The Competency of Teachers Using Information and Communication Technology in a Higher Secondary Schools in Tirunelveli District, Tamil Nadu

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Abstract

Introduction: Nowadays Information and communication systems already cover more aspects of our lives. The study intends to identify the Competency of Teachers using Information and Communication Technology in a Higher Secondary Schools in Tirunelveli District of Tamil Nadu.

Purpose: The study aims to examine the access of ICT by teachers and the use of ICT for educational purposes. The Population of the study consists of secondary school teachers in Tirunelveli District, Tamil Nadu.

Method/Material: The respondents are selected on the base of stratified random sampling techniques method. The data was collected from 180 respondents.

Result: The study has been noted that most of the teachers do not have access to ICT. This is because teachers are not able to use ICT services. The Focused Group Discussion has indicated that Teachers of samples schools have used ICT tools for their instructional purpose.

Conclusion:

Keywords: Competency, Information and communication Technology, Secondary Teachers

INTRODUCTION

In today's society, computers are becoming more important every day because there is practically no human effort where computers do not find applications. Indeed, during work hours and in our private lives, we are faced with machines. Nowadays, as a result of computer networking, we have a lot more ways to connect with other people. A few examples of new contact options are cell phones, electronic mail, short message service (SMS) and chat boxes. All these modern means of communication have their own unique way of using them, their own benefits and drawbacks, and a special user community of their own.

One of the most important developments for technological growth is Information and Communication Technology (ICT). The word ICT comes from the integration of digital information in telecommunications, computing and broadcasting.

Secondary education is a link between primary and higher education, and Dr. S. Radhakrishnan says," Our secondary education continues to be the weakest link in our educational equipment and requires urgent change. By offering quality education materials and enabling a information network for students, ICT proves to be a boon for all children at secondary level

Competency is a term used extensively in various contexts by different individuals. So it is defined in various ways. It identifies the skills, knowledge and abilities that the teacher possesses and brings to the sense of teaching. A successful teacher's success depends on the specialization of the subject or fields to be taught and technical knowledge and skills; an appreciation of educational processes and teaching abilities.

Competencies of Teachers' skills are challenged. There is a growing process, realization that conventional teaching skills in learner-controlled settings cannot yield desirable outcomes. In order to be effective, teachers involved in teaching using face to face, distance, or online approaches need guidance and encouragement to recognize new roles. In addition to this, teachers of the 21st century are also required to cooperate with all sectors of the educational community in Program planning, supervision, execution and evaluation.

Competence of teachers and standard of teachers are terms that are also in various educational contexts, referred to and often applied: Awareness and comprehension of children and their learning, subject knowledge, instruction, the educational system and the role of the teacher are involved in professional competence.

LITERATURE REVIEW

Soanes (2001) defined the term 'competence' with strength, abilities, legal authority as synonyms. Competency means talent, capability. Competency is generally defined as adequate, acceptable for the function. Adequate, or similarly trained, trained, or capable. Competence refers to gaining information. Competency is defined as the expected outcome from the performance of functions associated with profession. **Nousiainen, Kangas et al. (2018)** established the core competencies of teachers such as Pedagogical, Technical, Collaborative and creative for game-based Pedagogy implementation. This competency facilitates the professional development of technical knowledge and skill repertoires in game-based learning by teachers. **Riel, Schwartz et al. (2000)** explained

the use of digital technology in the classroom to become more familiar with technology which has contributed to confidence in technology which teaching the researcher like **Resita and Ertikanto (2018)** has established that the LCDS-based electronic module's product design presents text, image, visual, video and animation representation on the Learning Content Development System (LCDS) to enable students to understand the definition of physics if they can move from one type to another. **Caena and Redecker (2019)** has identified the teacher competence frameworks for educational professionals in the education systems at different levels. This structure will provide reference benchmarks for initial teacher preparation and the quality of educational practitioners along the career spectrum, as well as being able to balance the interests of various stakeholders and serve as an innovation booster in 21st-century pedagogies.

Nikolić, Petković et al. (2019) explained the aspects of ICT implementation in teaching process. His main aim was to inspire teachers to think about the way ICT should be implemented in lectures because it would be relevant to have significant potential for simulating, displaying and visualizing learning materials. The presence of ICT in the teaching process presents great challenges for teachers and seeks to solve the challenges***Kaur and Singh (2018)*** conducted a teacher attitude research**.** Participants of the study are one hundred and fifty secondary school teachers from schools of Punjab state of India. Survey was used to study Teachers' attitude and beliefs towards ICT in Teaching and Learning. The findings show that teachers' attitude towards the use of ICT is highly positive but the use of ICT in classrooms is inadequate. It is because of poor internet connection, lack of modern infrastructure, limited technical support, lack of effective training, limited time, rigid curriculum, traditional methods of evaluation. So if these weeds are removed the teachers could execute the ICT curriculum in an effective manner.

Kristiawan (2020) conducted the study for Padang Secondary School teachers who did not use the computer as an instruction assistant. The pilot test was conducted by Ninety four (94) secondary school teachers and selected as a sample using purposeful technique from five hundred and fifty (550) populations. The result shows that the teachers' ability to use the computer as an instruction assistant was weak, and the implementation results suggested that a model was true, realistic, and efficient. **Carless and Boud (2018)** explained the student feedback literacy that represents the understandings, skills and arrangements needed to make sense of knowledge when promoting job or learning approaches through curriculum design, guidance and coaching.

RESEARCH METHODOLOGY

The study intends to identify the Competency of Teachers using Information and Communication Technology in a Higher Secondary Schools in Tirunelveli. Survey method was adopted for this study. The Population of the study consists of secondary school Teachers in Tirunelveli District, Tamil Nadu. The respondents are selected on the base of stratified random sampling techniques method. The primary data was collected through well-structured questionnaire from the respondents. The questionnaires were distributed among 180 respondents. The secondary data was collected through internet and other resources .The collected data were analysed and interpreted by using 20.0 version.

Objectives of the Study

- To identify the ICT-Competency Nature of Relationship among secondary schools teachers.
- To understand the Gender Variations in ICT – Competency Perception
- To study the level of ICT – Teacher's Subject Competence
- To study the Impact of ICT on Teaching Learning Process among secondary schools teachers.

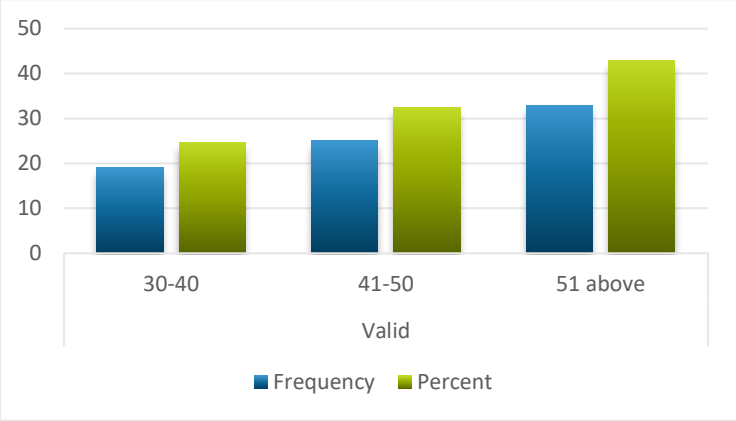
LIMITATION OF THE STUDY

The research is confined to eighteen schools from selected taluks in Tirunelveli District. The study has following limits.

- The study is limited to Tirunelveli District of Tamil Nadu only.
- The study is including only the secondary schools only.
- The study covers secondary school teacher's competency ICT Skills only.

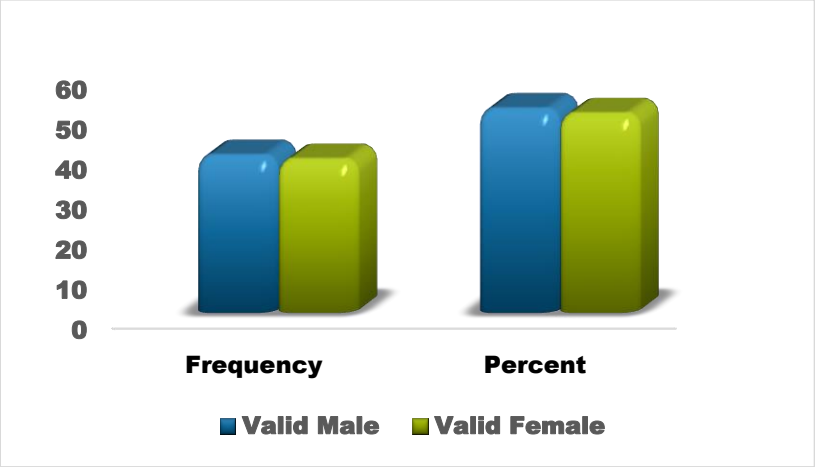
ANALYSIS AND DISCUSSION

Figure:1 Age composition of respondents



The above graph 1 reveals that the age composition of respondents is divided into three categories namely; 1st group is age between 30-40, which has twenty four percent. The second is age between 41-50, having 32 % of respondents, third group is having age group between 51 above, having 42 percent which is the highest. The highest group of respondents is the last group and many teachers have aged.

Figure:2 Sample Respondents: Gender Composition



The graph 2 shows that the Gender composition of respondents is divided into two categories namely: Male and Female. The Male respondents of the research is a bit higher side than the female respondents. The current research has taken the respondents both groups.

Table 1: Geographical Location Types

Study has been undertaken in two geographical locations namely: Rural schools having 42.9 % of influence in the research and urban schools having 57.1 %. The schools using ICT tools in the research has definite influences. The reason of ICT tools used in the urban schools is that they are able to adopt newer techniques of ICT and use them in the curriculum design.

The Objective 1: ICT-Competency Nature of Relationship among Teachers

To establish the nature of relationship among the ICT-Competency aspects, researcher has used the Pearson's correlation to determine the relationship. Pearson's Correlation Analysis has been used to find out the relationship among the ICT-Competency aspects and how interrelated they are. The

		Frequency	Percent
Valid	Rural	33	42.9
	Urban	44	57.1
	Total	77	100.0

nature of relationship of ICT aspects among the variables is having multiple categories like rural vs Urban, High Schools, Elementary Schools and Middle Schools.

Table: 2 The General aspect of ICT among Schools

ICT Aspects in general	Strategic Relationships with ICT Aspects
ICT-Competency based Curriculum	66
Outcome Based Learning	64
Lasting Learning	63
Student Intellectual growth	62
Knowledge Creation	61
Stimulus Learning	60
Collaborative learning environment	59
Student reflection Generation	58

The table 2 indicates about the ICT aspects having correlations with aspects used in the current research. The first aspect is ICT-Competency based Curriculum, has higher statistical value having relations with 66 aspects of the current research. ICT-Competency based Curriculum is one of the important aspect teaching-learning process and enabling teachers to increase the relevance of ICT in learning process among students. The use of ICT is to build the Competency of Teachers and promote the Collaborative Learning among the students. Teacher-competency is being validated through ICT usage and practice in their instruction and how they are able to adopt ICT tools and techniques to develop their teaching competencies. The strategic significance of ICT aspects with Statistical correlation. The second aspect is Outcome-Based Learning having statistical significance relationship with 64 aspects namely Knowledge creation, Stimulus Learning, Collaborative learning and outcome-based learning among the students in the current research. The teacher competency is to enhance the outcome-based learning and Teachers in the current research are educating themselves to learn with Learning Outcomes.

Objective 2: To Study the Gender Variations in ICT – Competency Perception

The following table shows how an ICT Competence variation aspect is having more statistically significant relationships with other aspects of the research. Collaborative learning environment is the first aspect which is having highest number (59) of relationship with other aspects. The female teachers are prone to use teaching competencies along with ICT tools to instruct students. These aspects are highly statistically significant in developing Collaborative learning environment as a strategy.

The second aspect is Fast Learning which is having overall 58 aspects statistically significant and relevant. Fast learning with ICT has become the prime move. The major aspect of Fast Learning is to teach students with creativity and innovative ICT medium of instruction.

Table: 3 ICT Competence variation: Female

ICT in Female Aspects	Total Number of strategic relationships with Female aspects
Collaborative learning environment	59
Fast Learning	58
Knowledge Application	57
Modification of Skills	55
Teacher Attitude	54
Stimulus Learning	53
Teaching Methods	52
ICT Curriculum Planning	51

Knowledge Application is the third aspect, which is having statistically significant relationships with 57 aspects. These aspects are interrelated. Teachers using ICT tools along with competency of teachers are able to help the students to apply their learning skills and convert them to apply their knowledge, skills and understanding. The understanding of their learning skills would enhance their learning style. In an FGD, teachers have voiced that Students today are growing up in a world overflowing with a variety of high-tech tools, from computers and video games to increasingly sophisticated mobile devices. Thus Learning has become a Student-Centred approach to help them to learn and apply their knowledge in real time problems. Competency of Teachers are oriented towards developing learning strategies.

The following table indicates that Male teachers are perceiving ICT-Competency Application in different ways in comparison with female teachers. It is to establish how an ICT-Competency Application aspect is having more statistically significant relationships with other aspects of the research. The current research, Male teachers are prone to adopt ICT-Competency Application to assist students to enhance Student Comprehension ability to study better.

Table: 4 ICT Competence perception: Male

ICT in Male Aspects	Total Number of strategic relationships with Male aspects
Student comprehension ability	57
Student reflection Generation	53
Knowledge Creation	51
Student Intellectual growth	50
Student Analytical Skill	49
Feedback	48
Clarity of Lessons	47
ICT instruction mode	46
Knowledge Application	45

The first aspect of ICT-Competency Application that has statistically significant relationships with other aspects of ICT, which is having 57 aspects. Male teachers are able to connect ideas within and between sentences and helps students understand the whole text. Male teachers are found to be emphasizing on comprehension ability. As students interpret the meaning of texts, they must strategically apply their background knowledge, their knowledge of the vocabulary, and their understanding of the language structures that exist between words and within sentences. The second aspect is Student reflection Generation, having 53 aspects. In order to promote Student reflection, Male Teachers in current research focus on the need for continually updating their teaching skills and practices. The third aspect is Knowledge Creation, which is having 51 statistically significant relationships. No body of knowledge can be formed without a system of communications, records, accumulation. It has been observed that Knowledge Creation is an important aspect of teaching-learning process, where the teachers are able to play significant role in creating knowledge building as the foundation to their education and moral development. The fourth aspect is Student Intellectual growth, which is having 40 aspects statistically significant. It has been observed that Student Intellectual Growth Activities include helping students to acquire disciplinary knowledge, develop critical thinking and problem-solving skills, enhance interpersonal and social skills, cultivate effective communication skills, apply knowledge and skills in their learning process.

Objective 3: To Study the ICT – Teacher's Subject Competence

Table :5 ICT- Teacher's Subject Competency: Rural Schools

	N	Mean
ICT based Language development	33	3.91
ICT Based Science Teaching	33	3.70
ICT Based Math teaching	33	3.67
ICT Subject Expertise	33	3.67
ICT based Social Science Teaching	33	3.42

ICT- teacher Subject Competence among teachers in Rural Schools are important aspect of current research. The table 5 shows the mean values of various aspects leading to understand the concepts of ICT- Subject Competency in Rural Schools. The first aspect of the table is ICT based Language development. The use of ICT has become essential in every day classroom to enhance teachers' subject competencies towards teaching and learning process. ICT has become essential tool for educational change and reform especially developing language. It has been observed that Teachers with ICT competency have the potential to play an important role in making language teaching and learning in schools more relevant, interesting and motivating for students. Therefore, consideration needs to be given to develop IT-based English activities in classrooms, which enable students to learn and experience at the same time. The second aspect is ICT Based Science Teaching, having 3.70 mean value, the third aspect is ICT Based Math teaching, having mean value of 3.67. The table gives us an over view of ICT based teaching interventions among rural teachers.

Table: 6 ICT- Subject Competency: Urban Schools

	N	Mean
ICT- Subject Competency	44	3.89
ICT based Language development	44	3.86
ICT Based Science Teaching	44	3.68
ICT based Social Science Teaching	44	3.66
ICT Based Math teaching	44	3.36

The table 6 indicates of Urban schools are having ICT- Subject Competency as the top mean value (3.89). ICT can be supported by an integrative framework of teacher professional knowledge which recognizes connections between subject domain knowledge, the didactic

relation with ICT tools and techniques. It has been observed that ICT- Subject Competency is to use ICT skills in developing and presenting information in the context of Teaching-learning process. For Urban Teachers, ICT is a new academic subject and ICT is a teaching and learning tool. In the current research, Urban Teachers are using ICT as a new subject matter, new skills that need to be learned by students. The second aspect is ICT based Language development having the mean value of 3.86. The third aspect is ICT Based Science Teaching having 3.68. The fourth aspect is ICT based Social Science Teaching having the mean value of 3.66. Thus, it has been noted from the FGD that Teachers are demonstrating knowledge and skills for using technology in ethical, legal and safe ways.

Objective 4: To Study the Impact of ICT on Teaching Learning Process among Schools

	N	Mean
Student reflection Generation	44	4.16
Student Intellectual growth	44	4.14
Student interest in Learning	44	4.11
Student Attitude to ICT curriculum	44	4.11
Student Overall performance	44	4.00
Student comprehension ability	44	3.95

Table: 7 ICT: Teaching Learning Impact in Urban

ICT-Learning Impact is the core aspect in Urban Schools and enabling them to create awareness of ICT- Teaching Learning outcomes. The outcome based learning gives us the knowledge and support the learning impact. The first aspect of the table is Student reflection Generation, having the mean value of 4.13. It has been ranked as top of the table. It has been observed that the teachers were hesitant in letting go some of the control they felt they had over students learning, and the students felt insecure in adopting some responsibility for their own

learning. Over time a sense of trust and ease developed and this 'control of learning' balance moved from what was traditionally accepted, but not without modifications and reservations.

The ICT-Learning Impact in Rural Schools is focused more on Student Overall performance. The sole focus of Student Overall performance indicates the mean value having 5.14 as the top of the table. In the interview with Teachers in Rural Areas, researcher could understand that the use of ICT is to enable teachers to bring desired result of Student Overall performance. It has been observed that the relationship between the use of information and communication technologies (ICT) and student performance in education is most significant.

Table: 8: ICT-Teaching Learning Impact in rural

	N	Mean
Student Overall performance	33	5.18
Student reflection Generation	33	4.24
Student Attitude to ICT curriculum	33	4.21
Student comprehension ability	33	4.09
Student Intellectual growth	33	4.09
Student interest in Learning	33	3.76

Researcher has observed that several studies in the review of Literature have tried to explain the role and the added value of these technologies in classrooms and on student's performances. It has been indicated along with research findings that the student performance is mainly explained by a student's characteristics, educational environment and teachers' characteristics, ICT may have an impact on these determinants and consequently the outcome of education. The second aspect is Student reflection Generation having 4.24 as the mean value. The third aspect is Student Attitude to ICT curriculum, having the mean value of 4.21.

CONCLUSION

ICT is one of the modern factors in shaping the global economy and making rapid changes in the society. In recent years, several studies and reports have highlighted the opportunities and the potential benefits of information and communication technologies (ICT) for improving the quality of education. The result has been noted that most teachers do not have access to ICT. This is because teachers are not able to use ICT services. The Focused Group Discussion has indicated that Teachers of samples schools have used ICT tools for their instructional purpose. They have expressed their concerned over the factors relating to lack of expertise, lack of confidence, insufficient teacher knowledge of ICT equipment, lack of infrastructure, insufficient knowledge of suitable software and lack of knowledge of how to assess the use and role of ICT in teaching and learning are factors that affect the use of ICTs for educational purposes.

SCOPE FOR FUTURE RESEARCH

The outcome of Research has indicated that there are new avenues have been proposed through this findings to enhance further research. This could be done by Information and Communication Technology (ICT):

1. The study was restricted to Higher Secondary School teachers in Tirunelveli District. The findings could be further expanded and studied in other Districts of Tamil Nadu.
2. A study can be undertaken to analyse the Factors impacting ICT curriculum development in Government schools alone.
3. It is proposed that the future study can be conducted in analysing the behaviour of teachers and students towards ICT implementation in secondary schools and Integration of Information and Communication Technology in other states.

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