on a contract basis, found exclusively in Government Aided schools.

Most science teachers have 10 years or less experience (61.8%), particularly in Private Schools (87.5%) and Samagra Schools (80%), suggesting a younger teaching workforce in these schools. Government Schools have a relatively balanced distribution, with 40.4% having less than 10 years of experience, 38.3% between 11-20 years, and 21.3% above 21 years. Deficit Schools show a similar trend, with a moderate number of science teachers (50%) in the early career stage. The number of highly experienced science teachers (21+ years) is quite low (10.8%) overall, with the highest percentage in Government Schools (21.3%). Private Schools have no science teachers with more than 21 years of experience, indicating high teacher turnover.

Objective No. 2: *Challenges faced by science teachers in execution of science practicals in Mizoram*

Table No. 2 : Problems of Science Teachers

Problems	Yes/ No	Govt. School (N=47)	Deficit School (N=8)	Samagra School (N=15)	Private School (N=32)	TOTAL (N=102)
Issues related to syllabus load	YES	8 (17%)	1 (12.5%)	3 (20%)	3 (9.4%)	15 (14.7%)
	NO	39 (83%)	7 (87.5%)	12 (80%)	29 (90.6%)	87 (85.3%)
Practical time allotment in the Time table	YES	34 (72.3%)	5 (62.5%)	12 (80%)	19 (59.4%)	70 (68.6%)
	NO	13 (27.7%)	3 (37.5%)	3 (20%)	13 (40.6%)	32 (31.4%)
Problems related to practical equipment	YES	35 (74.5%)	3 (37.5%)	15 (100%)	25 (78.1%)	78 (76.5)
	NO	12 (25.5%)	5 (62.5%)	0 (0%)	7 (21.9%)	24 (23.5%)
Issues related to practical examination	YES	7 (14.9%)	1 (12.5%)	3 (20%)	8 (25%)	19 (18.6%)
	NO	40 (85.1%)	7 (87.5%)	12 (80%)	24 (75%)	83 (81.4%)

Issues related to subject expertise	YES	3 (6.4%)	0 (0%)	0 (0%)	8 (25%)	11 (10.8%)
	NO	44 (93.6%)	8 (100%)	15 (100%)	24 (75%)	91 (89.2%)
Issues related to finance	YES	34 (72.3%)	4 (50%)	13 (86.7%)	15 (46.9%)	66 (64.7%)
	NO	13 (27.7%)	4 (50%)	2 (13.3%)	17 (53.1%)	36 (35.3%)
Problems related to laboratory	YES	18 (38.3%)	3 (37.5%)	11 (73.3%)	20 (62.5%)	52 (51%)
	NO	29 (61.7%)	5 (62.5%)	4 (26.7%)	12 (37.5%)	50 (49%)

The above table no. 2 presents the challenges faced by science teachers in issues related to syllabus load, time table, availability of equipment, examinations, subject expertise, financial problems, and laboratory across the different school types.

One of the least significant problems reported by science teachers is syllabus load. Only 14.7% of science teachers across all school types found it challenging. Among them, Samagra School science teachers reported the highest difficulty (20%), followed by Government Schools (17%), Deficit Schools (12.5%), and Private Schools (9.4%). This suggests that the syllabus is generally manageable for most science teachers.

Issues concerning allotment of time for practical in the time table are widespread, with 68.6% of science teachers facing difficulties in scheduling?. The problem is most prevalent in Samagra Schools (80%), Government Schools (72.3%), Deficit Schools (62.5%), and Private Schools (59.4%).

The availability of practical equipment is another significant challenge, with 76.5% of science teachers reporting issues. Samagra Schools are the most affected, with all science teachers (100%) from Samagra school appealed a lack of adequate equipment. Private Schools (78.1%) and Government Schools (74.5%) also face serious shortages, while Deficit Schools experience relatively fewer problems (37.5%).

The issues regarding practical examinations are reported by only 18.6% of science teachers. The issue is most prominent in Private Schools (25%), followed by Samagra Schools (20%), Government Schools (14.9%), and Deficit Schools (12.5%). The majority of science teachers do not find practical examinations particularly problematic.

Concerns related to subject expertise are the least reported, with only 10.8% of science teachers facing issues. Private Schools have the highest complaints in connection with subject expertise (25%), while no science teachers from Deficit or Samagra Schools expressed concerns. This suggests that, overall, science teachers in most schools are adequately qualified to handle practical subjects.

Issues related to financial problems are significant concerns, affecting 64.7% of science teachers. The highest percentage of financial difficulties is reported in Samagra Schools (86.7%), followed by Government Schools (72.3%), Deficit Schools (50%), and Private Schools (46.9%). The data indicates that financial constraints are a major barrier, particularly for purchasing required practical equipment in Government and Non-government schools

Lastly, laboratory problems are reported by 51% of science teachers, with Samagra Schools experiencing the highest percentage (73.3%), followed by Private Schools (62.5%), Government Schools (38.3%), and Deficit Schools (37.5%). This suggests that many schools lack proper laboratory infrastructure and resources, which can hinder students' learning experiences in science subject.

Findings and discussions

Findings in relation to Secondary Schools Science Teacher's Profile in Mizoram

Educational Qualification: Most science teachers in government and deficit schools hold B.Sc. or M.Sc. degrees. Private schools, however, have a more diverse teaching workforce, including a small percentage of B.E. and other degree holders.

Professional Qualification: Government and deficit schools employed a high percentage of B.Ed.-qualified teachers, while private schools have a significant proportion of unqualified science teachers (19.6%).

Nature of Appointment: Regular appointments are predominant in government and deficit schools, whereas Samagra schools fully rely on CSS funded employees, and private schools operate solely with privately appointed teachers.

Teaching Experience: Government schools have a balanced mix of experienced and early-career science teachers. In contrast, private and Samagra schools primarily employ young teachers with high turnover rates.

Discussions

The study highlighted significant disparities in the qualifications and experience of science teachers across Mizoram's school types. Government and deficit schools employ teachers with higher professional qualifications, such as B.Ed. degrees, while

private schools often rely on unqualified teachers. This raises concerns about the quality of science education in private institutions, echoing findings by Childs and McNicholl (2007), who noted that teachers lacking pedagogical knowledge struggle to deliver effective lessons. Additionally, government and deficit schools offer more stable teaching positions, whereas Samagra and private schools depend on contractual or temporary staff, leading to high turnover rates. Research by Salvan and Hambre (2020) suggests that teacher stability is crucial for consistent student outcomes, emphasizing the need for addressing these disparities.

Findings in relation to Challenges faced by Science Teachers in Mizoram

Science teachers across all school types faced challenges, including a lack of practical equipment and financial constraints. Issues related to laboratory facilities and scheduling practical classes are particularly prevalent in government and Samagra schools. However, concerns regarding subject expertise and syllabus load were relatively minor. The findings emphasized the need for better resource allocation, improved scheduling, and increased financial support to enhance the quality of science practical education.

Discussions

A key challenge is the lack of practical equipment and financial constraints, particularly in government and Samagra schools. Inadequate laboratory resources and difficulties in scheduling practical classes hinder hands-on learning, aligning with Braund and Driver (2005), who emphasized the importance of practical work in enhancing students' understanding of scientific concepts. Financial constraints, limited materials, and large class sizes further intensify these issues, as noted by Malathi and Rohini (2017) and Jalal (2019). While Mizoram's teachers revealed sufficient subject knowledge, infrastructure deficiencies limit their ability to conduct effective practical sessions. The study emphasizes the need for improved resource allocation, better scheduling, and increased financial support for practical science education. Arnejo et al. (2021) highlighted the benefits of well-equipped laboratories, reinforcing the necessity for functional labs in Mizoram's schools. Policymakers should prioritize investments in laboratory infrastructure, provide professional development for teachers, and ensure equitable resource distribution across school types.

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ICT for Teaching Science at Secondary Level of Education: Problems and Prospect based on Review on Literature

Elcy S. Lalropeki*
Lynda Zohmingliani**

Abstract

Information and Communication Technology (ICT) is an important tool in everyday life with the uprising technological world. Education has also integrated ICT to a great extent in its world. The use of ICT in schools and colleges has become one of the criteria for assessment. The present article is a summary of several reviews of literatures all connected with the integration of ICT in education. The integration of Information and Communication Technology (ICT) in science education at the secondary level in Mizoram presents significant opportunities but also faces notable challenges. The findings mainly showed that the integration of ICT in science education in Mizoram faces challenges like inadequate infrastructure, poor funding, teacher training gaps, power issues, and resistance to change. However, ICT offers prospects such as enhanced learning, access to resources, inquiry-based learning, and bridging urban-rural gaps. Addressing these challenges and leveraging ICT's potential can transform education and prepare students for the digital age.

Key words: *ICT, Secondary school, Mizoram, problems, prospects*

Introduction

With the rapid emergence of technology, the integration of Information and Communication Technology (ICT) as a means of learning has become increasingly essential across all levels of education. Recognizing this need, the Ministry of Human Resource Development (MHRD) introduced the ICT @ School scheme, aimed at modernizing education through the adoption of digital tools and resources. In Mizoram, this initiative has had a significant impact, fostering the use of ICT as a

*Elcy S. Lalropeki, Research Scholar; Department of Education, Mizoram University;
Email: elcypeki@gmail.com Ph: 9402189398
**Prof. Lynda Zohmingliani, Professor, Department of Education, Mizoram University;
Email: lynda.zohmingliani@gmail.com; Ph: 9436145408

mode of learning even in a state where traditional teaching methods have long been dominant. Since its inception in the financial year 2005-06, the ICT @ School scheme has been implemented in all 348 approved schools in Mizoram by the financial year 2017-18, reflecting the state's commitment to embracing technological advancements in education. This widespread implementation has enabled schools to integrate digital tools such as computers, projectors, and internet-based resources into their teaching and learning processes, enhancing the overall educational experience. The government has taken proactive measures at various levels to promote ICT usage, including providing infrastructure, training teachers, and developing digital content aligned with the curriculum. These efforts have not only improved access to quality educational resources but have also made learning more interactive and engaging for students. Teachers, equipped with ICT skills, are now better able to explain complex concepts through multimedia and simulations, while students benefit from personalized and self-paced learning opportunities. However, challenges such as ensuring consistent internet connectivity, addressing the digital divide, and sustaining teacher training programs remain. Despite these hurdles, the successful implementation of the ICT @ School scheme in Mizoram demonstrates the state's potential to leverage technology for educational advancement. By continuing to invest in infrastructure, teacher development, and community engagement, Mizoram can further strengthen its education system, ensuring that students are well-prepared to thrive in a technology-driven world. The ICT @ School Scheme serves as a testament to the transformative power of technology in education, paving the way for a more inclusive and innovative learning environment.

Science is a compulsory subject at the secondary school level, encompassing both theoretical knowledge and practical applications. It is a discipline rooted in facts, figures, and complex concepts, making it inherently challenging for students to grasp. Subjects like science and mathematics require special emphasis due to their intricate terminologies and abstract ideas, which often pose difficulties for learners. Despite concerted efforts by the government to improv e science education through initiatives like curriculum reforms, teacher training, and the integration of ICT, several challenges persist. At the infrastructure level, many schools lack well-equipped laboratories and resources for practical experiments, limiting hands-on learning. At the teacher level, inadequate training and reliance on traditional teaching methods hinder effective delivery of scientific concepts. Additionally, students often struggle with understanding complex theories and applying them in real-world contexts. Socio-economic disparities further exacerbate these issues, as students from underprivileged backgrounds may lack access to quality educational resources. Addressing these challenges requires a multi-faceted approach, including investment in infra-

structure, continuous teacher development, and innovative teaching methodologies to make science education more engaging and accessible for all students

Experimental studies on the use of Information and Communication Technology (ICT) in science education have consistently demonstrated its positive impact on learning outcomes. Ziden et al. (2012) conducted a study comparing ICT-based teaching with traditional methods and found that students taught using ICT tools achieved significantly higher academic performance. Their research also revealed a gender-based difference, with male students scoring higher than female students in ICT-enabled learning environments. This finding suggests the need for further exploration into gender dynamics and tailored approaches to ensure equitable learning opportunities. Similarly, Sharma and Sharma (2017) highlighted that ICT implementation not only enhances students' interest but also increases teachers' enthusiasm for delivering science education. Their study emphasized that ICT makes learning more interactive and engaging, helping students grasp complex scientific concepts more effectively. However, both students and teachers agreed that successful ICT integration requires careful planning, effort, and preparation. Teachers need adequate training to use ICT tools effectively, while students must be guided to adapt to digital learning platforms. These studies collectively underscore the transformative potential of ICT in science education, particularly in making learning more dynamic and accessible. However, challenges such as gender disparities, teacher preparedness, and the need for structured implementation strategies must be addressed to maximize the benefits of ICT. By overcoming these hurdles, ICT can play a pivotal role in creating an inclusive and innovative science education system

Problems Encountered for Teaching Science at the Secondary Level Using ICT in Mizoram based on Literature review

The deployment of Information and Communication Technology (ICT) in teaching has been globally acknowledged as a revolutionary tool for improving teaching and learning. However, in Mizoram, a state in Northeast India, the use of ICT in secondary-level science education faces numerous challenges. These challenges are deeply rooted in infrastructural, economic, socio-cultural, and pedagogical issues. This literature review examines the problems encountered in implementing ICT-based science education in Mizoram, drawing on existing research and studies.

Lack of Infrastructure

One of the major hindrances to the effective use of ICT in science teaching is the lack of adequate infrastructure. Research indicates that most schools in Mizoram, especially in rural areas, lack basic ICT tools such as computers, projectors, smart

boards, and reliable internet connections (Lallianthanga, 2019). Even in schools where ICT tools are available, they are often outdated or insufficient in number to cater to the entire student population. The digital divide between urban and rural schools in India is significant, with rural schools lagging far behind in terms of ICT infrastructure, as highlighted in a report by the National Council of Educational Research and Training (NCERT, 2020).

Poor Funding and Resource Allocation

Financial constraints are another substantial barrier to the adoption of ICT in science education. Schools in Mizoram often operate on limited budgets, which are inadequate for purchasing and maintaining ICT equipment (Ralte, 2021). The high costs of computers, software, and internet connectivity further exacerbate the problem. Additionally, there is a lack of funding for teacher training programs, which are essential for the effective use of ICT in classrooms. A study by Chakraborty and Mondal (2018) highlights that inadequate financial support from the government and private sectors is a significant obstacle to ICT integration in education, particularly in economically disadvantaged regions like Mizoram.

Inadequate Teacher Training

The successful integration of ICT into science education largely depends on the competence of teachers. However, many teachers in Mizoram lack the necessary skills and training to effectively use ICT tools (Lalrinawma, 2020). Research shows a shortage of professional development programs focused on ICT integration in teaching. As a result, even when ICT tools are available, teachers may not know how to use them to enhance science education. UNESCO (2017) emphasizes that teacher training is a critical factor in the successful implementation of ICT in education, and the lack of such training in Mizoram limits the potential of ICT to transform teaching and learning.

Power Supply Issues

Frequent power outages and unreliable electricity supply are common problems in Mizoram, particularly in rural areas (Zothansanga, 2019). Since ICT tools rely heavily on electricity, these disruptions make it difficult to conduct consistent ICT-based lessons. Power shortages not only interrupt teaching but also damage electronic equipment over time, increasing maintenance costs and reducing the lifespan of ICT tools. A report by the Ministry of Power, Government of India (2021), highlights that states in Northeast India, including Mizoram, face significant challenges in ensuring uninterrupted power supply, which directly impacts the use of ICT in education.

Digital Divide

The digital divide, or the gap between those who have access to ICT and those who do not, is a significant issue in Mizoram. This divide is evident not only between urban and rural areas but also among different socio-economic groups within the state (Lalthanzara, 2020). Students from economically disadvantaged backgrounds often lack access to digital devices and the internet at home, putting them at a disadvantage compared to their peers. This inequality in access to ICT resources creates unequal learning opportunities and undermines the goal of using ICT to promote inclusive education.

Resistance to Change

Traditional teaching methods are deeply entrenched in the education system in Mizoram, and there is often resistance to change among teachers and administrators (Ramliana, 2018). Many educators are accustomed to conventional teaching methods and are hesitant to adopt ICT-based approaches. This resistance is often fueled by a lack of awareness about the benefits of ICT in education and a fear of the unknown. A study by Bhattacharjee and Deb (2016) found that resistance to change is a common barrier to ICT integration in education, particularly in regions where traditional teaching methods have been the norm for decades.

Language Barriers

The availability of ICT resources in local languages is limited, which poses a challenge for both teachers and students in Mizoram (Lalhmachhuana, 2021). Most ICT tools and digital content are available in English or Hindi, which may not be the first language for many students in Mizoram. This language barrier hinders effective communication and understanding, making it difficult for students to fully benefit from ICT-based science education.

Maintenance Challenges

The maintenance of ICT equipment is another significant challenge in Mizoram. Many schools lack the technical expertise and resources to repair and maintain ICT tools, leading to frequent breakdowns and prolonged periods of inactivity (Lalrinmawia, 2020). A study by Sharma and Sharma (2019) highlights that the lack of technical support is a major barrier to the sustained use of ICT in education, particularly in remote and rural areas.

The integration of ICT into science education at the secondary level in Mizoram faces numerous challenges, including a lack of infrastructure, poor funding, inade-

quate teacher training, power supply issues, the digital divide, resistance to change, language barriers, and maintenance challenges. Addressing these issues requires a multi-faceted approach, involving increased investment in ICT infrastructure, comprehensive teacher training programs, and policies aimed at bridging the digital divide. By overcoming these obstacles, Mizoram can harness the potential of ICT to transform science education and provide students with the skills and knowledge they need to thrive in the 21st century.

Prospects of ICT for teaching science at secondary level of education in mizoram

The application of Information and Communication Technology (ICT) in education has the potential to transform science teaching and learning. At the secondary school level in Mizoram, the implementation of ICT in science education offers numerous possibilities to improve the quality of education, bridge learning disparities, and equip students for the challenges of the 21st century. This review of literature discusses the potential of ICT in secondary school science teaching in Mizoram, based on available research and studies.

Improved Teaching and Learning Experiences

ICT tools such as multimedia presentations, simulations, and virtual laboratories can enhance the learning of science by making it more interactive and engaging. As pointed out by Lalrinawma (2020), ICT can be used to visualize intricate scientific concepts, making them easier to grasp. For example, animations and videos can demonstrate biological processes, chemical reactions, and physical phenomena that are difficult to illustrate through conventional teaching methods. This interactive approach fosters a deeper understanding of scientific principles and enhances student achievement.

Access to Quality Educational Resources

ICT provides access to a plethora of digital resources, including e-books, online journals, and educational videos, which can complement conventional textbooks. In Mizoram, where access to quality educational materials is often limited, ICT can bridge this gap by exposing students and teachers to updated and relevant content (Lallianthanga, 2019). Platforms such as the National Digital Library of India (NDLI) and SWAYAM offer free access to high-quality educational content, enabling students in rural areas to learn at their own pace.

Encouragement of Inquiry-Based Learning

ICT tools such as virtual labs and simulation software allow students to experiment and investigate scientific principles in a safe and controlled environment. This facilitates inquiry-based learning, where students can hypothesize, test, and draw conclusions independently. According to Chakraborty and Mondal (2018), ICT-based inquiry learning enhances critical thinking, problem-solving skills, and scientific curiosity, which are essential for success in science education.

Bridging the Urban-Rural Divide

One of the greatest opportunities of ICT is its ability to narrow the educational gap between urban and rural communities. In Mizoram, where rural schools often lack access to qualified science teachers and laboratory facilities, ICT can provide virtual access to expert instructors and online lab experiments (Lalthanzara, 2020). This ensures that students in remote areas receive the same quality of education as their urban counterparts, promoting educational equity.

Teacher Professional Development

ICT offers avenues for the professional development of teachers through online training courses, webinars, and workshops. Teachers in Mizoram can enhance their pedagogical skills and learn to integrate ICT into their teaching practices. As emphasized by UNESCO (2017), well-trained teachers are essential for the effective use of ICT in education. By equipping teachers with the necessary skills, ICT can revolutionize science education in Mizoram.

Personalized Learning

ICT facilitates personalized learning, enabling students to learn at their own pace and according to their individual needs. Adaptive learning platforms and web-based assessments can identify students' strengths and weaknesses, allowing teachers to tailor their instruction accordingly (Ralte, 2021). This personalized approach helps students overcome learning challenges and achieve improved academic performance.

Preparation for the Digital Age

Integrating ICT into science education prepares students for the digital age by equipping them with essential digital literacy skills. In a world increasingly driven by technology, proficiency in using digital tools is critical for future employment and higher education (Bhattacharjee & Deb, 2016). By incorporating ICT into science education, Mizoram can ensure that its students are well-prepared for the challenges of the 21st century.

Cost-Effective Solutions

While the initial investment in ICT infrastructure may be high, ICT offers cost-effective solutions in the long run. Digital resources can be reused and shared, reducing the need for physical textbooks and laboratory equipment (Sharma & Sharma, 2019). Additionally, online platforms can minimize the costs associated with teacher training and professional development.

Research Gap

The research findings clearly revealed that most of the studies on ICT has been focusing on resources, teachers and students, but hardly any study was conducted on actual teaching experience and the impact of ICT on this aspect of education. This was a serious research gap and needs to be filled so that education may have more research findings for reference in order to improve and develop.

In light of the research findings and identified gaps, there is an urgent need for studies that focus on the actual teaching experiences and the effect of ICT on classroom practices. While existing research emphasizes resources, teachers, and students, the practical application of ICT in teaching remains underexplored. Understanding how ICT transforms teaching methods, enhances classroom interactions, and addresses pedagogical challenges is crucial. Such research will provide actionable insights to optimize ICT integration and improve educational outcomes in diverse contexts.

Challenges and the Way Forward

Despite its numerous prospects, the integration of ICT in science education in Mizoram faces challenges such as inadequate infrastructure, poor funding, and resistance to change. Addressing these challenges requires a multi-faceted approach, including increased investment in ICT infrastructure, comprehensive teacher training programs, and policies aimed at bridging the digital divide. Collaboration between the government, private sector, and educational institutions is essential to harness the full potential of ICT in science education

The integration of Information and Communication Technology (ICT) in science education in Mizoram offers significant prospects but also faces notable challenges. Mizoram, with one of the highest literacy rates in India, has the potential to revolutionize its education system by embracing ICT, particularly in science education. However, the dominance of traditional teaching methods poses a barrier to this transformation. To fully harness the benefits of ICT, stakeholders and authorities must address the challenges at three critical levels: infrastructure, teacher readiness, and student accessibility. To overcome these challenges, stakeholders must invest in

building robust ICT infrastructure, particularly in underserved areas. Teacher training programs should be prioritized to equip educators with the skills to integrate ICT into their teaching. Additionally, the curriculum should be revised to include ICT-based learning modules. Public-private partnerships and community engagement can also play a crucial role in bridging gaps and fostering a supportive environment for ICT integration. In conclusion, while ICT holds immense potential to enhance science education in Mizoram, addressing the challenges at the infrastructure, teacher, and student levels is essential. A collaborative effort from all stakeholders can pave the way for a modern, effective, and inclusive education system.

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Levels of Adjustment of Institutionalized and Non-Institutionalized Middle School Children in Mizoram

C. Chalthanmawii*
Dr. Kabita Kumari**

Abstract

Adjustment is adjusting to a changing circumstance in every given situation. It significantly impacts children's overall development, including academic success, social skills, relationships, and emotional health. The capacity of children to adapt is essential for enhancing their problem-solving abilities, refining their emotional regulation, and enabling them to effectively manage academic and social challenges. This study examines the adjustment levels of institutionalized and non-institutionalized middle school children across educational, social, and emotional domains in Mizoram. The study comprised 100 middle school students (50 institutionalized and 50 non-institutionalized) from five middle schools. A purposive sampling technique was employed to select institutionalized middle school children, while a random sampling technique was utilized for non-institutionalized children. Data were collected using an Adjustment Scale developed by the investigator and analyzed using descriptive and inferential statistics. The findings revealed a significant difference in the educational and emotional dimensions between the two groups. However, no significant difference was found in the social adjustment of institutionalized and non-institutionalized children.

Keywords: *Adjustment, Institutionalized children, non-institutionalized children*

Introduction

Adjustment is an individual's ability to adapt to various situations and environments. It is considered an essential skill and process for an individual's general well-being since maladjustment often leads to conflicts and psychological distress.

*C. Chalthanmawii, Research Scholar, Department of Education, Mizoram University,
Ph: 9862533215, Email: mamoitei@champhaicollege.edu.in
**Dr. Kabita Kumari, Assistant Professor, Department of education, Mizoram University,
Ph: 8106438098, Email: kabita5march@gmail.com

According to Good (1959), "adjustment is the process of finding and adopting modes of behaviour suitable to the environment or the changes in the environment." It is the maintenance of a harmonious relationship between humans and their environment; an individual needs to change or modify themselves in some way or another to fit into or accommodate themselves with their environment (Gates & Jersil cited in Mangal, S.K. 2008, p.490). Thus, adjustment is the ability to adapt to various situations and changes and to maintain a harmonious relationship between an individual and their environment.

The adjustment process begins as early as infancy and is lifelong. However, adolescents require the attention, care, and warmth of the people around them to adjust well to their changing environment and master this important behavioural process. Early adolescence, encompassing middle school years (ages 11–15), is a critical and transformative period in human development. This stage, often referred to as a time of "storm and stress," is marked by significant physical, social, emotional, and cognitive changes. These changes can create psychological discomfort as adolescents struggle to navigate their evolving roles and identities. During this stage, the adolescent may appear to be more of a problem to themselves than others due to confusion and maladjustment. The importance of an appropriate environment to ensure healthy adjustment during this period cannot be overstated.

Among the various environments that influence an adolescent's life—such as school, peer groups, and the broader community, the family environment is considered the most important environment for the child to be brought up. Family is an effective institution that guides children in their development, socialization and integration (Yavuzer, 2001, cited in Upreti & Sharma, 2018)). This lays the foundation for an adolescent's emotional and social well-being. A warm and understanding family provides adolescents with a sense of security and belonging, helping them feel valued and supported as they navigate the complexities of their developmental changes.

Institutionalization and Children's Adjustment

One of the primary needs and rights of a child is to receive care, comfort, and nurturing from parents and close relatives. Children are biologically predisposed to seek care and safety from their caregivers. This not only helps in developing a sense of security among children but also ensures their psychological well-being as they grow up. However, not all children are raised in a comfortable environment within their families and homes. Many children find themselves in institutional care for various reasonssuch as families facing extreme poverty, social stigma, or the inability to provide for their child's basic needs. The institutionalization of children has adverse repercussions on their overall physical, cognitive, emotional and psychological well-

being. Institutionalized children- children raised in different alternate care homes such as orphanages and shelter homes are considered a highly disadvantaged group of society. Early separation from families deprives them of one or more necessities of life. Early separation from parents disrupts normal socio-emotional development.

Review of Related Studies

Many studies have pointed out how institutionalized children struggle with adjustment compared to their peers who are raised in a caring family environment.

Chopra and Kalita (2006) conducted a study on "Adjustment problems of elementary school children of single-parental and intact-parent families" and found that 'the emotional, social, and educational adjustments of elementary school children of single parents have exhibited more problems compared to those from intact families, affecting their development'. The challenges they encountered were comparable to institutionalized children, who lacked the stability and emotional security found in a two-parent environment. The lack of a stable environment affected the development of both groups and hindered their adjustment.

Seggane et al. (2007) carried out a comparative study of the "Behavioural and emotional disorders of primary school-going orphans and non-orphans in Uganda". They found that 'school-going orphans reported more dissatisfaction with life and more psychosocial difficulties than non-orphans'. Orphans were found to be emotionally needy, insecure, and materially deprived. They suffer from emotional instability, depending on support from their guardians. Without it, they face difficulties coping with life challenges.

Hunshal and Gaonka (2008), in their study, "Adjustment of institutionalized children," found that most institutionalized children demonstrated unsatisfactory levels of social, emotional, and educational adjustment. The lack of a stable family environment plays a key role in emotional well-being and academic achievements, as few institutionalized children showed good adjustment. These children struggle to build secure relationships (with peers or caregivers), affecting their general adjustment.

Verma and Kumari (2016) conducted a study on "Academic Achievement of Children at the Elementary Stage in Relation to Their Adjustment" and found a significant relationship between a child's adjustment and academic achievement. Those with poor social, emotional, and educational adjustment generally perform worse academically. This highlights the fact that institutionalized children face educational and emotional challenges due to the lack of individualized attention provided in the family environment.

Sousa et al. (2023) made a study of "Academic Performance in Institutionalized and Non-Institutionalized Children: The Role of Cognitive Ability and Negative Lability" and found no significant difference in academic achievement, emotion regulation, and negative lability between institutionalized and non-institutionalized children. The findings suggest that institutionalized children should also receive high-quality, standardized care and emotional support comparable to family-raised children.

Rationale of the Study

This present study aimed to examine how institutionalized children, without the care of their family, cope with their circumstances and adjust to their environment. It also seeks to compare their educational, social, and emotional adjustment with non-institutionalized children who have grown up in a loving family setting. The present study also assessed whether institutional care can adequately fulfil the developmental needs of adolescents, foster their educational, social, and emotional well-being, and prepare them for a successful transition into adulthood. Understanding these areas will be helpful for informing policies, improving institutional care systems, and ensuring that all children will be given the opportunity to go through adolescence optimally, irrespective of their background.

Objectives of the Study

1. To determine the adjustment levels of institutionalized and non-institutionalized middle school children.
2. To compare the adjustment levels of institutionalized and non-institutionalized middle school children in Mizoram with regard to their educational, social and emotional adjustment.

Hypothesis

There is a significant difference in the educational, social and emotional adjustment of institutionalized and non-institutionalized middle school children in Mizoram.

Methodology of the study

The study employed a descriptive survey method to examine the adjustment levels of middle school students in both institutionalized and non-institutionalized environments and compare their adjustment levels within the educational, social, and emotional domains.

Population and Sample

The study population comprised all middle school children in Mizoram. The sample consisted of 100 middle school children, of whom 50 were institutionalized children selected using a purposive sampling technique, and 50 were non-institutionalized children selected through a simple random sampling method.

Tools used for data collection

An adjustment scale for middle school children developed by the investigator was used to collect the data. The scale consists of 40 items. Each item was provided with three alternatives (always, sometimes, and never). High scores indicate a high level of adjustment, and low scores indicate a low level of adjustment.

Statistical techniques used for data analysis

Descriptive statistics such as mean, standard deviation and percentage and inferential and statistics such as t-tests were used for data analysis.

Analysis and Interpretation of Data

Objective No.1: *To determine the adjustment levels of institutionalized and non-institutionalized middle school children.*

Table-1

Levels of Adjustment of Institutionalized and Non-institutionalized Middle School Children

Dimensions	Category	No of Institutionalized Children	%	No. of non-institutionalized children	%
Educational Adjustment	High	31	62%	37	74%
	Average	15	30%	13	26%
	Low	4	8%	0	0
	Total(N)	50		50	
Social Adjustment	High	36	72%	42	84%
	Average	13	26%	8	16%
	Low	1	2%	0	0
	Total(N)	50		50	

Emotional Adjustment	High	30	60%	43	86%
	Average	16	32%	7	14%
	Low	4	8%	0	0
	Total(N)	50		50	

Table 1 presents the adjustment levels in the three domains among institutionalized and non-institutionalized middle school children: educational, social, and emotional domains. Among the institutionalized children, 62% demonstrated high educational adjustment, 30% demonstrated an average, and 8% had low educational adjustment. Furthermore, 74% non-institutionalized children demonstrated high levels of educational adjustment, while 26% were in the average category.

Concerning social adjustment, the results indicated that 72% institutionalized children had a high social adjustment, 26% had an average social adjustment, and 2% child had a low social adjustment. On the contrary, 84% non-institutionalized children had high levels of social adjustment, 8 had average levels, and none had low levels.

In the emotional adjustment category, the table showed that 60% institutionalized children were found in the high adjustment level, with 32% in the average and 8% in the low adjustment category. Children in the non-institutionalized environment showed 86% in the high emotional adjustment category, 14% on average, and no children were found in the low emotional category.

Objective No. 2: *To compare the adjustment levels of institutionalized and non-institutionalized middle school children in Mizoram with regard to their educational, social and emotional adjustment.*

Table-2

Comparison of Educational Adjustment of Institutionalized and Non-institutionalized Middle School Children

Category of Respondents	No. of Respondents	Mean (M)	Standard Deviation (SD)	t-value	Significance at 0.05 level (p-value)
Institutionalized	50	33.98	4.461	3.89	Significant (S)
Non-institutionalized	50	36.87	2.777		

The data in Table 2 highlight the differences in educational adjustment between institutionalized and non-institutionalized children. The mean score of educational adjustment for institutionalized children was 33.98, with a standard deviation of 4.461, whereas non-institutionalized children had a higher mean score of 36.87, with a standard deviation of 2.777. A t-value of 3.89 indicates a statistically significant difference at the level of 0.05 (with a p-value of less 0.05). Therefore, the hypothesis "There will be a significant difference in the educational adjustment of institutionalized and non-institutionalized middle school children" was accepted. This suggests that institutionalized children experience significantly different levels of educational adjustment than their non-institutionalized counterparts.

Table-3

Comparison of Social Adjustment of Institutionalized and Non-institutionalized Middle School Children.

Category of Respondents	No. of Respondents	Mean (M)	Standard Deviation (SD)	t-value	Significance at 0.05 level (p-value)
Institutionalized	50	28.40	4.342	1.41	Not significant (NS)
Non-institutionalized	50	29.44	2.865		

Table 3 presents the differences in social adjustment between institutionalized and non-institutionalized children. The mean score of social adjustment for institutionalized children was 28.40, with a standard deviation of 4.342. In contrast, non-institutionalized children had a slightly higher mean score of 29.44, with a standard deviation of 2. 865. The computed t-value of 1.41 does not reach statistical significance at 0.05 level, indicating no significant difference in social adjustment between institutionalized and non-institutionalized children. Thus, the hypothesis "There will be a significant difference in the social adjustment of institutionalized and non-institutionalized middle school children" was rejected.

Table-4

Comparison of Emotional adjustment of institutionalized and non-institutionalized middle school children.

Category of Respondents	No. of Respondents	Mean (M)	Standard Deviation (SD)	t-value	Significance at 0.05 level (p-value)
Institutionalized	50	24.87	2.472	3.84	Significant (S)
Non-institutionalized	50	26.66	2.182		

Table 4 presents the differences in emotional adjustment between institutionalized and non-institutionalized middle school children. The mean emotional adjustment score for institutionalized children was 24.87, with a standard deviation of 2.472, whereas non-institutionalized children had a higher mean score of 26.66, with a standard deviation of 2.182. The t-value of 3.84 is statistically significant at 0.05, indicating a significant difference in emotional adjustment between the two groups. Therefore, the hypothesis "There will be a significant difference in the emotional adjustment of institutionalized and non-institutionalized middle school children" was accepted. This suggests that institutionalized children experience lower emotional adjustment than their non-institutionalized peers.

Discussions

1. The findings indicate that children raised in institutional care settings encounter greater challenges adjusting to the educational environment than those in family settings. Statistically significant differences were found between the two groups, and these findings were also aligned with those of Sousa et al. (2023) and Kaur and Chawla (2018). Children exhibit better academic adjustment in the family environment due to personalized attention, emotional support, and parental involvement, which are crucial for their educational success. Conversely, although institutionalized children may achieve some level of educational adjustment inconsistently, some experience significant difficulties, particularly in terms of poor educational adjustment. This could be attributed to the lack of individualized care in institutional settings, leading to more children falling into the low level of educational adjustment. This study emphasized the importance of a supportive environment for academic success and suggested that institutionalized children could benefit from more personalized care.

2. The findings of this study revealed that non-institutionalized children exhibited better social adjustment than institutionalized children; however, statistical analysis revealed no significant difference between the two groups. This suggests that institutional care does not substantially hinder social adjustment, challenging the belief that institutionalize children would experience greater social adjustment issues. The structured routine, organized activities, and peer interactions present in institutional settings may contribute to the development of social skills, even in the absence of informal socialization in the family environment. These findings are consistent with those of Padmaja et al. (2013) and Yeow et al. (2011), who also reported no significant differences in the social adjustment of children raised in institutional environments compared with those raised in family-based environments.
3. Non-institutionalized children exhibit better emotional adjustment than institutionalized children. Specifically, non-institutionalized children demonstrated significantly higher levels of emotional adjustment, as evidenced by the statistically significant difference. These results corroborate those of previous research by Ford et al. (2007) and Erol et al. (2010), which suggests that institutionalized children are more prone to experiencing emotional difficulties. The results of the present study confirmed that emotional development occurs within a stable environment, typically found in a family-based environment, where children receive consistent emotional support. Conversely, institutionalized children may encounter emotional challenges because of the uncertainty of emotional support.

Conclusions

This study provides valuable insights into the impact of institutional care on children's educational, social, and emotional adjustment. The findings revealed significant differences in educational and emotional adjustment between institutionalized and non-institutionalized children, with those in family settings demonstrating better outcomes. However, social adjustment showed no statistically significant differences between the two groups. These results highlight the complex relationship between various factors that influence child development in different care environments. While institutional care may present challenges in certain aspects of adjustment, it also appears to offer some protective factors, particularly in social domains. Future research should further explore the specific mechanisms underlying these differences and investigate potential interventions to support the holistic development of children in institutional care. Policymakers and caregivers should integrate these findings into the development and application of care strategies to ensure the best possible outcomes for all children, regardless of their living situations.

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Curriculum Intent Vs. Examination Reality: A Washback Study of English Assessment in Mizoram

Lalremchhungi*
Lallianzuali Fanai**

Abstract

Assessment plays a crucial role in shaping teaching and learning, influencing both instructional methods and student engagement. This study examines the alignment and discrepancies between the English curriculum prescribed by the Mizoram Board of School Education (MBSE) and the question designs of the High School Leaving Certificate (HSLC) and Higher Secondary School Leaving Certificate (HSSLC) examinations. Using a qualitative research approach, document analysis was conducted to identify alignments and discrepancies between curriculum objectives and examination formats. Findings indicate that while the HSLC and HSSLC examinations largely align with curriculum goals, discrepancies also exist in key areas. Listening comprehension and speaking skills are not explicitly tested, limiting students' ability to develop well-rounded communication skills. Additionally, translation skills, though mentioned in the curriculum, are not assessed. Positive washback effects include enhanced reading, writing, and critical thinking skills, but negative washback arises from the lack of focus on listening, speaking, and feedback mechanisms. To make assessments more effective, the study recommends adding listening and speaking tasks, translation exercises, and structured feedback. These changes would better match the curriculum and help students in Mizoram improve their English skills.

Keywords: *Assessment, washback effect, English curriculum, alignment, discrepancies.*

* Lalremchhungi, Research Scholar, Institute of Advanced Studies in Education (IASE), Aizawl, Mizoram Email: khiangteremtei@gmail.com Phone Number: 7085929806
** Lallianzuali Fanai , Retired Principal and Professor, Institute of Advanced Studies in Education (IASE), Aizawl, Mizoram Email: drzuali@gmail.com Phone Number: 9436141866

Introduction

Assessments strongly influence teaching and learning, shaping what teachers emphasize in lessons and how students participate. This influence of testing on teaching and learning is termed 'washback' or 'backwash', and it is a term now commonly applied in linguistics (Alderson & Wall, 1993). Teachers often design their lessons based on the content of end-of-term assessments, adjusting their teaching methods to ensure students are well-prepared for these tests. This alignment means that classroom activities, assignments, and discussions primarily focus on topics likely to appear in the examinations. As a result, students may spend more time practicing test-related skills rather than exploring subjects in depth or developing critical thinking abilities (Brown & Abeywickrama, 2019). While testing can sometimes hinder learning by promoting rote memorization and test-oriented teaching, it can also create a productive and positive environment by encouraging goal-driven learning and reinforcing key skills (Hughes, 2002). The overall impact of testing depends on factors such as question design, assessment format, and alignment with curriculum objectives.

Alderson and Wall (1993) suggest that tests can have a positive washback effect if they encourage students to focus more on the lessons and prepare thoroughly. For example, an oral proficiency test is introduced to enhance the teaching of speaking skills. Positive washback occurs when the objectives of the curriculum and that of the subsequent test coincides. When the curriculum and the test objectives match, students are more likely to focus on the right areas, and teachers can tailor their instruction to better meet the needs of the test. This alignment helps create a learning environment where both teaching and assessment are in harmony, leading to more meaningful learning experiences. Negative washback happens when test content or format focuses too narrowly on language skills, limiting both teaching methods and learning opportunities (Taylor, 2005).

The secondary school assessment system in Mizoram is managed by the Mizoram Board of School Education (MBSE), which conducts board exams for Grade 10 and Grade 12 students. These examinations are high-stakes as they mark the completion of school education for the High School Leaving Certificate (HSLC) and the Higher Secondary School Leaving Certificate (HSSLC). The results of these examinations play a key role in assessing students' academic performance and future opportunities. The higher the stakes of a test, the stronger its impact on teaching and learning. High-stakes examinations influence how students study and how teachers teach, as both focus on achieving good results. In Mizoram, MBSE examinations are crucial for students' academic progress, thus increasing the pressure to perform well. As a result, teachers often focus on exam-related topics and may ignore subjects or skills not to

be tested - like listening and speaking. This can help students improve in reading and writing but may also limit their overall language development, making it harder for them to communicate effectively in real-life situations.

The impact of exam-oriented teaching and learning highlights the importance of analysing question design in high-stakes assessments. Since students and teachers often tailor their learning strategies based on exam formats, the structure and content of these assessments play a crucial role in shaping language proficiency. If examinations primarily test reading and writing while neglecting listening and speaking, students may lack essential communication skills needed for higher education and professional settings (Alderson & Wall 1993).

A study by Zhao (2023) emphasises that a narrow focus on exam preparation leads to challenges in real-world interactions. Therefore, a critical examination of question design can help identify gaps in assessment that contribute to these limitations. When examinations evaluate a well-rounded set of language skills, they encourage more complete language development, equipping students with the skills needed for both academic and professional success. Analysing the alignment between curriculum objectives and content of examination is essential to understanding how assessments influence teaching methods, student engagement and long-term language proficiency.

Rationale of the Study

Assessments play a crucial role in shaping teaching and learning, with their impact largely dependent on factors such as test design and alignment with curriculum objectives. In the context of Mizoram, the MBSE examinations serve as high-stakes assessments that significantly influence how teachers teach and how students prepare. However, while these examinations assess core language skills, there is limited research on whether they comprehensively reflect the curriculum objectives.

By examining the alignment between the English curriculum objectives and the question designs in these examinations, this study seeks to identify both alignments and discrepancies. It also aims to determine the potential washback effects of these assessments, whether positive or negative, on teaching practices and student learning outcomes. Understanding these effects is essential for improving the effectiveness of assessments. It will also help in ensuring that students receive a well-rounded language education and in addressing potential gaps in the current examination system.

Objectives

1. To examine the alignments and discrepancies between the aims and objectives outlined in the English Curriculum prescribed by Mizoram Board of School Education (MBSE) and the High School Leaving Certificate (HSLC) English question design.
2. To examine the alignments and discrepancies between the aims and objectives outlined in the English Curriculum prescribed by Mizoram Board of School Education (MBSE and the Higher Secondary School Leaving Certificate (HSSLC) English question design.
3. To determine their potential washback effects.

Methodology

This study employs a qualitative research approach through document analysis to evaluate the alignment between the MBSE-prescribed English curriculum and the question design of the School Leaving Certificate examinations (HSLC and HSSLC) as well as discrepancies between the two. By comparing official curriculum documents with the prescribed question formats set by MBSE, the study aims to identify both alignments and discrepancies.

Findings

Findings on Objective No. 1: To examine the alignments and discrepancies between the aims and objectives outlined in the English Curriculum prescribed by MBSE and the High School Leaving Certificate (HSLC) English question design.

Alignments

i) Curriculum Objective 1 (Listening and Comprehension): This objective is covered in Writing (Section B), Grammar (Section C), and Literature (Section D) but lacks focus on listening skills.

ii) Curriculum Objective 2 (Independent Inquiry & Thinking): This objective can be observed in Reading (Section A) and Literature (Section D) but could include more structured reflection.

iii) Curriculum Objective 3 (Social Communication & Skills): This objective is addressed in Writing (Section B), Grammar (Section C), and Literature (Section D) but lacks real-world applications like discussions or role-plays.

iv) Curriculum Objective 4 (Reasoning & Articulation): The objectives specified in this is strengthened through Reading (Section A), Writing (Section B), and Literature (Section D) by developing logical thinking and structured responses.

v) Curriculum Objective 5 (Competence in English Registers & Language Use): The competence mentioned is found in Reading (Section A), Writing (Section B), Grammar (Section C), and Literature (Section D), ensuring exposure to different forms of English.

vi) Objective 6 (Cultural & Linguistic Competence): This is addressed in Literature (Section D) but could be expanded to other sections for a broader cultural perspective.

vii) Curriculum Objective 7 (Vocabulary & Reference Skills): The skills in these objectives are developed through Reading (Section A), Writing (Section B), and Grammar (Section C), though grammar could emphasize dictionary and thesaurus use more.

viii) Curriculum Objective 8 (Creativity & Expression): This is found to be encouraged in Reading (Section A) and Literature (Section D) but could be improved in grammar and writing exercises.

ix) Curriculum Objective 9 (Self-Learning & Independent Study): This objective is promoted in Writing (Section B) and Grammar (Section C) but lacks peer review and self-editing opportunities.

x) Curriculum Objective 10 (Organization & Editing Skills): The aimed- skills are strengthened through Literature (Section D) but could include more structured feedback activities.

Discrepancies

The HSLC question design does not fully achieve its intended objectives in several key areas-

i) Listening skills (Curriculum Objective 1) are not directly tested which limits students' from developing strong listening abilities.

ii) Independent thinking (Curriculum Objective 2) is present but lacks structured opportunities for students to engage in reflective thinking and express their ideas critically.

iii) Social communication (Curriculum Objective 3) is not effectively incorporated as real-world applications such as group discussions debates or interactive tasks are missing from the assessment.

iv) Reasoning skills (Curriculum Objective 4) could be strengthened by including more analytical questions and providing structured feedback to help students refine their logical thinking.

v) Cultural competence (Curriculum Objective 6) is addressed mainly through literature-based questions but it does not fully explore diverse cultural contexts that could enhance students' understanding of global perspectives.

vi) Vocabulary development (Curriculum Objective 7) is included in the assessment. However, it does not focus enough on using dictionaries or learning new words independently which are important for long-term language skills.

vii) Creativity (Curriculum Objective 8) could be better integrated into the examination particularly in writing and grammar tasks to encourage students to think imaginatively and express themselves more freely.

viii) Self-learning (Curriculum Objective 9) is another area that needs improvement as there are limited opportunities for peer review self-editing and independent exploration of language skills. Encouraging these activities would help students become more autonomous learners.

ix) Organization skills (Curriculum Objective 10) are assessed to some extent. However, students would improve more with structured feedback on organizing their thoughts effectively in written responses.

Findings on Objective No. 2: To examine the alignments and discrepancies between the aims and objectives outlined in the English Curriculum prescribed by MBSE and the Higher Secondary School Leaving Certificate (HSSLC) English question design

Analysis of HSSLC Question Design in Relation to MBSE Curriculum Aims and Objectives

Alignments

i) Curriculum Objective 1(Listening and Comprehension): The skills in this objective is tested in Section A and Section C, through comprehension passages and literature questions.

ii) Curriculum Objective 2 (Confidence and Proficiency in Language Skills): Reading, writing, and literature tasks in Section A, B and C help students communicate clearly and confidently in both academic and social settings.

iii) Curriculum Objective 3 (Participation in Discussions and Presentations): Writing tasks in Section B help students organize their thoughts

iv) Curriculum Objective 4 (Understanding Text Organization): Comprehension exercises, writing tasks, and literature study in Section A, B and C help students understand how different parts of a text fit together.

v) Curriculum Objective 5 (Identifying Main Points and Details): Activities like note-making, summarizing, and answering literature questions in Section A, B and C train students to recognize key ideas and supporting details.

vi) Curriculum Objective 6 (Using English in Different Contexts): Exposure to different text types, writing formats, and literary styles in all the sections improves students' ability to use English in various situations.

vii) Curriculum Objective 7 (Developing Advanced Language Skills) : Reading comprehension, essay writing, and literature analysis are tested in Section A, B and C which enhance reasoning, inference-making, and critical thinking skills.

viii) Curriculum Objective 8 (Translation Skills): Although there are no questions found that test this skill directly, comprehension and writing activities improve language clarity, which helps with translation.

ix) Curriculum Objective 9: Independent Thinking and Inquiry (Section A, Section B, Section C) – Discursive reading, opinion-based writing, and literature responses encourage students to think critically and express their ideas.

x) Curriculum Objective 10: Literary Appreciation and Creativity (Section A, Section B, Section C) – Reading literary texts, writing creatively, and analysing poetry and prose help students appreciate literature and develop their creativity.

Overall, the HSSLC English examination supports the curriculum objectives by helping students improve their language skills, reasoning, creativity, and independent thinking, making their learning more meaningful.

Discrepancies

The HSSLC English examination aligns well with the Higher Secondary English Curriculum objectives, with no major discrepancies. However, some objectives are not directly addressed. They are discussed below:

i) Listening comprehension (Curriculum Objective 1) is indirectly supported through reading tasks in Sections A and C but is not explicitly tested.

ii) Translation skills (Curriculum Objective 8) are also not directly included in any section, as comprehension and writing tasks focus on analysis and composition rather than language translation.

iii) Oral participation (Curriculum Objective 3) is encouraged through writing tasks in Section B, but direct assessment of discussions and presentations is missing.

Although these discrepancies are minor, adding translation exercises and oral activities could strengthen the alignment between the curriculum objectives and the examination.

Findings on Objective No. 3: To determine their potential washback effects

The HSLC and HSSLC English question design is likely to generate several positive washback effects. The potential benefits are outlined below:

i) It helps students develop their reading, writing, and comprehension skills. This makes communication easier in both academic and social settings.

ii) The examination helps students think critically by including reading passages, literature analysis, and opinion-based writing, which improve reasoning skills.

iii) It also encourages creativity and a love for literature by introducing different types of writing like stories, poems, and essays. These tasks inspire students to express their ideas in creative ways.

iv) Writing exercises also build confidence by teaching different writing styles and language use. This prepares students for real-life communication and helps them share their thoughts clearly in both school and daily life.

On the other hand, there are indications that the discrepancies found between the objectives in the curriculum and the subsequent examinations may lead to negative washback effects. The possible negative washback effects are outlined below.

i) Since listening comprehension is not tested, students may not develop strong listening skills which are essential for effective communication in both academic and real-life settings. When a skill is not assessed, teachers and students often give it less importance which leads to weaker proficiency in that area.

ii) Similarly, the absence of speaking assessments such as group discussions or presentations, limits opportunities for students to practice oral communication, which is a key part of language fluency.

iii) The curriculum includes translation skills, but they are not part of the examinations. As a result, students may lack motivation and structured practice to improve their bilingual abilities.

iv) Since there is little focus on feedback and revision, students may not get enough practice to improve their writing skills. This could make it more difficult for them to organize ideas clearly and create well-structured responses.

Addressing these issues by incorporating listening tasks, speaking exercises, and translation activities would create a more balanced assessment system that supports overall language development.

Conclusion

The MBSE English examinations for HSLC and HSSLC have a strong impact on how students learn and how teachers teach. They help students improve their reading, writing, and thinking skills. The examinations also encourage creativity and help students understand literature better. These positive effects make learning more meaningful and prepare students for real-life communication.

However, some important skills are not fully tested. Listening and speaking are not included, so students may not develop strong communication skills. Translation is mentioned in the curriculum but not tested, which may limit bilingual abilities. Also, students do not get enough practice in revising and improving their writing.

To make the examinations more effective, listening and speaking tasks should be included, translation exercises should be added, and more focus should be given to feedback and revision. These changes would help students develop a well-rounded understanding of English and prepare them better for the future. Implementing these changes would create a more balanced assessment that aligns better with the curriculum objectives. By testing a wider range of language skills, students would gain a more comprehensive understanding of English which will improve their ability to communicate effectively in both academic and real-life situations. A well-rounded examination system would not only enhance students' language proficiency but also encourage deeper learning, creativity, and independent thinking. Strengthening assessment practices in this way would ensure that students are better equipped for higher education and future career opportunities.

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Life Skills Awareness Level of Undergraduate Arts Students in Aizawl City

TC Rakil Ramhmachhuani*
Lalchhuanmawii**

Abstract

Life skills can be broadly defined as a combination of knowledge, behaviors, attitudes, and values that enable individuals to effectively deal with their environment and achieve their goals. These skills encompass competencies such as critical thinking, creativity, organization, social and communication abilities, adaptability, problem-solving, and cooperative engagement in a democratic context. Mastering these skills is essential for actively contributing to a peaceful and constructive future. With life skills, one is able to explore alternatives, weigh pros and cons and make rational decisions in solving each problem or issue as it arises. It also entails being able to establish productive interpersonal relationships with others. The present study aims to find out the life skills awareness of Undergraduate students in Aizawl city. A sample of 110 students (male & female) were taken for this study and the data were collected by using Life Skills Awareness scale containing five points by the investigators. For the analysis and interpretation of result, the researchers have used t-test, mean and standard deviation.

Keywords: *Life Skills, Awareness Scale, Undergraduate students.*

Introduction

Human beings' unlimited wants have led to the emergence of new challenges, which require a prompt and effective response from a socially responsible education system. In today's world, education plays a crucial role in supporting individuals and fostering a peaceful life. As such, the primary objective of education is to equip students with the necessary skills to become dynamic citizens capable of coping

* TC Rakil Ramhmachhuani, Research Scholar, Department of Education, Mizoram University; Ph no: 9862120132; email: rakiltochhawng@gmail.com
** Dr. Lalchhuanmawii, Assistant Professor, Department of Education, Pachhunga University College; Ph no: 9436154409; email: machhuaniralte@gmail.com

with future challenges and thriving in a rapidly changing world. Life skills serve as a bridge, enabling individuals to transform knowledge, attitudes and values into practical abilities.

The World Health Organization (1999), in its Life Skills Education initiative, define Life skills as "psychological competence." This refers to an individual's ability to maintain mental well-being and demonstrate adaptive, positive behavior when interacting with others and engaging with their culture and environment. WHO identifies 10 core life skills that are essential for psychological competence: Self-Awareness, Empathy, Critical Thinking, Creative Thinking, Decision Making, Problem-Solving, Effective Communication, Interpersonal Relationships, Coping with Stress, and Managing Emotions.

Being a part of any society, life styles of individuals demand certain changes with respect to moral, social and religious values. College students are directly affected by these inevitable life changes in terms of physical, psychological and social health. Resultantly, the exposure with high-risk behaviors such as onset of drug use, unprotected sexual behavior, extremism, conduct behaviors and low self-esteem and confidence during adolescent life activities is observed in them (Mangrulkar, 2022).

Life skills is any ability that helps you thrive in personal and professional settings. From managing finances to communicating effectively, life skills are fundamental abilities that help us navigate daily challenges effectively. Life skills meaning extends beyond basic survival - it encompasses the tools and capabilities needed to adapt, grow, and succeed in an ever-evolving society. It is the invisible force that shapes our success in every aspect of life. These skills are not innate but can be learned and developed over time. Life skills are crucial for personal growth, professional success, and overall well-being in various aspects of life, including education, work, relationships, and personal development. Individual's certain abilities to adapt positive behaviors and deal effectively with challenges and demands of everyday life are defined as life skills (Chaudhary &Mehta, 2012).

Life skills Education also helps students develop important strategies for managing problems, planning, time management, and decision-making. These skills are important in enabling students to successfully navigate transitions in life. Through Life skills Education, learners acquire abilities such as critical thinking, problem-solving, decision-making, effective communication, interpersonal relationships, stress and anxiety management, self-esteem, and empathy (Veena & Vivek, 2010). Ultimately, life skills foster healthy behavior and enhance self-confidence, empowering individuals to lead more fulfilling and resilient lives.

Need and Importance of the Study

In recent years, the needs of college students have evolved significantly. Today, they require more than just traditional academic instruction. Modern students face a range of unique challenges, including financial pressures, mental health concerns, and the lasting effects of global disruptions such as the COVID-19 pandemic. Young intellectuals suffered at increased rates from stress, anxiety, sleep-related issues, depression, and suicidal ideation. A firm action to protect the students' safety and physical, social, and mental well-being must be taken in partnership with their communities, students, and higher education institutions (Zarowski, 2024). Raising awareness about life skills is crucial for improving the overall quality of life. Such awareness enhances students' abilities and encourages a positive attitude toward acquiring more knowledge and skills.

Students play a vital role in preparing communities and societies to explore new opportunities, achieve higher levels of progress, and foster development. This can only be fully realized if students are equipped with essential life skills. To be effectively equipped, students must first understand what life skills are and recognize their significance in personal, social, and professional contexts.

Integrating life skills with teaching methods is key to fostering the development of positive behaviors, attitudes, knowledge, values, and skills in students. Awareness of life skills helps address various challenges, such as bullying, violence, crime, antisocial behavior, substance abuse (including alcohol and drugs), smoking, premarital pregnancy, peer conflicts, suicidal tendencies, stress, and trauma. It enables students to face life's challenges and meet its demands with resilience and confidence (Hanan,2019). Life Skills training can promote interactive, decision-making, problem - solving, critical thinking and stress management skills and lead to more social acceptability, which in turn reduce drug abuse tendency (Moshki, 2014). Additionally, self-reflection plays an important role in helping students transfer what they learn in the classroom to real-life situations, making their education more practical and impactful.

Objectives of the Study

1. To find out the Life Skills Awareness of Undergraduate Arts students in Aizawl City
2. To compare the Life Skills Awareness of Undergraduate Arts students with respect to gender.
3. To compare the Life Skills Awareness of Undergraduate Arts students with respect to locality.

4. To compare the Life Skills Awareness of Undergraduate students with respect to family type.
5. To give suggestions for improvement of Life Skills.

Definition of Key Terms

Life Skills: Life skills can be defined as abilities that enable humans to deal effectively with the demands and challenges of life. They may also be called psychosocial skills, as they are psychological in nature and include thinking and behavioral processes.

Undergraduate Students: Undergraduate students refer to students studying BA in Aizawl City.

Life Skills Awareness: A dispositional measure of mindfulness to assess the thinking skills, social skills and coping skills of individuals.

Delimitation of the Study

For the present study, the data collection was delimited to Undergraduate Arts students studying in Aizawl City. The scope of data collection was confined to this stream due to constraints in resources and time.

Methodology

Method of the study

The investigation is Descriptive in nature. The research methodology focuses on the Life Skills Awareness Level of Undergraduate Arts students in Aizawl City.

Population and Sample

The population includes Undergraduate Arts students studying in Aizawl City. Proportionate stratified random sampling was used for the study. The sample consists of 110 students in total. Out of these, 69 students are female and 41 students are male; 87 students belong to Urban locality and 23 students belong to Rural locality; 87 students belong to Nuclear family and 23 students belong to Joint family. All the sampled students belong to Arts stream.

Gender	Male	41	Total
	Female	69	110
Locality	Urban	87	
	Rural	23	
Family type	Nuclear	87	
	Joint	23	

Tool used

For the purpose of the study, a Life Skills Tool developed by the researcher was used. The tool was in the process of standardization which was reviewed and approved by the supervisor for use in the study. The tool consisted of statements designed to assess life skills, with responses rated on a 3-point Likert Scale: Strongly Agree, Agree, and Disagree.

Statistical Techniques

Descriptive statistical techniques such as Mean and Standard Deviation, and Inferential Statistical techniques like T- test will be used.

Analysis and Interpretation

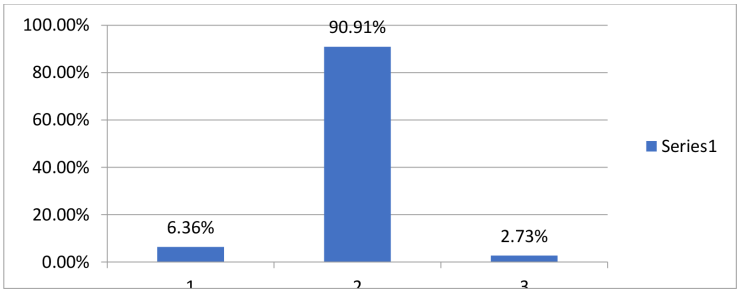
Table-1

Life Skills Awareness of Undergraduate students

S/No	Raw Scores	No of students	Percentage	Level of Awareness
1	68 to 100	7	6.36%	High
2	34 to 67	100	90.91%	Average
3	0 to 33	3	2.73%	Low

Figure-1

Life Skills Awareness of Undergraduate students



From the above Table and Figure 1.1, it has been found that 6.36% of the undergraduate Arts students in Aizawl City have scored high level of awareness, 90.91% have average level of life skills awareness and 2.73% have scored low level of life skills awareness. Hence, we can conclude that majority of the sampled students (90.91%) have Average Life skills awareness.

Table 2

Comparision of Life Skills Awareness of Undergraduate Students with respect to Gender.

gender	N	Mean	Std. Deviation	Std. Error Mean	Degrees of freedom (df)	t	Remarks
Female	69	1.20	.405	.049	106	1.98	Not significant at 0.05 level
Male	41	1.22	.419	.065			

The t-value testing the significance of mean difference in Life skills awareness of female and male undergraduate arts students came out to be 1.98, the calculated t value of 1.98 is lower than the criterion t value at both .01 and .05 level which indicates that there is no significant difference. This shows that there is no significant mean difference in life skills among undergraduate students with respect to gender.

Table 3: To compare the Life Skills Awareness of Undergraduate students with respect to locality.

Locality	N	Mean	Std. Deviation	Std. Error Mean	Degrees of freedom (df)	t	Remarks
Urban	87	1.37	.485	.052	106	1.98	Not significant at 0.05 level
Rural	23	1.39	.499	.104			

The t-value testing the significance of mean difference in Life skills awareness of undergraduate students in Aizawl City belonging to urban and rural came out to be 1.98 the calculated „t" value of 1.98 is lower than the criterion „t" value at both .01 and .05 level which indicates that there is no significant mean difference in life skills among undergraduate arts students with respect to locality.

Table 4

To compare the Life Skills Awareness of Undergraduate students with respect to Family type.

Family type	N	Mean	Std. Deviation	Std. Error Mean	Degrees of freedom (df)	t	Remarks
Nuclear	87	1.30	.460	.049	106	2.37	significant at the critical value 0.05 level
Joint	23	1.35	.487	.102			

The t-value testing the significance of mean difference in Life skills awareness of undergraduate students belonging to nuclear and joint family came out to be 2.37, the calculated „t" value of 2.37 is higher than the criterion „t" value at 0.05 level which indicates that there was significant difference. Likewise, the mean value is 1.30 for nuclear family; 1.35 for joint family. The standard deviation is .460 for nuclear family; and it is .487 for joint family respectively. This shows that there is significant mean difference in Life skills among undergraduate students with respect to Family type. It can also be observed from the above table that respondents from joint family had better life skills.

Major Findings of the Study

The present study revealed that the Life Skills Awareness of Undergraduate Arts students in Aizawl City is Average. It also shows that there is no significant difference in the Life skills awareness of undergraduate Arts students in Aizawl City with respect to Gender and Locality. A significant mean difference in their life skills awareness has been found with respect to Family type.

Discussion

1. It was found that undergraduate Arts students generally possess a moderate level of awareness regarding life skills. Prakash & Nirmala (2015) also found similar results. This is not surprising, as college students are in a transitional phase where they are still developing essential life skills through academic learning, social interactions, and real-world experiences

2. The researcher found that there is no significant difference in the life skills awareness of Undergraduate Arts students with respect to gender. Biswajita & Lakshmipriya (2024) also found similar results. This is because life skills education and exposure to real-life challenges are generally similar for both male and female students in academic settings. Both genders have access to the same curriculum, social interactions, and extracurricular activities, which contribute to their overall awareness of life skills. Additionally, societal changes and equal educational opportunities have reduced gender-based differences in life skills development.
3. The researcher found that there is no significant difference in the life skills awareness of Undergraduate Arts students with respect to locality. Thus, revealed that life skills awareness is primarily influenced by the individual, rather than by demographic factors.
4. Findings revealed that students from joint families have a higher level of life skills awareness compared to those from nuclear families. This is because joint family environments provide greater social interaction, collective decision-making, and opportunities to learn from multiple family members. Living in a larger family structure fosters interpersonal skills, adaptability, conflict resolution, and emotional intelligence through daily interactions and shared responsibilities. In contrast, students from nuclear families may have fewer social engagements within the household, limiting their exposure to diverse perspectives and collaborative problem-solving experiences.

Suggestions

1. Encourage Decision-Making and Responsibility – students should be given opportunities to make choices and take responsibility for their actions, as this helps them develop critical thinking, problem-solving, and accountability. Parents, teachers, and mentors can create supportive environments where adolescents are encouraged to make decisions—whether in academics, extracurricular activities, or daily life situations.
2. Real-Life Exposure and Practical Learning – Providing students with hands-on experiences through internships, career counselling, and financial literacy sessions helps them develop essential skills for real-world challenges. Internships offer practical workplace exposure, allowing them to explore career options and build professional skills. Career counselling helps them make informed decisions about their future, while financial literacy sessions teach money management, budgeting, and responsible spending. These opportunities bridge the gap

between theoretical knowledge and practical application, preparing students for independent and successful adulthood.

3. Digital Literacy and Safe Internet Use – Educate students on responsible social media usage, online safety, and critical thinking to help them navigate the digital world effectively. Teach them about privacy settings, recognizing cyber threats, avoiding misinformation, and maintaining a positive digital footprint. Encouraging ethical online behavior, media literacy, and awareness of cyberbullying ensures they use technology responsibly and safely while making informed decisions in the digital space.
4. Stress and Time Management Training – Teaching students effective stress and time management techniques helps them handle academic and personal pressures more efficiently. Mindfulness practices, such as meditation and deep breathing, promote emotional regulation and reduce anxiety. Goal setting enables them to break tasks into manageable steps, enhancing focus and motivation. Prioritization skills, including task scheduling and time-blocking, ensure they manage responsibilities effectively without feeling overwhelmed. Equipping students with these strategies fosters resilience, improves productivity, and enhances overall well-being.

Conclusion

Life skills are essential for students to navigate the complexities of academic, personal, and professional life. They provide the tools needed for effective communication, problem-solving, decision-making, emotional regulation, and time management—skills that are crucial for success in both higher education and beyond. By cultivating these skills, students can build resilience, adapt to challenges, and develop a sense of responsibility, which are key to personal growth and well-being. Furthermore, life skills enhance interpersonal relationships and contribute to a more positive and supportive campus environment. As undergraduate students prepare for the workforce and adult life, these competencies empower them to make informed choices, interact effectively with others, and contribute meaningfully to society. Therefore, integrating life skills education into the curriculum and fostering their development should be a priority, ensuring that students are equipped with the essential abilities to thrive in an increasingly complex and fast-paced world.

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AI in Educational Research: Transforming Knowledge Creation and Analysis

Bhavna Rajpoot*
Vinod Kumar Kanvaria**

Abstract

Artificial Intelligence (AI) is transforming the landscape of educational research to a degree previously unimaginable, providing new opportunities for creation, synthesis, and analysis of knowledge to a level never experienced before. AI-based tools from machine learning software to natural language processing (NLP) models are now simplifying literature review, performing data analysis, and helping with academic writing. These tools allow researchers to manage large quantities of information with minimal effort, detect patterns, and create valuable insights more accurately. AI-powered academic search engines, citation managers, and predictive analytics are redefining the way researchers access and work on knowledge, and research is becoming more dynamic and accessible. Although beneficial, AI research in education comes with methodological and ethical concerns. Bias in data, too much dependency on artificially generated data, and concerns regarding academic ethics are just a few among the many concerns that need to be met. Although efficiency is enhanced through AI, the depth of critical analysis and ethical deliberation necessary in research cannot be substituted. This research considers the double-edged role of AI—both its power to revolutionize research practices and its ethical implications. By analyzing AI's role in literature synthesis, research design, and scholarly communication, this paper provides a balanced perspective on its role in academia. As AI keeps evolving, its use in educational research in a responsible manner is imperative. Leverage the potential of AI with intellectual maturity and ethical integrity to facilitate more imaginative, equitable, and enlightened scholarship. This article is one among the increasing body of literature on the revolutionary yet responsible application of AI in mapping the future of educational research.

*Bhavna Rajpoot, M.Ed. Student, Department of Education, University of Delhi;
Ph – 9580728328, email - bhavnarajpoot326@gmail.com
**Prof. Vinod Kumar Kanvaria, Professor, Department of Education, University of Delhi;
Ph - 9810086033, email - vinodpr111@gmail.com

Keywords: *Artificial Intelligence, Educational Research, AI-Powered Tools, Knowledge Synthesis, Machine Learning, Academic Ethics.*

Introduction

AI, or Artificial Intelligence, refers to the simulation of human-like intelligence by machines, especially computer systems. It enables machines to perform tasks that typically require human intelligence, such as understanding language (natural language processing), recognizing images or speech, making decisions, learning from data (machine learning), problem-solving and reasoning, etc.

Common AI Technologies include Machine Learning (ML), Deep Learning, Natural Language Processing (NLP), Computer Vision, Robotics, etc. Real-life examples of AI such as Siri and Alexa (Voice Assistants), ChatGPT (Conversational AI), Google Translate (Language Translation), Tesla Autopilot (Self-driving technology) have become commonplace in classrooms and households worldwide. AI has a profound impact on human life, transforming how we work, learn, and interact. It powers virtual assistants, automates routine tasks, and enhances healthcare with faster diagnoses and personalized treatments. In daily life, AI improves customer service, recommends content, and enables smart home devices. Industries like finance, transportation, and manufacturing use AI for efficiency and innovation. AI also aids scientific research and environmental monitoring. However, it raises concerns about job displacement, privacy, and ethical use. Despite these challenges, AI continues to shape a more connected, convenient, and data-driven world, influencing nearly every aspect of modern human life.

AI is significantly transforming education by personalizing learning experiences, automating administrative tasks, and enhancing accessibility. Adaptive learning platforms use AI to tailor lessons to individual student needs, allowing them to learn at their own pace. Teachers benefit from AI-driven tools that assist in grading, lesson planning, and providing real-time feedback, saving valuable time. AI also supports students with disabilities through speech-to-text, translation, and other assistive technologies, promoting inclusive education. Virtual classrooms and AI-powered chatbots enhance remote learning and provide 24/7 academic support. Furthermore, AI analyzes student performance data to identify learning gaps and suggest improvements. By integrating AI into education, students are being prepared for a technology-driven future, gaining essential skills for the modern workforce. However, challenges such as data privacy, equitable access, and maintaining human interaction remain critical considerations. Overall, AI is reshaping education, making it more efficient, personalized, and accessible for learners worldwide.

Artificial Intelligence (AI) is also transforming research in education by transforming the creation, synthesis, and analysis of knowledge. AI-based platforms, such as machine learning algorithms and natural language processing (NLP) models, allow researchers to mechanize literature reviews, improve data interpretation, and improve the process of writing academically. UNESCO (2023) indicates that AI-driven research elevates efficiency by minimizing the time devoted to literature synthesis and facilitating predictive analytics for trend discovery. In the same vein, the Commonwealth of Learning (COL, 2022) points out that AI-based research methods yield more detailed insights, enhancing academic quality and decision-making. Governments across the globe acknowledge the role of AI in education and research. The Government of India (2020), in its National Education Policy (NEP) 2020, emphasizes the use of AI in promoting innovative educational research practices. AI-based tools like plagiarism detection tools, smart citation managers, and research assistants improve the authenticity and accuracy of academic work. The United Nations (2022) further emphasizes AI's transformative impact on global education, noting that AI-powered systems facilitate equitable access to research resources, particularly in developing regions. While it is advantageous, integration of AI into educational research raises methodological and ethical concerns. Algorithmic bias, data protection issues, and excessive dependence on AI-driven analysis are threats to academic integrity (UNESCO, 2023). The Government of India (2023) has launched the Responsible AI for Youth Initiative under which guidelines for ethical adoption of AI in academic environments have been brought forward. Researchers need to balance the capability of AI with intellectual control to ensure that scholarly work remains guided by critical thinking and ethical decision-making. In this paper, we discuss AI's contribution to literature synthesis, research methods, and scholarly communication and how it should be addressed with its limitations. With the continuous development of AI, its ethical integration into educational research is critical to promote innovation while upholding academic integrity.

Research Objectives

The research has the following objectives:

- Investigate the role of AI in revolutionizing literature synthesis, research methods, and academic communication in educational research.
- Evaluate the efficacy of AI-driven tools in enhancing research efficiency, accuracy, and accessibility.
- Discuss the ethical issues and challenges of AI deployment in educational research.

- Analyze the regulatory frameworks and best practices for the adoption of responsible AI in academic research.
- Provide recommendations on how to balance the power of AI with human control to produce quality and ethical research results.

Research Gap

Although there is a growing use of AI in education research, there are still huge gaps as far as its complete implications are concerned.

- Literature available mostly discusses efficiency and automation potential offered by AI but fails to engage in substantial discussions on long-term effect of AI on originality, quality, and critical reasoning in research work.
- The extent of the application of AI towards facilitating inclusiveness and fair access to academic literature, especially within developing nations.
- Issues of concern in terms of algorithmic discrimination, academic ethics, and personal data protection that continue to attract relatively less exploration within most study endeavors.
- Administrative hurdles into implementing AI-instituted study resources and fulfilling regulatory compliance of ethics.
- Empirical research on the impact of AI interventions upon research methods vis-a-vis making unsubstantiated claims.

These gaps must be filled in an effort to construct a more equitable understanding of the transformative potential of AI while keeping related risks at bay. This paper adds to the academic literature by providing a balanced view of the strengths and limitations of AI in educational research.

Literature Review

The widespread application of AI in academic research has revolutionized conventional practices, with researchers now able to work more effectively, accurately, and affordably. AI tools enable literature synthesis, data analysis, and communication among scholars, leading to a paradigm shift in the production and sharing of knowledge (UNESCO, 2023; COL, 2022; OECD, 2022).

AI in Literature Synthesis

Literature reviews have been revolutionized through AI technology like Semantic Scholar, Elicit, and IBM Watson, which has made research more efficient

and more complete. According to COL (2022), approximately 68% of higher education researchers use AI-supported tools to synthesize literature to minimize the scope of their research and follow associated scholarly research. The Organisation for Economic Co-operation and Development (OECD, 2022) recognizes that AI can scan enormous repositories of scholarly articles within a few minutes, down from hours previously spent using conventional means, reducing literature review time by up to 50% while enhancing the quality and usability of sources. Moreover, the World Bank (2023) acknowledges that AI-based search engines enhance access to academic content for researchers in low-income countries, equilibrating research availability imbalances.

AI in Research Methodology and Data Analysis

Artificial intelligence data analysis programs have transformed how quantitative and qualitative research is being carried out. Machine learning program codes enable more efficient identification of patterns and predictive modeling, strengthening the research output (United Nations, 2022; COL, 2022). Studies by the Government of India in 2023 identified that evidence-based studies with AI-based approaches increased the precision of such studies by 45%, especially in big-scale education evaluations and policy research. Besides that, AI-based statistical software like SPSS AI, NVivo, and Google AutoML facilitate efficient, streamlined processes in analyzing complex data, allowing researchers to uncover significant insights (OECD, 2022). According to the European Commission report (2023), AI-based research enhances data understanding by revealing correlations and trends in data that are usually ignored by conventional statistical methods.

Challenges and Ethical Issues

While AI poses many advantages, its use in educational research is also fraught with serious ethical issues. Algorithmic bias, data protection issues, and excessive dependency on machine-acquired knowledge are some of the most significant issues (UNESCO, 2023; United Nations, 2022). The United Nations (2022) warns that uncontrolled use of AI is likely to perpetuate systematic biases in research, generating biased or spurious results. The Government of India (2023) also launched guidelines under the Responsible AI for Youth Initiative to enable ethical usage of AI for research, with a focus on transparency, accountability, and inclusion in AI-driven strategies. The European Commission (2023) has also mooted stringent ethical requirements for using AI in academia for supporting data protection law to uphold research integrity. Academic integrity is also at risk due to AI. While content produced by AI can be used to supplement scholarly work, its abuse can lead to plagiarism and diluted

critical thinking. UNESCO (2023) advocates for ongoing human involvement in AI-driven research to authenticate originality and ethical implications. COL (2022) also underscores the need to provide researchers with AI literacy competencies to curb the risk of excessive dependence on AI content.

Methodology

This research is based on a mixed-methods design, where qualitative and quantitative approaches are integrated to comprehend the role of AI in educational research. Methodology consists of the following aspects:

Research Design

A mixed-methods design is employed to validate an integrated understanding of AI applications, benefits, and drawbacks in educational research. This includes:

Qualitative Analysis – Systematic literature review from authentic sources like UNESCO, COL, OECD, Government of India, and scholarly journal publications.

Quantitative Analysis – Survey research that collects empirical evidence regarding the uptake, effectiveness, and challenges of AI in education research.

Data Collection Methods

- Literature Review – Peer-reviewed journals, the government's official reports, and international agencies' publications like UNESCO, the United Nations, and the World Bank provide the secondary data.
- Survey Tool – A survey tool is designed and conducted among 200 Indian university education researchers, faculty, and postgraduate students.
- Expert Interviews – Expert interviews in the form of semi-structured interviews with AI and education technology experts are employed to gain in-depth understanding of the research process enabled by AI.
- Sampling Strategy - A planned sampling strategy for getting participants already involved in education research and familiar with AI-based research tools to some extent. The sample includes:
- 15 professors from educational institutions
- 30 postgraduate and doctoral students
- 5 AI and education technology experts

Data Analysis

- Qualitative Analysis – Thematic analysis is used for recurring themes and literature and expert interview findings.
- Quantitative Analysis – Quantitative computer packages such as SPSS and NVivo are used in analyzing responses given by questionnaires in a manner as to measure how it is perceived by individuals to be impacting efficiency, accuracy, and ethics in research.
- Problems involving Ethics Informed consent of all parties before information collection.
- Privacy and anonymization of data while collecting data.
- Bias and ethical issues involved in AI are taken very seriously such that the research adheres to research ethical standards.

Key Findings

From the methodology and data analysis of the study, the following key findings are established:

AI-Driven Literature Synthesis Improves Research Efficiency:

- AI technologies such as Semantic Scholar and IBM Watson cut literature review time by as much as 50%.
- AI improves the accuracy and relevance of selected literature, reducing human bias in research synthesis.

Widespread Application of AI in Education Research:

- Findings of a survey indicate that 68% of researchers apply AI-powered tools regularly in performing literature searches, citation management, and plagiarism detection.
- AI is enhancing the quality of research and workflow efficiency in higher learning institutions.

AI Empowering Data-Driven Research Methods:

- Statistical analysis software enabled through AI lower the complexity of gathering and analyzing data, especially big-scale research in education.
- Predictive analysis helps identify trends, supporting research design.
- Ethical and Methodological Challenges Still Persist:

- 42% of survey respondents to this indicated algorithmic bias and concerns regarding data privacy.
- Excessive dependence on insights generated by AI can affect research originality and critical thinking.

Requirement for Ethical Use of AI in the Academic Environment:

- Teachers and experts in AI, both emphasize in interviews, that institutional policy is a requirement to ensure responsible use of AI. Policies for AI are institution-specific, reflecting the non-standardization aspect of academic research.
- These results point to the potential of AI in assisting educational research towards the gravity of ethical deliberation and careful utilization.

Recommendations and Future Directions

To provide for responsible AI integration in educational research, institutions need to come up with standardized ethical guidelines governing the application of AI in academia (UNESCO, 2023). Ethical training programs should be implemented to educate researchers on responsible use of AI, making it transparent and accountable. Moreover, AI-based research tools need to have embedded bias detection frameworks as well as transparency mechanisms to avoid algorithmic discrimination and improve the credibility of AI-generated results (OECD, 2022). Researchers must exhibit an equanimous conduct, using AI as a supporting tool rather than replacing human logic, while peer-review processes must verify the AI-derived results to maintain the research integrity (European Commission, 2023). In order to supplement access inequities, governments and institutions must ensure investment in the infrastructure of AI, particularly for the developing world, to enable leveled access to research instruments (World Bank, 2023). Promoting open-access AI systems can also further democratize information and reduce disproportionate access to research. Future research must explore the long-term impact of AI on scholarly creativity and academic integrity through the examination of whether reliance on AI alters scholarly creativity. Interdisciplinary research should also attempt to explore the role of AI in enhancing the convergence of different fields of academics. Policymakers must further improve the development of global models of AI regulation to standardize AI regulation for academic research. By embracing these suggestions, AI can be employed to enhance education research without compromising ethical and scholarly integrity.

Discussion

The study reveals the potential of AI in transforming educational research, especially literature synthesis, data analysis, and study design. AI tools greatly

improve the effectiveness of research by enabling researchers to analyze vast information within condensed timelines. Despite AI being more accurate and readily available, however, intellectual honesty and algorithmic bias are still a concern. The research results are in agreement with UNESCO (2023) and OECD (2022), which emphasize the importance of ethical principles for AI to be able to abate biases in insights generated by AI. Further, the capability of AI in filling gaps in accessibility is evident, especially in the third world where researchers derive value from AI-sustained scholarly resources (World Bank, 2023). Nonetheless, survey findings show that 42% of researchers continue to be anxious about data confidentiality and excessive dependence on AI, highlighting the imperatives of human involvement in research processes. Secondly, the European Commission (2023) has highlighted the imperative for policy intervention towards responsibility in AI uptake through the lack of harmonized AI guidelines within institutions. While AI aids research processes, striking a balance between its virtues and ethical reflection and critical human judgment is paramount to ensuring research integrity and authenticity.

Conclusion

The use of AI in research in education is transforming the creation, synthesis, and analysis of knowledge to an unprecedented level of efficiency, accuracy, and accessibility. Tools assisted by AI simplify literature reviews, expedite data analysis, and streamline scholarly communication, hugely improving research methodology (UNESCO, 2023; OECD, 2022). AI has numerous benefits but also raises concerns such as algorithmic bias, ethics, and possible over-reliance on algorithmic insights, which need to be managed with sensitivity (European Commission, 2023). This research underscores the dual role of AI in educational research—both as an enabler of innovation and a potential disruptor of academic integrity if not properly managed. The results underscore the importance of striking a balance where AI supports human expertise and not vice versa. Ethical guidelines, regulatory policies, and ongoing monitoring are critical to counteract biases and maintain research integrity (World Bank, 2023). More studies must be conducted to examine the long-term impact of AI on scholarly creativity, critical thinking, and knowledge equality globally. Additionally, interdisciplinary research can explore more about how AI has the potential to narrow education gaps. With the deployment of ethical AI usage, academia can leverage its strength to spearhead quality research that is inclusive and morally appropriate. AI is not a substitute for human intelligence but an auxiliary tool to supplement and maximize scholarly inquiry to make an academic system more efficient and equitable.

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