INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY FUTURISTIC DEVELOPMENT

Conceptual Understanding of ICT Integration in Education among Secondary School Teachers: An Overview

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Article Info

P-ISSN: 3051-3618
E-ISSN: 3051-3626
Impact Factor (RSIF): 8.31
Volume: 07
Issue: 01
Received: 23-01-2026
Accepted: 21-02-2026
Published: 20-03-2026
Page No: 109-114

Abstract
The study examined the conceptual understanding of ICT Integration in Education among Secondary School Teachers in Mizoram. The research aimed to find out the level of conceptual understanding of secondary school teachers towards ICT integration in their teaching learning and how demographic factors like gender and age influence a teacher's ability. Data were randomly collected from 550 secondary school teachers (275 male and 275 female) from 11 districts in Mizoram. The Test for Conceptual Understanding (T-ICT) was constructed by the investigator and was used to collect data from secondary school teachers. The result revealed that 52.73% of teachers had an average level of conceptual understanding towards ICT integration in education. While 7.09% teachers had low level of conceptual understanding towards ICT integration in education. The findings revealed no significant difference in the level of conceptual understanding of ICT integration in education among secondary school teachers in Mizoram with respect to their gender and age. The study suggests that systematic training of ICT for both teachers and schools. Administrator should be provided with adequate ICT devices like computers, smart boards, projectors, online teaching platforms, multi-media content, and internet connectivity, uninterrupted electricity to support effective ICT-based teaching to make classroom teaching more effective and to enhance teachers' higher-order ICT integration competencies.

DOI: https://doi.org/10.54660/IJMFD.2026.7.1.109-114

Keywords: ICT, Integration, Secondary school, Teachers, Education

Introduction

Information and communication technologies (ICTs) are pivotal in transforming the global economy and enabling swift societal transformations. Within the last decade, the new ICT devices have deeply changed the way people communicate and do business. They have produced substantial revolutions in agriculture, industry, medicine, engineering, business, and other fields. They also have the potential to change the nature of education-where and how learning takes place and the roles of teachers and students in the teaching learning process. For education to obtain the full benefits of ICTs in teaching, it is necessary that teachers should equip ICT skills and competencies.

To engage efficient ICT integration in education, teachers must have a clear conceptual knowledge of ICT integration in education. The conceptual understanding of ICT integration in education refers to recognizing and grasping the notion of ICT integration as it relates to formulation, integrated, and operational grasp of ICT integration in education. Conceptual understanding means grasping the 'why' behind ideas, not just memorizing facts or procedures. It involves new knowledge to existing understanding and utilizing it flexibly across contexts. It is a systemic process of integrating technology into the curriculum to enable learning objectives and how technology can be used as a strategic tool to improve teaching and learning, rather than just using it as a digital version of traditional tools.

The integration approach of ICT in education involves the implementation of the right use of technology in a particular subject area that involves complex concepts and skills to improve learners' performance and achievement (Shah, 2022). According to Poudel (2018), the gradual integration of ICTs into teaching is essential. With the increasing use of ICTs in society, 21st-century teachers must be able to successfully incorporate technology into language education in the classroom.

Teachers should learn not only how to use technology to enhance traditional teaching or increase productivity but also learn from a student-centered perspective how ICT can be integrated into classroom activities in order to promote student learning. (Tezci, 2011) [5]. The adoption and use of ICT in schools can promote collaborative, active and lifelong learning, increase students' motivation, offer better access to information and shared working resources, deepen understanding, help students think and communicate creatively (Khan, Hasan & Clement, 2012) [3]

Need and importance of the Study

The success of ICT integration in education lies primarily in the conceptual understanding of the teachers. The integration of ICT has transitioned from a luxury to an essential requirement. The NEP 2020 had more emphasizing digital literacy and technological pedagogy are essential for educators to prepare students for the challenges of the 21st century. One of the main factors that affects the success of learning is not the availability of ICT devices, but the pedagogical model for effective use of technology. The computer must be tailored into the curriculum, not the curriculum into the computer.

Most professional ICT development programs focus on digital literacy and the functionality of ICT devices. A robust conceptual understanding permits a teacher to perceive ICT as a cognitive tool that can simplify complex subjects, making them more experiential for students. Conceptual understanding is the key to sustainable ICT use. When a teacher understands the 'why' behind a digital tool, they are more likely to continue using it despite technical challenges or infrastructure limitations.

Keeping these in view, the study of conceptual understanding of ICT integration in education among secondary school teachers of Mizoram and to suggest necessary measures to improve ICT integration among secondary school teachers.

Statement of the Problem

The problem of the present study is stated as "Conceptual Understanding of ICT Integration in Education of Secondary School Teachers of Mizoram".

Objectives of the study

1. To examine the conceptual understanding of ICT integration in education of the secondary school teachers of Mizoram.
2. To examine the conceptual understanding of ICT integration in education of the secondary school teachers of Mizoram with respect to gender.
3. To examine the conceptual understanding of ICT integration in education of the secondary school teachers of Mizoram with respect to age.

Hypotheses of the study

1. There is no significant difference in the conceptual understanding of secondary school teachers of Mizoram towards ICT integration in education with respect to their gender.
2. There is no significant difference in the conceptual understanding of secondary school teachers of Mizoram towards ICT integration in education with respect to their age.

Methodology

Research Approach: The present study was descriptive survey method.

Population and Sample: The study population is comprised of all secondary school teachers in Mizoram. The sample consisted of 550 teachers from 11 districts in Mizoram. The sample was selected using Simple random sampling technique.

Tool Used: For the present study, Test for Conceptual Understanding of ICT integration in education among secondary school teachers was developed by an investigator. The scale consisted of 25 test items. Each test question contains multiple choice responses with brackets; teachers must answer the questions by ticking any correct response for each item from the choices provided.

Statistical Techniques Used: Descriptive statistical techniques such as mean, Standard Deviation, Inferential statistical techniques like t-test will be used.

Analysis and Interpretation

- **Assessment on conceptual understanding of ICT integration in education of the secondary school teachers of Mizoram.**

  The results analysis of conceptual understanding of secondary school teachers towards ICT integration in education are reflected in the following table:

Overall Levels of Conceptual Understanding in Education T-ICT of the Secondary School Teachers in Mizoram

Table 1: Overall Levels of Conceptual Understanding

Range of z Score	Level of Conceptual Understanding in Education T-ICT	*f*
+1.26 and above	High	39 (7.09%)
+0.51 to +1.25	Above Average	96 (17.46%)
-0.51 to +0.50	Average	290 (52.73%)
-1.25 to -0.51	Below Average	86 (15.36%)
-1.26 and below	Low	39 (7.09%)

Table 1 shows that Majority 52.73% of secondary school teachers had average level of conceptual understanding towards ICT integration in education. However, 7.09% were found to have similar obtained of a high level and low level of conceptual understanding towards ICT integration in education. 17.46% were above average level and 15.36% were below average level.

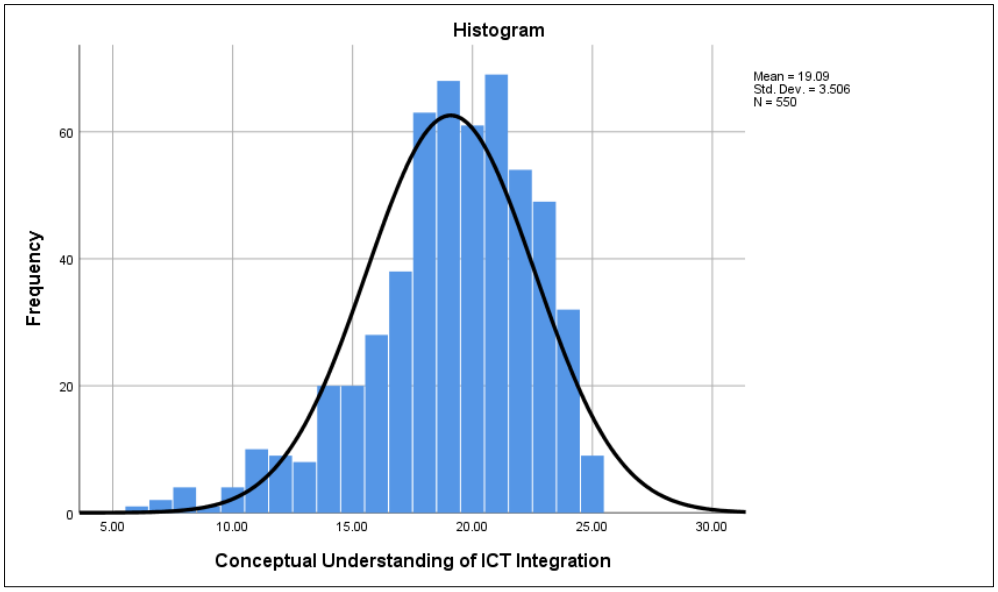

Fig 1: Overall Conceptual Understanding

Figure-1 indicates the overall mean score and standard deviation of secondary school teachers with respect to their conceptual understanding of ICT integration in education were found to be 19.09 and 3.51 respectively. Based on the established normative criteria, it can be inferred that the majority of respondents fall within the average category of conceptual understanding of ICT integration in education.

Assessment on the conceptual understanding of ICT integration in education of the secondary school teachers of Mizoram with respect to gender

For the purpose of statistical testing the following null hypothesis was formulated-

H_0 = There is no significant difference in the conceptual understanding of ICT integration in education of the secondary school teachers of Mizoram with respect to gender

To examine the conceptual understanding of ICT integration in education of the secondary school teachers of Mizoram with respect to gender. The scores were categorized into different levels, and the number of teachers in each level was tabulated as the following table 2.

Table 2: Overall levels of conceptual understanding of ICT integration in education of Mizoram -Gender wise

Gender	N	High	Above Average	Average	Below Average	Low
Male	275	24(8.73%)	56(20.36%)	135 (49.09%)	42 (15.27%)	18 (6.55%)
Female	275	20 (7.27%)	42 (15.27%)	142 (51.64%)	48 (17.45%)	23 (8.36%)

It is observed from table 2 that out of the total 275 male teachers, 28.73% male teachers had high level of conceptual understanding of ICT integration in education. 20.36% male teachers had the above average level, 49.09% male teachers had the average level, 15.27% were under the below average level, and 6.55% were under the low level of conceptual understanding towards ICT integration in education. Similarly, out of 275 female teachers, 7.27% female teachers had high level, 15.27% female teachers were under the above average level, 51.64% under the average level, 17.45% under the below average level, and 8.36% under the low-level category.

Comparison of the overall levels of conceptual understanding of ICT integration of secondary school teachers between male and female secondary school teachers in Mizoram

Table 3:

Variable	Gender	N	Mean	SD	SEM	t-value	p-value	Significant level
Conceptual Understanding	Male	275	19.2509	3.59323	.21668	1.070	548	0.289 NS
	Female	275	18.9309	3.41513	.20594			

As depicted in the above table, the computed 't' value for the significance of the difference between the mean score obtained by teachers belonging to male (M = 19.31, SD = 3.38) is slightly higher than that of teachers belonging to female (M = 18.70, SD = 3.69). The table shows that there was no significant difference in p-value (p = 548) at 0.05 level. This suggests that statistically, there was no significant difference in the conceptual understanding of secondary school teachers of Mizoram towards ICT integration in education with respect to gender.

The results of the t-test showed that there is no statistically significant difference in the level of conceptual understanding of ICT integration in education between male and female secondary school teachers in Mizoram. The obtained t-value was found to be not significant at the 0.05 level of significance. This indicates that gender does not have a significant influence on the conceptual understanding of ICT integration in education among secondary school teachers in Mizoram.

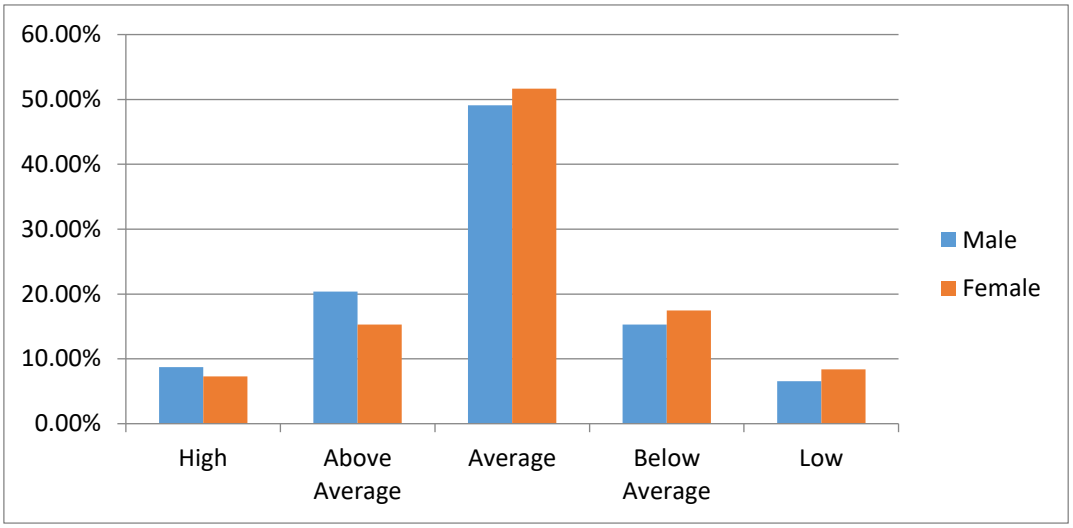

Fig 2: Conceptual understanding of ICT integration in education of Mizoram -Gender wise.

Figure 2 presents a comparison between male and female teachers conceptual understanding towards ICT integration in education. There was slightly higher level of female teachers fall under the average category, whereas a marginally greater proportion of male teachers are denoted in the high and above average categories. However, both male and female secondary school teachers of Mizoram are predominantly concentrated within the average level of conceptual understanding towards ICT integration in education. Thus, it can be concluded that majority of secondary school teachers of Mizoram show an average level of conceptual understanding towards ICT integration in education.

Results on conceptual understanding of ICT integration in education of the secondary school teachers of Mizoram with respect to age.

For the purpose of statistical testing the following null hypothesis was formulated-

H_0 = There is no significant difference in the conceptual understanding of ICT integration in education of the secondary school teachers of Mizoram with respect to age.

The respondents were categorized into two groups, such as teachers aged below 40 years and those above 40 years.

Table 4: Different Categories of Conceptual Understanding of ICT Integration in Education of the Secondary School Teachers of Mizoram with respect to Age.

Age	N	High	Above Average	Average	Below Average	Low
Under 40 Yrs	349	29 (8.31%)	69 (19.77%)	170 (48.71%)	51 (14.61%)	32 (.17%)
Over 40 Yrs	201	12 (5.97%)	34 (16.92%)	91 (45.27%)	35 (17.41%)	27 (13.43%)

Table 4 shows the distribution of secondary school teachers of Mizoram across different categories of conceptual understanding towards ICT integration in education with respect to their age. Out of 349 teachers belonging to the under 40 years age group, 8.31% of teachers fall under the high level, 19.77% under the above average level, 48.71% under the average level, 14.61% under the below average level, and 0.17% under the low-level category of conceptual understanding towards ICT integration in education.

Similarly, among the 201 teachers belonging to the over 40 years age group, 5.97% teachers fall under the high level, 16.92% under the above average level, 45.27% under the average level, 17.41% under the below average level, and 13.43% under the low-level category.

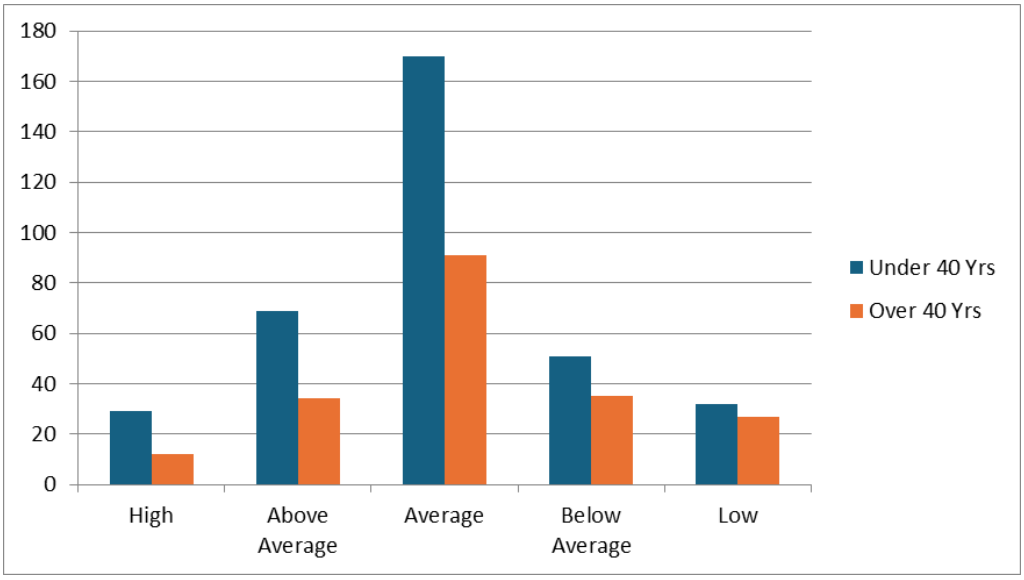

Fig 3: Comparison of the overall conceptual understanding of secondary school teachers of Mizoram with respect to their age.

Figure 3 reveals the comparatively higher mean score obtained by teachers below 40 years of age indicates that younger teachers tend to possess better conceptual understanding towards ICT integration in education than their senior counterparts.

Table 5: Difference in the Levels Conceptual Understanding of ICT Integration in Education of the Secondary School Teachers of Mizoram with Respect to Age

Variable	Age	N	Mean	SD	SEM	t	df	Significant level
Conceptual understanding of ICT integration	Below 40 Yrs	349	19.3123	3.38054	.18096			0.05
	Above 40 Yrs	201	18.70	3.69	.26	1.957	548	(NS)

As shown in the above table 5, the computed 't' value for the significance of the difference between the mean score obtained by teachers belonging to the under 40 years age group (M = 19.31, SD = 3.38) is slightly higher than that of teachers belonging to the over 40 years age group (M = 18.70, SD = 3.69). The table shows that there was no significant difference in p-value (p = 0.051) at 0.05 level. This suggests that statistically, there was no significant difference in the conceptual understanding of secondary school teachers of Mizoram towards ICT integration in education with respect to their age.

Major Findings:

Overall level of conceptual understanding towards ICT integration in education of the secondary school teachers of Mizoram

1. 52.73% of secondary school teachers had average level of conceptual understanding towards ICT integration in education
2. 7.09% were found to have similar obtained of a high level and low level of conceptual understanding towards ICT integration in education.
3. 17.46% of secondary school teachers had above average level and
4. 15.36% of secondary school teachers were below average level.

Conceptual understanding towards *ICT integration in education of the secondary school teachers of Mizoram* with respect to gender

1. 28.73% of male teachers had high level of conceptual understanding of ICT integration in education.
2. 20.36% of male teachers had the above average level of conceptual understanding of ICT integration in education.
3. Majority 49.09% of male teachers had the average level of conceptual understanding of ICT integration in education.
4. 15.27% of male teachers were below average level, and
5. 6.55% of male teachers were under the low level of conceptual understanding towards ICT integration in education.
6. 7.27% % of female teachers had high level of conceptual understanding towards ICT integration in education.
7. 15.27% under the above average level of conceptual understanding towards ICT integration in education.
8. Majority 51.64% of female teachers had the average level of conceptual understanding towards ICT integration in education.
9. 17.45% of female teachers under the below average level, and 8.36% of female teachers under the low-level category.

10. There is no significant difference in conceptual understanding towards ICT integration in education of the secondary school teachers of Mizoram with respect to gender.

Conceptual understanding towards *ICT integration in education of the secondary school teachers of Mizoram* with respect to age

- There is no significant difference in the conceptual understanding towards ICT integration in education of the secondary school teachers of Mizoram with respect to age.
- Out of 349 teachers belonging to the under 40 years of age group, 8.31% of teachers fall under the high level.
- 19.77% of teachers under 40 years of age fall above average level conceptual understanding towards ICT integration in education.
- Majority 48.71% of teachers under 40 years, had an average level of conceptual understanding towards ICT integration in education.
- 14.61% of teachers under 40 years had below-average level conceptual understanding towards ICT integration in education.
- 0.17% under the low-level category of conceptual understanding towards ICT integration in education.
- Among the 201 teachers belonging to over 40 years age group, 5.97% of teachers fall under the high-level conceptual understanding towards ICT integration in education.
- 16.92% of teachers belonging to the over 40 years had above average level conceptual understanding towards ICT integration in education.
- Majority 45.27% of teachers over 40 years had an average level of conceptual understanding towards ICT integration in education.
- 17.41% under the below average level, and 13.43% under the low-level category conceptual understanding towards ICT integration in education.

Suggestions and Conclusion

Based on the findings, most of the teachers exhibit an average level of conceptual understanding of ICT integration in classroom teaching learning. The study indicates that teachers acquire only the basic knowledge of how to integrate ICT into their teaching but struggle to integrate ICT into their core pedagogy. Understanding the “why” and “how” behind using technology can change and improve teaching and learning. The secondary school teachers in Mizoram need to improve from basic knowledge to high level conceptual understanding of ICT integration. It was suggested that the existing ICT training, which is currently a one-size-fits-all approach, should be replaced with a systematic training program that explores different ICT devices and educational apps to enhance teachers’ higher-order ICT integration competencies and move beyond basic literacy.

The secondary school teachers in Mizoram have a high potential to integrate ICT in their teaching, but they require systematic transformation from the authority. The training program should be redesigned to incorporate Technology Pedagogy Content and Knowledge (TPACK). The modern classroom is increasingly equipped with hardware devices like computers, projectors, laptops, high-speed internet, and so on. However, the mere presence of these devices is inadequate for effective classroom teaching. Policymakers and curriculum planners must know how to integrate ICT into mainstream curricula. Therefore, understanding ICT integration in education goes beyond just knowing how to click a button or use a computer in classroom teaching; it involves comprehending how technology can transform and enhance the way a subject is taught.

References

1. Arnseth HC, Hatlevik OE. Challenges in aligning pedagogical practices and pupils' competencies with the information society's demands: the case of Norway. In: Cases on interactive technology environments and transnational collaboration: concerns and considerations. Hershey, PA: IGI Global; 2010. p. 266-80. doi:10.4018/978-1-61520-909-5.ch014
2. Aktaruzzaman M, Shamim MR, Clement CK. Trends and issues to integrate ICT in teaching learning for the future world of education. Int J Eng Technol. 2011;11(3):114-9.
3. Khan MSH, Hasan M, Clement CK. Barriers to the introduction of ICT into education in developing countries: the example of Bangladesh. Int J Instr. 2012;5(2):61-80. Available from: https://www.e-iji.net/dosyalar/iji_2012_2_4.pdf
4. Poudel AP. Use of information and communication technologies in collaborative learning activities. 2020. doi:10.5281/zenodo.6993007
5. Tezci E. Turkish primary school teachers' perceptions of school culture regarding ICT integration. Educ Technol Res Dev. 2011;59(3):429-43. doi:10.1007/s11423-010-9177-9 (Available from: https://www.researchgate.net/publication/251083065)

How to Cite This Article

Zairemtluangi, Lalhriatpuii. Conceptual understanding of ICT integration in education among secondary school teachers: an overview. Int J Multidiscip Futur Dev. 2026;7(1):109-114. doi:10.54660/IJMFD.2026.7.1.109-114.

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