



# ICT COMPETENCY OF SECONDARY SCHOOL TEACHERS

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**Abstract:** ICT competency in education increases learning opportunities, nurtures critical thinking and collaboration, encourages active participation, and prepares students for the digital era. The purpose of the study was to investigate the ICT competency of secondary school teachers. Survey was conducted with a sample of 48 secondary school teachers selected through stratified random sampling technique. A self-develop rating scale consisting of 52 items based on eight components such as word processing, presentation, spreadsheets, e-mail, internet and networking, communication, professional, and digital tools was used as a tool for data collection. The collected data were analyzed using percentage, mean, standard deviation, t-test in SPSS software. The findings of the present study indicated that more number (47%) of the teachers were low competency in ICT. There is no significant difference between male and female, arts and science and urban and rural teachers with reference to ICT competency. It is suggested that secondary school teachers should be provided opportunities to enhance and improve their competency in ICT. Capacity building programmes may be organised by the state authority on use of ICT for teaching and learning for teachers to enhance ICT competency.

**Index Terms:** ICT Competency, Secondary School Teachers, Word processing, Presentation tools, digital tools.

## 1. INTRODUCTION

Information and Communication Technology (ICT) competency is having adequate knowledge about technology and teaching domain and to be able to create suitable technology-based lessons that can be used in learning processes. The existing society is innovative and creative with this innovative environment to bring and encourage learning with interactive atmosphere. ICT plays an essential and crucial role and it encourages lifelong learning. Moreover, it encourages focusing and attention brought down into the classroom in learning. Innovative and creative environment, to meet the suitable learning ICT competencies is obligatory in the present context. NEP 2020 emphasizes new technologies involving artificial intelligence, machine learning, smart boards, handheld computing devices and adaptive computer testing. It also emphasizes a rich variety of educational software and it must be made available for teachers at all levels to improve teaching learning and assessment. Adapting with these imminent innovative and creative teaching learning processes, the existing situations need to be investigated. ICT integration into the curriculum holds importance as it enables teachers and students to engage in flexible and personalized learning experiences. ICT consents individuals to learn at their own convenience, methods and progress at their own pace. Integrating technology into curriculum with

the objective of positively influencing teaching and learning has evolved over the last 20 years (Dias & Atkinson, 2001; Dockstader, 1999). ICT describes the competence in using computer technology in the teaching learning process. Effective communication in the teaching and learning process is largely dependent on ICT competency. Consequently, teachers should have the ICT knowledge and skills to adopt a problem-solving strategy and impart knowledge to students. In order to stay abreast of new technologies, teachers must possess essential competencies that are required of teachers in the classroom environment. ICT competency refers to a set of skills, knowledge, and attitudes that enable people to understand, use, and adapt to technological tools and digital resources. ICT competency encompasses skills in word processing, presentations, spreadsheets, email, internet, networking, communication, professional software applications, and digital tools, all necessary for success in today's digital world. It has the potential to contribute an important contribution to enhancing the quality of education. Academic achievements and ICT use have been demonstrated to be highly connected. The use of ICT and academic achievement has been found to be significantly correlated, Mehmood et al. (2022). These technologies used by the teachers enhance the teaching learning effectively and bring learning more engaging. The incorporation of ICT in education has enhanced learning ecosystems. The integration of ICT in education has encouraged to more engaging and effective teaching and learning processes. Initiatives like ePathshala, DIKSHA, and the National Digital Library have been developed to provide digital resources, including videos, textbooks, and periodicals, to students and teachers across the country. These platforms aim to bridge the digital divide and promote equal access to high-quality education. It offer self-paced learning opportunities and encompass a wide range of educational materials from prestigious universities. These ICT initiatives contribute to enhancing the quality of education and supporting lifelong learning.

## 2. RATIONALE OF THE STUDY

ICT competencies enhanced internalization of the learning process and created an innovation which steered to improve student knowledge and encourage their interest in learning. In the field of education in recent times due to the growth of technological revolution and advancement, ICT is a fundamental mechanism in transforming teaching-learning. The institutions of education and the corporate sectors are fascinated by the interest of ICT implementation. The teachers play a critical role for the effective implementation of ICT in the classroom. So, there is a need to investigate teacher's ICT competencies. ICT competency is the common delinquent in Tripura. Based on the National Achievement Survey (NAS) 2021, Tripura State Report Card, schools have only 28 percent adequate audio-visual resources. ICT competency is essential for the teacher in this dynamic world to perpetrate an innovative and creative learning environment in the teaching learning process. ICT significantly underwrite to improve the quality of education. At the moment, technology has an impact on every aspect of our way of life, including communication and transportation. Since the expectations of society and the curriculum have changed as a result of the growth of ICT, so should the teaching techniques and competencies, given how heavily dependent today's youth are on technology. In the classroom learning easily inculcates and attracts the students with the use of ICT competencies with an advanced technique. The academia, stakeholders, researchers has agreed the need of ICT in the classroom for better concentration and developing ideas. In order to improve the teaching-learning process, it is now crucial

to have the ability for timely acquisition, use, communicate, and retrieve relevant and accurate information through ICT (Adebayo, 2008). Erstwhile researchers have systematically studied ICT Competencies in the past. Parameshwar and Kolle, (2015) found that ICT competencies in India have concentrated in gender, age, experience and the common target were elementary and higher secondary teachers. Subsequently, other researchers conducted similar studies on ICT competency in the Philippines (Dalayan and & Estrellado, 2022), (Marcial & Rama, 2015). Republic of Macedonia (Vitanova et. al., 2015). These studies found that ICT competency of teachers commonly has in urban areas, especially in cities. Moreover, some studies have been conducted on the ICT attitude of teachers in Tripura (Debbarma and Das 2019). This study is important in addressing certain gaps in the literature. Previous studies were commonly conducted in other countries and only a few were conducted in Tripura. And, the latter have inconclusive results related to the questions in this study. ICT is not only a means of realizing the educational goals but important factors in a complete restructuring in the educational system, introducing new interactive and participatory models of education, new educational pedagogy, continuous and lifelong-learning.

The analysis of above research studies indicates that some studies have been conducted on attitude of teachers towards ICT. But less study has been examined the ICT competency of rural and urban secondary school teachers. Hence, the present study is to determine the ICT competency of secondary school teachers in Tripura is relevant. Specifically, the study aims to determine the gender, subject background (art and science) and based on the location (Urban and Rural) ICT competency of secondary school teachers at Tripura.

### 3. OPERATIONAL DEFINITION OF THE KEY TERMS USED

**ICT Competency:** In the present study, ICT competency denotes an individual's ability to effectively and proficiently use information and communication technologies for doing various educational tasks.

**Secondary School:** Secondary school refers to the education of students from classes IX to XII in India nationwide. However, in the present study, secondary school pertains to schools affiliated Tripura Board of School Education.

### 4. OBJECTIVES

1. To study the level of ICT competency of secondary school teachers
2. To compare the ICT competency of secondary school teachers with reference to gender, subject background, and location of schools.

### 5. HYPOTHESES

1. **H<sub>01</sub>**: There is no significant difference in ICT competency of male and female secondary school teachers.
2. **H<sub>02</sub>**: There is no significant difference in ICT competency of secondary school teachers with reference to their subject background (Arts and Science).
3. **H<sub>03</sub>**: There is no significant difference in ICT competency of urban and rural secondary school teachers.

## 6. METHOD

The researchers employed survey method to gather quantitative data on the ICT competency of secondary school teachers. The area covered in the study is Dhalai district of Tripura, which comprises the four blocks. A sample of 48 secondary school teachers were selected from Dhalai district of Tripura by using stratified random sampling taking gender as strata. Equal number of male and female teachers were selected from secondary schools. The present study is restricted to 28 secondary school teachers of Dhalai district of Tripura state only.

## 7. TOOL

The investigators used self-developed rating scale consisting of 52 items. These items are based on eight components of ICT such as word processing, presentation, spreadsheets, e-mail, internet and networking, communication, professional, and digital tools. The Likert type scale of three options such as highly competency (HC) 3-point, moderate competency (MC) 2 point, and low competency (LC) 1 point used as scale. The content validity of the rating scale was ensured by taking experts opinion on the items. The Cronbach Alfa reliability (.78) was estimated, which found to be significant.

## 8. PROCEDURE OF DATA COLLECTION AND TECHNIQUES OF ANALYSIS

The investigator personally visited all 12 schools from 4 blocks under the Dhalai district of Tripura state. After getting permission, the investigator explained the purpose of the study and detailed information about the tools to the teachers and then the investigator provided them with a copy of the tool for fill up. The collected data were analysed by using both descriptive and inferential statistics such as mean, standard deviation and t-test in SPSS Software accordingly interpretation was made.

## 9. DATA ANALYSIS AND INTERPRETATION

### 9.1. Levels of ICT Competency of Secondary School Teachers.

The first objective is to study the levels of ICT competency of secondary school teachers. The investigator grouped teachers as high, moderate and low competent on the Q3, Q2 and Q1. In this section, the researcher has studied the levels of ICT competency of secondary school teachers, which are presented in following pages.

**Table 1: Level of ICT competency of secondary school teachers**

SL No	Score Range	Number & Percent of Teachers	Level of ICT Competency
1	118 above	07 (15%)	High Competency
2	100 to 118	18 (38%)	Moderate Competency
3	Below 100	23 (47%)	Low Competency
	Total	48	

It is clear from table-1 that among the 48 secondary school teachers, 07 (15%) teachers were highly competent, 18 (38%) were moderately competent and 23 (47%) were low competent in ICT. These

observations clearly indicate that maximum numbers of the secondary school teachers have low ICT competency, which is graphically presented in the figure-1.

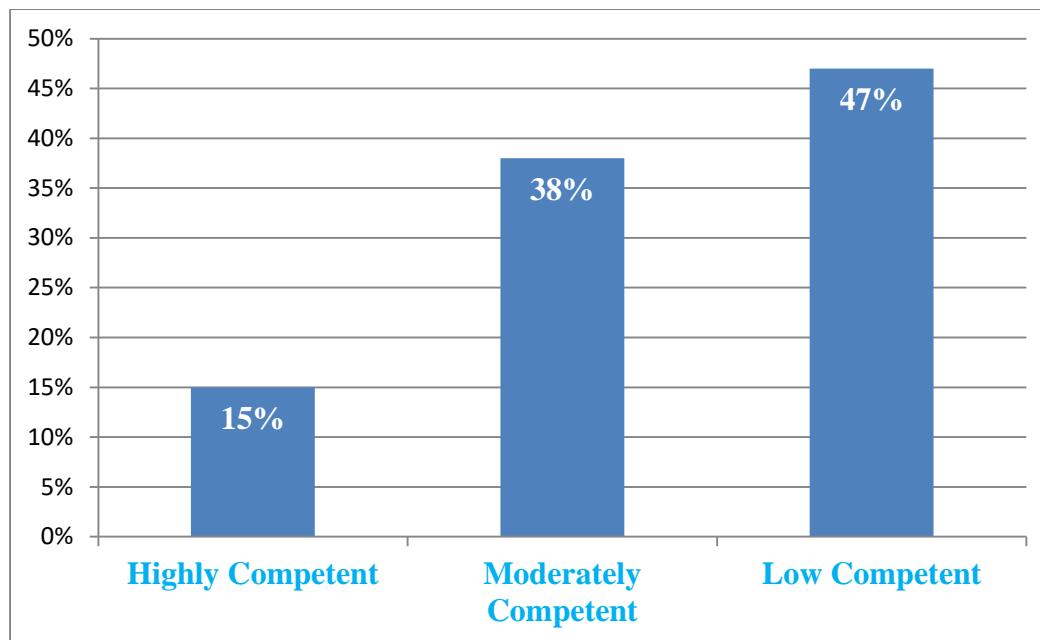


Figure -1. Percentage of the secondary school teachers with different ICT competency

## 9.2.Comparison of the ICT competency of Secondary School Teachers

The second objective of the study is to compare the ICT competency of secondary school teachers with reference to gender, subject background and location of school. For this, the investigator compared the ICT competency by using inferential statistics (t-test), which are presented in following tables.

**Table-2: Comparison of the ICT competency of male and female secondary school teachers**

Sl. No.	Gender	N	Mean	SD	df	't' Value	Significance
1	Male	24	105.13	19.24	46	1.83	.067
2	Female	24	95.8	16.06			

The results pertaining to ICT competency of secondary school teachers as shown in table 2, reveals that the critical value of 't'. The calculated value of 't', i.e., 1.83 is smaller than the critical table value 2.02 at 0.05 levels and hence it is not significant. Therefore, the null hypothesis there is not rejected. So, it can be concluded that male and female secondary school teachers possess similar level of ICT competency.

### 9.3.Comparison of the ICT Competency of Secondary School Teachers with Reference to Subject Background (Arts and Science)

In this section the investigators compared the ICT competency of secondary school teachers with reference to subject background (art and science).

**Table-3: Comparison of the ICT competency of arts and science teachers**

Sl. No.	Subject Background	N	Mean	SD	df	't' Value	Level of Significance
1	Arts	24	97.8	14.78	46	1.02	.313
2	Science	24	103.13	20.99			

From the above table 3, it is clear that 't' value 1.02 with mean of 97.8 for arts and 103.13 for science teachers. The calculated 't' value i.e., 1.02 is smaller than the table value 2.02 at 0.05 levels of significance. Hence, the null hypothesis, there is no significant difference in ICT competency of the subject background (Arts and Science) secondary school teachers is accepted. The study revealed that the ICT competency of arts and science secondary school teachers is similar.

### 9.4.Comparison of the ICT Competency of Secondary School Teachers with Reference to Location of School

The investigator has compared the ICT competency of secondary school teachers with reference to location (Urban and Rural) of school, which are presented in table 4.

**Table-4: ICT competency of urban and rural secondary school teachers with reference to location of school**

Sl. No.	Location	N	Mean	SD	df	't' Value	Level of Significance
1	Urban	24	96.09	17.43	46	1.71	.086
2	Rural	24	104.84	18.17			

It is found from table 4, that the calculated 't' value is 1.71 which is lesser than the table value 2.02 at 0.05 levels of significance. Hence, it is to be regarded as not significant and thereby the null hypothesis of there is no significant difference in ICT competency of urban and rural secondary school teachers cannot be rejected and as a result null hypothesis is accepted. Thus, it can be said that urban and rural teachers do not differ significantly in their ICT competency.

## 10. MAJOR FINDINGS

- The findings pertaining to the level of ICT competency of secondary school teachers have reported 15% were high competent, 37% were moderate competent and 48% were low competent. Hence, it can be concluded that most of the teachers were low competency in ICT.
- There is no significant difference in ICT competency of male and female secondary school teachers at 0.05 levels. Both male and female teachers working in secondary level have similar level of ICT competency.
- There is no significant difference in ICT competency of arts and science secondary school teachers at 0.05 levels. Teachers of arts and science background have similar level of ICT competency.
- There is no significant difference in ICT competency of urban and rural teachers' at 0.05 levels. Teachers working in rural area and urban area have same level of ICT competency.

## 11. DISCUSSION OF RESULTS

The researchers studied the level of ICT competency of secondary school teachers with reference to gender, subject background and location. This study found that the maximum teacher (47%) has a low ICT competency. This finding is supported with previous research studies (Karaca, 2011; Marcial & Rama, 2015; Basilotta et al., 2022) who found that the majority of the teachers have low competency in ICT due to lack of knowledge and skills related to technology. This study also found that there is no significant difference between male and female teachers in ICT competency. This is supported with previous research findings and results from the works of Debbarma and Das (2019) who investigated the ICT-related attitudes of the teachers working in the public schools in the Dhalai district of Tripura. Further, present study revealed that there is no significant difference in ICT competency of arts and science, and urban and rural teachers. This finding may be due to the report that not providing and facilitating computer subjects in the school curriculum. The more teachers use ICT and the more will be their ICT competency (Bariu et al., 2022).

## 12. EDUCATIONAL IMPLICATIONS

The primary aim of education is to provide and facilitate learning to develop understanding and skills in different areas of learning. Use of ICT can promote experiential learning in classroom. The present study revealed that 47% of teachers have low level of ICT competency and there is no significant difference in ICT competency of male and female, arts and science, rural and urban teachers. Hence, the study result can provide input for planning in-service teacher education programme relating to ICT competency and use of technology for teaching and assessment. This study would be useful for the school heads to develop ICT infrastructure in school and motivate teachers to use ICT for different educational activities. The National Education Policy (NEP 2020) suggested that ICT integrated pedagogy as an innovative and new strategy of teaching for education. So, all efforts must be initiated by the educational planners and administrators to develop capacity of teachers to use ICT integrated pedagogy in teaching.

### 13. CONCLUSION

The present study sought to establish the level of ICT competency of secondary school teachers in Tripura. The findings of the study clearly indicated that maximum number of teachers of secondary schools were low competency in ICT. Hence, the training related to use of ICT for teaching, learning, assessment and administration is essential to organise for the teachers in the school. This research finding would be beneficial for the teachers, administrators, curriculum developer, educational researchers for taking cooperative effort to enhance ICT competency of teacher and facilitate ICT based education in schools.

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