Study on Effectiveness of Training Program on E-Learning and Teaching for Middle School Teachers in Saitual District

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Abstract **- This study examines the effectiveness of a structured training program on e-learning and teaching for 94 middle school teachers in Saitual District, Mizoram. Using a pre-experimental one-group pre-test and post-test design, the program focused on digital tools, learning management systems, online assessments, and student engagement. Results indicated a statistically significant improvement in teachers' knowledge and skills, with the mean post-test score higher than the pre-test. While gains varied among participants, the findings highlight the value of short-duration training in enhancing digital teaching competencies. The study underscores the need for continuous, context-specific teacher development to achieve NEP 2020 goals.**

Index terms – E-learning, ICT, learning management system, National Education Policy 2020, pedagogical strategies, post-test, pre-test, professional development, training program.

I. INTRODUCTION

The integration of digital technology into the education system has emerged as a transformative force, reshaping how teaching and learning are designed and delivered. E-learning, which encompasses the use of electronic media and digital tools to facilitate education, has become increasingly relevant in the 21st century. With rapid technological advancements the demand for online and blended learning environments has intensified. As a result, the role of teachers has evolved significantly—from being sole disseminators of knowledge to facilitators who can effectively leverage digital tools to support student learning. (Anderson & Dron, 2011).

In the Indian context, the National Education Policy (NEP) 2020 recognizes the transformative potential of technology in education. It emphasizes the need to strengthen teacher capacity through continuous professional development in digital pedagogies, instructional design, and the use of e-resources. (Ministry of Human Resource Development [MHRD], 2020). The NEP also highlights the importance of equipping teachers to handle diverse learning environments, including online and hybrid classrooms. However, in many rural and semi-urban areas, such as the Saitual District in Mizoram, access to structured training in e-learning remains limited.

Teachers in these regions often encounter challenges such as insufficient digital literacy, lack of access to digital tools, and unfamiliarity with online learning platforms. (Selwyn, 2012). These barriers hinder the effective implementation of e-learning, thereby affecting student outcomes and the overall quality of education. Addressing this gap requires focused training interventions that not only introduce teachers to e-learning technologies but also guide them in applying these tools in contextually relevant ways.

As education systems continue to transition toward digital learning ecosystems, equipping teachers with the necessary skills and knowledge becomes not just important, but essential for equitable and quality education (Mishra & Koehler, 2006; UNESCO, 2020).

II. REVIEW OF LITERATURE

The integration of e-learning in teacher education has gained momentum globally and in India. Several studies have explored its impact on teacher effectiveness, digital literacy, and student engagement. The following literature provides insights from both Indian and international perspectives.

Kumar and Vigil (2011) investigated the perceptions of Indian teacher educators towards technology integration in teacher education institutions. The study revealed that while many educators were aware of the benefits of e-learning, actual usage remained limited due to infrastructural constraints

and lack of training. The authors emphasized the need for systematic professional development programs to bridge the digital divide in education.

Yadav, R., & Saini, S. (2019) examined the effectiveness of e-learning training modules for in-service school teachers in Haryana. Their quasi-experimental study showed significant improvement in the teachers' instructional practices and digital competency post-training. The findings supported the implementation of e-learning as a powerful tool for continuous professional development.

Panda and Mishra (2007) explored the readiness and motivation of Indian teachers in adopting e-learning platforms through a large-scale survey conducted across open and distance learning institutions. Results indicated a positive attitude towards online education but identified major barriers such as lack of institutional support and technical guidance.

Anderson and Dron (2011) proposed a pedagogical model based on three generations of distance education: cognitive-behaviourist, constructivist, and connectivist. Their work emphasized that effective e-learning environments should balance content delivery, interaction, and learner autonomy. This framework is widely cited in designing modern e-learning training programs for educators.

Mishra and Koehler (2006) introduced the TPACK (Technological Pedagogical Content Knowledge) model, which outlines the complex interplay between technology, pedagogy, and content knowledge required for effective teaching. The model has been extensively applied in teacher training programs worldwide and serves as a foundation for developing digital teaching competencies.

Sangrà, Vlachopoulos, and Cabrera (2012) attempted to define e-learning in a holistic manner, highlighting that it encompasses not only the delivery of education through digital means but also pedagogical transformation. Their research stressed the importance of designing learner-centered e-learning environments supported by adequate teacher training and institutional strategies.

These studies collectively highlight the critical role of teacher training in the successful implementation of e-learning. Indian research underscores the need for localized solutions and infrastructure, while international literature contributes broader theoretical and pedagogical frameworks to inform practice.

III. NEED OF THE STUDY

In recent years, the use of e-learning and digital tools in education has become increasingly significant, especially after the disruptions caused by the COVID-19 pandemic. As schools across India were forced to switch to remote teaching, the necessity for digital competence among teachers became more evident than ever. However, a wide gap exists between policy ambitions and ground-level realities, particularly in rural and semi-urban areas like Saitual District in Mizoram. Teachers in such regions often have limited exposure to structured training in digital education, resulting in low confidence, poor engagement with digital platforms, and underutilization of available technology.

While the National Education Policy (NEP) 2020 emphasizes the integration of technology and digital infrastructure in schools, it also highlights the importance of equipping teachers with the skills necessary to navigate and facilitate e-learning environments effectively. (Ministry of Human Resource Development, 2020). Without proper training, even well-equipped classrooms and schools cannot achieve their educational goals. Therefore, it is essential to conduct focused training programs aimed at enhancing teachers' capacity in using e-learning tools, designing digital content, and conducting online assessments.

Preliminary observations from schools in Saitual suggest that although teachers are open to adopting new teaching practices, they often lack the necessary pedagogical knowledge and technological skills. Furthermore, previous studies have indicated that professional development programs related to e-learning can significantly improve teaching practices and student outcomes. (Yadav & Saini, 2019; Panda & Mishra, 2007). However, there is limited documentation on the actual impact of such training programs in North-East India, particularly in Mizoram.

This study was conceived in response to this identified gap. It aims to assess the effectiveness of a structured training program on e-learning and teaching strategies conducted for middle school

teachers in Saitual District. By comparing the pre- and post-training performance of participating teachers, the study seeks to provide empirical evidence on how such programs can enhance digital teaching competencies. The findings will also help inform educational policy and planning, especially for teacher professional development in remote and underserved regions.

Moreover, the study aligns with broader educational goals of inclusivity and innovation. By strengthening the digital capacity of teachers, schools can better meet the diverse learning needs of students, promote continuous learning, and ensure educational continuity during disruptions. Hence, this research is both timely and relevant, offering practical implications for educational administrators, policy-makers, and teacher training institutions.

IV. RESEARCH QUESTIONS

1. What is the level of knowledge in e-learning among middle school teachers before the training?
2. Does the training significantly improve the teachers' knowledge and skills in e-learning?
3. What is the difference in pre- and post-test scores among participants?

V. OBJECTIVES OF THE STUDY

1. To evaluate the pre-training knowledge level of teachers regarding e-learning.
2. To assess the effectiveness of the training on e-learning and teaching.
3. To compare the performance of teachers before and after the training program.

VI. HYPOTHESIS

Null Hypothesis (H_0): There is no significant difference between the pre-test and post-test scores of the participants.

VII. RESEARCH DESIGN

This study employed a pre-experimental one-group pre-test and post-test design to assess the effectiveness of the training program titled *"Training on E-Learning & Teaching for Middle School Teachers of Saitual District"*, conducted from May 26 to 30, 2025.

Population

The population for this study included all middle school teachers of Saitual District, who are actively teaching in government institutions. These teachers represent a wide range of academic disciplines and years of teaching experience.

Sample

A total of 94 middle school teachers were participated in the training program. These participants formed the sample for the study. The sample was selected using a convenience sampling method, as the training was open to all the schools in the district willing to attend.

Training Description

The training was conducted over five consecutive days, covering the following core areas:

- Introduction to e-learning platforms and tools
- Designing digital content
- Using Learning Management Systems (LMS)
- Conducting online assessments
- Student engagement in digital environments

Each day included interactive lectures, demonstrations, hands-on sessions, and peer collaboration.

Tool Used

A researcher-made tool was developed to assess the knowledge and skills related to e-learning. The test included objective-type questions aligned with the training content. The same tool was used for both pre-test and post-test to ensure consistency. Pre-test was administered on the first day before the training sessions began. Post-test was conducted on the final day after the completion of all sessions. The test measured knowledge of educational technology terminology, Application of digital tools in classroom settings and Pedagogical strategies for online teaching

Data Collection

Data was collected by recording individual scores for both the pre-test and post-test for all 94 participants. These scores were tabulated and later analyzed using statistical techniques to determine the effectiveness of the training.

VIII. ANALYSIS AND INTERPRETATION

Objective 1: To evaluate the pre-training knowledge level of teachers regarding e-learning

Table 1: Pre-test and post-test score

Metric	Pre-test	Post-test	Score Difference
Mean	15.04	15.77	0.72
Standard Deviation	2.85	2.88	1.91
Minimum	6.0	6.0	-6.0
Maximum	20.0	20.0	+6.0
Median	16.0	16.0	0.0

The pre-test scores provided an overview of participants' baseline knowledge and skills in e-learning. The mean pre-test score was 15.02 (out of 20), with a standard deviation of 2.82. While this suggests a fair level of prior understanding, it also reflects inconsistencies, with scores ranging from as low as 6 to as high as 20. The data indicates that some teachers were already familiar with digital tools, while others had limited exposure. This justifies the need for training interventions targeted at standardizing digital teaching competencies across the district.

Objective 2: To assess the effectiveness of the training on e-learning and teaching

To evaluate the effectiveness of the five-day training program on e-learning and teaching, pre-test and post-test scores of 94 middle school teachers from Saitual District were analyzed using t-test.

Hypothesis (H_0): There is no significant difference between the pre-test and post-test scores of the participants.

Table 2: Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	PreTest	15.0426	94	2.85459	.29443
	PostTest	15.7660	94	2.88647	.29772

Table 3: Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 PreTest - PostTest	-.72340	1.91993	.19803	-1.11664	-.33017	-3.653	93	.0001

The mean pre-test score was 15.04 with a standard deviation of 2.85, indicating a moderate level of existing knowledge among participants. The post-test mean score rose to 15.77, with a slightly higher standard deviation of 2.89, suggesting some variation in improvement levels. The average score gain was 0.72 points, with some participants showing significant improvement (up to +6), while a few showed no change or a decrease.

A paired sample t-test was conducted to assess whether the observed difference was statistically significant. The result yielded a t-value of -3.65 and a p-value of 0.0001, well below the 0.05 threshold. This allows for the rejection of the null hypothesis and supports the conclusion that the training program had a significant positive impact on participants' e-learning knowledge and skills.

Objective 3: To compare the performance of teachers before and after the training program

A comparison of pre- and post-test scores showed that 68 teachers improved, 20 maintained the same score, and 6 showed a slight decrease, indicating that the training positively impacted most participants, with varied levels of progress across the group.

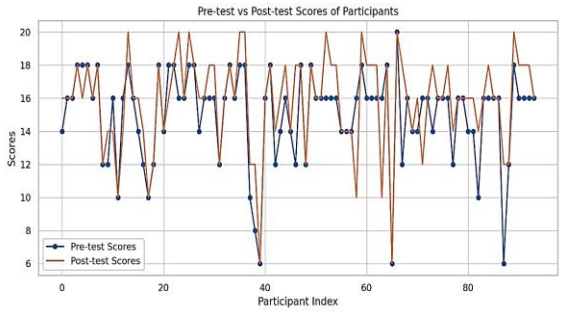

Fig. 1: Line chart comparing pre-test and post-test scores

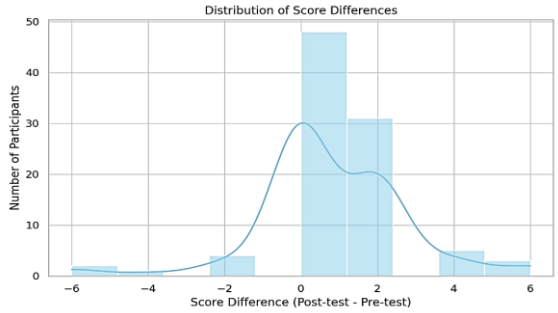

Fig 2: Histogram of score difference

The line chart comparing pre-test and post-test scores demonstrates an upward trend for the majority of participants, while the histogram of score differences highlight a concentration of gains between +1 and +3. These outcomes suggest that the training was generally effective, though the variation in gains implies differing levels of engagement, prior experience, or learning pace among participants.

The results support the conclusion that short-duration, structured training can positively influence teacher readiness for digital teaching. While the average improvement was under 1 point, the statistical significance of this gain demonstrates that even brief interventions can bridge gaps in technological understanding. However, the variability in score changes also suggest a need for differentiated or follow-up training for teachers who require additional support.

The study's findings are particularly important for rural and semi-urban districts like Saitual, where digital infrastructure is improving, but teacher preparedness may still lag. Scaling up such programs, while tailoring content to varied proficiency levels, can contribute significantly to the broader goals of the National Education Policy (NEP) 2020, which advocates for the integration of ICT and capacity-building in teaching.

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