# TEACHING AND ICT COMPETENCIES OF SECONDARY SCHOOL TEACHERS OF NAGALAND

*Thesis Submitted to Nagaland University in Partial Fulfilment of the Requirement for the Degree of Doctor of Philosophy in Education*


**By**

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UNDER THE SUPERVISION OF

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**DEPARTMENT OF TEACHER EDUCATION**

**NAGALAND UNIVERSITY**

**KOHIMA CAMPUS, MERIEMA, KOHIMA, NAGALAND**

**2024**

*Dedicated to my dearest husband, daughter and son with much love and gratitude*

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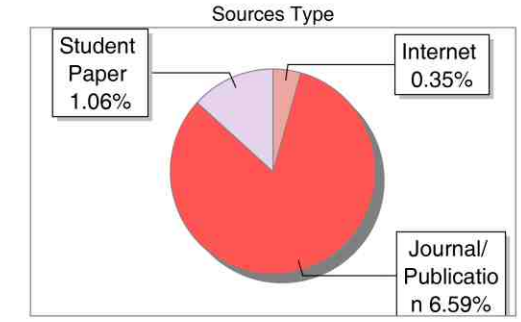


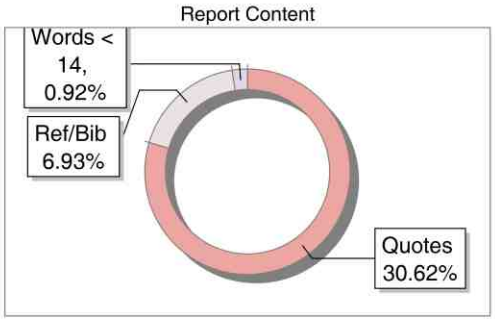


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# CERTIFICATE

This is to certify that **Ms. Thronlem Jorlim Konyak**, bearing Registration No. **Ph.D./TED/00401** from the Department of Teacher Education, Nagaland University, has completed her Ph.D. Thesis entitled "**Teaching and ICT Competencies of Secondary School Teachers of Nagaland"**, under my supervision and guidance.

This is her original work and has not been submitted earlier in part or in full, for award of any degree at any other university or institution. The thesis is fit for submission for the award of the Degree of Doctor of Philosophy in Education.

Place: Kohima

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Supervisor

Date:

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"Joy is the simplest form of gratitude" (Karl Barth)

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Place: Kohima **(THRONLEM JORLIM KONYAK)**

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## List of Abbreviations used

| | | | |
|---|---|---|---|
| i. | **B. Ed** | : | Bachelor of Education |
| ii. | **ICT** | : | Information and Communication Technology |
| iii. | **DVD** | : | Digital Versatile Disc |
| iv. | **CD ROM** | : | Compact Disc Read-Only Memory. |
| v. | **NETS-T** | : | National Educational Technology Standards for Teachers |
| vi. | **BTC** | : | Basic Training Certificate |
| vii. | **SBTC** | : | Secondary Basic Training Certificate |
| viii. | **NICS** | : | National Information and Communications Technology Competency Standard |
| ix. | **NBSE** | : | Nagaland Board of School Education |
| x. | **NCERT** | : | National Council of Educational Research and Training |
| xi. | **NCTE** | : | National Council of Teacher Education |
| xii. | **NEP** | : | National Education Policy |
| xiii. | **UNESCO** | : | United Nations Educational, Scientific and Cultural Organization |
| xiv. | **SPSS** | : | Statistical Package for the Social Science |
| xv. | **ANOVA** | : | Analysis of Variance |
| xvi. | **S.D** | : | Standard Deviation |
| xvii. | **Df** | : | Degrees of freedom |
| xviii. | **N** | : | Sample size |
| xix. | **NIELIT** | : | National Institute of Electronics and Information Technology |

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# INTRODUCTION

## 1.1. Introduction

*"Teachers truly shape the future of our children - and, therefore, the future of our nation"* (National Education Policy, 2020, para.5.1).

Teachers are the creator of history, the builder of the country, the maker of the humanity, an architect of our future and a yardstick which measures the accomplishment and aspirations of the nation. The failure and success of the system rest on the teacher alone as success is ensured only if a teacher is well educated, knowledgeable, competent, and skilful and takes an interest in his profession. It is through the work of teachers that the value and potentialities of a nation are evaluated. The country's future relies on the standard of education provided in its schools and the attribute of education is intimately associated with the calibre of teaching delivered by teacher in the classroom (Sidhu, 1996). Therefore, a teacher is regarded as the most critical influencer in the education system.

Dr. S. Radhakrishnan expressed, "The teacher's place in society is of vital importance. He acts as the pivot for the transmission of intellectual traditions and technical skills from generation to generation, and helps to keep the lamp of civilization burning. He not only guides the individual, but also, so to say, the destiny of the nation" (as cited in Sidhu, 1996, p. 125).

Considering the significant role of teachers, University Education Commission (1948-49) opined, "The right kind of teacher is one who possesses a vivid awareness of his mission. He, not only loves his subject, but he loves also those whom he teaches. His success will be measured not in terms of percentage of passes alone, not even by the quantity of original contribution of knowledge-important as they are, but equally through the quality of life and character of men and women whom he taught" (as cited in Saxena et al., 2009, p. 46). Teacher is regarded as an educational or a foster parent who supplements the responsibilities of the parents in educating the child. A teacher is a powerful influence in forming a child's character. The child holds and regards him or her regarding values, wisdom, guidance, moral, manner, inspiration and enlightenment. Teacher is the primary driving force within the school and is more valuable than magnificent buildings, infrastructure, rich curricula and expensive

equipments. A school lacking a good teacher would resemble a body without a soul, and without a competent and effective teacher, even the school with the most exceptional system is destined to fail. It is only through a good teacher that one can undoubtedly make the best out of even the worst system (Sidhu, 1996).

National Curriculum Framework for Teacher Education (2009) stated that the importance of competent teachers to the country's school system cannot be overstated. It is commonly acknowledged that teacher competence, motivation and sensitivity play a significant role in establishing the quality and extent of learner achievement. Thus, to mould and shape the young minds in tune with the ever evolving demands of society, teachers ought to possess all the essential dispositions, skills, information and knowledge. They must have an extensive variety of competencies to cope with the new challenges of present-day era.

Today, the world is experiencing a radical shift and rapidly contracting into a global village due to massive and immense advancement in technological, industrial, and scientific development, as well as explosion of knowledge, expectations, and population. This rapidly evolving scenario of the global world leads to a new demand for education system worldwide. The different dimensions of education have changed, ultimately revamping the practices and teaching strategies of teachers (Krishnamurthy and Lakshmi, 2010, p. 35). Education now focuses on supporting students in gaining new knowledge, skills, abilities, and attitudes necessary to secure their survival and success as individuals, community members, and citizens of the country. This poses teachers with more significant roles and responsibilities, and thus, they need to develop and enhance the required skills, knowledge, and abilities to perform their roles competently.

On the evolving responsibilities of teachers, International Commission on the Development of Education (UNESCO, 1972) boldly opined, "The teacher's duty is less and less to inculcate knowledge and more and more to encourage thinking, his formal functions apart, he will have to become more and more an adviser, a partner to talk to; some-one who helps seek out conflicting arguments rather than handling out ready-made truths. He will have to devote more time and energy to productive and creative activities; interaction, discussion, stimulation, understanding, encouragement" (as cited in Aggarwal, 2013, p. 11). Additionally, the commission expressed, "In general the teacher's role is changing, in that authoritative delivery of knowledge is being supplemented by spending more time diagnosing the learner's needs, motivating and encouraging study, and checking the knowledge required"

(as cited in Aggarwal, 2013, p. 11). Considering this, every teacher's ultimate objective should go beyond making the students pass the examinations and to make them full-fledged and well-defined personality of high- intellectual, moral and spiritual worth.

In today's world every educational institution needs teachers who are capable, competent, and technologically skilful to address the changing requirements of the educational system. Teachers must have the right values, awareness, attitude, skills, competencies, and knowledge to effectively impact the standard of education of the pupils at relevant stages. These are necessary to adapt to the changing scenario of education as they are the ones who are said to determine the destination of a nation. Therefore, teachers' teaching and ICT competencies are indispensable to meet the demands of the present educational system.

## 1.2. Competencies

Competencies or competency refers to an individual's inherent traits and attributes which enables an efficient and/or exceptional execution in a job (McMullan et al., 2003). Competencies indicate value, effectiveness, and the desirable attribute of carrying out tasks correctly, skilfully, and by social norms while collaborating and living with people in the right way. It refers to a preferred attribute of works performance. The characteristics of competencies are fluency, neatness, industry, originality, enthusiasm, thriftiness and flexibility (Pachaiyappan, 2020). It implies not just a person's technical ability and obtained skill but also a social identification, which leads to the construction of the social element of identity. Possessing an incredible amount of knowledge and skill does not result in competence. Knowledge must blend into a pattern of behaviour and become functionally operative at the appropriate time to serve a useful purpose.

Walker (1992) reflected that "Competence is the attributes (knowledge, skill, attitudes) which enable an individual or group to perform a role or set of tasks to an appropriate level or grade of quality or achievement (i.e. an appropriate standard) and thus make the individual of group competent in that role" (as cited in Singh, 2010, p. 33).

Rao (1998) emphasized that competence simply represents a refined modern term of an age-old human value; for example, the appropriate approach to live and carry out task in association and collaboration with others, the proper way to perform a job and the right

approach of accomplishing things competently. He further classified competencies into five categories that provide a structured framework for understanding competencies. The classifications are as follows:

1. **Cognitive based competencies**

   This type of competency specifies the intellectual skills and knowledge anticipated from learners. They are subject-oriented and help in expanding the scope of activities.

2. **Performance based competencies**

   They are overt action oriented and skill based. Here the learner showcases that he or she can execute some activity instead of merely being aware of the factual knowledge.

3. **Consequence based competencies**

   An individual is required to facilitate change in others to demonstrate this competency. The level of achievement or success is assessed by what one accomplishes. The accomplishment of pupils is, thus, a benchmark of the consequence based competency.

4. **Affective competency**

   A significant focus has been laid on this kind of competency because what one can teach and change the pupils is essential. These competencies define the expected values and attitudes and incline to defy specificity. These types of competencies are expressed in terms of behaviour.

5. **Exploratory competencies**

   This competency cannot be suited into any of the above mentioned four types of competency-based. Activities here involve providing opportunities for learning to pupils, but the specific nature of the result cannot be desired. They are also known as expressive objectives or experience objectives.

Gallego and Caingcoy (2020) observed that competencies are the benchmarks that determine the skills of an employee in executing tasks applicable to the job and are the features related to effective performance in a task. It is a collection of abilities, skills, behavioural traits and knowledge needed to deliver excellent job's performance. It means executing a task efficiently and effectively based on the integration, acquisition, composite building and application of related knowledge and skills. Competencies are criteria used to determine whether a person has the necessary skills to perform job-related duties. Thus, it can

be described as the state of having or showing skills, knowledge, attitudes and aptitude while performing a job.

## 1.3. Teaching

Teaching is the most essential component of education, with the intention of creating knowledge, developing skills as well as understanding. It is an act of a teacher that causes a child to gain the desired skills, wisdom, knowledge, and desirable approach of living in society. It is a course of action that involves teacher, learner, curriculum and other additional variables to facilitate learning. The most vital part of teaching is what is being taught, who is being taught and by whom it is being taught (Goswami, 2017). Morrison (n.d.) inferred that teaching is a close interaction between an immature and a grown-up personality, intended to advance the education of the former (as cited in Goswami, 2017). It is an engaging process between the students, subject matter and teacher that aims to facilitate the desired modification in student's behaviour. It is an application of specialized knowledge, skills, and attributes accomplished by a designated teacher to provide special services to fulfil the educational requirements of individuals and the society. Thus, teaching is an action undertaken by teacher to connect the subject matter and the learner. Both teacher and student remain dynamic, when it comes to teaching; the latter in learning while the former in teaching. Teaching is therefore the complicated art of directing students towards attaining an appropriate teaching-learning goal through various selected experiences (Aggarwal, 2014).

According to Smith B. O. (1963), "Teaching is a system of actions involving an agent, an end in view, and a situation including two sets of factors - those over which the agent has no control (class size, size of classroom, physical characteristics of pupils, etc.) and those that he can modify (ways of asking questions – almost instruction – and way of structuring information or ideas gleaned)" (as cited in Aggarwal, 2014, p. 29).

David G. Rayns (1969) asserted, "Teaching is complex and many-sided, demanding a variety of human traits and abilities. These may be grouped in two major categories - first those involving the teacher's mental abilities and skills, his understanding of psychological and educational principles and his knowledge of general and specific subject-matter to be taught and second those qualities stemming from the teacher's personality, his interests, attitudes and beliefs, his behaviour in working relationships with pupils and other individuals and the likes" (as cited in Aggarwal, 2013, p. 203).

Teaching, at its widest scope, is an action that enables learning. It is the specific application of skills, knowledge, and characteristics intended to furnish distinctive support and satisfy society's and each individual's educational needs. Teaching profession is responsible for choosing learning activities that help the schools achieve the objectives of education. Teaching stresses on fostering values and leading learners in their interpersonal connections in society besides supplying them with learning prospects to fulfil curriculum outcomes (Jha, 2016). Thus, it is a complex, intentional, and professional activity that demands a teacher to be equipped with different competencies to work effectively and efficiently for achieving successful teaching by catering to the needs of an ever-changing society.

### 1.3.1. Characteristics of Teaching

Aggarwal (1996) identified the major characteristics of teaching which are detailed as below.

1. Teaching is communicating information and knowledge. There are multiple aspects which the students can only explore for themselves if they are told. Thus, communicating or giving knowledge and information is regarded as one of the essential parts of teaching.
2. Teaching means causing the child to learn. Knowledge may only be transferred from one individual to another, if the receiver is ready to accept it. Teaching thus, means teacher convincing the learner to learn through one method or the other.
3. Teaching involves helping the student respond and adjust himself to his environment effectively.
4. Teaching stimulates and encourages the child to develop his desire to engage in activity.
5. Teaching is guiding pupils to do things properly and at the right time. It means guiding the pupils to do things in order to avoid wastage of time, energy and materials.
6. Teaching regulates child's emotions by fostering an environment of affection, freedom and love. It means assisting the child to develop a secure emotional identity.
7. Teaching entails helping the child emotionally, physically, spiritually and intellectually to engage effectively in the community's life.
8. Teaching is both formal and informal. It is formal as teaching is deliberately planned, organised methodically and always goal-oriented, and they are the official

representatives of teaching. It is informal as it is carried out outside of the classroom by parents and other family members, playmates and community.

9. It is both art and science. Teaching is an art that involves intelligent action through which an ordinary course and event can be modified, and it is scientific in nature because it entails different skills, techniques and procedures.
10. Teaching is a process by which the relation between the student, the teacher and the subject is established.

As a profession, teaching is an activity which is concerned with bringing desirable changes in learners. It requires experience, maturity, competency, training and subject matter specialization for a teacher to impart variety of skills to students in different ways to assist learning in them and achieve the goals of education. It also involves decision-making in utilizing and integrating various teaching skills to facilitate students' learning.

## 1.4. Teaching Competency

In teaching and learning, competency or competencies is/are an effort to switch the spotlight from superficial textbook-based factual content to pupils-centred by employing suitable strategy, methodology and adaptation of varied techniques (Pachaiyappan, 2020). It means the proper approach of communicating units of knowledge, skills and application to pupils by teachers. The proper approach here comprises the teacher's knowledge of methods, processes, contents and means of communicating them to students in an intriguing manner by incorporating students' participation (Shrivastava, 2014).

The report by the Education Commission (1964-1966), reprinted by the National Council of Educational Research and Training (1970), highlights that "Of all factors which determine the quality of education and its contribution to national development, the teacher is undoubtedly the most important. It is on his personal qualities and character, his educational qualifications and professional competence that the success of all educational endeavour must ultimately depend" (p. xiii). It is the ability, capability and potentiality of a teacher to deliver the subject matter, content and concept to the students efficiently and optimally.

The Commonwealth Report (1974) also aptly viewed that "In order to be competent the teacher must have a knowledge of child development, of the material to be taught and suitable methods; his skills must enable him to teach, advice and guide his pupils, community

and culture with which he is involved; his attitudes should be positive without being aggressive, so that his example is likely to be followed as he transmits explicitly and implicitly the national aims and moral and social values" (as cited in Aggarwal, 2013, p. 202).

According to Good (1973) "Teaching competency is those skills, concepts and attitudes needed by a teacher for the act of instructing in an educational institutional institution" (as cited in Shrivastava, 2014, p. 7).

Rao (1998) added that applied to teachers, competency refers to the right way of imparting information, skills, and applications to the pupils. The right way involves both subject-matter expertise and an understanding of the procedures, techniques, and strategies for presenting them to students in an engaging manner. A competent teacher is the one who can transform the teaching-learning process in to a delightful experience for pupils as well as for himself or herself.

Saxena et al. (2009) in *"Teacher Education"* enumerated that competent teachers are expected to possess some qualities which are as follows:

1. Teachers ought to be educated in the true essence of education to contribute his valuable inputs both as citizens and as individuals.
2. Teachers need to be proficient at portraying the teaching profession and their subject field within the context of both community and school.
3. They must be deeply rooted in their subject-matter's theory and practical and possess requisite skills and knowledge to teach theory and practical in a cohesive way.
4. They should be able to create and apply numerous productive teaching-learning procedures.
5. They must be able to devise and employ educational materials such as audio-visual aids.
6. They should be capable to choose and structure subject-matter for educational objectives.
7. They should be capable to employ varied methods to evaluate and assessed pupil's advancement and the efficacy of his own teaching.
8. Teachers must be competent in managing, structuring, and engaging in co-scholastic activities.
9. They should be capable to function efficiently in schools' guidance programme.

10. They must be able to perform efficiently as validated by authentic classroom performance.
11. They must have interest in sustainable growth by engaging in community activities, research and experiment, in-service education and professional associations.

Teacher competence is a collection of standards essential for teachers to acquire a range of educational proficiencies to meet the current educational demands (Zamri & Hamzah, 2019). It involves effective communication, classroom management, problem-solving, as well as collaboration with parents, students, co-workers and other stakeholders. Singh (2010) viewed teaching competency as distinguishable productive teaching behaviours or complex skills required for transacting the curriculum and can be determined in behavioural expression, which aim to fetch preferred learning results and are fairly demonstrable. Over the years different educational organizations has served as a catalyst for enhancing teaching competency of teachers by providing necessary support and resources. In the consultations initiated by National Council for Teacher Education (NCTE, 1998), ten remarkable inter-related categories of competencies were identified. These ten competency areas are:

1. **Contextual competencies**

   The responsibility of teacher is not confined to transmitting knowledge to students, but includes other wider responsibilities. His role is an essential aspect of the formation of the whole educational framework of society. The teacher should have knowledge and ability to find out and study various factors responsible for educational problems in the country and the concerned state and find out remedies for them and strive towards building a cohesive society. The teacher needs to be aware of his role and responsibility in fostering national integration and international understanding among the citizens.

2. **Conceptual competencies**

   Teachers' understanding and knowledge of the various concepts of learning and education and the aspects of sociology and psychology of education will help them as effective classroom teachers. The teacher should know the significant characteristics of child development at different stages, the inter-relationship among the students, and the needs of special needs children. He should also have sound knowledge about the concepts of constitutional provision, globalization, liberalization, privatization and

modernization and their educational implications to facilitate an effective teaching-learning process.

3. **Content competencies**

   Content competencies prepare teacher to teach optimally and this necessitates teacher to have in-depth knowledge and full mastery of the subject content to be taught. Besides this, they should be able to analyse and comprehend the existing curriculum and must give special attention to the content enrichment needs of children. The curriculum should be transacted in such a way that emphasises joyful learning activities, individual differences among students and encourages group learning as well. The teacher should also integrate technology in the teaching-learning process.

4. **Transactional competencies**

   It involves planning of evaluation and action, incorporating a variety of teaching materials, technologies and activities in the teaching-learning operation. The teacher ought to be competent in utilizing varied strategies, tools and methods, and should have good communication skills to make learning meaningful and effective. Effective teaching-learning can be achieved only through how well the teacher executes and transact the curriculum. Therefore, the teacher must be well versed in the purposeful usages of different techniques, devices and methods to produce qualitative and effective classroom transactions.

5. **Competencies related to other educational activities**

   To achieve wholesome development of a child it is inadequate to focus only on his cognitive development alone. Non-cognitive aspect is equally important and it deserves a considerable place in the teaching-learning method. Harmonious personality development of a child has a potential to be achieved only when the cognitive and non-cognitive aspects of their development are given due importance. Therefore, the teacher should have the skills and competencies in planning, organizing and executing co-curricular and other educational activities that contribute towards the development of students' non-cognitive aspects.

6. **Competencies to develop teaching learning materials**

   Apart from the prescribed textbooks, there are many other teaching-learning materials for enriching the quality of teaching. The teacher ought to have the capability to

prepare and develop different kinds of teaching-learning materials. Teachers should be competent in developing materials such as textbooks, workbooks and teacher's handbooks to encourage group learning and inter-learning among students and to enhance their professional standards. They should also be able to prepare, identify and utilize varieties of teaching aids such as maps, charts, models, tables etc., innovative and technology based teaching-learning materials, specially designed materials and those resources which are locally available as per the requirement of the curriculum and needs of the students for successful educational outcomes among the learners.

7. **Evaluation competencies**

   Evaluation is vital to understand and trace the learner's strengths and weaknesses in the learning activity. It also helps in assessing teachers' teaching performance. The teacher must be able to prepare, select and utilize different techniques and methods for diagnostic and prognostic purposes. Teachers are expected to know different techniques and methods of a continuous and comprehensive assessment of the student's total development and also be aware of different diagnostic and remedial measures to help the weak students.

8. **Management competencies**

   A teacher is regarded as the manager of a particular class or group of students. This responsibility requires a teacher to have competencies and skills for effective classroom management. The teacher is also an important part of the administrative set-up of the school which demands to carry out his roles and responsibilities outside the school that involves the school affairs. Therefore, they should foster necessary competencies and qualities for effective maintenance and management of school affairs as a single teacher as well as a responsible partner to enhance teaching-learning outcome of the school as a whole.

9. **Competencies related to working with parents**

   Parental responsibility for their children's education cannot be neglected. Teachers should work in cooperation with parents to identify and understand the needs and problems of every child. In this way, parents could contribute tremendously to ensure the proper development of every child. The teacher should, therefore, posses various competencies and skills in seeking parental co-operation and working with them towards achieving quality education for the children.

10. **Competencies related to working with community and other agencies**

The school and community partnership helps in strengthening and optimizing the quality of school education. Therefore, teacher must be competent in seeking co-operation and support from the members of the community and other local agencies for improving the school's situation. He must understand the importance of community participation and other local agencies in bringing about both the school and community development. They should incorporate and utilize various resources of the community in teaching-learning activities to enhance the standard of school education and also organize various activities which can bring the community and school closer to contribute towards their overall development.

National Council of Educational Research and Training (NCERT) also play a vital role in promoting the teachers' teaching competency. Aggarwal (2014) in his book *Essentials of Educational Technology* enumerated the teaching skills outlined by NCERT in its publication Core Teaching Skills (1982), which is presented in Table 1.1.

**Table 1.1**

**Core Teaching Skills and their Components lay down by NCERT (1982)**

| Sl. No. | Skill | Components |
|---|---|---|
| 1. | Writing instructional objectives | Clarity, relevance to the content, adequacy with reference to the domains and levels of objectives, attainability in terms of pupil outcomes. |
| 2. | Organising the content | Logical organisation according to content and psychological organisation as per needs of the pupils. |
| 3. | Creating set for introducing the lesson | Greeting, accepting greeting, securing attention and giving instructions, establishing rapport, ensuring facilities like chalk, duster, aids, apparatus, etc. |
| 4. | Introducing the lesson | Linking with past experiences, link between introducing and main parts, use of appropriate devices/techniques like questioning, examples, exhibits, etc. |
| 5. | Structuring classroom questions | Structuring questions at different levels which are grammatically correct, precise and relevant to content. |

| | | |
|---|---|---|
| 6. | Question delivery and distribution | Questions delivered with appropriate speed, with proper intonation and pitch, allowing pause for thinking and questions well-distributed covering even non-volunteers. |
| 7. | Response management | Management of pupil responses using techniques like prompting, eliciting further information, refocusing and asking critical awareness questions accepting, reflecting and redirection. |
| 8. | Explaining | Clarity, continuity, relevance to the content, using beginning and concluding statements, covering essential points. |
| 9. | Illustrating with examples | Simple, interesting and relevant to the point being explained. |
| 10. | Using teaching aids | Relevant to content, appropriate to the pupil's level, proper display and appropriate use. |
| 11. | Stimulus variation | Body movements, gestures, change in intonation and pitch, change in interaction pattern and pausing. |
| 12. | Pacing the lesson | Adjusting the speed of the lesson to the level of the pupils and difficulty level of the content. |
| 13. | Prompting pupil participation | Providing opportunity to pupils to increase participation through asking questions, creating climate of participation, use of silence and non-verbal cues calling upon pupil's physical participation. |
| 14. | Use of blackboard | Legible, neat, adequate with reference to the content covered. |
| 15. | Achieving closure of the lesson | Summarization, establishing link between the current learning, previous knowledge, and future learning, fostering a sense of achievement in pupils. |
| 16. | Giving assignments | Relevant to the content and level of pupils. |
| 17. | Evaluating the pupil's progress | Relevant to the instructional objectives, use of appropriate questions and observations. |

| | | |
|---|---|---|
| 18. | Diagnosing pupil learning difficulties and taking remedial measures | Identifying leaning difficulties along with causes, remedial measures suited to the type of learning difficulties and level of pupils. |
| 19. | Management of the class | Attention behaviour reinforced and directions given to eliminate non-attending behaviour, clarity of directions, appropriate handling of pupils' disruptive behaviour. |

Source: Aggarwal (2014). Essentials of Educational Technology (3rd ed.). pp. 232-233.

Teaching competency is those qualities and values that equip and enable teachers to carry out their professional tasks efficiently and insightfully. It is teacher's abilities in generating standardized educational outcomes.

### 1.4.1. Dimensions of Teaching Competency

There is different teaching competency related to different dimensions that make teachers competent and proficient in their profession. The following are the dimensions of teaching competency of teachers, as identified by Vidushy and Kishore (2021), which are elaborated as follows:

1. **Planning lessons**:
   This refers to the teacher's competence in planning lessons considering the goal of lesson, plan and guide innovative activities for creating the interest of the pupils, learning by doing and strategies to deal with tough topics.

2. **Classroom management**:
   This refers to the teacher's competence in managing the classroom environment by providing wide range of learning activities, to keep pupils alert and enthusiastic, to make them disciplined, proper feedback, try to identify their learning difficulties and contribute towards creation of climate conducive to learning and progress of all pupils.

3. **Knowledge of the subject**:
   The teacher must possess mastery over his subject, appropriate content selection to be taught, age of the pupils and competence to implement lessons in a way that provides

consistency and progression in learning. He must have vision and expertise in his field of study so that he can yield the best possible results.

4. **Interpersonal relationships**:
   This refers to the teacher's competence in developing sound and good interpersonal relationships with colleagues and pupils to avoid mismanagements and to invite new practices for better academic growth.

5. **Development of teaching learning material**:
   This refers to the teacher's competence in developing teaching-learning materials includes innovative ways to teaching, preparation of worksheets, preparation of relevant supporting materials at low cost/ no cost, design and relate classroom content to the real-life situations, local visits and other community resources.

6. **Time management**:
   This refers to the teacher's competence in punctuality, managing time to display teaching learning material and complete the syllabus in appropriate time.

7. **Evaluation process during teaching learning**:
   This refers to the teacher's competence for positivistic evaluation process, use of different evaluation techniques during teaching learning without giving undue pressure, to supply remedial inputs to help the child and give them practical shape.

8. **Competencies related to working with parents, communities and other organization**:
   This refers to teacher's competence in dealing with parents, the need for their collaboration in the process of teaching and learning as well as comprehension of the value of community in the comprehensive development and growth of students.

Teachers' teaching competence encompasses a variety of fundamental skills and qualities tailored to fulfil the unique requirements of diverse students. It includes a range of knowledge, skills as well as attributes that enable teachers to facilitate learning and support student's growth effectively. It involves the ability to plan, design and deliver engaging and exciting lessons, foster supportive and conducive learning environments, evaluate student's progress accurately, give constructive feedback, and adapt instructions to fit the various learning styles of diverse learners. In a more comprehensive term, it can be said that teaching

competency is the efficient and productive performance of all the tangible behaviour of a teacher which includes excellent use of a variety of teaching skills that brings about desirable results in a pupil. It also covers the knowledge of strategies, learning process and pupils' psychology. Thus, teachers also need to engage in continuous professional advancement to enhance their teaching competency as per the changing demands of the system of education and students.

## 1.5. Information and Communication Technology (ICT)

Information and Communication Technology is condensed as ICT, it implies using technology to collect, process, store, and disseminate information for effective and productive communication. It refers to the application of technology that provides access to information and communication, which involves utilizing computers and software database. It is an application of technologies in processing information through telecommunication. It embraces a wide range of technologies that manipulate, gather, and present information electronically in a digital form (Pachauri & Kumar, 2011). Computer, radio, broadband, television, e-mail, interactive forums, management information systems, learning management systems, web-based content repositories, cell phones, wireless networks, hardware gadgets connected to a computer, software programs and other communication mediums are all parts of ICTs (Chaudhary, 2019).

UNESCO (2002) defined that "Information and communication technologies (ICT), the term refer to the forms of technologies that are used to create, store, share or transmit, exchange information. This broad definition of ICT includes such technologies as: radio, television, video, DVD, telephone (both fixed line and mobile phones), satellite systems, computer and network hardware and software; as well as the equipment and services associated with these technologies, such as video conferencing and electronic mail" (as cited in Pachauri & Kumar, 2011, p. 60).

ICT is a means that allows individual and different agencies to interact and disseminate information technologically (Pachauri & Kumar, 2011). It is a term that encompasses digitization processes, content implementation and management, platforms development and implementation, processes for skill enhancement and establishment of interaction, exchange and discussion forums. ICT is a catch-all expression that describes a

broad category of technologies used for collecting, storing, processing, retrieving, evaluating and conveying information (Chaudhary, 2019).

### 1.5.1. ICT and Education

ICTs are changing the whole spectrum of the educational system with the development and innovations of new resources, new facilities, materials, and applications that are more effective than traditional methods. Today, ICT has become a key element of learning, and as a result, many educational and training institutions conveying skills in the basic and sophisticated concepts of ICT have been established. ICT is enabling education by facilitating online designing courses, computer-aided teaching, and online delivery of courses, online assessment, networking and management of many educational establishments. ICT has enhanced the effectiveness and efficiency of purposeful educational processes (Chaudhary, 2019).

National Policy on ICT in School Education (2012) noted, "Information and Communication Technologies refers to all devices, tools, content, resources, forums, and services, digital and those that can be converted into or delivered through digital forms, which can be deployed for realizing the goals of teaching-learning, enhancing access to and reach of resources, building of capacities, as well as management of the educational system" (para. 3).

ICTs are the dominant tools for providing formal and non-formal educational opportunities to every section of the population who wishes to acquire education without any discrimination. ICT technologies lead to novel approaches of classroom transaction which eventually revamp the role of both teachers and students. It has the prospects to upgrade and radically change the educational system and boost the standard of education by aiding new ways of communication between educators and students. It provides students and teachers with new tools and more interactive educational materials which develop learners' motivation and develop their skill formation, and facilitate effective learning. ICTs also lead to the assimilation of technologies with conventional methods of education and offer a more demanding and captivating learning environment for all levels of students. It facilitates the learner with greater flexibility and individualized learning provision and provides speedy delivery of uniform quality content, serving multiple teaching purposes to diverse students. ICT thus helps to enhance the productivity and efficacy of the overall education system.

#### 1.5.1.1. Characteristics and Purposes of ICT in Education

Kumar and Kumar (2018) in *ICT in Teaching and Learning Process* provide the following characteristics and purposes of ICT in education.

**a. Characteristics**

The characteristics of ICT in education are:

1. ICT in education consists of computer technology including its hardware, such as personal computer machines, infrastructure needed for arranging internet facilities, software such as E-learning strategies, various program packages, CD-ROM, etc.

2. In education, ICT refers to whatever information technology direct towards acquiring, storing, manipulating, managing, and transmitting or receiving data required for educational purposes.

3. In education, ICT is any technology used to communicate knowledge and information in the teaching-learning process, such as teleconferencing, PowerPoint presentations, internet use, Google apps, etc.

4. ICT comprises the support materials used by the individual engaged in educational process that supplement and enhance the standard of education.

5. In education, ICT involves the application of the science of online and offline learning with the help of computer technology.

6. In education, ICT comprises of hardware approach, such as the utilization of equipments and resources, software approach, such as employing teaching learning methodologies and strategies and a system approach, which utilizes management technology that handles the organized arrangement of the hardware and software packages used in various departments of education such as administration software, library software and software associated in managing the whole teaching-learning process.

**b. Purposes**

The purposes for applying ICT in education are as follows:

1. To disseminate material, CD-ROM or online facility to use as references of data in various discipline.

2. Enable special needs students to communicate.

3. Utilize digital toys for enhancing psychomotor skill management and spatial perception.

4. Use web-based assets such as chat, e-mail and forum to encourage team writing, talks, and information sharing.

5. Enable to engage broad spectrum of students from across geographic areas through Virtual-conferencing and variety of Tele-conferencing.

6. Use blended mode of learning by merging digital learning systems with conventional classroom instruction.

7. To manage assessment and administrative details.

8. Swapping and sharing of ideas for career advancement among teachers.

9. To conduct internet-based study to advance the process of education.

Robert Bracewell and Therese Laferriere (1996) presented fourteen (14) observations relating to changes in learner's behaviour attributed to ICT (as cited in Arulsamy & Sivakumar, 2009), which are as follows:

1. ICT has the power to emulate the advancement of various intellectual skills such as problem-solving and reasoning ability, creativity and learning to learn.

2. It can contribute in varied approach to better learning in different subjects and to the advancement of multiple attitudes and skills. The essence and breath of learning relies on previously obtained knowledge and type of learning pursuits using technology.

3. Learners exhibit extensive spontaneous interest in learning pursuit that uses ICT in class.
4. The span of learners' attention devoted to learning activities increases with the use of ICT.

5. ICT has the capability to emulate and access extensive information on a subject and foster the inquiry spirit.

6. It promotes broader cooperation among learners within and beyond school.

7. The accessibility of stimulation, graphic representation, rapid merging of data and virtual manipulation contributes to linkage in knowledge and more consolidated and better comprehended learning.

8. Teachers obtain information on novel instructional resources and accessibility of support for using them far more promptly with ICT.

9. It facilitates the teacher's cooperation with other people and colleagues inside and outside the school for development or planning of learning activities targeted for students.

10. The orientation of strategizing is more towards learners executing real work in collaboration with other learners.

11. The interaction between teachers and learners are more dynamic and guiding, rather than transmitting information from teacher to learner. The teacher interacts with learners in classroom as a mentor, facilitator and a guide to the discovery and subtle mastery of attitudes, skill and knowledge.

12. ICT helps teachers to perceive teaching and learning as a process of continuous inquiry where they share the difficulties and outcome with their learners.

13. ICT nurtures a positive, close relation of learners with the analysis of their learning, and uses and handles much more challenging evaluation techniques.

14. It enables effective understanding of learner's strength as well as the specific learning challenges he/she encounters.

### 1.5.2. ICT and Teacher

The explosion of digital technology has revolutionized the whole education system, demanding teachers to be effective and capable technology users. The tasks of teachers are no longer limited to teaching a certain body of knowledge and skills. Teachers are expected to assist and help students acquire higher cognitive skills like critical thinking, creativity, corporative learning, analysis, synthesis and application of new knowledge to new situations. The rapid expansion of knowledge has burdened teachers to update their knowledge and

expose them to various modern channels of ICT. Technology has ushered in novel prospects into the domain of education; however, they have placed more demand on teachers (Chandra, 2004).

*International Conference on ICT and Post-2015 Education (2015), Leveraging Information and Communication Technologies to achieve the Post-2015 Education Goal* aptly observed that reconsidering teachers' role and revamping their training programme and career advancement are required to incorporate ICT into educational process successfully. It calls for fostering a culture of excellence across various domains: deliberate planning and development, curriculum and course development, staff and student support, and course delivery. Therefore, it make sure that teacher preparation programme are thoroughly prepared to utilize ICT sufficiently, expanding the advantages of training programme and career advancement to every educators and serving as a pioneer in using ICT based advancements in education. It also pledge to help educators with comprehensive backing for integrating ICT into their teaching practices, incentivize teacher innovation, and establish networks and platforms for sharing experiences and approaches that can benefit their colleagues and other stakeholders.

## 1.6. ICT Competency

ICT competence is the capacity of an individual to use technologies effectively and efficiently to solve issues, communicate, and accomplish tasks. It includes the ability to use software and hardware applications, comprehend digital platforms and digital literacy, and use technology creatively and productively. In today's digital era, ICT competency has increasingly become significant in a person's professional and personal life.

Teacher's competence is an essential capability needed for executing ICT in educational process (Bariu et al., 2022). ICT competency of teachers could be termed as the proficiency of teachers that involves skills to use ICT, knowledge and maintenance of ICT equipment, both hardware components and software application and updated skills of teachers to operate modern technologies. It involves teachers' competencies in MS-office application such as visual presentation software, word processors, spreadsheets, Google App, e-mail and the Internet. It entails proficiently utilising various digital tools, software programmes, and online resources to support instruction, produce exciting and engaging lesson plans, evaluate student's progress, and encourage digital literacy in the classroom. ICT

competency of teachers also includes adapting to new technologies, keeping up with current trends and best practices in education technology and managing digital resources and data protection issues. The ICT competency of teachers is crucial to successfully integrate technology into the classroom and enhance students' learning journey.

The presence of ICT in the educational setting does not ensure a quality and effective teaching-learning process. To achieve this, teachers must have ICT competency to boost the teaching-learning process (Amin, 2016). Therefore, today's teachers need to be prepared as it has become an integral skill in every teacher's profession to furnish technology enhanced learning opportunities to students. ICT has the capacity to change teaching methods by facilitating instruction approaches that are student-centred, fostering advanced skills and encouraging cooperative activities. Every classroom and school, both physical and online, ought to have teachers who are aware of and are knowledgeable about the implications of ICT, proficient with technological resources and skills, and are able to teach subject matter content effectively while integrating ICT concepts and skills. Teachers must revise their skills and knowledge as the school curriculum and technologies evolve (Khan, 2010). Teachers require adequate digital skills and knowledge to apply ICT and hold great confidence in utilizing it in a classroom setting (Ghavifekr & Rosdy, 2015).

*Workshop on the Development of Guideline on Teacher Training in ICT Integration and Standards for Competency in ICT (2003), Final Report* emphasized that teachers should develop the knowledge and skills for implementing technology to stay abreast with the fast-changing teaching and learning tools. Competent teachers will master the use of ICT tools proficiently and may even develop competency in addressing simple maintenance and repair minor issues. Technology competencies will enable teachers to gather, communicate, present, manipulate and access information in images, text, title page sound, designs, and references. Teachers need to be acquainted with the educational ramifications of just and fair utilization of the national education information system, encompassing safeguarding the intellectual property rights and avoiding dissemination of unethical content. In general, they need to assist the requirements and goals of emerging knowledge-driven communities.

*International Society for Technology in Education (2002), National Educational Technology Standards for Teachers, Preparing Teachers to Use Technology* provides guidelines for teachers to promote the pertinent application of technological advancement in

teaching and learning. There are six (6) NETS-T standards, which are broadly categorized as follows:

1. **Technology Operations and Concepts:**
   In order to comply with the present and advancing technologies, teachers should display basic abilities, comprehension as well as knowledge of concepts connected to technology. They should exhibit continuous development in the knowledge and skills of using technology.

2. **Planning and Designing Learning Environments and Experiences:**
   To satisfy the various needs of the learners, teachers should try to create conducive learning atmosphere and technology-enhanced experience.

3. **Teaching, Learning and the Curriculum:**
   To maximize student learning, teachers should carry out strategy for developing curricular that include approaches and tactics to utilize technology and facilitate technology-enhanced experiences.

4. **Assessment and Evaluation:**
   To enhance instructional practice and optimize student learning, teachers should integrate technology in order to enable different practical assessment and evaluation techniques and use appropriate technological assets to gather and examine information, translate the outcomes as well as share the results.

5. **Productivity and Professional Practice:**
   To boost student learning, teachers should utilize technology to improve their professional practice and effectiveness. They should use technology to improve their professionalism and communicate with colleagues, parents, and the community.

6. **Social, Ethical, Legal and Human Issues:**
   Teachers should have a sound comprehension of the legal, ethical, human and social issues regarding the utilization of technology in schools settings. They should serve as role models to apply this understanding in practice to encourage the application of technology in safe and healthy ways.

Teachers need to master the skills of operating technologies and utilizing them for educational purposes. They must master the use of ICTs and be competent in using new hardware and software to transform the teaching-learning system. Teachers must be proficient in applying technology in teaching-learning, appropriately furnished with more didactic competencies to teach efficiently. Thus, training and professional development programmes are needed to help teachers fulfil the changing needs of education in the digital world.

*UNESCO (2018), ICT Competency Framework for Teachers, Version 3*, in enabling teachers to evolve in their professional practices and embrace new ways of teaching and learning, emphasize that using new technology facilitates the acceptance of new teacher roles that incorporate new pedagogies and approaches to teacher education. The ability of teachers to create socially engaged classrooms, integrate technology with pedagogy appropriately, organise learning in novel ways, and promote cooperative and collaborative learning and group work will all be necessary for the successful incorporation of ICT into the learning environment. For people, this will call for new skill sets beyond what they possess now. Teaching in the future will require the capacity to create new and creative uses of technology to improve the learning environment and promote knowledge generation, acquisition, and deepening. An essential element of this educational advancement will be teachers' professional learning.

The framework presents eighteen (18) ICT competencies structured into three levels, to support this transformation with six (6) components. Every level corresponds with usual ways in which every teacher integrates technology.

The six (6) aspects of teachers' professional practices are:

1. **Understanding ICT in Education Policy**

   Here, teachers are encouraged to comprehend the role of ICT in accordance with policies regarding national education. Teachers are encouraged to recognize their crucial role and strive to educate the learners to become productive citizens of the country.

2. **Curricular and Assessment**

   This aspect investigates the incorporation of ICT to support the particular goals determined in the curriculum as well as aid in assessment.

3. **Pedagogy**

   This facet motivates teachers to obtain ICT skills for enhancing their approach to teaching-learning. They are encouraged to incorporate ICT into pedagogical techniques and to take up problem-driven approaches that integrate team work and collaboration, and alternative student-centred pedagogies-ideal project.

4. **Application of Digital Skills**

   Since incorporating technology into a teacher's task requires having a foundational understanding of ICT, this component is significant at the Knowledge Acquisition level. The most important digital tools identified at this level are presentation packages, word processors, social networking apps and e-mail clients.

5. **Organization and Administration**

   This aspect deals with managing the school's digital assets and ensuring the safety of the users. It involves organizing physical environment like classrooms and computer labs that allow productive application of ICT for the purpose of learning. It also emphasizes creating a virtual learning environment that supports pervasive education and flipped classrooms.

6. **Teacher Professional Learning**

   The final aspect emphasizes how teachers can enhance their digital literacy, utilize ICT to progress in their profession, interact with educational networks and access relevant information. It focuses on teachers who are master learners and knowledge creators who use ICT to enhance classroom practices.

Every level encompasses six (6) components which mirror the usual responsibilities of practising teachers. Every level is built upon the knowledge and skills obtained in the preceding level to facilitate the ongoing development for teachers. These six (6) aspects are divided into three (3) successive levels which are as follows:

1. **Knowledge Acquisition**

   This level equips teachers with the necessary skills to contribute effectively for the educational community and facilitate students to become committed and contributing participant of society. Teachers who have mastered the competencies at this level can:

i. Explain how their classroom activities align with institutional and/or national policies.
ii. Examine curriculum requirements and determine the pedagogical application of ICT to help students meet the benchmarks.
iii. Use ICT towards assisting particular teaching and learning approaches.
iv. Understand the purpose of software applications and hardware elements and utilize them.
v. Arrange the physical environment in a way that allows for various learning methodologies to be accommodated by using ICT.
vi. Use ICT towards promoting the development of their professions.

2. **Knowledge Deepening**

This stage aims to provide teachers with the skill to utilize ICT for enhancing their efficiencies in all dimensions of their profession and to facilitate a student-centred learning environment. Teachers who have mastered this skill can:

i. Implement classroom practices that support educational policies.
ii. Incorporate ICT into the teaching, learning, and assessment processes to establish a favourable ICT-enhanced learning environment.
iii. Develop learning activities based on project, supported by ICT as well as employ ICT to facilitate students.
iv. Blend numerous digital tools and resources to develop problem-solving abilities in students.
v. Utilize technological resources to manage and promote cooperative learning and supervise the process of learning.
vi. Employ ICT to collaborate with the networks of professionals for professional development.

3. **Knowledge Creation**

This level equips teachers with the skills to establish Knowledge Societies for the community, school colleagues and students. Teachers who have mastered this level can:

i. Reflect on different educational policies and contribute ideas for improvement.
ii. Choose the most effective way to integrate student-centred and collaborative learning.

iii. In choosing learning criteria, promote collaborative learning and student self-management in learner-centred classroom.
iv. Create knowledge communities as well as utilize ICT to support pervasive learning.
v. Develop a technology-based strategy to transform the school into a learning organization.
vi. Develop, coach, experiment, share best practices and innovate consistently for ascertaining how technology can help the educational institutions optimally.

**Table 1.2**

**The UNESCO ICT Competency Framework for Teachers**

| | **Knowledge Acquisition** | **Knowledge Deepening** | **Knowledge Creation** |
|---|---|---|---|
| Understanding ICT in Education Policy | Policy Understanding | Policy Application | Policy Innovation |
| Curricular and Assessment | Basic Knowledge | Knowledge Application | Knowledge Society Skills |
| Pedagogy | ICT Enhanced Teaching | Complex Problem-Solving | Self-Management |
| Application of Digital Skills | Application | Infusion | Transformation |
| Organization and Administration | Standard Classroom | Collaborative Groups | Learning Organization |
| Teacher Professional Learning | Digital Literacy | Networking | Teachers as Innovator |

Source: UNESCO (2018). ICT Competency Framework for Teachers, Version 3, 2018.

### 1.6.1. Dimensions of ICT competency

Brief descriptions of the dimensions of ICT competency are as follows:

1. **Knowledge:**

   It refers to the understanding, awareness, familiarity and information that the teachers have regarding ICT. It also involves understanding the advantages of using ICT in day-to-day life.

2. **Skill:**

   It refers to the teachers' capability and expertise to capitalize on the knowledge of ICT and use a wide variety of digital devices, in the pedagogical process and their application in executing and performing different works through ICT in general.

3. **Maintenance:**

   It refers to the teacher's action of taking care and handling their personal ICT devices well by carrying out a few regular tasks to make sure that they continue to operate properly and to keep them running smoothly.

There is a widespread acceptance that ICT can enhance teaching-learning process as it has a great potential of transforming the way in which the teacher teaches and the students learn. It provides an array of tools and technologies that can transform the text-bound, teacher-centred and isolated classroom teaching into more interactive environment, technology enriched and student-centred classroom settings. Therefore, teachers need to be technology savvy to equip students for 21$^{st}$ century digital era (Amin, 2016).

## 1.7. Secondary Education

The secondary education acts as a link between higher and elementary education. The goal of secondary education is to produce high standard education that is affordable and easily accessible to all students at the age of 14 and 18 years. Classes 9 and 10 form the part of secondary stage. It is the stage that prepares the young mind for entry into higher education and the world of employment. Secondary education initiates to unveil the young pupils to different functions of humanities, social science, and science that provide them with the historical awareness and national perspective. It also gives students the opportunities to comprehend their rights as citizens and constitutional duties through appropriately formulated curricula (Chand & Prasad, 2017).

According to National Curriculum Framework (2005) “Secondary school is a period of intense physical change and formation of identity. It is also the period of intense vibrancy and energy. The ability for abstract reasoning and logical thinking emerges, allowing children the possibility of deep engagement with both understanding and generating knowledge beyond the here and now. A critical understanding of the self in relation to society also emerges during this period” (p. 68).

### 1.7.1. Need and Significant of Secondary Education

The education system is categorized into different levels based on psychology because there is a significant variation in the psychology of infants, children, adolescents and adults. The secondary education is the level of education meant for adolescents and is the fundamental education for them. Some of the needs and significant of secondary education are:

i. **Secondary education is a complete unit in itself**

Secondary education is assumed to be a bridge between primary and higher education. However, only few students join higher education, which makes secondary education a complete unit. Secondary education is mandatory in all developed nations as most youth step into the realm of work to earn their livelihood by working in various vocations.

ii. **Secondary education act as the basis for the development and growth of human resources in any country**

Secondary education develops human resources of the nation because students at this stage are trained to develop their capability to think and judge, cultivate work culture in them and thereby moulding and shaping them into a complete person.

iii. **Secondary education is the constructive and citizenship education of children**

Adolescence is a crucial stage in the growth and development of human beings, and children of this stage study at the secondary level. A child can become a contributing member and responsible citizen only if the right feelings of responsibility are inculcated among them. Therefore, secondary education should provide appropriate direction to adolescents to facilitate them to proceed on the right path.

iv. **Secondary education is the basis of higher education**

Secondary education forms the basis for higher education enabling students to go for higher studies and equip themselves for diverse specialized fields of life after completing their secondary education.

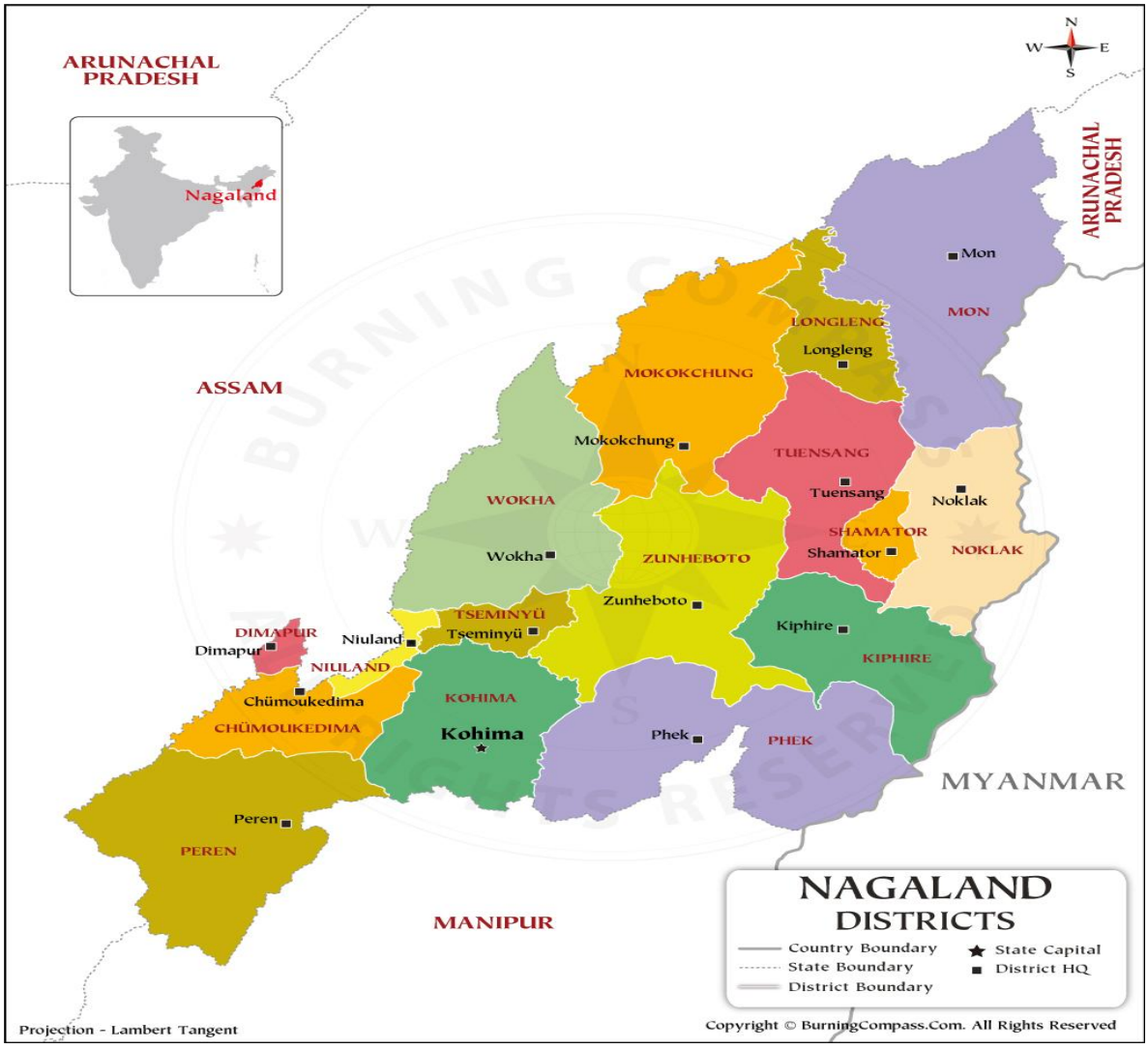
v. **Secondary education for most people is complete education**

Secondary education is a complete education for a vast population of any country because only intelligent and capable students enter higher education. As such, secondary schooling in most nations of the world is well advanced as a complete unit, so that it might develop the personality of children, make them competent in some vocation, and prepare them as common citizens.

## 1.8. A Brief Over View of Nagaland

The 16th state to legally join the Indian Union is Nagaland, which was inaugurated on December 1st, 1963. Assam borders the state's western region, Myanmar borders the state's eastern part, Arunachal Pradesh and a portion of Assam lies in the state's northern part, and Manipur borders the state's southern region. With the creation of four (4) new districts on 18th December 2021 and 19th January 2022, the State at present has 16 (sixteen) administrative districts: Kohima, Tuensang, Mokokchung, Dimapur, Zunheboto, Wokha, Phek, Mon, Peren, Longleng, Kiphire, Noklak, Tseminyu, Shamator, Chumoukedima and Niuland. Tseminyu became the 13th district, followed by Nuiland, Chumukedima and Shamator as the 14th, 15th and 16th districts respectively. Along with some few sub-tribes, these districts are home to 17 (seventeen) significant tribes. They are Angami, Ao, Chakhesang, Chang, Dimasa Kachari, Khiamniungan, Konyak, Kuki, Lotha, Phom, Pochury, Rengma, Sangtam, Sumi, Tikhir, Yimkhiung and Zeliang. Every tribe has unique customs, traditions, dress and language. These tribal people who dwell in the exotic hilly state of Nagaland can be characterized by the vibrant and colourfully designed attires, jewellery and ornaments they adorn. Nagaland is also called as the 'land of festivals'. Every tribe has its festivals, which they celebrate compulsorily with a pageantry of colour and a feast of music. The state capital is Kohima.

**Figure 1 (a): Map of Nagaland**




Source: https://www.burningcompass.com/countries/india/nagaland-district-map.html#google_vignette

### 1.8.1. Geography and climate of Nagaland

Nagaland state is primarily mountainous and measures 16,579 square kilometres (6,401 square miles). From the Brahmaputra valley, the Naga Hills rise sharply to a height of around 2000 feet (610 metres) before rising to more than 6,000 feet (1,830 metres) in the southeast. Mount Saramati, which rises 12,552 feet above sea level and marks the point where the Patkai Range in Myanmar and the Naga Hills meet, is the highest point in the state. The entire state is extensively dissected by Rivers Dhiku and Doyang to the north, in the southwest is the Barak River, with the Chindwin River in Myanmar extending in the southeast part of the state. The climate in the state is primarily monsoonal, with elevated

humidity levels. The annual rainfall averages is approximately 70-100 inches (1,800 and 2,500 mm) and is concentrated within the southwest monsoon months (between May and September). The temperatures in the state vary from 70 degrees to 104 degrees Fahrenheit. During winter, the temperatures hardly fall below 40 degrees Fahrenheit, even though higher elevations frequently get frost.

### 1.8.2. Population and Density

According the 2011 Census of India, Nagaland has 1,978,502 population overall, with 1,024,649 males and 953,853 females, respectively, with a density of 119 per square kilometre. The district-wise area, population, and density are displayed in the following Table 1.3, based on the 2011 Indian Census.

**Table 1.3**

**District- wise Area, Population and Density of Population of Nagaland according to 2011 Census of India**

| Sl.No. | State/District | Area in sq. km | Population | Density per sq. km | Percentage Share to total Geographical Area (%) |
|---|---|---|---|---|---|
| 1. | Nagaland | 16579 | 1978502 | 119 | 100 |
| 2. | Kohima | 1463 | 267988 | 183 | 8.82 |
| 3. | Peren | 1651 | 95219 | 58 | 9.95 |
| 4. | Dimapur | 927 | 378811 | 409 | 5.59 |
| 5. | Phek | 2026 | 163418 | 81 | 12.22 |
| 6. | Mokokchung | 1615 | 194622 | 121 | 9.74 |
| 7. | Zunheboto | 1255 | 140757 | 112 | 7.56 |
| 8. | Wokha | 1628 | 166343 | 102 | 9.81 |
| 9. | Tuensang | 2536 | 196596 | 78 | 15.29 |
| 10. | Kiphire | 1130 | 74004 | 65 | 6.81 |
| 11. | Longleng | 562 | 50484 | 90 | 3.38 |
| 12. | Mon | 1786 | 250260 | 140 | 10.77 |

Source: Directorate of Economics & Statistics, Government of Nagaland. (2022). Nagaland Statistical Handbook, 2022.

### 1.8.3. Literacy in Nagaland

As per 2011 census, Nagaland has a literacy rate of 79.55%. The literacy rate for male is 82.75%, while the rate for female is 76.11% respectively. The following Table 1.4 shows the district-by-district literacy rate for Nagaland as per the 2011 Indian Census.

**Table 1.4**

**District-by-district Population and Literacy rate for Nagaland as per 2011 Indian Census**

| Sl. No. | State/District | Literacy Rate (%) | | |
|---|---|---|---|---|
| | | Person | Male | Female |
| 1. | Nagaland | 79.55 | 82.75 | 76.11 |
| 2. | Kohima | 85.23 | 88.69 | 81.48 |
| 3. | Dimapur | 84.79 | 87.54 | 81.77 |
| 4. | Phek | 78.05 | 83.66 | 72.21 |
| 5. | Mokokchung | 91.62 | 92.18 | 91.01 |
| 6. | Wokha | 87.69 | 90.81 | 84.48 |
| 7. | Zunheboto | 85.26 | 87.85 | 82.62 |
| 8. | Tuensang | 73.08 | 76.31 | 69.59 |
| 9. | Mon | 56.99 | 60.94 | 52.58 |
| 10. | Peren | 77.95 | 82.84 | 72.58 |
| 11. | Kiphire | 69.54 | 74.88 | 63.97 |
| 12. | Longleng | 72.17 | 74.48 | 69.63 |

Source: Directorate of Economics & Statistics, Government of Nagaland. (2022). Nagaland Statistical Handbook, 2022.

### 1.8.4. A Brief History of Education in Nagaland

Any discourse on the development of education in Nagaland must go back to the years when the Baptist American Missionaries first entered the area inhabited by a people

who till that time were savage head hunters (Chuba & Liegise, 2017). In the uninhabited Naga territory formal education was unknown prior to the advent of western Christian Missionaries and the British rule. Indigenous education imparted by the parents in the family, the morungs and the community was the only system of education in the then Naga Hills (Temjenkaba, 1993). It was the Christian Missionaries from the West who introduced modern education and ushered in modern civilization among the Nagas. Wherever the Missionaries found the church, a school was simultaneously established, known as the Mission Schools. However, with India's independence, the educational programme was either undertaken by the government or integrated with government-run schools (Hrangkhuma, 1998). Nagaland was still educationally backward when it was a part of Assam. Only after attaining statehood in 1963, did the State made serious efforts to develop education (Imnayongdang, 1990). The statehood of Nagaland gave the expansion of education a boost. Several schools and colleges have been established with the initiative taken by the state government and private citizens to educate everyone through formal education. Colleges and schools have expanded significantly over time. Even though education took a while to develop in Nagaland, it has advanced significantly after statehood (Liezietsu, 2021). Thus, following statehood, the state has experienced remarkable educational development, leading to the establishment of numerous schools, colleges and universities.

## 1.9. Secondary Education in Nagaland

To handle all the matters related to secondary education, Nagaland has its own body, the Nagaland Board of School Education (NBSE). It is the state's organisation under the Nagaland government that is responsible for advancing secondary education in the region. Act No. 4 of the Nagaland Legislative Assembly created the Nagaland Board of School Education (NBSE) on the 15$^{th}$ November 1973, and it began operations on October 1$^{st}$, 1974 covering the whole of Nagaland. As empowered by the Act, the Board prescribe, regulates, supervise and develop the educational system of the State up to higher secondary level.

The total number of government and private secondary schools offering secondary education in the state as per Nagaland Board of School Education (NBSE), Result Gazette (Provisional), High School Leaving Certificate Examination, 2023 is presented in Table 1.5.

**Table 1.5**

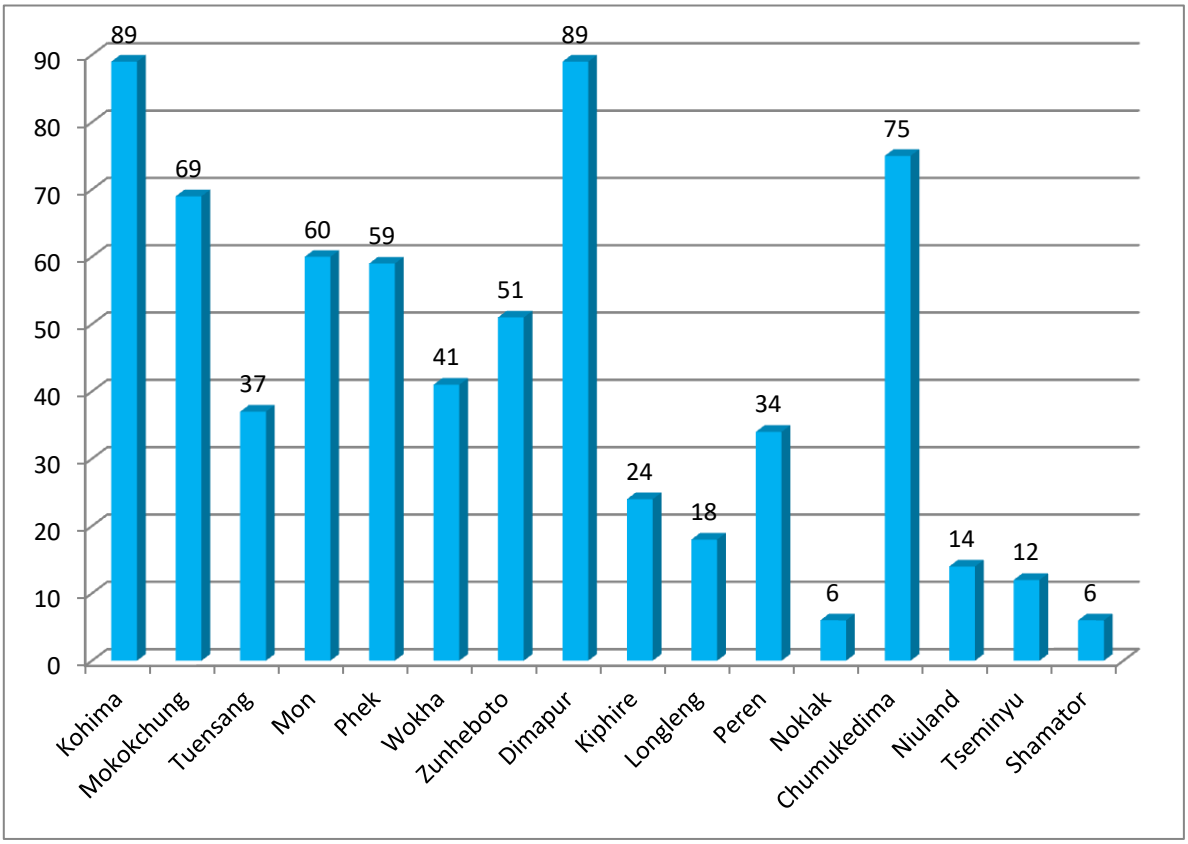
**Districts-wise total number of Government and Private Secondary Schools in Nagaland affiliated with the Nagaland Board of School Education (NBSE)**

| Sl. No. | District | Total No. of Government and Private Secondary Schools |
|---|---|---|
| 1. | Kohima | 89 |
| 2. | Mokochung | 69 |
| 3. | Tuensang | 37 |
| 4. | Mon | 60 |
| 5. | Phek | 59 |
| 6. | Wokha | 41 |
| 7. | Zunheboto | 51 |
| 8. | Dimapur | 89 |
| 9. | Kiphire | 24 |
| 10. | Longleng | 18 |
| 11. | Peren | 34 |
| 12. | Noklak | 06 |
| 13. | Chumukedima | 75 |
| 14. | Niuland | 14 |
| 15. | Tseminyu | 12 |
| 16. | Shamator | 06 |
| **Total** | | **684** |

Source: Nagaland Board of School Education, Kohima, Nagaland. (2023). Result Gazette (provisional), High School Leaving Certificate Examination, 2023.

The above table shows that out of the 684 government and private secondary schools offering secondary education in Nagaland affiliated with the Nagaland Board of School Education (NBSE), Kohima and Dimapur districts, with 89 schools each, have the highest number of institutions offering secondary education. Noklak and Shamator districts have the least number of schools, with 06 schools each.

**Figure 1 (b): Districts-wise total number of Government and Private Secondary Schools in Nagaland affiliated with the Nagaland Board of School Education (NBSE)**




## 1.10. Significance of the Study

As stated by Prof. Humayun Kabir, "Teachers are literally the arbiters of a nation's destiny. It may sound truism, but it still needs to be stressed that the teacher is the key to any educational, reconstruction" (as cited in Saxena et al., 2009, p. 1). The impact of teachers is enduring. He is the one who mould the fate of future citizens. Teacher holds extremely significant place in the society as he facilitates dissemination of the knowledge heritage from one generation to another. He preserves the degree of technical proficiency and sustains the flame of civilization alive (Saxena et al., 2009).

National Education Policy (2020) rightly emphasized that "The teacher must be at the centre of the fundamental reforms in the education system. The new education policy must help re-establish teachers, at all levels, as the most respected and essential members of our society, because they truly shape our next generation of citizens. It must do everything to

empower teachers and help them to do their job as effectively as possible" (p. 4). The effectiveness of teaching-learning, the success of students and the educational quality largely depend on teachers' competencies. This demands teachers to have proficiency in utilizing different strategies of teaching and have the knowledge, skills, and competency to incorporate ICTs optimally and productively in the process of teaching-learning to give quality education to students.

Teachers' competency, closely related to student's achievement, is seen as the primary source of all advancement in the education. It is crucial in ensuring that educational objectives are met. Competent teachers accept the additional responsibilities and try to advance their teaching knowledge and skills while working to enhance their school and community significantly. They implement new instructional techniques to captivate students' interest and motivate them to learn, thus striving to become true professionals. If teachers are ineffective and incompetent even with top-notch resources, the entire educational programme is expected to lack effectiveness and mostly wasteful. Thus, teacher's teaching and ICT competencies significantly influence the efficiency of teaching and learning process.

The shift in educational approach from a behaviourist to a constructivist approach has also brought about a tremendous transition in the function of teachers from providers of information to guides who scaffold students' learning experiences. The shift has typically enhanced the teaching competency of teachers by encouraging more interactive and student-centred learning opportunities. According to the constructivist approach, teachers have to be the facilitators of knowledge, fostering collaboration, critical thinking, problem-solving, and creativity in students, thus encouraging a more dynamic and engaging learning atmosphere. In a constructivist classroom, teachers must also integrate technology to effectively support inquiry-based learning, collaboration, and innovation. It requires teachers to have skills and knowledge in selecting and using educational software, digital media, online resources, and communication platforms and the ability for maintenance of their personal ICT resources. This paradigm shift in an educational approach has necessitated teacher competencies that are student-centred. Thus, continuous professional development is crucial for teachers to remain updated on emerging technologies and pedagogical approaches that can enrich the constructivist learning environment.

Today, the whole world is actively encouraging the utilization of ICT in the domain of education. The recent rise in epidemics and pandemics has also necessitated teachers to be

prepared with high-quality alternative modes of education to use when the traditional and in-person learning environments are not feasible (National Education Policy, 2020). As such, schools and colleges worldwide are now integrating ICT to enable students to overcome the challenges of the educational atmosphere. However, the presence of technologies in educational institutions does not ensure the quality and effectiveness of the educational process. To achieve this, teachers must have ICT competency to integrate it into their regular teaching-learning process. Therefore, besides other teaching competencies, today's teachers need ICT competency too, as it has become an integral component in every teacher's profession to give digital-enhanced learning opportunities to students.

Teacher perform a multifaceted role in moulding and shaping the next generation of citizens and leaders, thereby contributing towards the economic, social, and cultural advancement of society. Thus, teaching and ICT competencies of secondary school teachers are crucial as they directly impact the quality of education that the students receive. Present teachers have to be more proficient to meet the evolving demands of education in the 21$^{st}$ century. By being more competent, they can effectively nurture students for the challenges and opportunities of the ever-changing society, equipping them with the values, skills, and knowledge required to excel in school and life. Therefore, understanding teachers' teaching and ICT competencies is crucial.

In the educational hierarchy, secondary education is the most crucial period that provides the base for lifelong learning (Chand & Prasad, 2017). Therefore, to give quality education to students, teachers at this stage need to be furnished with all the necessary abilities and skills to be competent in their teaching and well-versed in effectively utilizing ICT tools.

The present investigation has been initiated to examine the Teaching and ICT Competencies of Secondary School Teachers of the state of Nagaland. As apparent from the review of related literature, so far no investigation has been done particularly in the area of secondary school teachers' teaching and ICT competencies of the state. Therefore, investigator has decided to do the investigation on the teaching and ICT competencies of secondary school teachers of Nagaland.

## 1.11. Statement of the Problem

This study attempts to investigate the teaching and ICT competencies of secondary school teachers of Nagaland. The study aims to determine the teaching and ICT competencies of secondary school teachers in relation to their gender, types of management, locality, teaching experience and educational qualification. Thus, based on this, the statement of the problem under investigation is entitled **"Teaching and ICT Competencies of Secondary School Teachers of Nagaland"**.

## 1.12. Operational Definition of the Terms Used

Following are the operational definition of the terms used:

**Teaching Competency**:

Teaching Competency may be defined as an efficient teaching behaviour and skills of a teacher that brings about desirable changes in pupil's behaviour. In the present study it is related to eight major dimensions of teaching competency namely planning lessons, classroom management, interpersonal relationships, knowledge of the subject, development of teaching learning material, evaluation process during teaching learning, time management and competencies related to working with parents, community and other agencies.

**ICT Competency**:

ICT Competency can be defined as the proficiency of teachers in handling ICT devices (both hardware and software) for successful utilization in teaching-learning process. In the present study it is related to three dimensions namely knowledge, skills and maintenance. For the current study the investigator selected some selective ICT devices, such as computer/laptop/tablet, smart phone, printer, scanner, digital camera, LCD projector, MS-office application software, Google App, email, social media and internet.

**Secondary School Teachers**:

The term Secondary School Teachers in this study refers to those teachers teaching in classes 9 and 10 in different schools of Nagaland, affiliated with the Nagaland Board of School Education (NBSE).

## 1.13. Objectives of the Study

The objectives of the study are as follows:

1) To determine the teaching competency of secondary school teachers of Nagaland.
2) To determine the ICT competency of secondary school teachers of Nagaland.
3) To find out the difference in teaching competency of secondary school teachers with respect to gender, types of management, locality, teaching experience and educational qualification.
4) To find out the difference in ICT competency of secondary school teachers with respect to gender, types of management, locality, teaching experience and educational qualification.
5) To determine the relationship between teaching competency and ICT competency of secondary school teachers with respect to certain variables separately and in totality.
6) To find out the influence and interaction of gender, types of management and locality on teaching competency of secondary school teachers.
7) To find out the influence and interaction of teaching experience and educational qualification on teaching competency of secondary school teachers.
8) To find out the influence and interaction of gender, types of management and locality on ICT competency of secondary school teachers.
9) To find out the influence and interaction of teaching experience and educational qualification on ICT competency of secondary school teachers.

## 1.14. Hypotheses of the Study

Following are the hypotheses of the study:

1. There is no significant difference in teaching competency of secondary school teachers.
    1.1. There is no significant difference in teaching competency of secondary school teachers with respect to gender.
    1.2. There is no significant difference in teaching competency of secondary school teachers with respect to types of management.
    1.3. There is no significant difference in teaching competency of secondary school teachers with respect to locality.

1.4. There is no significant difference in teaching competency of secondary school teachers with respect to teaching experience.

1.5. There is no significant difference in teaching competency of secondary school teachers with respect to educational qualification.

2. There is no significant difference in ICT competency of secondary school teachers.

2.1. There is no significant difference in ICT competency of secondary school teachers with respect to gender.

2.2. There is no significant difference in ICT competency of secondary school teachers with respect to types of management.

2.3. There is no significant difference in ICT competency of secondary school teachers with respect to locality.

2.4. There is no significant difference in ICT competency of secondary school teachers with respect to teaching experience.

2.5. There is no significant difference in ICT competency of secondary school teachers with respect to educational qualification.

3. There is no significant relationship between teaching competency and ICT competency of secondary school teachers with respect to certain variables separately and in totality.

4. There is no significant influence and interaction of gender, type of management and locality on teaching competency of secondary school teachers.

4.1. There is no significant influence of gender on teaching competency of secondary school teachers.

4.2. There is there is no significant influence of types of management on teaching competency of secondary school teachers.

4.3. There is no significant influence of locality on teaching competency of secondary school teachers.

4.4. There is no significant interaction of gender and types of management on teaching competency of secondary school teachers.

4.5. There is no significant interaction of gender and locality on teaching competency of secondary school teachers.

4.6. There is no significant interaction of types of management and locality on teaching competency of secondary school teachers.

4.7. There is no significant interaction of gender, types of management and locality on teaching competency of secondary school teachers.

5. There is no significant influence and interaction of teaching experience and educational qualification on teaching competency of secondary school teachers.
   5.1. There is no significant influence of teaching experience on teaching competency of secondary school teachers.
   5.2. There is no significant influence of educational qualification on teaching competency of secondary school teachers.
   5.3. There is no significant interaction of teaching experience and educational qualification on teaching competency of secondary school teachers.

6. There is no significant influence and interaction of gender, types of management and locality on ICT competency of secondary school teachers.
   6.1. There is no significant influence of gender on ICT competency of secondary school teachers.
   6.2. There is no significant influence of types of management on ICT competency secondary school teachers.
   6.3. There is no significant influence of locality on ICT competency of secondary school teachers.
   6.4. There is no significant interaction of gender and types of management on ICT competency of secondary school teachers.
   6.5. There is no significant interaction of gender and locality on ICT competency of secondary school teachers.
   6.6. There is no significant interaction of types of management and locality on ICT competency of secondary school teachers.
   6.7. There is no significant interaction of gender, types of management and locality on ICT competency of secondary school teachers.

7. There is no significant influence and interaction of teaching experience and educational qualification on ICT competency of secondary school teachers.
   7.1. There is no significant influence of teaching experience on ICT competency of secondary school teachers.
   7.2. There is no significant influence of educational qualification on ICT competency of secondary school teachers.

7.3. There is no significant interaction of teaching experience and educational qualification on ICT competency of secondary school teachers.

## 1.15. Delimitation of the study

i. The study is delimited to Secondary School Teachers of Nagaland only.
ii. The study is delimited to Teaching Competency and ICT Competency of secondary school teachers of Nagaland.
iii. The study is delimited to Government and Private secondary schools affiliated to Nagaland Board of School Education (NBSE).

## 1.16. Variables of the Study

The variables of the study are Teaching Competency and ICT Competency. These variables are studied with respect to gender, types of management, locality, teaching experience and educational qualification.

# CHAPTER - II

# REVIEW OF LITERATURE

## 2.1. Introduction

An analysis of relevant literature helps researchers gain insight into previous studies and enlightens them with present knowledge and understanding in the field of their research. It is an ongoing process that commences prior to formulating a particular research problem until finalising the report. It allows the researcher to establish the limits of his/her investigation, provides an understanding of the methodology, tools and technique that has proven beneficial and promising in the prior researches and also the recommendations of the previous researchers. It gives the researcher updated knowledge of the previous studies done by others and helps eliminate the duplication of knowledge (Koul, 2020). Thus, reviewing the related literature is essential in research.

A review of related literature serves the following objectives (Reddy et al., 2016):

1. It aids in bringing clarity and concentration to a research problem.
2. It aids in identifying knowledge gaps.
3. It aids in eliminating the replication of knowledge.
4. It aids in broadening the base of knowledge.
5. It aids in contextualizing the research project.
6. It aids in enhancing the methodology of the study.
7. It helps in identifying opposing views.

This chapter addresses the previous researches related to Teaching Competency and ICT Competency. To get more insight into the present problem, the researcher attempted to trace and obtain relevant materials through different sources of information.

## 2.2. Classification of the related Literature Reviewed

The related literature reviewed have been summarized and presented under the following two headings:

2.2.1 Studies related to the Teaching Competency

2.2.2 Studies related to the ICT Competency

### 2.2.1. Studies related to the Teaching Competency

**Sabu (2005)** studied secondary school teachers' teaching competence. The research goal was to ascertain the most accurate predictor of teachers' teaching competency from a collection of predictors. The study used descriptive and correlation types of research. 631 teachers comprised the study's sample chosen through a simple random sampling procedure. The "Teaching Competency Scale" by PVSR Raju was applied to gather the data. Sex, educational qualifications, teaching experience and type of schools were found to have no impact on teachers' total teaching competency. However, it was discovered that locality significantly influenced teaching competency. Additionally, results showed rural teachers were more competent than their urban counterparts.

**Seferoglu (2005)** studied teacher candidates' teaching competencies. The study aimed to investigate the extent of teacher competencies possessed by teacher candidates as specified by the Ministry of Education. The study used a descriptive research method. A total of 163 students of Hacettepe University's Faculty of Education formed the study's sample. The category of instructional competencies from the "Teaching Competencies Scale" by a Ministry of National Education commission was used to obtain data. The findings determined that teacher candidates differ significantly in teaching competencies with regard to their gender.

**Raju and Rao (2011)** studied teaching competency among secondary school teachers. 224 secondary school teachers, chosen by random sampling procedure, made up the sample. Data was obtained using "Teaching Competency Scale" by Pakalapali (2004). The study found that the teaching competencies of teachers differ in terms of their experience, locality and types of institution. However, pertaining to gender and qualifications, no significant difference was determined.

**Ranjini (2012)** studied secondary teacher trainees' competencies. The research aimed to determine teacher competencies and their dimensions among secondary teacher trainees. The study used a normative survey method. A total of 1132 secondary teacher trainees comprised the study's sample, chosen by a stratified cluster random sampling approach. The "Scale of Teacher's Competencies" by Amutha Ranjini and Mohanasundaram was employed to gather data. The study found that teacher trainees' overall level of teacher competencies was average, and insignificant differences were discovered in the total teacher competencies

of secondary teacher trainees concerning gender, locality, qualification and type of management.

**Köksal (2013)** did a study to determine the general teaching competency of pre-service teachers graduated from four-year education faculties. A descriptive method was adopted in the investigation, and 379 senior-year students comprised the study sample. The "General Teaching Competencies self-assessment form" was used to obtain data. No difference was seen between the types of high school that pre-service teachers graduated from concerning their perceptions of teacher competencies**.**

**Kaur and Talwar (2014)** investigated teaching competency of secondary school teachers. The research aimed to ascertain difference in teaching competency concerning types of schools and gender. The investigation used a descriptive correlation design. 100 teachers of Amritsar district, who were chosen using a non-probability sampling approach made up the sample. Data was gathered by employing "General Teaching Competency Scale" by Passi and Lalita (2011). Insignificant difference was discovered in the teaching competency of private and government schools teachers. It also showed that teaching competence of teachers was unaffected by their gender.

**Aziz and Akhtar (2014)** diagnosed how teacher competencies were impacted by training. The research aimed to compare the overall competencies of teachers with and without training. The investigation was descriptive in nature. A total of 596 faculty comprised the sample, who were chosen through a random sampling approach. Data was gathered by utilizing "Teachers Competencies Measurement Scale". According to study's results, teachers with training had higher overall competency than teachers without training.

**Ahmad and Khan (2016)** examined teachers' teaching competency of secondary schools. The study aimed to evaluate the teaching competency relating to the type of school and educational qualification. By using a simple random approach, 447 secondary school teachers from the eastern Uttar Pradesh region were selected as the sample. Data was gathered by utilizing the "General Teaching Competency Scale" by Passi & Lalitha. According to the findings, teachers at government schools were determined to be more competent than those in private schools. It was also discovered that qualification does not influence secondary school teachers' teaching competency, but the type of school does.

**Malik and Sonia (2016)** examined secondary school teachers' teaching competency. The investigation aimed to find and compare the locality of secondary school teachers' teaching competency. The method of the investigation was a descriptive survey. A total of 180 teachers from secondary school, selected using a purposive sampling technique, comprised the sample. The "General Teaching Competency Scale" by Passi and Lalitha (2011) was utilized to gather the data. The findings observed that teachers significantly differ in teaching competency based on locality.

**Sekar (2016)** examined B.Ed. female teacher trainees' teaching competency. The study's goal was to determine the difference in teaching competency of the B.Ed. female teacher trainees concerning certain variables. The research used a survey method. The study sample comprised of 148 B.Ed. female teacher trainees chosen using a stratified random sampling approach. Data was gathered using the "Teaching Competency Scale" by Dorathi Rani (2000). The study found that B.Ed. female teacher trainees significantly differ in the teaching competency in relation to urban and rural, and self-financing and government colleges.

**Jan (2016)** did investigation on teaching competency of government and private secondary school teachers. The investigation aimed to determine the teaching competences of private and government secondary school teachers and compare their teaching competences. 100 secondary school teachers, selected randomly made up the sample. Data was gathered using the "General Teaching Competency Scale" by B.K Passi. The results showed significant difference between private and government teachers in teaching competency.

**Das and Nalinilatha (2017)** examined secondary school teachers' teaching competency. The study's goals were to determine teachers' levels of teaching competency and the impact of personal factors. A survey approach was employed in the investigation. Utilizing a simple random sampling approach, 300 school teachers from 8 schools under the district of Palakkad were selected as a sample. Passi & Lalitha's "Teaching Competency Scale (1994)" was used to obtain the data. As per the findings, insignificant difference was discovered in teachers' teaching competency regarding gender, type of management, experience and educational qualification.

**Patel (2017)** assessed teaching competency level of primary school teachers. Using a stratified random approach, 200 teachers from primary school were chosen as the sample.

The "General Teaching Competency Scale (1994)" by Passi & Lalitha was employed to assemble the data. As per the survey, most primary school teachers had average teaching competency. A significant difference was revealed between government and private school teachers, BTC and SBTC-trained teachers, and more experienced and less experienced teachers. Nonetheless, insignificant difference was observed in teachers concerning gender and locality.

**Balyer (2017)** investigated how pre-service teachers perceived their competence and readiness for teaching profession. The investigation employed a survey method and 993 pre-service teachers formed the sample. The "Pre-Service Teachers' Competency Scale" adapted based on Foster's research called "INTASC Standards for Beginning Teachers (2001)" was utilized for gathering the data. Findings revealed that the pre-service teachers perceived themselves as competent and ready for their careers. No significant difference was found in relation to gender. The study suggested that the authorities of the Higher Education Council and the Ministry of National Education should work collaboratively to improve the teacher training system to catch up with the latest developments.

**Moshahid and Hussain (2017)** conducted a study with the objective to explore the teaching competency of government and private primary school teachers. The study adopted a survey type descriptive research method, and a sample of 112 primary school teachers was selected using a stratified random sampling technique. The data was collected using the "General Teaching Competency Scale" by Passi and Lalitha (2009). The results revealed that government teachers possessed significantly better teaching competency than private teachers. No significant difference was observed between the teaching competency of government male and female primary school teachers. Private female teachers were found to have significantly better teaching competency than their male counterparts. Further, government school male teachers were found to have significantly better teaching competency than their private counterparts. However, no significant difference was observed between the teaching competency of government and private female primary school teachers.

**Arslani and Yavuz (2018)** examined competency of prospective secondary mathematics teachers in terms of general teacher behaviors. The research used a descriptive survey method. The study sample comprised of 104 prospective teachers. Data was gathered using "Prospective Teacher Competency Scale" by Erisen and Celikoz (2003). The study

revealed that teachers had a fairly level of proficiency perception in terms of general teaching behaviors.

**Raj and Verma (2018)** studied high school teachers' teaching competence. The objectives of the study were to find the overall teaching competence of high school teachers and to find out the significant differences in teaching competence of high school teachers. The study used a descriptive survey method. The study sample comprised of 160 teachers from 20 schools, selected using a random sampling technique. The data was collected by employing "The General Teaching Competency Scale (1994)" by B.K Passi and M.S Lalitha. The study found that most teachers had above-average levels of teaching competence. No significant difference was found in the teaching competency of high school teachers concerning their gender. The study further found significant differences in the teaching competence of high school teachers concerning their teaching experience and type of institution.

**Sunder (2018)** studied the teaching competency among teachers working in government senior secondary schools. The sample of the study comprised of 100 teachers, selected using the incidental sampling method. The data was collected using "The General Teaching Competency" by B.K. Passi and M.S. Lalitha. The study found a significant relationship between the teachers' effectiveness and teaching competency. The study also found a significant difference in the teaching competency of senior secondary school teachers in relation to gender and area.

**Rana and Shivani (2019)** examined the teaching competency of secondary school teachers related to selected variables. A descriptive survey approach was utilized in the research. 100 teachers comprised the study's sample, chosen using a random sampling method. The "General Teaching Competency Scale (1994)" by Passi and Lalitha was applied to obtain the data. Secondary school teachers were found to differ significantly in their teaching competencies regarding qualifications, location, teaching experience, and types of school. On the other hand, no significant difference was shown in terms of the teachers' gender. Additionally, it was discovered that postgraduate teachers had higher teaching competencies than graduate teachers, teachers in private secondary schools were more competent than those in government schools, and teachers in rural areas had better teaching competencies than those in urban areas. However, less experienced teachers were found to have higher teaching competencies than more experienced teachers. Thus, it was

concluded that teachers' teaching competencies significantly vary in relation to selected variables.

**Balasubramaniam (2019)** studied student teachers' teaching competency at the B.Ed level in selected variables. The study's goal was to determine whether the teaching competency of student teachers differs significantly. The research utilized a normative survey approach. The study's sample comprised of 745 B.Ed. II-year student teachers, chosen randomly from 26 colleges of education in the Coimbatore and Tirupur districts. The investigator developed and standardized the "Teaching Competency Scale for Student Teachers" to gather the data. As per the survey, 44% of student teachers had an average level of teaching competency, and 42% had a high level. There was no significant difference in the student teachers' teaching competency concerning gender and type of institution.

**Shivaprakash (2019)** researched the teaching competency of secondary school teachers. The research aimed to assess the level of secondary school teachers' teaching competency and examine the geographical factors influencing the teaching competency of teachers. The study's sample contained 300 teachers and 300 students, chosen by a stratified sampling approach. "Teaching Competency Scale" by R Rajeshwari and self-developed "Academic Achievement" tool were employed to collect the data. The research revealed a significant difference concerning gender, locality and types of school of secondary school teachers' teaching competency.

**Srinivasan and Pugalenthi (2019)** examined the prospective teachers' teaching competency. The study aimed to investigate whether there was a significant difference in teaching competency of prospective teachers concerning gender and difference in mean scores with the type of college. The research employed a normative survey method. The study's sample consisted of 650 prospective teachers, chosen through a random sampling approach. The "Teaching Competency Scale" developed, standardised, and validated by the researcher was used to acquire the data. Concerning gender, the survey did not find any significant difference in prospective teachers' teaching competency. Regarding the type of college too, there was no significant variation in the mean scores for teaching competency.

**Ratheeswari (2020)** studied the importance of secondary school teachers' teaching competency. The study aimed to assess the teaching competency levels of secondary school teachers belonging to sub-samples. The study also sought to determine whether there were

any significant differences in the teaching competency of secondary school teachers. Descriptive research was employed in the investigation. 300 secondary school teachers were selected to form the sample using a random selection approach. The "Rama's Teaching Competency Scale" by P.V.S.R. Raju was applied to collect data. The survey indicated that secondary school teachers had an average level of teaching competency. The survey further discovered no significant difference in the teaching competency of secondary school teachers among sub-samples based on teaching experience, gender, type of school, and school location.

**Sheela and Rajendran (2020)** investigated student teachers' teaching competency. The study aimed to assess the level of teaching competency of student teachers and examine whether there was any significant difference among them in their teaching competency. A survey approach was utilised in the investigation. The sample comprised of 300 student teachers, chosen through the technique of stratified random sampling. The "Teaching Competency Scale" by Baskar (2012) was employed to assemble the data. The survey indicated that student teachers' teaching competency was average. There was no significant difference in the student teachers' teaching competency with regard to gender and locality. However, the research revealed a significant difference in the teaching competency of undergraduate (UG) and postgraduate (PG) student teachers.

**Vidushy and Kishor (2020)** investigated the teaching competence of secondary school teachers related to their location and teaching experience. A descriptive research approach was employed in the investigation. Using multistage and proportional sampling, 700 regular in-service teachers from government high schools and government senior secondary schools throughout seven districts in Punjab made up the study's sample. A self-developed "Teaching Competence Scale for teachers" was used to gather the data. It was found that teaching experience significantly impacted teaching competency, while location did not substantially affect it.

**Parveen and Srivastava (2020)** conducted research with the goal of determining the teaching competency of state and central government upper primary school teachers. A descriptive survey was employed in the investigation. 200 teachers from central and upper primary schools were randomly selected to make up the study's sample. The "General Teaching Competency Scale" by B. K. Passi and M. S. Lalitha was used to acquire the data. The results showed substantial differences in teaching competency between state and central

government school teachers in terms of teaching experience and gender. The locale was found to have no major effect on teaching competence among secondary school teachers. However, teaching experience was found to significantly affect their teaching competence.

**Bindusha and Bindu (2020)** conducted research with the aim of examining graduate-level teacher trainees' teaching competency. The survey approach was employed in the investigation. 150 B.Ed. teacher trainees were selected as sample using a stratified random sampling procedure. A teaching competency scale constructed by the investigator was used to assemble the data. As per the results, there was no significant difference in graduate-level teacher trainees' teaching competency based on their qualifications and locality. However, a notable disparity was discovered in the teaching competency based on the institution's management style. The teaching competency level of government college teacher trainees was determined to be greater than that of self-financing trainees.

**Rao and Singh (2020)** conducted a survey with the objective to examine the general teaching competency of student-teachers of Bareilly district's teacher-training institutions. The normative survey approach was utilized in the study. The study's sample comprised of 525 pupil-teachers chosen through a stratified random sampling method. "General Teaching Competency Scale" by B. K. Passi and M. S. Lalitha (2005) was employed to acquire the data. The results indicated that the general teaching competency of pupil-teachers was below average. The general teaching competency of male and female student-teachers was shown to differ.

**Hoovinbhavi (2021)** studied secondary school teachers' general teaching competency concerning a few selected variables. The research employed a normative survey approach. A total of 200 teachers comprised the study's sample, chosen by stratified simple random selection. The "General teaching competency scale" by B.K Passi and M. S. Lalitha was employed to gather the data. In terms of urban and rural, male and female, qualified versus lowly qualified, high teaching and low teaching experience and types of management, the study discovered a significant difference in teaching competency of secondary school teachers.

**Jorilla and Bual (2021)** evaluated the teaching competence of Antique diocesan schools compared to the Philippine Professional Standards for Teachers. A descriptive-correlational design was used in the investigation. 102 high school teachers of the diocesan

schools in Antique from 2019-2020 comprised the study's sample, chosen by a stratified random sampling. A standardized Philippine Professional Standards for Teachers questionnaire was used for data collection. The result discovered that teachers' sex had no bearing on their competence in teaching.

**Parveen et al. (2021)** did a study to assess secondary school teachers' teacher competency. The intended sample, which consisted of 100 male and 100 female secondary school teachers, was selected using the stratified random selection approach. The data was gathered using a 20-item self-developed questionnaire. The findings revealed that female teachers were more competent than male teachers. Additionally, teachers at private schools demonstrated greater teaching competency than those in public schools. The study also revealed that teachers with less than 5 years of experience outperformed their more experienced counterparts.

**Shobha (2022)** conducted an investigation with the aim of ascertaining secondary school teachers' teaching competency. A survey approach was utilized in the investigation. The study's sample comprised of 39 Male teachers and 41 Female teachers, selected randomly. Standardized Teaching Competency Scale was used to gather the data. Results of the study revealed no discernible variations in the teaching competency concerning gender and type of school of the secondary school teachers.

**Kaur (2023)** investigated secondary school teachers' teaching competency. The study's goals were to ascertain secondary school teachers' levels of teaching competency and whether there were any appreciable differences between the mean scores of male and female secondary school teachers. Using a random sampling approach, 100 senior secondary teachers were chosen as the study's sample. The General Teaching Competency Scale by Passi and Lalitha (2009) was employed to acquire the data. According to the study's result, the mean scores of teaching competency for secondary school teachers working in government and private schools; and male and female teachers do not significantly differ.

**Rasheed and Sultan (2023)** conducted research to compare the teaching competence of male and female secondary school teachers. The "General Teaching Competence Scale by Passi & Lalitha (2009)" was employed to gather data. The findings discovered that most secondary school teachers have average teaching competence. Additionally, the findings showed a noteworthy distinction in the teaching competence of male and female secondary

school teachers. The mean score for female teachers was considerably higher than for male teachers.

**Paul and Jeyanthi (2024)** examined how several demographic characteristics influenced the teaching competency of Kerala's secondary school teachers. 247 teachers in different secondary schools in the Ernakulam district were chosen using a stratified random method to form the sample. "Teaching Competency Scale for Secondary School Teachers" developed by Sheena and Arjunan (2015) was used to gather data. The findings indicated notable variations in the effects of gender, level of education, service experience, and school management style on secondary school teachers' teaching competency. It was discovered that male teachers were more competent in teaching than female teachers.

**Kumar and Kayalvizhi (2024)** examined the teaching competency of school teachers. A survey method was adopted for the study. 520 teachers from the Dindigul District of Tamil Nadu, taken through a stratified random sampling technique, made up the sample. The "Teaching Competency Scale" by B. K. Passi and M.S. Lalitha, was administered to obtain the data. It was found that the teaching competency of school teachers differs significantly with regard to gender and experience. Highly experienced teachers were found to have high levels of teaching competency.

**Table 2.1**

**Summary of studies related to the Teaching Competency**

| Sl.No | Researcher/s and Year | Major Focus of the Study | Major Findings |
|---|---|---|---|
| 1. | Sabu (2005) | Secondary school teachers' teaching competence. | Sex, educational qualifications, teaching experience and type of schools had no impact on teaching competency. Locality significantly impacted total teaching competency. Rural teachers had higher teaching competence than urban teachers. |

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| 2. | Seferoglu (2005) | Teacher candidates' teaching competencies. | Revealed a significant difference among teacher candidates concerning their gender. |
| 3. | Raju and Rao (2011) | Teaching competency among secondary school teachers. | Teachers differ in their locality, experience, and types of institution. Pertaining to gender and qualifications, no significant difference was determined. |
| 4. | Ranjini (2012) | Secondary teacher trainees' competencies. | No differences were discovered in the total teacher competencies of secondary teacher trainees concerning gender, type of management, qualification and locality. |
| 5. | Köksal (2013) | General teaching competency levels of pre-service teachers | No difference was seen between the types of high school that pre-service teachers graduated from concerning their perceptions of teacher competencies. |
| 6. | Kaur and Talwar (2014) | Teaching competency of secondary school teachers. | Insignificant difference was discovered among government and private schools teachers. Teaching competency was shown to be unaffected by their gender. |
| 7. | Aziz and Akhtar (2014) | The impact on teacher competencies by training. | Teachers with training had higher overall competency than teachers without training. |

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| 8. | Ahmad and Khan (2016) | Secondary schools teachers' teaching competency. | Government schools teachers were more competent, qualification does not influence secondary school teachers' teaching competency, but the type of school does. Postgraduate teachers were shown to have a greater degree of competency than graduate teachers. |
| 9. | Malik and Sonia (2016) | Secondary School teachers' teaching competency. | Urban and rural teachers were found to differ. |
| 10. | Sekar (2016) | B.Ed. female teacher trainees' teaching competency. | Found that B.Ed. female teacher trainees notably differ in the teaching competency in relation to urban and rural, and self-financing and government colleges. |
| 11. | Jan (2016) | Teaching competency of secondary school teachers in government and private schools. | Observed difference between private and government teachers. |
| 12. | Das and Nalinilatha (2017) | Secondary school teachers' teaching competency. | Determined no difference in terms of gender, teaching experience, qualification and type of management. |
| 13. | Patel (2017) | Primary school teachers' teaching competency. | Discovered difference in government and private school teachers and more experienced and less experienced teachers. Nonetheless, no difference was observed among teachers concerning gender and locality. |

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| 14. | Balyer (2017) | How pre-service teachers perceive their competence and readiness for the teaching profession. | Insignificant difference was seen regarding gender. |
| 15. | Moshahid and Hussain (2017) | Teaching competency of government and private primary school teachers. | Government teachers possessed better teaching competency than private counterparts. |
| 16. | Arslani and Yavuz (2018) | Competency of prospective secondary mathematics teachers in terms of general teacher behaviors. | Teachers had a fairly level of proficiency perception in terms of general teaching behaviors. |
| 17. | Raj and Verma (2018) | High school teachers' teaching competence. | No significant difference was found concerning gender but was found in teaching experience and type of institution. |
| 18. | Sunder (2018) | Teaching competency among teachers of government senior secondary schools. | Found difference among teachers based on gender and area. |
| 19. | Rana and Shivani (2019) | Teaching competency of secondary school teachers related to selected variables. | Differ significantly concerning qualifications, location, types of school and teaching experience but insignificant difference was found based on gender. |
| 20. | Balasubramaniam (2019) | Student teachers' teaching competency at the B.Ed level in selected variables. | No significant difference was observed concerning gender and type of institution. |
| 21. | Shivaprakash (2019) | Teaching competency of secondary school teachers. | Difference was revealed concerning gender, locality and types of school. |

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| 22. | Srinivasan and Pugalenthi (2019) | Prospective teachers' teaching competency. | No difference was revealed in gender and type of college. |
| 23. | Ratheeswari (2020) | Secondary school teachers' teaching competency. | Revealed no difference in teaching experience, type of school, gender, and school location. |
| 24. | Sheela and Rajendran (2020) | Student teachers' teaching competency. | Determined no difference in gender and locality but shown difference in undergraduate (UG) and postgraduate (PG) students. |
| 25. | Vidushy and Kishor (2020) | Teaching competence of secondary school teachers. | Teaching experience significantly impacted teaching competency, while location does not. |
| 26. | Parveen and Srivastava (2020) | Teaching competency of teachers in state and central government and upper primary school. | A substantial difference was shown about teaching experience and gender. Locale had no major effect on teaching competence but teaching experience had. |
| 27. | Bindusha and Bindu (2020) | Graduate-level teacher trainees' teaching competency. | No significant difference in qualifications and locality but difference was found in management style. |
| 28. | Rao and Singh (2020) | General teaching competency of student-teachers. | Differences were found in male and female student-teachers. |
| 29. | Hoovinbhavi (2021) | Secondary school teachers' general teaching competency concerning a few selected variables. | Significant difference was discovered in locality, gender, qualification, teaching experience and types of management. |

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| 30. | Jorilla and Bual (2021) | Teaching competence of Antique diocesan schools compared to the Philippine Professional Standards for Teachers (PPST). | Revealed teachers' sex had no bearing on their competence in teaching. |
| 31. | Parveen et al. (2021) | Secondary school teachers' teacher competency. | Female teachers and teachers at private schools were more competent than their counterparts. Teachers with less than 5 years of experience outperformed their more experienced counterparts. |
| 32. | Shobha (2022) | Secondary school teachers' teaching competency. | No discernible variations were indicated concerning gender and type of school. |
| 33. | Kaur (2023) | Secondary school teachers' teaching competency. | Teachers of government and private schools as well as male and female teachers do not significantly differ. |
| 34. | Rasheed and Sultan (2023) | Teaching competence of male and female secondary school teachers. | Most secondary school teachers had average teaching competence. Female teachers were competent than male teachers. |
| 35. | Paul and Jeyanthi (2024) | Influence of demographic characteristics on the teaching competency of Kerala's secondary school teachers. | Notable variations were found in the effects of gender, level of education, service experience, and school management style. Male teachers were more competent than female teachers. |
| 36. | Kumar and Kayalvizhi (2024) | Teaching competency of school teachers. | Significant difference was found in gender and experience. |

### 2.2.2 Studies related to the ICT Competency

**Kibirige (2011)** studied the attitudes of science teachers who are in-service with regard to information and communication technology (ICT) in education. An exploratory method was applied in the study. The study's sample comprised of 25 in-service teachers from Limpopo Province. The data was collected using a modified "Ohio State University's Attitudes towards Computer Technology questionnaire". Results discovered that 92% of in-service teachers had a positive attitude towards computers. It was found that in-service teachers possessed good computer competence. It was further revealed that in-service teachers' gender does not affect their attitudes towards ICT in education.

**Arslan et al. (2011)** investigated the opinion of pre-service maths teachers towards information and communication technologies. The study aimed to ascertain the maths teacher candidates' attitudes towards using ICT. The case study method was employed in the survey. There were 104 pre-service maths teachers in the sample. A questionnaire was used in the data collection. According to the survey, prospective maths teachers showed a favourable attitude towards using ICT in the classroom. A significant correlation was revealed in teachers' opinions towards using ICT concerning gender.

**Buabeng-Andoh and Totimeh (2012)** investigated secondary school teachers' innovative use of computer technologies in the classroom. The study's objectives were to ascertain how frequently ICT is used in the classroom and whether there were any notable differences between teachers' innovative uses of ICT. 273 teachers, chosen through a simple random sampling method, made up the study's sample. The data was gathered via a self-developed questionnaire. According to the survey, male teachers had more computer access than female teachers. It was shown that compared to male, female teachers utilise ICT for evaluation reasons far more frequently. Additionally, a strong positive correlation between teachers' computer access, experience and skills was observed in the study. Ultimately, it was shown that the most critical factor influencing teachers' computer skills was their access to computers.

**Nagamani and Muthuswamy (2013)** studied how secondary school teachers used information and communication technology in schools. A survey approach was employed in the investigation. The study sample contained 157 teachers selected from Tamil Nadu secondary school. A questionnaire constructed by the researchers was employed to gather the

data. Teachers in different localities were found to use ICT in rather varied ways. It revealed that gender do no differ significantly in the use of ICT. The study's conclusion observed that teachers utilized ICT for their profession reasonably and effectively.

**Umar and Yusoff (2014)** examined the levels of ICT skills of Malaysian teachers related to both basic and advanced ICT skills. 7,320 primary and secondary school teachers were included in the study sample, chosen by stratified random selection. A questionnaire was used in the data collection process. Teachers were found to have a moderate level of advanced ICT skills. The survey also discovered that compared to their female colleagues, male teachers utilise ICT more frequently.

**Thakur (2014)** conducted a research to investigate trained teachers' awareness of information and communication technology. A descriptive survey method was employed in the research. The research's sample was made up of 300 trained secondary school teachers, who were chosen purposively. Data was acquired by employing a questionnaire form constructed by the researcher. The results discovered that the overall level of ICT awareness of trained teachers was low, and no significant difference was revealed in trained teachers' ICT awareness levels when it comes to gender. However, a significant difference was noted between the rural and urban-trained teachers.

**Kumari and Humaira (2014)** conducted an investigation with the objective to examine the elementary level in-service teachers' ICT competency. The sample comprised of 15 elementary teachers who were selected randomly. A questionnaire constructed by the investigators was employed to acquire the data. According to the findings, teachers were capable of using ICT. In areas including school practice, administrative work, personal use, and professional development, they were judged to be competent.

**Nwalado and Obro (2014)** studied the ICT competence among social studies teachers in Delta State. The study aimed to ascertain the ICT competence among social studies teachers and its difference. The research design was survey-based. 31 social studies teachers were chosen to make a sample through the purposive sampling approach. "Social Studies ICT Competence Questionnaire" consisted of two (2) sections was used for gathering the data. The study discovered that the ICT competency level of teachers of social studies was low and their use of ICT in teaching was observed to differ significantly. Regarding

gender, no significant difference was determined in the social studies teachers' competency, although a significant difference was found in terms of locality.

**Yadav (2015)** investigated secondary school teachers' attitudes towards using ICT in the classroom. The descriptive survey approach was applied in this research. Purposive random sampling was adopted to pick 200 secondary school teachers for the research sample. An ICT Attitude Scale that the researcher created was used to gather the data. According to the study, female teachers, private schools teachers, and teachers in urban areas had more positive views towards ICT use. The study concluded that teachers should view ICT as their main resource for curricular instruction and learning.

**Cakir and Önal (2015)** studied the information technology competencies of middle school math teachers in education. Convenience sampling was used to pick 124 middle maths teachers teaching in the spring semester of 2013–2014 for the research sample. Forms created by the researchers were utilized to assemble the data. The survey found that elementary teachers were very competent in storing data using flash drives and external hard drives. Still, they only possessed minimal competency in connecting interactive whiteboards to computers. Additionally, it was discovered that teachers were quite proficient with the cut, copy, and paste commands on desktop computers. They had, nonetheless, the minimum level of network file sharing proficiency. The survey also discovered that teachers were highly skilled at utilizing MS Word to organize documents. Furthermore, it was discovered that there was very little proficiency in developing and maintaining websites.

**Akarawang et al. (2015)** examine teachers' ICT competency to determine the requirements and training for improving ICT competency. The study adopted a survey technique. 377 teachers from 35 schools, 12 professional teachers, supervisors and directors comprised the sample. An interview and a standardized questionnaire were used to gather the data. The study reported that more than 40% (excluding those 50 years or older) of teachers utilized ICT in teaching students. Most schools were found to have sufficient IT resources and internet connections, and younger teachers generally seemed to have strong ICT competency. It was noted that to improve their practical abilities and comprehension of ICT, teachers needed training.

**Michael et al. (2016)** examined the impact of teachers' competency concerning the use of ICT in teaching and learning. The research employed a descriptive survey research approach. The sample contained 126 teachers and 21 head teachers of secondary schools. Data was gathered by employing questionnaires. The results discovered that majority of head teachers and teachers only possessed rudimentary ICT literacy, and because of their low level of ICT proficiency, only a few of them blended ICT into their lesson plans. A strong correlation between ICT integration and teacher competency was revealed. As per the findings, secondary school teachers should receive training on how to integrate ICT into their subject areas for both teaching and learning, as well as gain necessary teaching and learning abilities.

**Maksimović and Dimić (2016)** studied teachers' attitudes about integrating ICT competencies into the school. A descriptive strategy was adopted in the investigation. A total of 100 teachers from the primary schools of Nis's city made up the study sample. A self-developed scale was adopted to gather the data. Regarding gender, years of service, and education, the findings showed insignificant differences in the teachers' opinions about using ICT competency in the classroom. It was shown that teachers lacked the skills to use ICT in the school regardless of years of service, gender, and education.

**Daling (2017)** examined secondary school teachers' ICT competency. The research aimed to ascertain teachers' competency in integrating ICT in terms of knowledge, skills, and attitude. A descriptive research approach was employed in the investigation. 160 students were chosen at random to make up the research sample. A questionnaire was utilized to acquire the data. The study found that teachers were proficient in incorporating ICT into the classroom. Teachers were found to be excellent in word processing and skill on computers and their functions.

**Caluza et al. (2017)** investigated public school teachers' ICT competencies. The investigation aimed to assess public school teachers' proficiency with ICT. A descriptive strategy was adopted in the investigation. The sample was made of 62 educators. Questionnaires were utilized for assembling the data. According to the results, most of the teachers had rudimentary ICT knowledge but still needed to improve.

**Parveen (2018)** investigated secondary school teachers' attitudes regarding the application of technology in the classroom. The investigation set out to ascertain any

differences in secondary school teachers' attitudes in utilizing technology in the classroom. 116 teachers were chosen as sample using the non-probability purposive selection approach. The "Attitude scale" by Avinash Thapa was utilized for acquiring the data. Based on gender or experience, the survey's results showed no differences in teachers' attitudes about using technology in the classroom. Nonetheless, it was shown that there were substantial differences between the attitudes of rural and urban areas about "the application of technology in the classroom".

**Thakur and Chaudhury (2019)** investigated teacher educators' ICT competence. The study aimed to determine teacher educators' ICT competency level and compare it with specific variables. A descriptive survey approach was utilised in the investigation. 207 teacher educators were chosen at random to form the research sample. A self-created questionnaire was utilized for acquiring the data. The study found no differences among teacher educators in the ICT competency concerning gender and the kind of teacher training institution they attended (self-financed and government).

**Mailizar and Fan (2020)** investigated Indonesian secondary teachers' ICT usage and knowledge. The investigation aimed to ascertain the knowledge as well as the usage of ICT among Indonesian secondary school maths teachers. The research combined a cross-sectional survey methodology with a quantitative strategy. There were 341 secondary maths teachers as the research's sample. A questionnaire was employed to obtain the data. The investigation showed a deficiency in teachers' knowledge of ICT and how to utilize it in the classroom. Additionally, it was discovered that teachers knew more about computers and laptops, and specifically, most teachers had the highest knowledge of word processors like Microsoft Word and PowerPoint. The survey also showed that teachers' familiarity with internet resources was lacking.

**Dela Fuente & Binas (2020)** examined the competence of teachers in ICT. The research aimed to assess teachers' ICT competence in different skills. The sample consisted of 72 teachers who were purposively chosen. "The National Information and Communications Technology Competency Standards (NICS)-Basic of the Commission of Information and Communication Technology" was the source of the standardised survey questionnaire used to gather the data. The research found that teachers' proficiency with various information and communications technology (ICT) skill sets was intermediate. It was found that gender had no effect on teachers' ICT competency.

**Joshi et al. (2021)** did a research to ascertain the ICT competency of Nepal's secondary school mathematics teachers. The research utilised a cross-sectional survey methodology, and 336 secondary school teachers in Nepal made up the research sample chosen using a multistage cluster purposive selection approach. A tool developed by the researchers was utilized to obtain the data. According to findings, teachers had high level ICT skills regarding basic computer concepts and internet usage. However, regarding software and hardware, teachers' competency was found to be at the developing level. Additionally, it was found that teachers with more experience and teachers from rural regions were less competent. The aggregate results showed that secondary school maths teachers in Nepal require ICT development programmes.

**Machmud et al. (2021)** examined the competencies of Indonesian educators to incorporate ICT in education. The research aimed to determine teachers' attitude towards technology and their competency and preparedness to use it in teaching activities. A basic random selection approach was used to pick 300 elementary, junior and senior high schools teachers to make up the research sample. The data was acquired via a questionnaire form and an interview. As per the survey, Indonesian teachers had a high level of ICT proficiency. It was discovered, nonetheless, that some teachers continued to lack creativity and contribution to the advancement of ICT for education. Additionally, it was demonstrated that the teachers' attitudes towards ICT were good.

**Ikwuka et al. (2021)** examined the ICT competencies of teachers required to teach English language effectively in Nigeria. The study's goal was to look into the computer operational competencies that secondary school teachers require for efficient English language teaching, as well as the interactive whiteboard competencies that teachers need to master for successful teaching of the English language. A descriptive survey was employed in the investigation. There were 54 English language teachers in the research sample. The "ICT Competencies Needed by Teachers for Effective Teaching of English Language", created by the researchers, was adopted for data gathering. The findings revealed that English language teachers were proficient in fundamental computer functions, which are often used for official purposes rather than in the classroom. It was discovered that teachers lacked sufficient proficiency in using the PowerPoint. The study also found that although English language teachers were proficient in using interactive whiteboards, their proficiency was insufficient for efficiently teaching and learning English.

**Fidelis and Onyango (2021)** did a research on teachers' competence in utilizing ICT. The study aimed to determine how competent teachers were in using ICT. A descriptive survey approach was utilised in the investigation, and 84 respondents were chosen for the research sample using purposive and simple random selection methods. A self-created questionnaire was employed to obtain the data. The investigation discovered that a sizable portion of teachers lacked computer proficiency in all areas. It was found that relatively few teachers used the internet, and even fewer had some hardware and programming expertise.

**Mandal (2021)** carried out a research to evaluate West Bengal teacher educators' ICT teaching ability. 180 teacher educators, chosen by a simple random selection method, made up the research sample. A self-developed "Scale for teaching Competency of Teacher Educators towards ICT," was utilized to acquire the data. The research discovered that the majority of teacher educators were found to be proficient in ICT. No significant difference was revealed between male and female teacher educators towards ICT.

**Venumadhav and Sarsani (2022)** conducted an investigation to ascertain teacher educators' ICT competencies. The investigation employed a normative survey approach. 210 teacher educators made up the study sample, using a simple random selection procedure. Data was gathered through a self-constructed questionnaire. The investigation results found a substantial mean difference in the teacher educators' ICT competencies concerning their management style, gender, location, academic qualification, and teaching experience.

**Novela (2022)** investigated teachers' ICT competency in the context of the new normal. Descriptive, correlational, and quantitative approaches were used in the study. A complete or total enumeration sampling method was used to pick 105 teachers as sample from 4 secondary schools in Bulan 1 District. The data was assembled utilizing a self-made questionnaire. The results found that compared to male, female teachers had higher frequency of ICT competency.

**Isorena and Malangen (2022)** conducted a research with the aim to determine Sauyo High School teachers' ICT competency and capability. The descriptive correlational approach was employed in the investigation. The research sample contained 112 teachers chosen using a random purposive sampling method. A set of questions via Google Forms, and a choice of answers devised for the purpose were adopted for assembling the data.

Teachers were determined to be proficient in ICT competency and very satisfactory in ICT capability. No statistically significant variation was observed concerning gender in teachers' ICT proficiency and capability. Regarding the highest level of education attained, the ICT proficiency of teachers was found to differ.

**Syahrial et al. (2022)** examined teachers' ICT competencies. A mixed technique was utilized in the investigation. Purposive sampling was used to choose 120 primary teachers for the research sample. Data was acquired via a questionnaire and an interview. The study discovered that ICT capability of rural teachers was good, with the 49%, whereas ICT capability of urban teachers were found to be average.

**Mijares (2022)** performed a research to ascertain elementary teachers' ICT competencies. The methodology used in the study was descriptive-quantitative. The elementary teachers in 2 Districts of the Schools made up the sample for the research. A questionnaire adapted from "the National ICT Competency Standards for Teachers (NICS)" was used to gather the data. No difference was shown concerning teachers' level of education and gender in using ICT in teaching, but a significant difference was observed related to length of service.

**Reang and Mohalik (2023)** investigated secondary school teachers' ICT competency. The study's goals were to ascertain the ICT competency of secondary school teachers and assess that competency concerning certain factors. A survey approach was used in the investigation. 48 secondary school teachers who were chosen using a stratified random selection procedure made up the research sample. The data was acquired through a rating scale of 52 items developed by the investigators. The survey found that 47% of teachers had poor ICT competency, 38% had moderate competence, and 15% had high competence. It was further shown that there were no differences in teachers' ICT competency concerning gender and locality.

**Kumari and Jha (2023)** studied the competency of teacher educators in Jharkhand towards ICT. Using a simple random sampling method, 100 samples were chosen from 20 teacher education institutes in Jharkhand to participate in the survey. The "Teaching Competency Scale" by B.K. Passi and M.S. Lalita was employed to gather data. According to the findings, most teacher educators were proficient in ICT. It also revealed no statistically

significant distinction in the ICT-based teaching competency levels of government urban and private urban college teacher educators.

**Kumar and Sri (2023)** surveyed how competent female student teachers felt they were in information and communication technology (ICT). This study included 301 female student instructors as a convenient sample. The information was gathered using the "Information and Communication Technology Competency Scale," a self-developed tool. The findings show that female student teachers were proficient in most ICT domains. The study found that several essential characteristics, such as education level and residence locality, impacted female student teachers' ICT competencies.

**Balasubramanian and Naveen (2024)** examined the ICT competency of B.Ed trainee teachers. 500 B.Ed. trainee teachers from the Khammam District's institutions of education made up the study's sample. The ICT competency tool developed and validated by the investigator was administered to collect data. The study's conclusions showed gender differences in the ICT proficiency of B.Ed. Trainee Teachers. Male teachers were found to be more proficient in ICT than female teachers.

**Radiamoda et al. (2024)** studied ICT engagement and digital competence of pre-service English teachers. A sample of 103 pre-service English teachers from the University of Mindanao-Matina Campus, Davao City, selected by purposive sampling, participated in the descriptive correlational analysis. This study employed adopted survey questionnaires to collect data. The results showed that pre-service English teachers were quite competent with technology and had high level of ICT engagement.

**Table 2.2**

**Summary of the studies related to the ICT Competency**

| Sl.No. | Researcher/s and Year | Major Focus of the Study | Major Finding |
|---|---|---|---|
| 1. | Kibirige (2011) | Attitudes of science teachers who are in-service with regard to ICT in education. | In-service teachers' gender does not affect their attitudes towards ICT in education. |
| 2. | Arslan et al. (2011) | Opinion of pre-service maths teachers towards ICTs. | Significant correlation was indicated between teachers' opinions towards using ICT concerning gender. |
| 3. | Buabeng-Andoh and Totimeh (2012) | Secondary school teachers' innovative classroom use of computer technologies. | Male teachers had more computer access than female teachers and compared to male, female teachers utilized ICT for evaluation reasons far more frequently. |
| 4 | Nagamani and Muthuswamy (2013) | Use of ICT in schools by secondary school teachers. | Difference was observed in locality but not in the case of gender. |
| 5. | Umar and Yusoff (2014) | ICT skills of Malaysian teachers related to both basic and advanced ICT skills. | Teachers had a moderate level of advanced ICT skills. Compared to their female colleagues, male teachers utilise ICT more frequently. |
| 6. | Thakur (2014) | Awareness of ICT among trained teachers. | No gender difference was revealed but discernible difference was noted between the rural and urban-trained teachers. |

| | | | |
|---|---|---|---|
| 7. | Kumari and Humaira (2014) | Elementary level in-service teachers' ICT competency. | Teachers were judged to be competent in using ICT. |
| 8. | Nwalado and Obro (2014) | ICT competence among social studies teachers. | Regarding gender, there was no significant difference but a significant difference was found in terms of locality. |
| 9. | Yadav (2015) | Secondary school teachers' attitudes towards using ICT. | Female teachers, private schools teachers, and urban teachers had more positive views towards ICT use. |
| 10. | Cakir and Önal (2015) | Information technology competencies of middle school math teachers in education. | Teachers were quite proficient with the cut, copy, and paste commands on desktop computers and highly skilled at utilizing MS Word to organize documents. |
| 11. | Akarawang et al. (2015) | Teachers' ICT competency to determine the requirements and training for improving ICT competency. | Younger teachers generally seemed to have strong ICT competency. |
| 12. | Michael, et al. (2016) | Impact of teachers' competency about ICT usage in teaching and learning. | A strong relationship concerning usage of ICT and teacher competency was revealed. |
| 13. | Maksimović and Dimić (2016) | Teachers' attitudes about integrating ICT competencies into the school. | No significant difference was revealed regarding gender, years of service, and education. |
| 14. | Daling (2017) | Secondary school teachers' ICT competency. | Teachers were proficient in incorporating ICT into the classroom. |

| | | | |
|---|---|---|---|
| 15. | Caluza et al. (2017) | Teachers of public school ICT competencies. | Majority teachers had rudimentary ICT knowledge but still needed to improve. |
| 16. | Parveen (2018) | Secondary school teachers' attitudes regarding the use of technology in the classroom. | No significant differences were found concerning gender or experience, but substantial differences was observed in rural and urban teachers. |
| 17. | Thakur and Chaudhury (2019) | Teacher educators' ICT competence. | No significant difference was revealed in gender and the kind of teacher training institution they attended (self-financed and government). |
| 18. | Mailizar and Fan (2020) | Indonesian secondary teachers' ICT usage and knowledge. | Showed a deficiency in teachers' knowledge of ICT and how to utilize it in the classroom. |
| 19. | Dela Fuente and Binas (2020) | Competence of teachers in ICT. | Teachers' proficiency with various ICT skill sets was intermediate and gender had insignificant impact on teachers' ICT competency. |
| 20. | Joshi et al. (2021) | ICT competency of Nepal's secondary school mathematics teachers. | Revealed that teachers with more experience and teachers from rural regions were less competent. |
| 21. | Machmud et al. (2021) | Competencies of Indonesian educators to incorporate ICT in education. | Teachers had a high degree of ICT proficiency. |

| | | | |
|---|---|---|---|
| 22. | Ikwuka et al. (2021) | ICT competencies of teachers required to teach English language effectively in Nigeria. | English language teachers were proficient in using interactive whiteboards, but their proficiency was insufficient for efficiently teaching and learning English. |
| 23. | Fidelis and Onyango (2021) | Teachers' competence in using ICT. | A sizable portion of teachers lacked computer proficiency in all areas. Relatively few teachers used the internet, and even fewer had some hardware and programming expertise. |
| 24. | Mandal (2021) | West Bengal teacher educators' ICT teaching ability. | Majority of teacher educators were proficient in ICT and no significant difference was found in gender. |
| 25. | Venumadhav and Sarsani (2022) | Teacher educators' ICT competencies. | Substantial mean difference was found in management style, gender, locality, academic qualification, and teaching experience of teachers. |
| 26. | Novela (2022) | Teachers' ICT competency in the context of the new normal. | Compared to male, female teachers had higher frequency of ICT competency. |
| 27. | Isorena and Malangen (2022) | High School teachers' ICT competency and capability. | Teachers were determined to be proficient in ICT competency. No statistically significant variation was observed concerning gender but was observed in terms of greatest level of education attained. |

| | | | |
|---|---|---|---|
| 28. | Syahrial et al. (2022) | Teachers' ICT competencies. | Rural teachers had good ICT competency. |
| 29. | Mijares (2022) | Elementary teachers' ICT competencies. | No difference was shown about teachers' level of education and gender in using ICT in teaching, but a significant difference was observed related to length of service |
| 30. | Reang and Mohalik (2023) | Secondary school teachers' ICT competency. | No differences were shown in the ICT competency of teachers concerning gender and locality. |
| 31. | Kumari and Jha (2023) | Competency of teacher educators in Jharkhand towards ICT. | Most teacher educators were proficient in ICT. |
| 32. | Kumar and Sri (2023) | Competency of female student teachers ICT. | Female student teachers were proficient in most ICT domains. Education level and resident's locality impacted their ICT competencies. |
| 33. | Balasubramanian and Naveen (2024) | ICT competency of B.Ed Trainee Teachers. | Male teachers were more proficient in ICT than female teachers. |
| 34. | Radiamoda et al. (2024) | ICT engagement and digital competence of pre-service English teachers. | Pre-service English teachers were quite competent with technology and had high level of ICT engagement. |

## 2.3. Summary of the Literature Reviewed

The researcher had reviewed 36 literature related to the teaching competency and 34 related to the ICT competency. Thus, all together the researcher had reviewed 70 related literatures for the present study.

Researchers like Seferoglu (2005), Shivaprakash (2019), Parveen and Srivastava (2020), Hoovinbhavi (2021), Parveen et al. (2021), Paul and Jeyanthi (2024), and Kumar and Kayalvizhi (2024) investigated the variable of gender on teaching competency and showed substantial variation in teachers' teaching competency. However, Raju and Rao (2011), Ranjini (2012), Das and Nalinilatha (2017), Balyer (2017), Patel (2017), Rana and Shivani (2019), Balasubramaniam (2019), Srinivasan and Pugalenthi (2019), Ratheeswari (2020), Sheela and Rajendran (2020), Shobha (2022), and Kaur (2023) found no significant difference.

Raju and Rao (2011), Jan (2016), Patel (2017), Moshahid and Hussain (2017), Shivaprakash (2019), Rana and Shivani (2019), Bindusha and Bindu (2020), Hoovinbhavi (2021) and Parveen et al. (2021) found a notable variation in teachers' teaching competency in relation to types of management. However, Ranjini (2012), Kaur and Talwar (2014), Das and Nalinilatha (2017), Balasubramaniam (2019), Ratheeswari (2020), Shobha (2022), and Kaur (2023) found no difference.

Regarding the variable of locality Sabu (2005), Raju and Rao (2011), Shivaprakash (2019), Rana and Shivani (2019), and Hoovinbhavi (2021) indicated notable difference in teachers' teaching competency. On the other hand, the findings of Ranjini (2012), Patel (2017), Ratheeswari (2020), Bindusha and Bindu (2020) and Sheela and Rajendran (2020) showed no notable difference.

Raju and Rao (2011), Patel (2017), Rana and Shivani (2019), Parveen and Srivastava (2020), Hoovinbhavi (2021), Parveen et al. (2021), and Kumar and Kayalvizhi (2024) studied teachers' teaching competency concerning teaching experience and revealed significant variation. On the other hand, researchers like Das and Nalinilatha (2017) and Ratheeswari (2020) reported no significant difference among secondary school teachers.

Aziz and Akhtar (2014), Rana and Shivani (2019), Sheela and Rajendran (2020), and Hoovinbhavi (2021) examined teachers' teaching competency in respect to educational qualification and discovered a significant difference. Meanwhile, researchers like Raju and Rao (2011), Ranjini (2012), Das and Nalinilatha (2017), and Bindusha and Bindu (2020) showed no notable difference.

Sabu (2005) found that educational qualifications, types of school, gender and teaching experience had no influence but found that locality significantly influenced secondary school teachers' total teaching competency. Kaur and Talwar (2014) revealed teaching competency was unaffected by gender. Ahmad and Khan (2016) found that the types of school influence the teaching competency of secondary school teachers, but qualification does not. Parveen and Srivastava (2020) found that locale had no significant affect on the teaching competence of secondary school teachers, but teaching experience had. Vidushy and Kishor (2020) indicated that locale had no major impact on teachers' teaching competence but teaching experience was shown to have a significant impact.

Researchers like Venumadhav and Sarsani (2022), Novela (2022), and Balasubramanian and Naveen (2024) examined the variable of gender in relation to teachers' ICT competency and revealed a significant variation. However, Nwalado and Obro (2014), Thakur and Chaudhury (2019), Mandal (2021), Isorena and Malangen (2022), Mijares (2022)**,** and Reang and Mohalik (2023) showed no notable difference.

Venumadhav and Sarsani (2022) examined the ICT competency of teachers concerning the types of management and found a significant difference. A few researchers like Nwalado and Obro (2014), Joshi et al. (2021), Venumadhav and Sarsani (2022), and Syahrial et al. (2022) examined the ICT competency of teachers in relation to locality and uncovered a significant difference. However, Reang and Mohalik (2023) revealed no significant difference.

Joshi et al. (2021), Venumadhav and Sarsani (2022), and Mijares (2022) investigated ICT competency of teachers in connection to teaching experience and unveiled that a significant difference persists in the ICT competence of teachers. Isorena and Malangen (2022), and Venumadhav and Sarsani (2022) found a significant difference in the ICT competency of teachers in connection to educational qualification. On the other hand, Mijares (2022) found no significant difference in the teachers' ICT competency. Further, Kumar and

Sri (2023) found that characteristics, such as education level and resident's locality, impacted female student teachers' ICT competencies.

The extensive review of the relevant literature revealed that although many researches were undertaken on teaching competency, most of the studies were in relation to teachers' emotional intelligence, self-efficacy, emotional maturity, sense of humour, and academic achievement of students only. No studies on teaching competency were found in relation to teachers' ICT competency. It also shows that minimal effort has been made on the influence of gender, types of management, locality, experience and educational qualification of secondary school teachers and their interaction upon teaching competency. Thus, these open much scope for further research as teaching competency is essential to be an effective and efficient teacher.

The examination of relevant literature further presents the concept that ICT is a fundamental instrument in education, and as such teachers' ICT proficiency is crucial in the modern educational process as the existence of technology is driving major transformations in education. It has been noted that majority of the studies on ICT were carried out in relation to awareness and the attitude of teachers about ICT. The available literature review also revealed that no study was found on ICT competency of teachers with the dimension of knowledge, skill and maintenance as a whole. Moreover, it was found that no such study had been undertaken on the combination of teaching and ICT competencies of teachers so far in the state of Nagaland. Hence, the investigator took up the present study, entitled "Teaching and ICT Competencies of Secondary School Teachers of Nagaland".

# CHAPTER - III

# RESEARCH METHODOLOGY

## 3.1. Introduction

Research design is a collection of guidelines for gathering data and analyses to balance procedural economy with significance for the study objective. It serves as a theoretical foundation within which the research is conducted and a blueprint for collecting, measuring and analyzing data. Mouton (1996) stated, "The research design serves to plan, structure and execute the research to maximize the validity of the findings. It gives directions from the underlying philosophical assumptions to research design and data collection" (as cited in Reddy et al., 2016, p. 64). The design of research is required to facilitate seamless execution of various research activities, enhance research efficiency, and yield optimal information with minimal investment. It refers to planning the methods for gathering the appropriate data and selecting analysis technique considering the research objective and the availability of resources (Reddy et al., 2016).

This chapter presents the research strategy used to achieve the goals of the present research that aimed at studying the teaching and ICT competencies of secondary school teachers of Nagaland. The chapter explains the details regarding the method, population and sample of the present study. It also contains a description of the tools, preparation of tool, data collection, statistical techniques used, and data analysis.

## 3.2. Method

A Descriptive Survey Method is devised to obtain accurate and relevant details about the current state of phenomena and, if feasible, make reliable characterizations from the information gathered. The method is confined not only to gathering facts but may frequently result in establishing essential principles of knowledge and resolutions to significant issues. The descriptive survey method investigates phenomena or events in their natural environment, and has both short and long-term goals (Koul, 2020).

This type of study is concerned with describing, surveying, comparing and interpreting the states or connections that exist, customs that are prevalent, beliefs, attitudes

or perspectives which are maintained, activities which are occurring, impacts which are being sensed and the trends that are emerging (Reddy et al., 2016). It also involves past occurrences that are linked to an existing condition. In the field of education, the descriptive research method is the most popular and extensively used research approach. At times, the descriptive survey is the only approach by which attitudes, opinions and recommendations for enhancement in teaching methods and educational practices can be achieved and through which other data can be obtained (Koul, 2020).

For the present investigation, the investigator employed the Descriptive Survey Method as this method is found to be most appropriate for studying "Teaching and ICT Competencies of Secondary School Teachers of Nagaland".

## 3.3. Population

Koul (2020) stated, "A population refers to any collection of a specified group of human beings or non-human entities such as objects, educational institutions, time units, geographical areas, prices of wheat or salaries drawn by individuals" (p. 219). In any research, it is essential to define a population properly to avoid any uncertainty and clarify if a particular unit is a member of the population. An inadequate definition of the population will confuse the investigator about which units to consider when choosing the sample.

The population for the present research consists of all the secondary school teachers teaching in classes 9 and 10 in government and private secondary schools of Nagaland, affiliated with the Nagaland Board of School Education (NBSE).

**Table 3.1**

**Districts-wise total number of Government and Private Secondary Schools in Nagaland, affiliated with the Nagaland Board of School Education (NBSE)**

| Sl. No. | District | Total No. of Government and Private Secondary Schools |
|---|---|---|
| 1. | Kohima | 89 |
| 2. | Mokochung | 69 |
| 3. | Tuensang | 37 |
| 4. | Mon | 60 |
| 5. | Phek | 59 |
| 6. | Wokha | 41 |
| 7. | Zunheboto | 51 |
| 8. | Dimapur | 89 |
| 9. | Kiphire | 24 |
| 10. | Longleng | 18 |
| 11. | Peren | 34 |
| 12. | Noklak | 06 |
| 13. | Chumukedima | 75 |
| 14. | Niuland | 14 |
| 15. | Tseminyu | 12 |
| 16. | Shamator | 06 |
| **Total** | | **684** |

Source: Nagaland Board of School Education, Kohima, Nagaland. (2023). Result Gazette (provisional), High School Leaving Certificate Examination, 2023.

## 3.4. Sample

A sample is a collection of a portion or subset of the objects or people in the population chosen to represent the population sample acquired by gathering information only of some members of a population. In order to study any problem, it is infeasible to study the absolute population. Therefore, it is convenient to select a sample from the universe intended

to be covered for study. The sampling process allows for drawing a reasonable inference or generalizations by carefully observing variables within a tiny subset of the population.

In the present investigation, Simple Random Sampling technique (lottery method) was utilized to draw the sample. This method ensures that every item in the population has an equal likelihood of being part of the sample. Thus, in the Simple Random Sampling Method, all members have the probability of being selected.

### 3.4.1. Selection of Schools

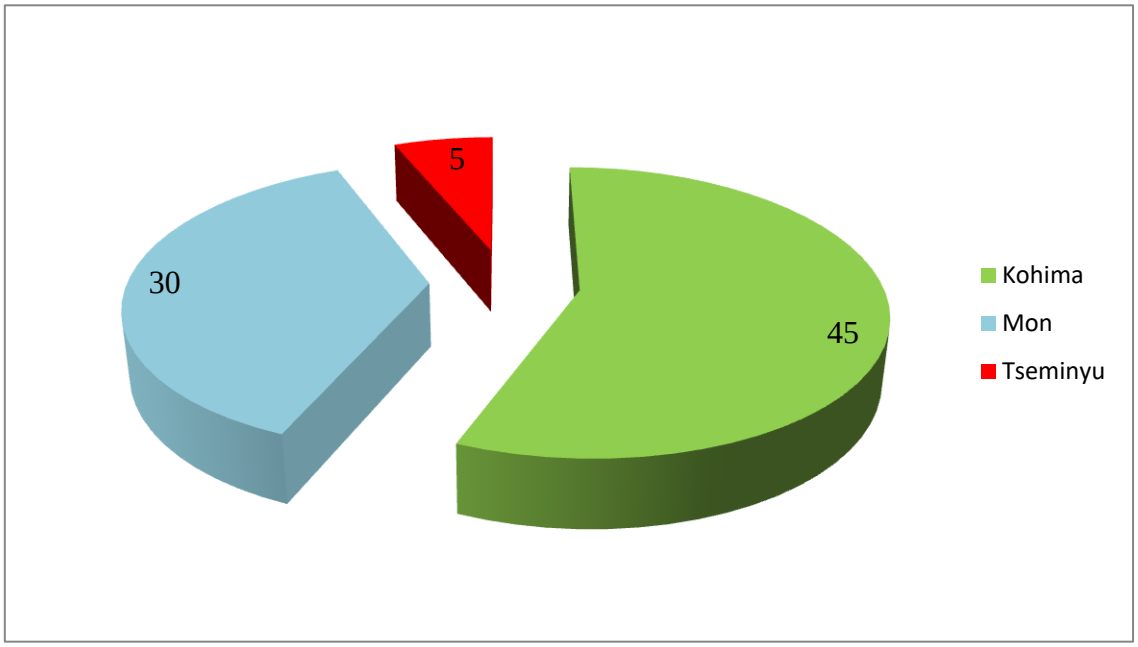
Out of the total 16 administrative districts of Nagaland, the researcher selected 3 districts (approximately 20% of the total districts) for the present study randomly by lottery method, i.e., Kohima, Mon and Tseminyu. From the total 684 secondary schools in Nagaland, as per Nagaland Board of School Education, Kohima, Nagaland, Result Gazette (Provisional), High School Leaving Certificate Examination, 2023, a list of the schools in the selected districts was drawn out. Thus, out of the total 161 secondary schools across the 3 selected districts, 45 schools from Kohima, 30 from Mon and 5 from Tseminyu were chosen for the present study, which comes to approximately 50% of the total schools from each district. Therefore, the total number of secondary schools selected for the present study was 80. The district-wise distribution of secondary schools from the 3 districts is presented in Table 3.2.

**Table 3.2**

**Distribution of Secondary Schools from 3 selected Districts**

| Sl. No. | District | Total no. of Secondary Schools | Total no. of Selected Secondary Schools |
|---|---|---|---|
| 1. | Kohima | 89 | 45 |
| 2. | Mon | 60 | 30 |
| 3. | Tseminyu | 12 | 05 |
| **Total** | | **161** | **80** |

**Figure 3 (a): Total number of selected Secondary Schools from 3 Districts**




### 3.4.2. Selection of Sample

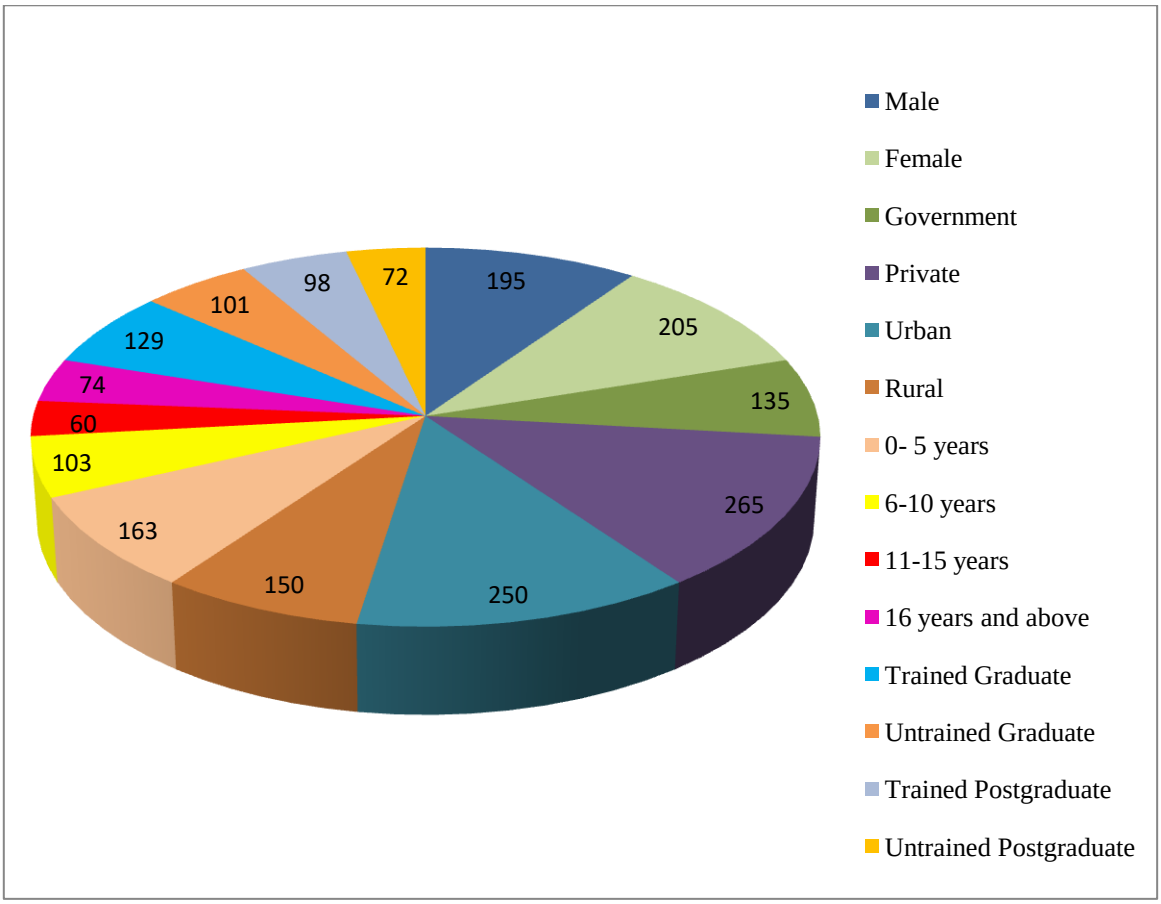
For the present study, a sample of 5 teachers from each school was selected randomly and proportionately. Thus, 400 secondary school teachers from 80 secondary schools, from 3 districts of Nagaland i.e., Kohima, Mon and Tseminyu were selected using Simple Random Sampling Technique (lottery method). Government and private were the two types of management from which the schools were selected. Sample distribution across different variables is shown in Table 3.3.

**Table 3.3**

**Sample distribution across different Variables**

| Sl. No. | Category | Variables | Total | Grand Total |
|---|---|---|---|---|
| 1. | Gender | Male | 195 | 400 |
| | | Female | 205 | |
| 2. | Types of Management | Government | 135 | 400 |
| | | Private | 265 | |
| 3. | Locality | Urban | 250 | 400 |
| | | Rural | 150 | |
| 4. | Teaching Experience | 0-5 years | 163 | 400 |
| | | 6-10 years | 103 | |
| | | 11-15 years | 60 | |
| | | 16 years and above | 74 | |
| 5. | Educational Qualification | Trained Graduate | 129 | 400 |
| | | Untrained Graduate | 101 | |
| | | Trained Postgraduate | 98 | |
| | | Untrained Postgraduate | 72 | |

**Figure 3 (b): Sample distribution across different Variables**




## 3.5. Tools for Data Collection

The investigator employed the following tools to collect data for the present study.

i. To measure the teaching competency of secondary school teachers, the investigator used Teacher's Teaching Competence Scale, constructed and standardized by Vimal Vidushy and Nand Kishor (2021).

ii. To measure the ICT competency of secondary school teachers, the investigator used Self-Constructed tool; ICT Competency Scale for Secondary School Teachers.

### 3.5.1. Teacher's Teaching Competence Scale

Teacher's Teaching Competence Scale constructed and standardized by Dr. Vimal Vidushy and Dr. Nand Kishor (2021) was used to assess the teaching competency of secondary school teachers of Nagaland. The scale has been designed for use among secondary school teachers. It is intended to serve as a tool for in-service teachers. Since a vital component of the educational system is the quality of education, it is increasingly

judged by focusing on the performance of the students, on what the students are learning, and how well they are learning. In this circumstance, the teacher's role in the society is crucial for its improvement. If a teacher is incompetent and dissatisfied with his/her job and does not perform well, the entire edifice of educational system will collapse.

Teaching is a competitive activity. Despite the great demand for teachers working for the profession it has not attracted much attention with adequate qualifications, training and ambition worldwide. Teachers need to become more familiar with new skills, strategies, methods and requirements and a change in mindset designed to create new responsibilities. The quality of education depends much on the competence of the teacher, as teacher is considered to be the hub of teaching-learning process. Thus, school's effectiveness depends directly on teaching competence. Without teaching competence, even the best curriculum and the best syllabus could not give the desired result. Hence, teaching competence leads to teacher effectiveness.

Brief descriptions of the dimensions of Teacher's Teaching Competence are as below:

1. **Planning lessons**:

   This refers to the teacher's competence in planning lessons considering the goal of lesson, plan and guide innovative activities for creating the interest of the pupils, learning by doing and strategies to deal with tough topics.

2. **Classroom management**:

   This refers to the teacher's competence in managing the classroom environment by providing wide range of learning activities, to keep pupils alert and enthusiastic, to make them disciplined, proper feedback, try to identify their learning difficulties and contribute towards creation of climate conducive to learning and progress of all pupils.

3. **Knowledge of the subject**:

   The teacher must possess mastery over his subject, appropriate content selection to be taught, age of the pupils and competence to implement lessons in a way that provides consistency and progression in learning. He must have vision and expertise in his field of study so that he can yield the best possible results.

4. **Interpersonal relationships**:

This refers to the teacher's competence in developing sound and good interpersonal relationships with colleagues and pupils to avoid mismanagements and to invite new practices for better academic growth.

5. **Development of teaching learning material**:

This refers to the teacher's competence in developing teaching-learning material includes innovative ways to teaching, preparation of worksheets, preparation of relevant supporting materials at low cost/ no cost, design and relate classroom content to the real-life situations, local visits and other community resources.

6. **Time management**:

This refers to the teacher's competence in punctuality, managing time to display teaching learning material and complete the syllabus in appropriate time.

7. **Evaluation process during teaching learning**:

This refers to the teacher's competence for positivistic evaluation process, use of different evaluation techniques during teaching learning without giving undue pressure, to supply remedial inputs to help the child and give them practical shape.

8. **Competencies related to working with parents, communities and other agencies**:

This refers to teacher's competence in dealing with parents and the need for their collaboration in teaching and learning and understanding of the value of community in the comprehensive development and growth of students.

a) **Item Analysis**

The first draft of the 57 items was administered on a sample of 100 secondary school teachers teaching in the various government secondary and senior secondary schools. The scale was administered with proper instructions and in a relaxed, calm, and comfortable environment. The responses of the subjects were scored as per the scoring procedure. The total score for each subject were recorded and the scores were then arranged in descending order from highest total scores to the lowest total scores. The t-test was then calculated item wise. It was found that the subjects' responses for 22 items were not showing significant difference between the upper and lower groups. Hence only 35 items were retained as rest 22 items were found either very easy or

very difficult and these items were seen inefficient to differentiate the difficulty level for the teachers. Item to total correlation was also worked out to check internal consistency of the scale. Items with lower values of r lack consistency and were discarded.

b) **Final Draft of the Scale**

After conducting item analysis of the first draft a total of 35 items were selected for the final draft of the General Teaching Competence Scale for Teachers and rest 22 items were weeded out. The dimension wise distribution of these 35 items in the final draft is shown below in Table 3.4.

**Table 3.4**

**Dimension-wise distribution of Items for General Teaching Competence Scale for Teachers (Final draft)**

| Sl. No. | Dimension | Sl. No. of items | No. of items |
|---|---|---|---|
| 1. | Planning lessons | 1,2,3,7 | 4 |
| 2. | Classroom management | 8,10,11,22,26,27,31,35 | 8 |
| 3. | Knowledge of subject | 4,6,23 | 3 |
| 4. | Interpersonal relationships | 12,21 | 2 |
| 5. | Development of teaching learning material | 5,9,32,33,34 | 5 |
| 6. | Time management | 20,29 | 2 |
| 7. | Evaluation process during teaching learning | 13,14,15,25,28,30 | 6 |
| 8. | Competencies related to working with parents, community and other agencies | 16,17,18,19,24 | 5 |
| **Total** | | | **35** |

Source: Vidushy & Kishor (2021), Teacher's Teaching Competence Scale.

c) **Scoring Pattern**

The scoring of the scale is based on the method of summated ratings as given by Likert (1932). Each item on the scale was rated on five consecutive points that if the answer to a positive item means Most of the time, the score is 5, to Often, the score is 4, Rarely, the score is 3, for Sometimes, the score is 2 and for Not at all, the score is 1. The score is presented below in 3.5.

**Table 3.5**

**Scoring Pattern for General Teaching Competence Scale for Teachers**

| Most of the Time | Often | Sometimes | Rarely | Not at all |
|---|---|---|---|---|
| 5 | 4 | 3 | 2 | 1 |

Source: Vidushy & Kishor (2021), Teacher's Teaching Competence Scale.

d) **Reliability of the scale**

The reliability of Teacher's Teaching Competence Scale for teachers was established through test-retest reliability**.**

e) **Test-retest reliability**

A single test form was given to the sample of 100 secondary school teachers twice in order to determine the test-retest reliability with a 30-day time gap. Test-retest was established by correlating the two sets of scores using Product moment correlation. The value of test-retest reliability, i.e., the reliability index for this Teacher's Teaching Competence Scale for Teachers, was found to be 0.95, which is regarded as very good. It indicates that the Teacher's Teaching Competence Scale for Teachers is appreciably reliable in measuring competence among secondary school teachers, and there is good stability in the competence scores of the teachers over different times.

f) **Internal consistency**

The internal consistency of the scale after being administered on 100 secondary school teachers also revealed a high value of Cronbach's alpha, which was established to be 0.90.

g) **Content validity**

The preliminary draft of items was reviewed by ten experts. They were explained the evaluation parameters and were requested to give their valuable suggestions on each item in terms of its technical and logical accuracy as well as its relevance for the respective dimension and for the entire scale of General Teaching Competence for Teachers. Their criticism, comments and approval for each item were thoroughly studied. Moreover, modifications were done in the items as suggested by various experts. Language experts were also consulted to seek their feedback, so to remove any linguistic ambiguity contained in the items.

h) **Standardization**

The final draft of the Teacher's Teaching Competence Scale with 35 items was administered to a randomly selected 700 male and female secondary school teachers working in government and private schools in Punjab in India.

i) **Statistical Results**

On the basis of scores of 700 protocols, the following statistical results were found:

**TABLE 3.6**

**Statistical Results**

| N | Mean | SD | Range of Scores |
|---|---|---|---|
| 700 | 110.50 | 15.60 | 35-175 |

Source: Vidushy & Kishor (2021), Teacher's Teaching Competence Scale.

j) **Norms**

On the basis of the statistical results, Norms for interpretation have been established.

### 3.5.2. ICT Competency Scale for Secondary School Teachers

The investigator constructed and standardized the ICT Competency Scale for Secondary School Teachers. This scale was used to collect data to examine the ICT competency of secondary school teachers of Nagaland.

a) **Need for development of ICT Competency Scale for Secondary School Teachers**

The application of ICT in the educational sector is currently being actively promoted throughout the world. As a result, educational institutions worldwide are incorporating ICT, and bringing about tremendous changes in the educational system, thereby demanding teachers to be proficient in handling different ICT devices. In this research, the investigator aimed at examining the ICT competency of secondary school teachers, for which a tool was required that could measure teachers' ICT competency. But the researcher could not find any appropriate tool applicable for this particular study. Therefore, to assess the ICT competency of secondary school teachers, the necessity to create a new tool became apparent. After consulting the supervisor, the investigator ultimately made a decision to construct and validate a new scale to assess the ICT competency of secondary school teachers.

b) **Planning of the Scale**

In planning to construct a tool, the limitations under which the tool has to be developed must be considered. Some of the fundamental factors that need to be planned while constructing a test include the nature of the population for which the test is constructed, the length of the test, the type and nature of the test items and the method of scoring the test (koul, 2020).

The first and foremost step followed by the investigator in constructing a scale was planning. Hence, in planning to construct a scale on ICT competency of secondary school teachers, the investigator consulted and referred various literatures related to ICT competency and different existing ICT tools to obtain a more thorough and wide-ranging comprehension of ideas before beginning to design a scale. The investigator therefore determined 3 key dimensions that are essential to the scale of ICT competency of secondary school teachers after analysing pertinent literature. Thus, the 3 key dimensions; Knowledge, Skill, and Maintenance were identified. Each of these dimensions contributes significantly in providing a comprehensive understanding of the scale. A detailed description of these dimensions is provided below:

i. **Knowledge**

It refers to the understanding, awareness, familiarity and information that the teachers have regarding ICT. It also involves understanding the advantages of using ICT in day-to-day life.

ii. **Skill**

It refers to the teachers' capability and expertise to capitalize on the knowledge of ICT and use a wide variety of digital devices, in the pedagogical process and their application in executing and performing different works through ICT in general.

iii. **Maintenance**

It refers to the teacher's action of taking care and handling their personal ICT devices well by carrying out a few regular tasks to make sure that they continue to operate properly and to keep them running smoothly.

Thus, considering these 3 dimensions, items were framed to measure the ICT Competency of Secondary School Teachers.

c) **Construction of Items**

While preparing preliminary draft of the test, the researcher must refer and consult the exiting tests in the concern area (koul, 2020). Thus, after consulting and referring the exiting tools related to ICT competency, the investigator prepared a pool of 85 items in the preliminary draft with the help of the supervisor by considering the broad and clear objectives of the investigation. Items were prepared in such a way that they are not vague and ambiguous but clear-cut and pinpointed. Thus, a preliminary draft of 85 items was developed. There were 31 items for Knowledge, 26 for Skill and, 28 for Maintenance. The dimension-wise distribution of 85 items in the preliminary draft is presented in Table 3.7.

**TABLE 3.7**

**Dimension-wise distribution of Items of ICT Competency Scale for Secondary School Teachers (Preliminary Draft)**

| Sl. No. | Dimension | No. of Items | Total No. of Items |
|---|---|---|---|
| 1. | Knowledge | 1-31 | 31 |
| 2. | Skill | 32-57 | 26 |
| 3. | Maintenance | 58-85 | 28 |
| **Total** | | | **85** |

d) **Validity**

Validity of the test can be defined as the extent to which it assesses what it is supposed to assess. Heale and Twycross (2015) stated that validity is the extent to which a concept is precisely assessed. If a test is designed for assessing the specific traits and it actually measure those traits and nothing else, then a test can be considered valid.

- **Content Validity**

Content validity is rooted in the opinion of a number of subject experts and test specialists, careful examination of instructional objectives, and the subject matter studied. Because of its rational as well as judgemental nature, content validity is sometimes referred to as rational or logical validity (Koul, 2020).

To ensure the content validity of the present tool, the investigator sought the expertise of a panel of 17 experts from the field of education and NIELIT (National Institute of Electronics & Information Technology), Kohima to review the preliminary draft of 85 items with different dimensions. The investigator consulted and requested these experts to give their valuable suggestion, comments and approval for the items. After which, necessary modification was made in the light of the feedbacks and suggestions of the experts while selecting the different items pertaining to the dimensions of the tool. Thus, the investigator deleted 19 items and retained 66 items.

e) **Pilot Study**

A pilot study helps to improve the validity and reliability of the research. It aids in creating a logical and realistic research that the researcher intends to carry out within the allotted period (Reddy et al., 2016).

The ICT Competency Scale for Secondary School Teachers' first draft consisting of 66 items obtained after the expert's opinions was used for a pilot study. Each item on the scale was put in 3 point scale; "Yes", "Can't Say", and "No". The scoring of the scale for the item was 2 for Yes, 1 for Can't Say and 0 for No, respectively. The scale was administrated on a sample of 50 secondary school teachers of 2 districts. After administration of the scale, their responses were collected and discussed with the supervisor. Changes were made in question items of the scale, new instructions were added wherever required and other necessary changes were made and then, scoring was done according to the scoring procedure.

f) **Item Analysis**

After the administration of a preliminary draft of the test on a group of teachers and then scoring, item analysis of a test was performed. Every statement was analyzed, item by item using a statistical technique t-test through SPSS V.20, finding out one-sample t-value of each statement at the 0.01 level of significance. Based on the t-value, items with a value greater than 2.69 were selected. Thus, out of 66 items, a total of 60 items were selected, and 6 items were removed as per the significant level. One-sample t-test analysis of the selected items of ICT competency scale for secondary school teachers are presented in Table 3.8.

**Table 3.8**

**One-sample t-test for ICT Competency Scale for Secondary School Teachers**

| Item | Mean | Std. Deviation | Std. Error Mean | t-value | Remark |
|---|---|---|---|---|---|
| 1. | 1.96 | 0.28 | 0.04 | 49.00 | Selected |
| 2. | 1.78 | 0.51 | 0.07 | 24.84 | Selected |
| 3. | 1.56 | 0.61 | 0.09 | 18.04 | Selected |
| 4. | 1.88 | 0.39 | 0.05 | 34.49 | Selected |
| 5. | 1.58 | 0.73 | 0.10 | 15.29 | Selected |
| 6. | 1.36 | 0.69 | 0.10 | 13.88 | Selected |
| 7. | 1.40 | 0.70 | 0.10 | 14.15 | Selected |
| 8. | 1.38 | 0.83 | 0.12 | 11.75 | Selected |
| 9. | 1.86 | 0.35 | 0.05 | 37.52 | Selected |
| 10. | 1.72 | 0.61 | 0.09 | 20.02 | Selected |
| 11. | 1.24 | 0.87 | 0.12 | 10.07 | Selected |
| 12. | 1.36 | 0.88 | 0.12 | 10.99 | Selected |
| 13. | 1.40 | 0.83 | 0.12 | 11.88 | Selected |
| 14. | 1.28 | 0.70 | 0.10 | 12.91 | Selected |
| 15. | 1.76 | 0.52 | 0.07 | 24.05 | Selected |
| 16. | 1.80 | 0.45 | 0.06 | 28.17 | Selected |
| 17. | 1.98 | 0.14 | 0.02 | 99.00 | Selected |
| 18. | 1.72 | 0.57 | 0.08 | 21.23 | Selected |
| 19. | 1.80 | 0.45 | 0.06 | 28.17 | Selected |
| 20. | 1.12 | 0.72 | 0.10 | 11.03 | Selected |
| 21. | 1.82 | 0.39 | 0.05 | 33.16 | Selected |
| 22. | 1.90 | 0.30 | 0.04 | 44.33 | Selected |
| 23. | 1.70 | 0.58 | 0.08 | 20.72 | Selected |

| | | | | | |
|---|---|---|---|---|---|
| 24. | 1.66 | 0.59 | 0.08 | 19.80 | Selected |
| 25. | 1.66 | 0.63 | 0.09 | 18.74 | Selected |
| 26. | 1.60 | 0.67 | 0.09 | 16.89 | Selected |
| 27. | 1.36 | 0.75 | 0.11 | 12.83 | Selected |
| 28. | 1.86 | 0.35 | 0.05 | 37.52 | Selected |
| 29. | 1.90 | 0.36 | 0.05 | 36.89 | Selected |
| 30. | 1.24 | 0.85 | 0.12 | 10.36 | Selected |
| 31. | 1.58 | 0.64 | 0.09 | 17.41 | Selected |
| 32. | 1.66 | 0.59 | 0.08 | 19.80 | Selected |
| 33. | 1.20 | 0.83 | 0.12 | 10.19 | Selected |
| 34. | 1.68 | 0.65 | 0.09 | 18.20 | Selected |
| 35. | 1.74 | 0.56 | 0.08 | 21.79 | Selected |
| 36. | 1.80 | 0.49 | 0.07 | 25.72 | Selected |
| 37. | 1.28 | 0.88 | 0.12 | 10.27 | Selected |
| 38. | 1.22 | 0.79 | 0.11 | 10.92 | Selected |
| 39. | 1.50 | 0.61 | 0.09 | 17.26 | Selected |
| 40. | 1.70 | 0.61 | 0.09 | 19.56 | Selected |
| 41. | 1.58 | 0.57 | 0.08 | 19.44 | Selected |
| 42. | 1.52 | 0.71 | 0.10 | 15.21 | Selected |
| 43. | 1.70 | 0.58 | 0.08 | 20.72 | Selected |
| 44. | 1.70 | 0.61 | 0.09 | 19.56 | Selected |
| 45. | 1.74 | 0.53 | 0.07 | 23.34 | Selected |
| 46. | 1.44 | 0.81 | 0.11 | 12.54 | Selected |
| 47. | 1.68 | 0.62 | 0.09 | 19.14 | Selected |
| 48. | 1.68 | 0.47 | 0.07 | 25.21 | Selected |
| 49. | 1.46 | 0.76 | 0.11 | 13.56 | Selected |

| | | | | | |
|---|---|---|---|---|---|
| 50. | 1.80 | 0.53 | 0.08 | 23.81 | Selected |
| 51. | 1.22 | 0.79 | 0.11 | 10.92 | Selected |
| 52. | 1.62 | 0.60 | 0.09 | 19.02 | Selected |
| 53. | 1.58 | 0.73 | 0.10 | 15.29 | Selected |
| 54. | 1.56 | 0.73 | 0.10 | 15.05 | Selected |
| 55. | 1.62 | 0.64 | 0.09 | 18.03 | Selected |
| 56. | 1.84 | 0.37 | 0.05 | 35.13 | Selected |
| 57. | 1.46 | 0.81 | 0.12 | 12.69 | Selected |
| 58. | 1.16 | 0.87 | 0.12 | 9.48 | Selected |
| 59. | 1.32 | 0.89 | 0.13 | 10.48 | Selected |
| 60. | 1.50 | 0.74 | 0.10 | 14.42 | Selected |

g) **Final Draft of the Scale**

The final draft of the scale was prepared after the first draft of the scale was item analyzed. All the required modifications were made, other relevant requirements for preparing the final scale were taken care of, and the scale was reframed. Thus, a total of 60 items were finalized for the ICT Competency Scale for Secondary School Teachers. The dimension-wise distribution of 60 items in the final draft is presented in Table 3.9.

**Table 3.9**

**Dimension-wise distribution of Items of ICT Competency Scale for Secondary School Teachers (Final Draft)**

| Sl. No. | Dimension | No. of Items | Total No. of Items |
|---|---|---|---|
| 1. | Knowledge | 1 - 21 | 21 |
| 2. | Skill | 22 - 43 | 22 |
| 3. | Maintenance | 44 - 60 | 17 |
| **Total** | | | **60** |

h) **Reliability**

When a thing is measured by a tool frequently, and the measurement obtained is consistent or similar every time, it can be said that the tool is reliable. Reliability refers to the degree of consistency with which the instrument or procedure consistently produces the same results when measuring a particular attribute or variable. A test is considered reliable when it consistently measures whatever it is measuring, yielding stable and similar results across multiple administrations (Best et al., 2006).

In the current investigation, the split-half method was followed to find the scale's reliability co-efficiency by using even and odd split. The Spearman-Brown Coefficient of relationship was determined to be 0.915, Cronbach's Alpha was 0.945 and Guttman Split Half Coefficient of connection was 0.907. These values are sufficiently high to assume that the present ICT Competency Scale for Secondary School Teachers is a highly reliable tool to measure the ICT competency of secondary school teachers. Thus, it is indicated that the "ICT Competency Scale for Secondary School Teachers" developed by the investigator is highly reliable. The reliability value of the scale is shown in Table 3.10.

**Table 3.10**

**Reliability of ICT Competency Scale for Secondary School Teachers**

| | Spearman-Brown Coefficient | Cronbach's Alpha | Guttman Split-Half Coefficient |
|---|---|---|---|
| ICT Competency Scale for Secondary School Teachers | 0.915 | 0.945 | 0.907 |

i) **Scoring**

ICT Competency Scale for Secondary School Teachers comprise of 60 items. Each item on the scale was rated on 3 point scale. The scores were given as, if the answer to an item is Yes, the score is 2, to Can't Say, the score is 1 and for No, the score is 0. The range of the scores is 0-120. The scoring of ICT competency scale for secondary school teachers is shown in Table 3.11.

**Table 3.11**

**Scoring for ICT Competency Scale for Secondary School Teachers**

| Yes | Can't Say | No |
|---|---|---|
| 2 | 1 | 0 |

## 3.6. Data Collection

A standardized scale on Teacher's Teaching Competence by Dr. Vimal Vidushy and Dr. Nand Kishor (2021) and the ICT Competency Scale for Secondary School Teachers developed by the investigator were employed for data collection.

The investigator personally visited each school and obtained permission from the heads of the institutions by explaining in detail the purpose of the study and the procedure for data collection. After obtaining approval, the investigator administered the tools to the selected teachers. They were given clear guidelines and instructions and were requested to read each statement carefully and give their valuable responses to all the items in the questionnaire by ticking against the appropriate response. Further, they were advised not to skip and leave any items unanswered. Teachers were also assured that the information obtained would remain confidential and utilized exclusively for the study. Necessary care was taken to avoid interfering with the teachers' academic schedules. In some schools, questionnaires were collected back with the assistance of some teachers, and in some, the investigator personally collected the questionnaires from teachers after a few days.

## 3.7. Statistical Techniques Used

The following statistical techniques were used to analysis the data.

i. Mean and Standard Deviation (SD) were computed to ascertain the status of secondary school teachers for the variables of teaching competency and ICT competency.

ii. Pearson's Product Moment Correlation technique was applied to find the correlation between teaching competency and ICT competency.

iii. A t-test was utilized to establish the differences in the teaching competency and ICT competency of secondary school teachers concerning gender, types of management and locality.

iv. One-way ANOVA and Post-Hoc t-Test of mean and standard deviation was employed to analyze the mean of more than two groups within the same variable, namely, teaching experience and educational qualification.

v. Three-way ANOVA was employed to study the influence and interaction among gender, types of management, locality, teaching experience and educational qualification in relation to teaching competency and ICT competency of secondary school teachers.

## 3.8. Analysis of Data

After the data collection, the response sheets of the sample were assembled for coding, scoring and tabulation. Then SPSS V.20 (Statistical Package of Social Sciences) and the Microsoft Excel package were utilized for the statistical analysis of the data and interpretations were made accordingly. Tables and bar graphs were also used to present the analysis.

# CHAPTER - IV

# ANALYSIS AND INTERPRETATION

## 4.1. Introduction

This chapter deals with the analysis and interpretation of the data collected. The obtained data were examined carefully, keeping in view the objectives of the study, and the hypotheses formulated were tested using appropriate statistical techniques. The detailed presentations of the results, as per the objectives of the study, are as follows.

## 4.2. Objective - 1: To determine the Teaching Competency of Secondary School Teachers of Nagaland

The teaching competency of secondary school teachers were analyzed with the help of mean and standard deviation, and the results are given in Table 4.1.

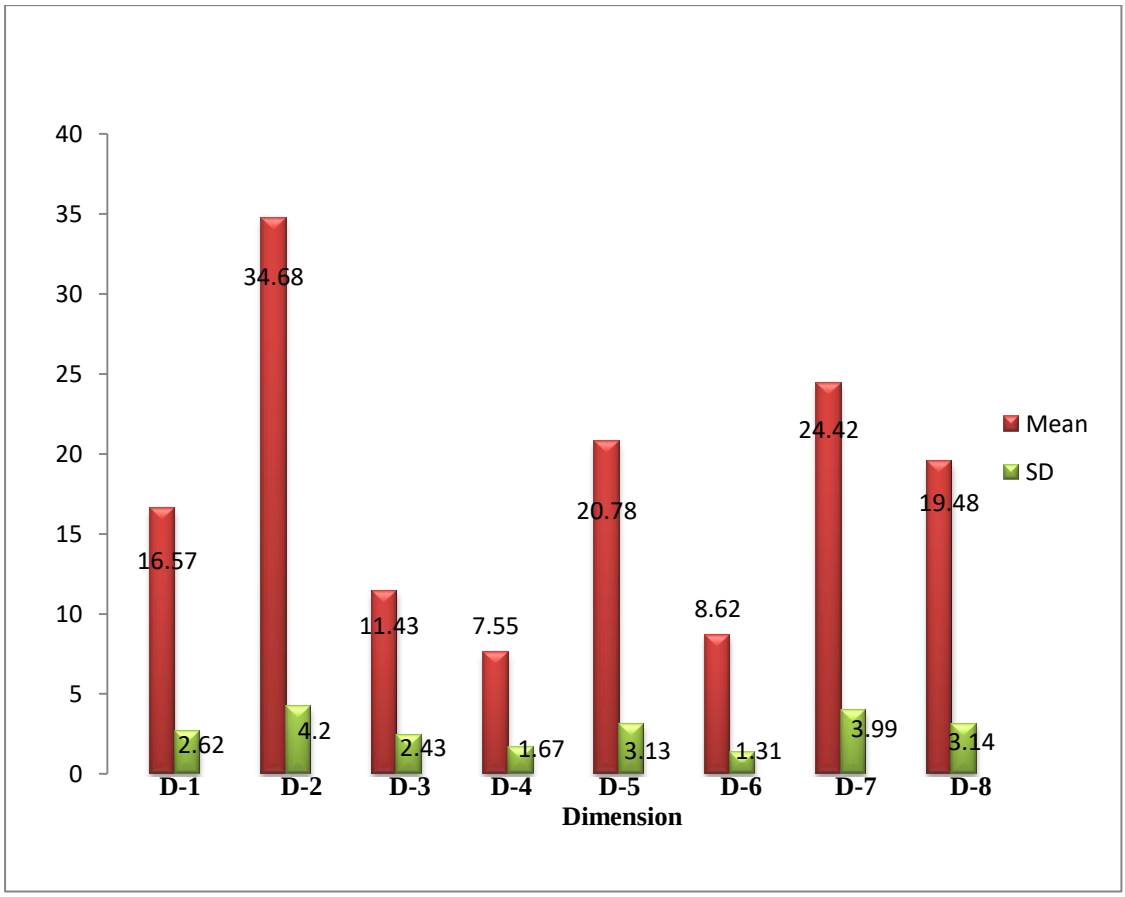
**Table 4.1**

**Dimension-wise Mean and SD of Teaching Competency of Secondary School Teachers**

| Sl. No. | Dimension | N | Mean | SD |
|---|---|---|---|---|
| 1. | Planning lessons | 400 | 16.57 | 2.62 |
| 2. | Classroom management | | 34.68 | 4.20 |
| 3. | Knowledge of subject | | 11.43 | 2.43 |
| 4. | Interpersonal relationships | | 7.55 | 1.67 |
| 5. | Development of teaching learning material | | 20.78 | 3.13 |
| 6. | Time management | | 8.62 | 1.31 |
| 7. | Evaluation process during teaching learning | | 24.42 | 3.99 |
| 8. | Competencies related to working with parents, community and other agencies | | 19.48 | 3.14 |

Table 4.1 reveals that in the teaching competency of secondary school teachers, the mean scores for planning lessons is 16.57, classroom management is 34.68, knowledge of Subject is 11.43, interpersonal relationships is 7.55, development of teaching learning material is 20.78, time management is 8.62, evaluation process during teaching learning is 24.42 and competencies related to working with parents, community and other agencies is 19.48 with the corresponding standard deviation scores of 2.62, 4.20, 2.43, 1.67, 3.13, 1.31, 3.99 and 3.14 respectively. This demonstrates that teachers scored the highest mean score of 34.68 in the dimension of classroom management and the lowest mean score of 7.55 in interpersonal relationships. This indicates that secondary school teachers have high competency in classroom management than in other dimensions of teaching competency. Therefore, it can be concluded that secondary school teachers of Nagaland have high competency in classroom management.

**Figure 4 (a): Dimension-wise scores of Teaching Competency of Secondary School Teachers**



## 4.3. Objective - 2: To determine the ICT Competency of Secondary School Teachers of Nagaland

The ICT competency of secondary school teachers were analyzed with the help of mean and standard deviation, and the results are given in Table 4.2.

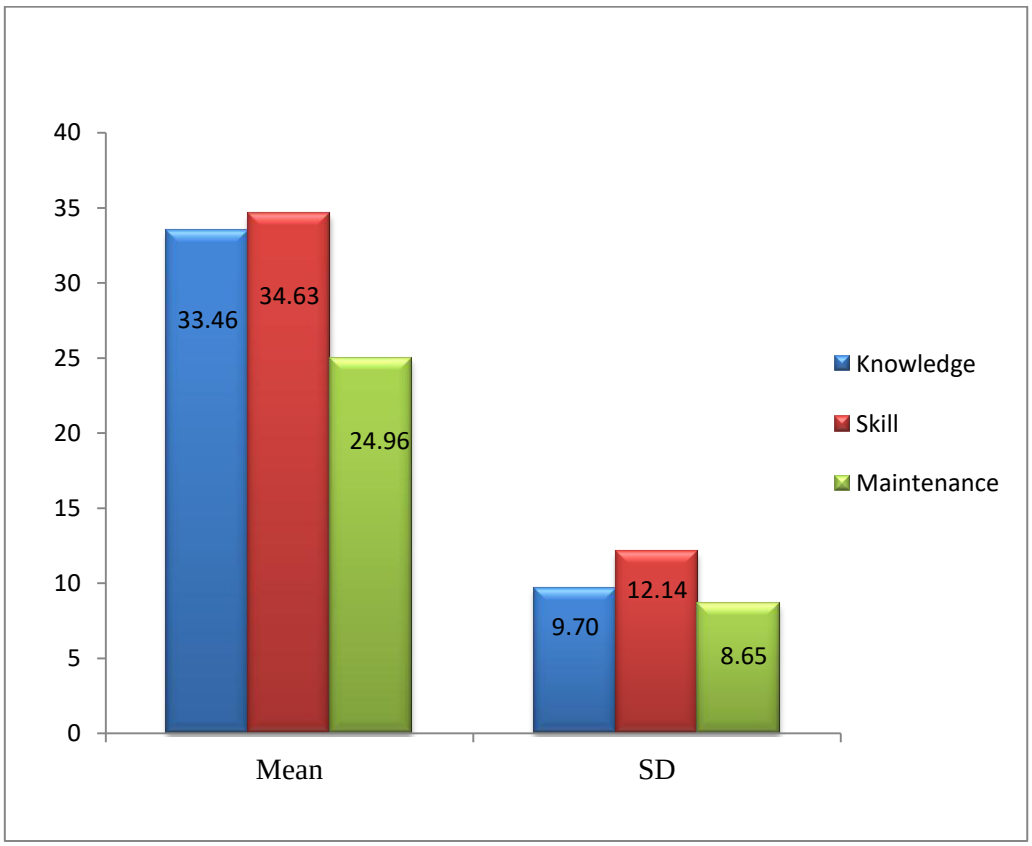
**Table 4.2**

**Dimension-wise Mean and SD of ICT Competency of Secondary School Teachers**

| Sl. No. | Dimension | N | Mean | SD |
|---|---|---|---|---|
| 1. | Knowledge | 400 | 33.46 | 9.70 |
| 2. | Skill | | 34.63 | 12.14 |
| 3. | Maintenance | | 24.96 | 8.65 |

Table 4.2 reveals that in the dimensions of ICT competency of secondary school teachers, the mean scores for knowledge is 33.46, skill is 34.63, and maintenance is 24.96, with the corresponding standard deviation of 9.70, 12.14 and 8.65, respectively. This demonstrates that secondary school teachers scored the highest mean score of 34.63 in the dimension of skill and scored the lowest mean score of 24.96 in maintenance. Thus, it indicates that secondary school teachers have high competency in ICT skill than in other dimensions of ICT competency. Therefore, it can be concluded that secondary school teachers of Nagaland have high competency in ICT skill.

**Figure 4 (b): Dimension-wise scores of ICT Competency of Secondary School Teachers**




## 4.4. Objective - 3: To find out the difference in Teaching Competency of Secondary School Teachers with respect to Gender, Types of Management, Locality, Teaching Experience and Educational Qualification

For the difference in teaching competency of secondary school teachers with respect to gender, types of management and locality, t-test was computed, and for teaching experience and educational qualification, one-way ANOVA was applied.

### 4.4.1. Difference in Teaching Competency of Secondary School Teachers with respect to Gender, Types of Management and Locality

**Table 4.3**

**Mean, SD and t-value of the Teaching Competency of Secondary School Teachers with respect to Gender, Types of Management and Locality**

| Teaching Competency of Different Group | | N | Mean | SD | df | t-value |
|---|---|---|---|---|---|---|
| Gender | Male | 195 | 141.01 | 19.46 | 398 | 2.66** |
| | Female | 205 | 145.91 | 17.41 | | |
| Types of Management | Government | 135 | 135.80 | 23.26 | | 6.21** |
| | Private | 265 | 147.45 | 14.17 | | |
| Locality | Urban | 250 | 146.84 | 14.70 | | 4.73** |
| | Rural | 150 | 137.99 | 22.67 | | |

****Significant at the 0.05 level**

**Gender:**

Table 4.3 reveals that the t-value for gender 2.66 is statistically significant at the 0.05 level of significance with df=398. This shows that the mean scores of teaching competency of male and female teachers differ significantly. Thus, the null hypothesis (1.1), formulated as "there is no significant difference in teaching competency of secondary school teachers with respect to gender", was rejected. Therefore, it can be concluded that a significant difference exists in the teaching competency of secondary school teachers with respect to gender. Additionally, the mean score of male teachers is 141.01, which is lower than that of female teachers at 145.91. It may, thus, be said that female secondary school teachers have significantly higher teaching competency than their male counterparts. Similar findings were reported by Seferoglu (2005), Shivaprakash (2019), Parveen and Srivastava (2020), Hoovinbhavi (2021), Parveen et al. (2021), Paul and Jeyanthi (2024), and Kumar and Kayalvizhi (2024).

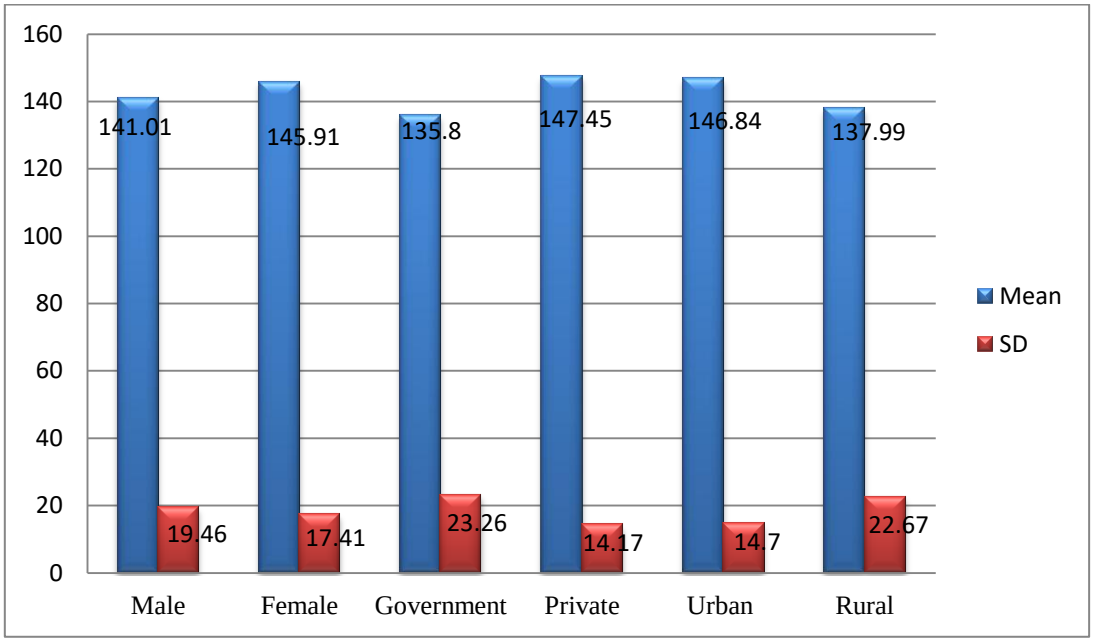
**Types of Management:**

From Table 4.3, it can be observed that the t-value for types of management 6.21 is statistically significant at the 0.05 level of significance with df=398. It indicates a significant difference in the mean scores of teaching competency of government and private school teachers. Thus, the null hypothesis (1.2), formulated as "there is no significant difference in teaching competency of secondary school teachers with respect to types of management", was rejected. Therefore, it can be concluded that a significant difference exists in the teaching competency of secondary school teachers with respect to types of management. Additionally, the mean score of the government teachers is 135.80, which is lower than that of the private teachers at 147.45. Hence, it may be inferred that teachers of private secondary schools have significantly higher teaching competency than government secondary school teachers. Similar results were documented by Raju and Rao (2011), Jan (2016), Patel (2017), Moshahid and Hussain (2017), Shivaprakash (2019), Rana and Shivani (2019), Bindusha and Bindu (2020), Hoovinbhavi (2021) and Parveen et al. (2021).

**Locality:**

Table 4.3 further exhibits that the t-value for locality 4.73 is statistically significant at the 0.05 level of significance with df=398. This signifies that the mean scores of teaching competency of secondary school teachers in urban and rural areas differ significantly. Thus, the null hypothesis (1.3), formulated as "there is no significant difference in teaching competency of secondary school teachers with respect to locality", was rejected. Therefore, it can be concluded that there is a significant difference in the teaching competency of secondary school teachers with respect to locality. Additionally, the mean score of urban areas teachers is 146.84, which is higher than that for rural areas teachers at 137.99. It may, therefore, be said that urban secondary school teachers were found to have significantly higher teaching competency than rural secondary school teachers. This result aligned with the findings of Sabu (2005), Raju and Rao (2011), Shivaprakash (2019), Rana and Shivani (2019), and Hoovinbhavi (2021).

**Figure 4 (c): Teaching Competency of Secondary School Teachers with respect to Gender, Types of Management and Locality**




### 4.4.2. Difference in Teaching Competency of Secondary School Teachers with respect to Teaching Experience

**Table 4.4**

**Summary of ANOVA on Teaching Competency of Secondary School Teachers with respect to Teaching Experience**

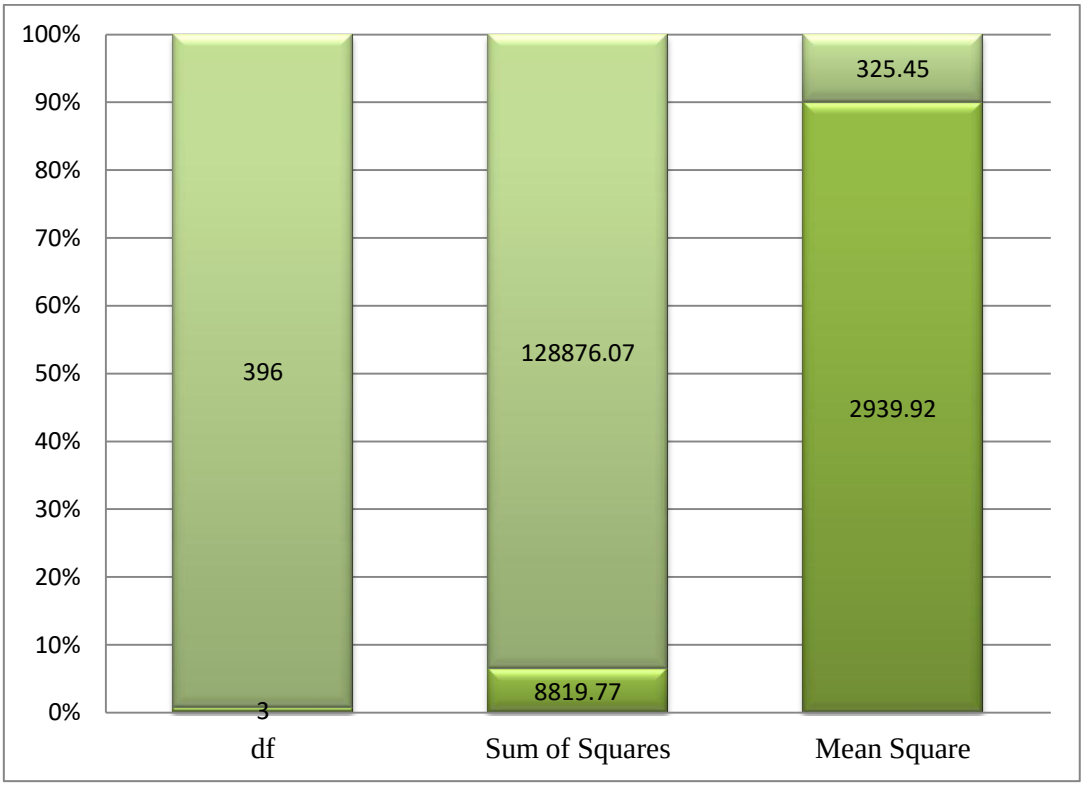
| Teaching Competency | Source of Variance | df | Sum of Squares | Mean Square | F-ratio |
|---|---|---|---|---|---|
| Teaching Experience | Between Groups | 3 | 8819.77 | 2939.92 | 9.03** |
| | Within Groups | 396 | 128876.07 | 325.45 | |
| | **Total** | **399** | **137695.84** | | |

****Significant at the 0.05 level**

From Table 4.4, it can be seen that the obtained F-ratio of 9.03, with df=3/396, is statistically significant at the 0.05 level of significance. This suggests that secondary school teachers with different teaching experiences differ significantly in teaching competency. Therefore, the null hypothesis (1.4), formulated as "there is no significant difference in

teaching competency of secondary school teachers with respect to teaching experience", was rejected. Thus, it may be concluded that there is a significant difference in the teaching competency of secondary school teachers with respect to teaching experience. Similar findings were documented by Raju and Rao (2011), Patel (2017), Rana and Shivani (2019), Parveen and Srivastava (2020), Hoovinbhavi (2021), Parveen et al. (2021), and Kumar and Kayalvizhi (2024).

**Figure 4 (d): Teaching Competency of Secondary School Teachers with respect to Teaching Experience**




### 4.4.2.1. Post-Hoc t-Test of Mean and Standard Deviation for Teaching Competency of Secondary School Teachers with respect to Teaching Experience

The Post-hoc t-test of mean and standard deviation was used to examine the difference between the mean scores across different teaching experience of secondary school teachers in relation to teaching competency.

**Table 4.5**

**Results of Post-Hoc t-Test on Teaching Competency of Secondary School Teachers with respect to Teaching Experience**

| Teaching Competency | Group | N | Mean | SD | t-value |
|---|---|---|---|---|---|
| Teaching Experience | 0-5 Years | 163 | 148.35 | 15.16 | 2.20** |
| | 6-10 Years | 103 | 143.79 | 17.31 | |
| | 0-5 Years | 163 | 148.35 | 15.16 | 3.55** |
| | 11-15 Years | 60 | 138.17 | 20.26 | |
| | 0-5 Years | 163 | 148.35 | 15.16 | 4.02** |
| | 16 Years and above | 74 | 136.85 | 22.47 | |
| | 6-10 Years | 103 | 143.79 | 17.31 | 1.81 |
| | 11-15 Years | 60 | 138.17 | 20.26 | |
| | 6-10 Years | 103 | 143.79 | 17.31 | 2.23** |
| | 16 Years and above | 74 | 136.85 | 22.47 | |
| | 11-15 Years | 60 | 138.17 | 20.26 | 0.36 |
| | 16 Years and above | 74 | 136.85 | 22.47 | |

****Significant at the 0.05 level**

In the post-hoc t-test, the mean difference in the teaching competency of secondary school teachers across different teaching experiences was examined. Thus, from Table 4.5, it can be determined that secondary school teachers with teaching experience of 0-5 years and 6-10 years, 0-5 years and 11-15 years, 0-5 years and 16 years and above, and 6-10 years and 16 years and above differ significantly. However, there was no significant difference among secondary school teachers with teaching experience of 6-10 years and 11-15 years, and 11-15 years and 16 years and above.

### 4.4.3. Difference in Teaching Competency of Secondary School Teachers with respect to Educational Qualification

**Table 4.6**

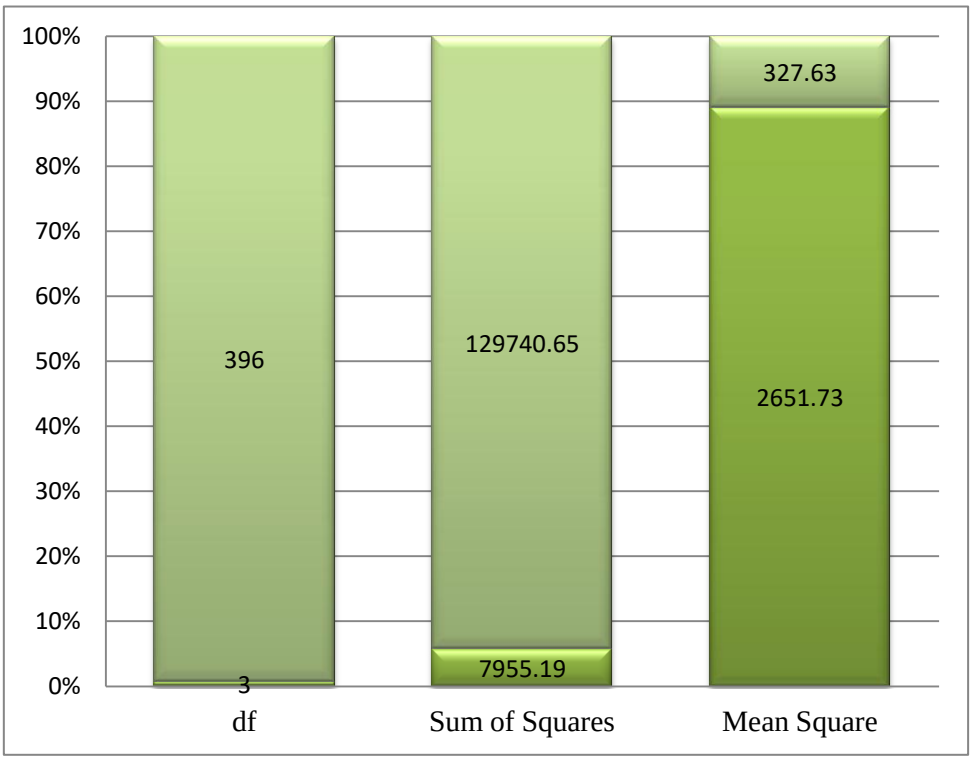
**Summary of ANOVA on Teaching Competency of Secondary School Teachers with respect to Educational Qualification**

| Teaching Competency | Source of Variance | df | Sum of Squares | Mean Square | F-ratio |
|---|---|---|---|---|---|
| Educational Qualification | Between Groups | 3 | 7955.19 | 2651.73 | 8.09** |
| | Within Groups | 396 | 129740.65 | 327.63 | |
| | **Total** | **399** | **137695.84** | | |

****Significant at the 0.05 level**

From Table 4.6, it is evident that the obtained F-ratio of 8.09, with df=3/396, is statistically significant at the 0.05 level of significance. This indicates that secondary school teachers with different educational qualifications differ significantly in teaching competency. Therefore, the null hypothesis (1.5), formulated that "there is no significant difference in teaching competency of secondary school teachers with respect to educational qualification", was rejected. Thus, it can be concluded that there is a significant difference in the teaching competency of secondary school teachers with respect to educational qualification. The result coincides with the findings of Aziz and Akhtar (2014), Rana and Shivani (2019), Sheela and Rajendran (2020), and Hoovinbhavi (2021).

**Figure 4 (e): Teaching Competency of Secondary School Teachers with respect to Educational Qualification**




### 4.4.3.1. Post-Hoc t-Test of Mean and Standard Deviation for Teaching Competency of Secondary School Teachers with respect to Educational Qualification

The Post-hoc t-test of mean and standard deviation was used to examine the difference between the mean scores across different educational qualification of secondary school teachers in relation to teaching competency.

**Table 4.7**

**Results of Post-Hoc t-Test on Teaching Competency of Secondary School Teachers with respect to Educational Qualification**

| Teaching Competency | Group | N | Mean | SD | t-value |
|---|---|---|---|---|---|
| Educational Qualification | Trained Graduate | 129 | 143.97 | 17.85 | 2.76** |
| | Untrained Graduate | 101 | 136.37 | 22.72 | |
| | Trained Graduate | 129 | 143.97 | 17.85 | 1.24 |
| | Trained Postgraduate | 98 | 146.59 | 13.94 | |
| | Trained Graduate | 129 | 143.97 | 17.85 | 0.23 |
| | Untrained Postgraduate | 72 | 142.57 | 16.14 | |
| | Untrained Graduate | 101 | 136.37 | 22.72 | 3.84** |
| | Trained Postgraduate | 98 | 146.59 | 13.94 | |
| | Untrained Graduate | 101 | 136.37 | 22.72 | 2.10** |
| | Untrained Postgraduate | 72 | 142.57 | 16.14 | |
| | Trained Postgraduate | 98 | 146.59 | 13.94 | 1.65 |
| | Untrained Postgraduate | 72 | 142.57 | 16.14 | |

****Significant at the 0.05 level**

In the post-hoc t-test, the mean difference in the teaching competency of secondary school teachers across different educational qualifications was investigated. Thus, Table 4.7 indicates that there exists a significant difference in the teaching competency of teachers with educational qualifications categorized and compared as; trained graduate and untrained graduate, untrained graduate and trained postgraduate, and untrained graduate and untrained postgraduate. However, insignificant differences were spotted between trained graduate and trained postgraduate, trained graduate and untrained postgraduate, and trained postgraduate and untrained postgraduate teachers.

## 4.5. Objective - 4: To find out the difference in ICT Competency of Secondary School Teachers with respect to Gender, Types of Management, Locality, Teaching Experience and Educational Qualification

For the difference in ICT competency of secondary school teachers with respect to gender, types of management and locality, t-test was computed, and for teaching experience and educational qualification one-way ANOVA was applied.

### 4.5.1. Difference in ICT Competency of Secondary School Teachers with respect to Gender, Types of Management and Locality

**Table 4.8**

**Mean, SD and t-value of ICT Competency of Secondary School Teachers with respect to Gender, Types of Management and Locality**

| ICT Competency of Different Group | | N | Mean | SD | df | t-value |
|---|---|---|---|---|---|---|
| Gender | Male | 195 | 94.08 | 30.39 | 398 | 0.70 |
| | Female | 205 | 92.07 | 27.09 | | |
| Types of Management | Government | 135 | 80.12 | 34.20 | | 6.78** |
| | Private | 265 | 99.64 | 22.91 | | |
| Locality | Urban | 250 | 97.42 | 25.51 | | 4.00** |
| | Rural | 150 | 85.76 | 32.20 | | |

****Significant at the 0.05 level**

**Gender:**

Table 4.8 reveals that the t-value for gender 0.70 is statistically not significant at the 0.05 level of significance with df=398. This implies that the mean scores of ICT competency of male and female teachers do not differ significantly. Hence, the null hypothesis (2.1), formulated as "there is no significant difference in ICT competency of secondary school teachers with respect to gender", was retained. Thus, it can be concluded that there is no significant difference in the ICT competency of secondary school teachers with respect to

gender. Additionally, the mean score of male is 94.08, which is slightly better than that of female, whose score is 92.07. It may, therefore, be concluded that male secondary school teachers have slightly better ICT competency compared to their female counterparts. But the difference was not significant enough. Similar results were reported by Nwalado and Obro (2014), Thakur and Chaudhury (2019), Mandal (2021), Isorena and Malangen (2022), Mijares (2022), and Reang and Mohalik (2023).

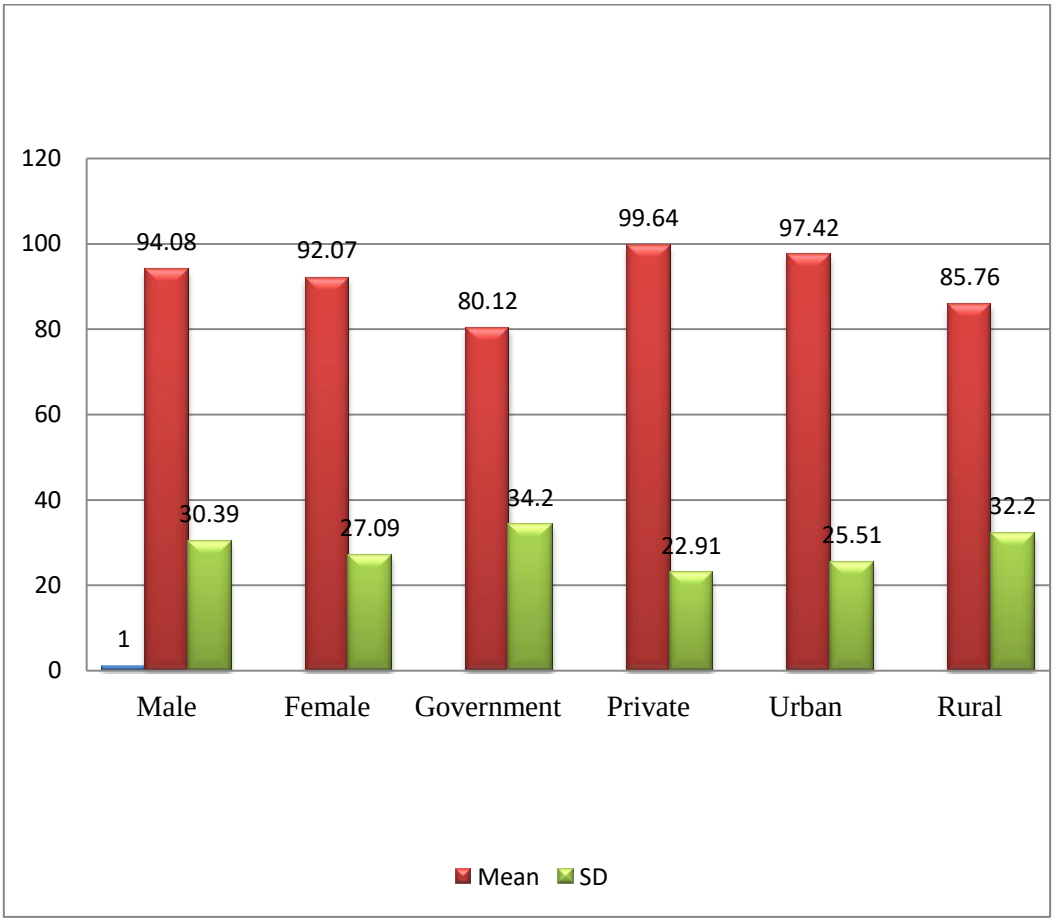
**Types of management:**

From Table 4.8, it is further seen that the t-value for types of management is 6.78, which is statistically significant at the 0.05 level of significance with df=398. It connotes that the mean scores of ICT competency for government and private school teachers differ significantly. Hence, the null hypothesis (2.2), formulated as "there is no significant difference in ICT competency of secondary school teachers with respect to types of management", was rejected. Thus, it can be concluded that there is a significant difference in the ICT competency of secondary school teachers with respect to types of management. Additionally, the mean score of government teachers is 80.12, which is lower than that of private teachers, whose score is 99.64. It may, therefore, be said that teachers at private secondary schools have significantly higher ICT competency than government secondary school teachers. A similar finding was reported by Venumadhav and Sarsani (2022).

**Locality:**

Table 4.8 indicates that the t-value for locality 4.00 is statistically significant at the 0.05 level of significance with df=398. This signifies that the mean score of ICT competency of urban and rural school teachers differs significantly. Hence, the null hypothesis (2.3), formulated as "there is no significant difference in ICT competency of secondary school teachers with respect to locality", was rejected. Thus, it can be concluded that there is a significant difference in the ICT competency of secondary school teachers with respect to locality. Additionally, the mean score of urban teachers is 97.42, which is higher than that of rural teachers, whose score is 85.76. It may, therefore, be said that urban secondary school teachers have significantly higher ICT competency than rural secondary school teachers. Similar findings were reported by Nwalado and Obro (2014), Joshi et al. (2021), Venumadhav and Sarsani (2022), and Syahrial et al. (2022).

**Figure 4 (f): ICT Competency of Secondary School Teachers with respect to Gender, Types of Management and Locality**




### 4.5.2. Difference in ICT Competency of Secondary School Teachers with respect to Teaching Experience

**Table 4.9**

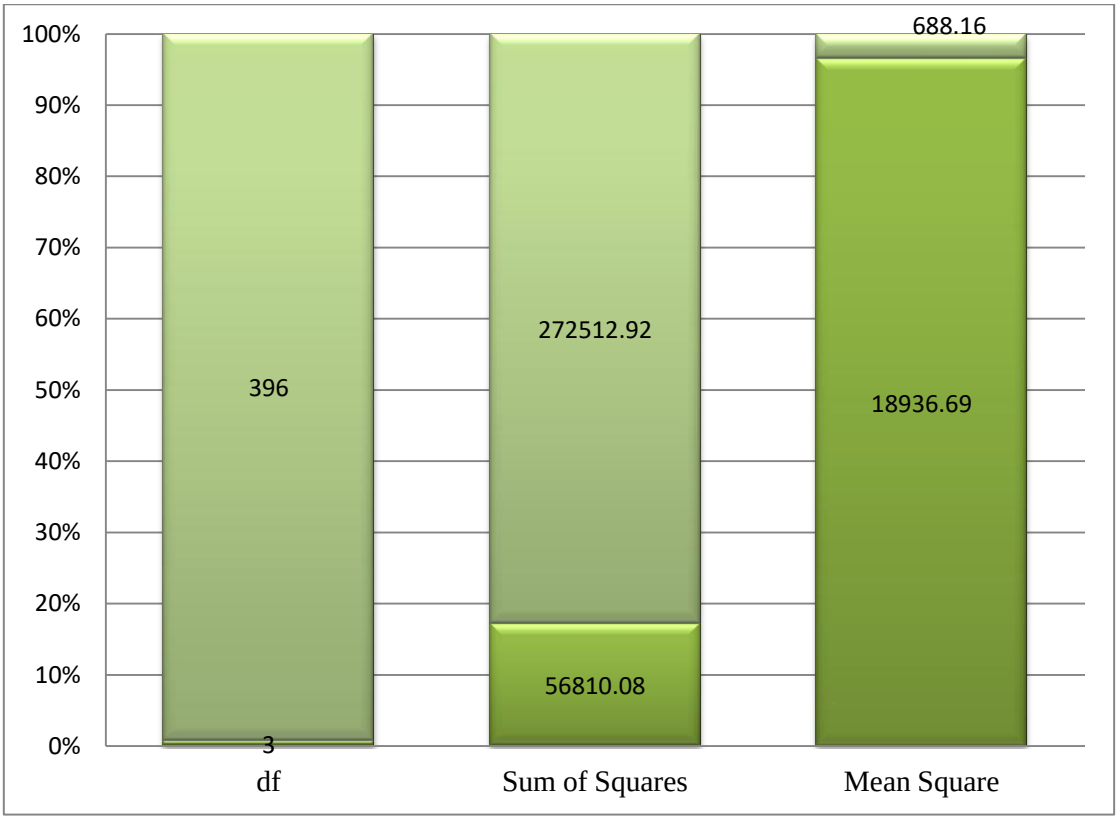
**Summary of ANOVA on ICT Competency of Secondary School Teachers with respect to Teaching Experience**

| ICT Competency | Source of Variance | df | Sum of Squares | Mean Square | F-ratio |
|---|---|---|---|---|---|
| Teaching Experience | Between Groups | 3 | 56810.08 | 18936.69 | 27.52** |
| | Within Groups | 396 | 272512.92 | 688.16 | |
| | Total | 399 | 329323.00 | | |

****Significant at the 0.05 level**

From Table 4.9, it is revealed that the obtained F-ratio of 27.52, with df=3/396, is statistically significant at the 0.05 level of significance. It indicates that teachers with different teaching experiences differ significantly in ICT competency. Hence, the null hypothesis (2.4), formulated as "there is no significant difference in ICT competency of secondary school teachers with respect to teaching experience", was rejected. Therefore, it can be concluded that a significant difference exists in the ICT competency of secondary school teachers with respect to teaching experience. This result supports the findings of Joshi et al. (2021), Venumadhav and Sarsani (2022), and Mijares (2022).

**Figure 4 (g): ICT Competency of Secondary School Teachers with respect to Teaching Experience**




### 4.5.2.1. Post-Hoc t-Test of Mean and Standard Deviation for ICT Competency of Secondary School Teachers with respect to Teaching Experience

The Post-hoc t-test of mean and standard deviation was used to examine the difference between the mean scores across different teaching experience of secondary school teachers in relation to ICT competency.

**Table 4.10**

**Results of Post-Hoc t-Test on ICT Competency of Secondary School Teachers with respect to Teaching Experience**

| ICT Competency | Group | N | Mean | SD | t-value |
|---|---|---|---|---|---|
| Teaching Experience | 0-5 Years | 163 | 102.61 | 17.71 | 2.27** |
| | 6-10 Years | 103 | 95.76 | 27.26 | |
| | 0-5 Years | 163 | 102.61 | 17.71 | 2.72** |
| | 11-15 Years | 60 | 91.45 | 29.88 | |
| | 0-5 Years | 163 | 102.61 | 17.71 | 7.57** |
| | 16 Years and above | 74 | 69.51 | 35.74 | |
| | 6-10 Years | 103 | 95.76 | 27.26 | 0.91 |
| | 11-15 Years | 60 | 91.45 | 29.88 | |
| | 6-10 Years | 103 | 95.76 | 27.26 | 5.31** |
| | 16 Years and above | 74 | 69.51 | 35.74 | |
| | 11-15 Years | 60 | 91.45 | 29.88 | 0.68 |
| | 16 Years and above | 74 | 69.51 | 35.74 | |

****Significant at the 0.05 level**

In the post-hoc t-test, the mean difference in the ICT competency of secondary school teachers across different teaching experiences was identified. Thus, from Table 4.10, it is observed that significant difference exists among secondary school teachers with teaching experience of 0-5 years and 6-10 years, 0-5 years and 11-15 years, 0-5 years and 16 years and above, and 6-10 years and 16 years and above. However, no significant difference was found concerning teachers with teaching experience of 6-10 years and 11-15 years, and 11-15 years and 16 years and above.

### 4.5.3. Difference in ICT Competency of Secondary School Teachers with respect to Educational Qualification

**Table 4.11**

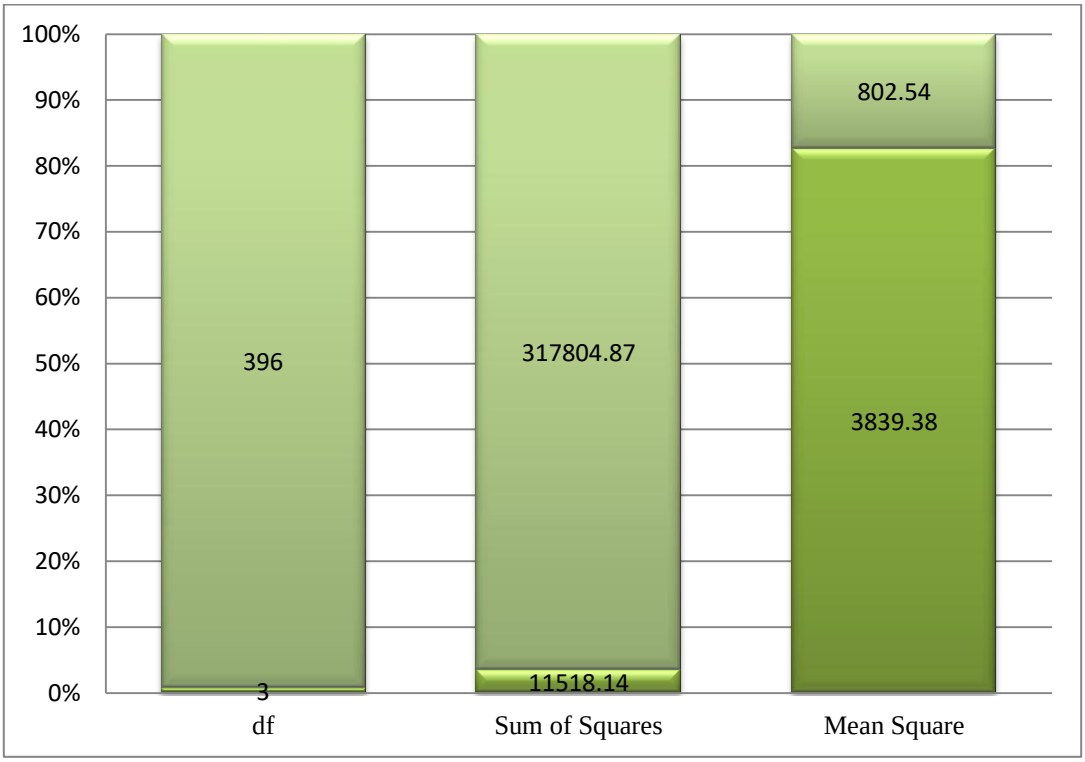
**Summary of ANOVA on ICT Competency of Secondary School Teachers with respect to Educational Qualification**

| ICT Competency | Source of Variance | df | Sum of Squares | Mean Square | F-ratio |
|---|---|---|---|---|---|
| Educational Qualification | Between Groups | 3 | 11518.14 | 3839.38 | 4.78** |
| | Within Groups | 396 | 317804.87 | 802.54 | |
| | **Total** | **399** | **329323.00** | | |

****Significant at the 0.05 level**

Table 4.11 shows that the obtained F-ratio of 4.78, with df=3/396, is statistically significant at the 0.05 level of significance. This denotes that teachers with different educational qualifications differ significantly in ICT competency. Therefore, the null hypothesis (2.5), formulated as "there is no significant difference in ICT competency of secondary school teachers with respect to educational qualification", was rejected. Thus, it can be concluded that there is a significant difference in the ICT competency of secondary school teachers with respect to educational qualification. A similar result was documented by Isorena and Malangen (2022), and Venumadhav and Sarsani (2022).

**Figure 4 (h): ICT Competency of Secondary School Teachers with respect to Educational Qualification**




### 4.5.3.1. Post-Hoc t-Test of Mean and Standard Deviation for ICT Competency of Secondary School Teachers with respect to Educational Qualification

The Post-hoc t-test of mean and standard deviation was used to examine the difference between the mean scores across different educational qualification of secondary school teachers in relation to ICT competency.

**Table 4.12**

**Results of Post-Hoc t-Test on ICT Competency of Secondary School Teachers with respect to Educational Qualification**

| ICT Competency | Group | N | Mean | SD | t-value |
|---|---|---|---|---|---|
| Educational Qualification | Trained Graduate | 129 | 88.69 | 31.70 | 0.12 |
| | Untrained Graduate | 101 | 88.18 | 30.78 | |
| | Trained Graduate | 129 | 88.69 | 31.70 | 2.68** |
| | Trained Postgraduate | 98 | 98.51 | 23.73 | |
| | Trained Graduate | 129 | 88.69 | 31.70 | 2.18** |
| | Untrained Postgraduate | 72 | 97.26 | 23.69 | |
| | Untrained Graduate | 101 | 88.18 | 30.78 | 2.66** |
| | Trained Postgraduate | 98 | 98.51 | 23.73 | |
| | Untrained Graduate | 101 | 88.18 | 30.78 | 2.19** |
| | Untrained Postgraduate | 72 | 97.26 | 23.69 | |
| | Trained Postgraduate | 98 | 98.51 | 23.73 | 0.34 |
| | Untrained Postgraduate | 72 | 97.26 | 23.69 | |

****Significant at the 0.05 level**

In the post-hoc t-test, the mean difference in the ICT competency of secondary school teachers across different educational qualifications was determined. Thus, from Table 4.12, it is observed that significant difference exists among secondary school teachers with different educational qualifications such as trained graduate and trained postgraduate, trained graduate and untrained postgraduate, untrained graduate and trained postgraduate, and untrained graduate and untrained postgraduate. However, no significant difference was observed between a trained graduate and an untrained graduate, and trained postgraduate and untrained postgraduate teachers.

## 4.6. Objective - 5: To determine the relationship between Teaching Competency and ICT Competency of Secondary School Teachers with respect to certain variables separately and in totality

The relationship between teaching competency and ICT competency of secondary school teachers with respect to certain variables separately and in totality were analyzed using Person's Coefficient of Correlation. The values of correlations are presented in Table 4.13.

**Table 4.13**

**Coefficient of Correlation between Teaching Competency and ICT Competency of Secondary School Teachers**

| Variables | Category | N | r | Sig at 0.05 Level |
|---|---|---|---|---|
| Teaching Competency and ICT Competency | Male | 195 | 0.271 | Significant |
| | Female | 205 | 0.208 | Significant |
| | Government | 135 | 0.092 | Not Significant |
| | Private | 265 | 0.233 | Significant |
| | Urban | 250 | 0.202 | Significant |
| | Rural | 150 | 0.199 | Significant |
| | Teaching experience 0-5 Years | 163 | 0.169 | Significant |
| | Teaching experience 6-10 Years | 103 | 0.262 | Significant |
| | Teaching experience 11-15 Years | 60 | 0.316 | Significant |
| | Teaching experience 16 Years and above | 74 | -0.015 | Not Significant |
| | Educational Qualification Trained Graduate | 129 | 0.198 | Significant |
| | Educational Qualification Untrained Graduate | 101 | 0.283 | Significant |

| | | | | |
|---|---|---|---|---|
| | Educational Qualification Trained Postgraduate | 98 | 0.041 | Not Significant |
| | Educational Qualification Untrained Postgraduate | 72 | 0.261 | Significant |
| | Total Sample | 400 | 0.235 | Significant |

Table 4.13 present the coefficient of correlation between teaching competency and ICT competency of secondary school teachers with respect to certain variables separately and in totality:

i. The coefficient of correlation between teaching competency and ICT competency of male secondary school teachers is 0.271, which is positive and significant at the 0.05 level, thus indicating a positive and significant relationship. Therefore, the null hypothesis formulated as "there is no significant relationship between teaching competency and ICT competency of male secondary school teachers" was rejected.

ii. The coefficient of correlation between teaching competency and ICT competency of female secondary school teachers is 0.208, which is positive and significant at the 0.05 level, thus indicating a positive and significant relationship. Therefore, the null hypothesis formulated as "there is no significant relationship between teaching competency and ICT competency of female secondary school teachers" was rejected.

iii. The coefficient of correlation between teaching competency and ICT competency of government secondary school teachers is 0.092, which is positive but not significant at the 0.05 level, thus indicating a positive but insignificant relationship. Therefore, the null hypothesis formulated as "there is no significant relationship between teaching competency and ICT competency of government secondary school teachers" was retained.

iv. The coefficient of correlation between teaching competency and ICT competency of private secondary school teachers is 0.233, which is positive and significant at the 0.05 level, thus indicating a positive and significant relationship. Therefore, the null hypothesis formulated as "there is no significant relationship between teaching competency and ICT competency of private secondary school teachers" was rejected.

v. The coefficient of correlation between teaching competency and ICT competency of urban secondary school teachers is 0.202, which is positive and significant at the 0.05

level, thus indicating a positive and significant relationship. Therefore, the null hypothesis formulated as “there is no significant relationship between teaching competency and ICT competency of urban secondary school teachers” was rejected.

vi. The coefficient of correlation between teaching competency and ICT competency of rural secondary school teachers is 0.199, which is positive and significant at the 0.05 level, thus indicating a positive and significant relationship. Therefore, the null hypothesis formulated as “there is no significant relationship between teaching competency and ICT competency of rural secondary school teachers” was rejected.

vii. The coefficient of correlation between teaching competency and ICT competency of secondary school teachers with teaching experience of 0-5 years is 0.169, which is positive and significant at the 0.05 level, thus indicating a positive and significant relationship. Therefore, the null hypothesis formulated as “there is no significant relationship between teaching competency and ICT competency of secondary school teachers with teaching experience of 0-5 years” was rejected.

viii. The coefficient of correlation between teaching competency and ICT competency of secondary school teachers with teaching experience of 6-10 years is 0.262, which is positive and significant at the 0.05 level, thus indicating a positive and significant relationship. Therefore, the null hypothesis formulated as “there is no significant relationship between teaching competency and ICT competency of secondary school teachers with teaching experience of 6-10 years” was rejected.

ix. The coefficient of correlation between teaching competency and ICT competency of secondary school teachers with teaching experience of 11-15 years is 0.316, which is positive and significant at the 0.05 level, thus indicating a positive and significant relationship. Therefore, the null hypothesis formulated as “there is no significant relationship between teaching competency and ICT competency of secondary school teachers with teaching experience of 11-15 years” was rejected.

x. The coefficient of correlation between teaching competency and ICT competency of secondary school teachers with teaching experience of 16 years and above is -0.015, which is negative and not significant at the 0.05 level, thus indicating a negative and insignificant relationship. Therefore, the null hypothesis formulated as “there is no significant relationship between teaching competency and ICT competency of

secondary school teachers with teaching experience of 16 years and above" was retained.

xi. The coefficient of correlation between teaching competency and ICT competency of trained graduate secondary school teachers is 0.198, which is positive and significant at the 0.05 level, thus indicating a positive and significant relationship. Therefore, the null hypothesis formulated as "there is no significant relationship between teaching competency and ICT competency of trained graduate secondary school teachers" was rejected.

xii. The coefficient of correlation between teaching competency and ICT competency of untrained graduate secondary school teachers is 0.283, which is positive and significant at the 0.05 level, thus indicating a positive and significant relationship. Therefore, the null hypothesis formulated as "there is no significant relationship between teaching competency and ICT competency of untrained graduate secondary school teachers" was rejected.

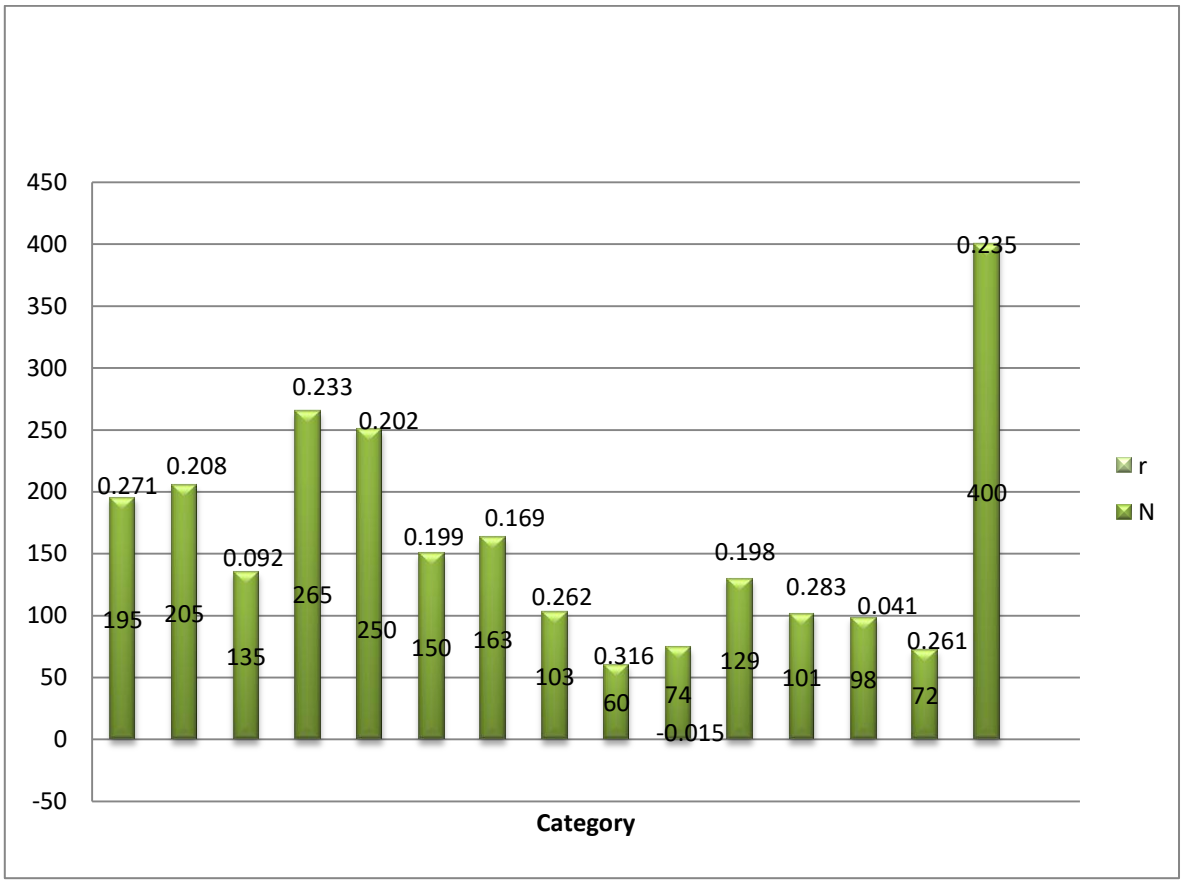
xiii. The coefficient of correlation between teaching competency and ICT competency of trained postgraduate secondary school teachers is 0.041, which is positive but not significant at the 0.05 level, thus indicating a positive but insignificant relationship. Therefore, the null hypothesis formulated as "there is no significant relationship between teaching competency and ICT competency of trained postgraduate secondary school teachers" was retained.

xiv. The coefficient of correlation between teaching competency and ICT competency of untrained postgraduate secondary school teachers is 0.261, which is positive and significant at the 0.05 level, thus indicating a positive and significant relationship Therefore, the null hypothesis formulated as "there is no significant relationship between teaching competency and ICT competency of untrained postgraduate secondary school teachers" was rejected.

xv. The coefficient of correlation between teaching competency and ICT competency of secondary school teachers in totality is 0.235, which is positive and significant at the 0.05 level, thus indicating a positive and significant relationship. Therefore, the null hypothesis (3), formulated as "there is no significant relationship between teaching

competency and ICT competency of secondary school teachers in totality", was rejected.

**Figure 4 (i): Coefficients of Correlation between Teaching Competency and ICT Competency of Secondary School Teachers with respect to certain variables separately and in totality**




## 4.7. Objective - 6: To find out the influence and interaction of Gender, Types of Management and Locality on Teaching Competency of Secondary School Teachers

The influence and interaction of gender, types of management and locality on teaching competency of secondary school teachers was analyzed using a three-way ANOVA. The results are given in Table 4.14.

**Table 4.14**

**Summary of ANOVA of influence and interaction of Gender, Types of Management and Locality on Teaching Competency of Secondary School Teachers**

| Sources of Variance | df | Sum of Squares | Mean Squares | F-ratio |
|---|---|---|---|---|
| Gender (A) | 1 | 4972.37 | 4972.37 | 16.55** |
| Types of Management(B) | 1 | 7147.53 | 7147.53 | 23.79** |
| Locality(C) | 1 | 439.26 | 439.26 | 3.98** |
| Gender ×Types of Management (A×B) | 1 | 121.36 | 121.36 | 0.40 |
| Gender ×Locality (A×C) | 1 | 9.53 | 9.53 | 0.03 |
| Types of Management ×Locality (B×C) | 1 | 1977.80 | 1977.80 | 6.58** |
| Gender ×Types of Management ×Locality (A×B×C) | 1 | 2127.81 | 2127.81 | 7.08** |
| Within (error) | 392 | 117790.70 | 300.49 | |
| **Total** | **399** | | | |

****Significant at the 0.05 level**

### 4.7.1. Influence of Gender on Teaching Competency of Secondary School Teachers

It can be observed from Table 4.14 that the F-ratio of 16.55 for gender is statistically significant at the 0.05 level of significance with df= 1/392. Thus, the null hypothesis (4.1), formulated as "there is no significant influence of gender on teaching competency of secondary school teachers", was rejected. It may therefore, be said that gender significantly influences teaching competency of secondary school teachers.

### 4.7.2. Influence of Types of Management on Teaching Competency of Secondary School Teachers

It can be observed from Table 4.14 that the F-ratio of 23.79 for types of management is statistically significant at the 0.05 level of significance with df=1/392. Hence, the null hypothesis (4.2), formulated as "there is no significant influence of types of management on teaching competency of secondary school teachers", was rejected. It may therefore, be said

that types of management significantly influences the teaching competency of secondary school teachers. This result is in aligned with the findings of Ahmad and Khan (2016).

### 4.7.3. Influence of Locality on Teaching Competency of Secondary School Teachers

From Table 4.14 it is evident that the F-ratio of 3.98 for locality is statistically significant at the 0.05 level of significance with df=1/392. Hence, the null hypothesis (4.3), formulated as "there is no significant influence of locality on teaching competency of secondary school teachers", was rejected. It may therefore, be said that locality significantly influences the teaching competency of secondary school teachers. A similar finding was reported by Sabu (2005).

### 4.7.4. Interaction of Gender and Types of Management on Teaching Competency of Secondary School Teachers

From Table 4.14 it is evident that the F-ratio of 0.40 for interaction between gender and types of management is statistically not significant at the 0.05 level of significance with df=1/392. Hence, the null hypothesis (4.4), formulated as "there is no significant interaction of gender and types of management on teaching competency of secondary school teachers", was accepted. Thus, it can be said that there is no significant interactional influence of gender and types of management on the teaching competency of secondary school teachers. It may further be inferred that the teaching competency of secondary school teachers is independent of the interaction between gender and types of management.

### 4.7.5. Interaction of Gender and Locality on Teaching Competency of Secondary School Teachers

From Table 4.14 it is evident that the F-ratio of 0.03 for interaction between gender and locality is statistically not significant at the 0.05 level of significance with df=1/392. Hence, the null hypothesis (4.5), formulated as "there is no significant interaction of gender and locality on teaching competency of secondary school teachers", was accepted. Thus, it can be said that there is no significant interactional influence of gender and locality on the teaching competency of secondary school teachers. It may further be deduced that the teaching competency of secondary school teachers is independent of the interaction between gender and locality.

### 4.7.6. Interaction of Types of Management and Locality on Teaching Competency of Secondary School Teachers

From Table 4.14 it is evident that the F-ratio of 6.58 for interaction between types of management and locality is statistically significant at the 0.05 level of significance with df=1/392. Hence, the null hypothesis (4.6), formulated as "there is no significant interaction of types of management and locality on teaching competency of secondary school teachers", was rejected. Thus, it can be said that there is significant interactional influence of types of management and locality on the teaching competency of secondary school teachers. It may further be inferred that the teaching competency of secondary school teachers is dependent on the interaction between types of management and locality.

### 4.7.7. Interaction of Gender, Types of Management and Locality on Teaching Competency of Secondary School Teachers

From Table 4.14 it is evident that the F-ratio of 7.08 for interaction between gender, types of management, and locality is statistically significant at the 0.05 level of significance with df=1/392. Hence, the null hypothesis (4.7), formulated as "there is no significant interaction of gender, types of management and locality on teaching competency of secondary school teachers", was rejected. Thus, it can be said that there is significant interactional influence of gender, types of management and locality on the teaching competency of secondary school teachers. It may further be deduced that the teaching competency of secondary school teachers is dependent on the interaction between gender, types of management**,** and locality.

## 4.8. Objective - 7: To find out the influence and interaction of Teaching Experience and Educational Qualification on Teaching Competency of Secondary School Teachers

The influence and interaction of teaching experience and educational qualification on teaching competency of secondary school teachers were analyzed using three-way ANOVA. The results are provided in Table 4.15.

**Table 4.15**

**Summary of ANOVA of influence and interaction of Teaching Experience and Educational Qualification on Teaching Competency of Secondary School Teachers**

| Sources of Variance | df | Sum of Squares | Mean Squares | F-ratio |
|---|---|---|---|---|
| Teaching Experience (A) | 3 | 4427.87 | 1475.96 | 4.66** |
| Educational Qualification (B) | 3 | 5298.08 | 1766.03 | 5.58** |
| Teaching Experience×Educational Qualification (A×B) | 9 | 1474.81 | 163.87 | 0.52 |
| Within (error) | 384 | 121534.42 | 316.50 | |
| **Total** | **399** | | | |

****Significant at the 0.05 level**

### 4.8.1. Influence of Teaching Experience on Teaching Competency of Secondary School Teachers

Table 4.15, reveals that the F-ratio of 4.66 for teaching experience is statistically significant at the 0.05 level of significance with df=3/384. Thus, the null hypothesis (5.1), formulated as "there is no significant influence of teaching experience on teaching competency of secondary school teachers", was rejected. It may therefore, be said that the teaching experience significantly influences the teaching competency of secondary school teachers.

### 4.8.2. Influence of Educational Qualification on Teaching Competency of Secondary School Teachers

Table 4.15 indicates that the F-ratio of 5.58 for educational qualification is statistically significant at the 0.05 level of significance with df=3/384. Thus, the null hypothesis (5.2), formulated as "there is no significant influence of educational qualification on teaching competency of secondary school teachers", was rejected. It may therefore, be concluded that educational qualification significantly influences the teaching competency of secondary school teachers.

### 4.8.3. Interaction of Teaching Experience and Educational Qualification on Teaching Competency of Secondary School Teachers

Table 4.15 indicates that the F-ratio of 0.52 for interaction between teaching experience and educational qualification is statistically not significant at the 0.05 level of significance with df=9/384. Thus, the null hypothesis (5.3), formulated as "there is no significant interaction of teaching experience and educational qualification on teaching competency of secondary school teachers", was accepted. It may therefore, be concluded that there is no significant interactional influence between teaching experience and educational qualification on the teaching competency of secondary school teachers. It may further be deduced that the teaching competency of secondary school teachers is independent of the interaction between teaching experience and educational qualification.

## 4.9. Objective - 8: To find out the influence and interaction of Gender, Types of Management and Locality on ICT Competency of Secondary School Teachers

The influence and interaction of gender, types of management and locality on ICT competency of secondary school teachers was analyzed using three-way ANOVA. The results are provided in Table 4.16.

**Table 4.16**

**Summary of ANOVA of influence and interaction of Gender, Types of Management and Locality on ICT Competency of Secondary School Teachers**

| Sources of Variance | df | Sum of Squares | Mean Squares | F-ratio |
|---|---|---|---|---|
| Gender (A) | 1 | 36.04 | 36.04 | 0.05 |
| Types of Management (B) | 1 | 22077.15 | 22077.15 | 29.84** |
| Locality (C) | 1 | 990.38 | 990.38 | 4.02** |
| Gender ×Types of Management (A×B) | 1 | 1036.56 | 1036.56 | 1.40 |
| Gender ×Locality (A×C) | 1 | 35.66 | 35.66 | 0.05 |
| Types of Management ×Locality (B×C) | 1 | 1502.84 | 1502.84 | 2.03 |
| Gender ×Types of Management ×Locality (A×B×C) | 1 | 384.77 | 384.77 | 0.52 |
| Within (error) | 392 | 289980.84 | 739.75 | |
| **Total** | **399** | **329323.00** | | |

****Significant at the 0.05 level**

### 4.9.1. Influence of Gender on ICT Competency of Secondary School Teachers

Table 4.16 shows that the F-ratio of 0.05 for gender is statistically not significant at the 0.05 level of significance with df=1/392. Thus, the null hypothesis (6.1), formulated as "there is no significant influence of gender on ICT competency of secondary school teachers" was accepted. Therefore, it may be concluded that gender has no significant influence on the ICT competency of secondary school teachers.

### 4.9.2. Influence of Types of Management on ICT Competency of Secondary School Teachers

Table 4.16 indicates that the F-ratio of 29.84 for types of management is statistically significant at the 0.05 level of significance with df=1/392. Thus, the null hypothesis (6.2), formulated as "there is no significant influence of types of management on ICT competency secondary school teachers", was rejected. Therefore, it may be concluded that types of management significantly influence the ICT competency of secondary school teachers.

### 4.9.3. Influence of Locality on ICT Competency of Secondary School Teachers

Table 4.16 shows that the F-ratio of 4.02 for locality is statistically significant at the 0.05 level of significance with df=1/392. Thus, the null hypothesis (6.3), formulated as "there is no significant influence of locality on ICT competency of secondary school teachers", was rejected. Therefore, it may be concluded that the locality significantly influence the ICT competency of secondary school teachers.

### 4.9.4. Interaction of Gender and Types of Management on ICT Competency of Secondary School Teachers

Table 4.16 reveals that the F-ratio of 1.40 for interaction between gender and types of management is statistically not significant at the 0.05 level of significance with df=1/392. Thus, the null hypothesis (6.4), formulated as "there is no significant interaction of gender and types of management on ICT competency of secondary school teachers", was accepted. Therefore, it may be concluded that there is no significant interactional influence of gender and types of management on the ICT competency of secondary school teachers. It may further be inferred that the ICT competency of secondary school teachers is independent of the interaction between gender and types of management.

### 4.9.5. Interaction of Gender and Locality on ICT Competency of Secondary School Teachers

Table 4.16 shows that the F-ratio of 0.05 for interaction between gender and locality is statistically not significant at the 0.05 level of significance with df=1/392. Therefore, the null hypothesis (6.5), formulated as "there is no significant interaction of gender and locality on ICT competency of secondary school teachers", was accepted. Thus, it can be concluded that there is no significant interactional influence of gender and locality on the ICT competency of secondary school teachers. It may further be deduced that the ICT competency of secondary school teachers is independent of the interaction between gender and locality.

### 4.9.6. Interaction of Types of management and locality on ICT competency of secondary school teachers

Table 4.16 shows that the F-ratio of 2.03 for interaction between types of management and locality is statistically not significant at 0.05 level of significance with

df=1/392. Thus, the null hypothesis (6.6), formulated as “there is no significant interaction of types of management and locality on ICT competency of secondary school teachers”, was accepted. Therefore, it may be concluded that there is no significant interactional influence of types of management and locality on the ICT competency of secondary school teachers. It may, further be inferred that the ICT competency of secondary school teachers is independent of the interaction between types of management and locality.

### 4.9.7. Interaction of Gender, Types of Management and Locality on ICT Competency of Secondary School Teachers

Table 4.16 shows that the F-ratio of 0.52 for interaction between gender, types of management and locality is statistically not significant at the 0.05 level of significance with df=1/392. Thus, the null hypothesis (6.7), formulated as “there is no significant interaction of gender, types of management and locality on ICT competency of secondary school teachers”, was accepted. Therefore, it may be concluded that there is no significant interactional influence of gender, types of management and locality on the ICT competency of secondary school teachers. It may further be deduced that the ICT competency of secondary school teachers is independent of the interaction between gender, types of management and locality.

## 4.10. Objective - 9: To find out the influence and interaction of Teaching Experience and Educational Qualification on ICT Competency of Secondary School Teachers

The influence and interaction of teaching experience and educational qualification on ICT competency of secondary school teachers were analyzed using three-way ANOVA. The results are shown in Table 4.17.

**Table 4.17**

**Summary of ANOVA of influence and interaction of Teaching Experience and Educational Qualification on ICT Competency of Secondary School Teachers**

| Sources of Variance | df | Sum of Squares | Mean Squares | F-ratio |
|---|---|---|---|---|
| Teaching Experience (A) | 3 | 23760.36 | 7920.12 | 13.80** |
| Educational Qualification (B) | 3 | 7010.10 | 2336.70 | 4.07** |
| Teaching Experience ×Educational Qualification (A×B) | 9 | 10742.95 | 1193.66 | 2.08** |
| Within (error) | 384 | 218155.19 | 574.09 | |
| **Total** | **399** | **329323.00** | | |

****Significant at the 0.05 level**

### 4.10.1. Influence of Teaching Experience on ICT Competency of Secondary School Teachers

Table 4.17 indicates that the F-ratio of 13.80 for teaching experience is statistically significant at the 0.05 level of significance with df=3/384. Hence, the null hypothesis (7.1), formulated as "there is no significant influence of teaching experience on ICT competency of secondary school teachers", was rejected. Thus, it may be concluded that the teaching experience significantly influences the ICT competency of secondary school teachers.

### 4.10.2. Influence of Educational Qualification on ICT Competency of Secondary School Teachers

Table 4.17 indicates that the F-ratio of 4.07 for educational qualification is statistically significant at the 0.05 level of significance with df=3/384. Hence, the null hypothesis (7.2), formulated as "there is no significant influence of educational qualification on ICT competency of secondary school teachers", was rejected. Thus, it may be concluded that educational qualification significantly influences the ICT competency of secondary school teachers.

### 4.10.3. Interaction of Teaching Experience and Educational Qualification on ICT Competency of Secondary School Teachers

Table 4.17 indicates that the F-ratio of 2.08 for interaction between teaching experience and educational qualification is statistically significant at the 0.05 level of significance with df=9/384. Hence, the null hypothesis (7.3), formulated as “there is no significant interaction between teaching experience and educational qualification on ICT competency of secondary school teachers”, was rejected. Thus, it may be concluded that there is a significant interactional influence of teaching experience and educational qualification on the ICT competency of secondary school teachers. It may further be inferred that the ICT competency of secondary school teachers is dependent on the interaction between teaching experience and educational qualification.

# CHAPTER - V

# MAJOR FINDINGS, DISCUSSIONS, EDUCATIONAL IMPLICATIONS, CONCLUSION AND SUGGESTIONS FOR FUTURE RESEARCH

## 5.1. Introduction

This chapter presents the major findings, discussions, educational implications, conclusion and suggestions for future research on the study titled "Teaching and ICT Competencies of Secondary School Teachers of Nagaland". The researcher investigated the teaching and ICT competencies of secondary school teachers of Nagaland in this study. The variables of the study, teaching competency and ICT competency, were studied in relation to gender, types of management, locality, teaching experience, and educational qualification.

Based on the analysis and interpretation of the data, the findings are presented according to the objectives of the study. Additionally, this chapter provides discussions, educational implications, conclusion and suggestions for future research.

## 5.2. Major Findings of the Study

The major findings of the study are summarised objective-wise and presented as follows:

### Objective - 1: To determine the Teaching Competency of Secondary School Teachers of Nagaland.

The study revealed that in the dimension of teaching competency, secondary school teachers of Nagaland have high competency in classroom management.

### Objective - 2: To determine the ICT Competency of Secondary School Teachers of Nagaland.

The study revealed that in the dimension of ICT competency, secondary school teachers of Nagaland have high competency in ICT skill.

## Objective - 3: To find out the difference in Teaching Competency of Secondary School Teachers with respect to:

a) **Gender:**

It was found that there is a significant difference in the teaching competency of male and female secondary school teachers.

b) **Types of Management:**

It was found that there is a significant difference in the teaching competency of government and private secondary school teachers.

c) **Locality:**

It was found that there is a significant difference in the teaching competency of urban and rural secondary school teachers.

d) **Teaching Experience:**

It was found that there is a significant difference in the teaching competency of secondary school teachers with respect to teaching experience; 0-5 years, 6-10 years, 11-15 years and 16 years and above.

e) **Educational Qualification:**

It was found that there is a significant difference in the teaching competency of secondary school teachers with respect to educational qualification; trained graduate, untrained graduate, trained postgraduate and untrained postgraduate.

## Objective - 4: To find out the difference in ICT Competency of Secondary School Teachers with respect to:

a) **Gender:**

It was found that there is no significant difference in the ICT competency of male and female secondary school teachers.

b) **Types of Management:**

It was found that there is a significant difference in the ICT competency of government and private secondary school teachers.

c) **Locality:**

It was found that there is a significant difference in the ICT competency of urban and rural secondary school teachers.

d) **Teaching Experience:**

It was found that there is a significant difference in the ICT competency of secondary school teachers with respect to teaching experience; 0-5 years, 6-10 years, 11-15 years and 16 years and above.

e) **Educational Qualification:**

It was found that there is a significant difference in the ICT competency of secondary school teachers with respect to educational qualification; trained graduate, untrained graduate, trained postgraduate and untrained postgraduate.

## Objective - 5: To determine the relationship between Teaching Competency and ICT Competency of Secondary School Teachers with respect to certain variables separately and in totality.

a) **Male:**

It was found that there is a positive and significant relationship between teaching competency and ICT competency of male secondary school teachers.

b) **Female:**

It was found that there is a positive and significant relationship between teaching competency and ICT competency of female secondary school teachers.

c) **Government:**

It was found that there is a positive but insignificant relationship between teaching competency and ICT competency of government secondary school teachers.

d) **Private:**

It was found that there is a positive and significant relationship between teaching competency and ICT competency of private secondary school teachers.

e) **Urban:**

It was found that there is a positive and significant relationship between teaching competency and ICT competency of urban secondary school teachers.

f) **Rural:**

It was found that there is a positive and significant relationship between teaching competency and ICT competency of rural secondary school teachers.

g) **0-5 years Teaching Experience:**

It was found that there is a positive and significant relationship between teaching competency and ICT competency of secondary school teachers with teaching experience of 0-5 years.

h) **6-10 years Teaching Experience:**

It was found that there is a positive and significant relationship between teaching competency and ICT competency of secondary school teachers with teaching experience of 6-10 years.

i) **11-15 years Teaching Experience:**

It was found that there is a positive and significant relationship between teaching competency and ICT competency of secondary school teachers with teaching experience of 11-15 years.

j) **16 years and above Teaching Experience:**

It was found that there is a negative and insignificant relationship between teaching competency and ICT competency of secondary school teachers with teaching experience of 16 years and above.

k) **Trained graduate:**

It was found that there is a positive and significant relationship between teaching competency and ICT competency of trained graduate secondary school teachers.

l) **Untrained graduate:**

It was found that there is a positive and significant relationship between teaching competency and ICT competency of untrained graduate secondary school teachers.

m) **Trained postgraduate:**

It was found that there is a positive but insignificant relationship between teaching competency and ICT competency of trained postgraduate secondary school teachers.

n) **Untrained postgraduate:**

It was found that there is a positive and significant relationship between teaching competency and ICT competency of untrained postgraduate secondary school teachers.

o) **Variables in totality:**

It was found that there is a positive and significant relationship between teaching competency and ICT competency of secondary school teachers in totality.

## Objective - 6: To find out the influence and interaction of Gender, Types of Management and Locality on Teaching Competency of Secondary School Teachers.

a) **Influence of gender on teaching competency of secondary school teachers:**

Gender was found to have significant influence on the teaching competency of secondary school teachers.

b) **Influence of types of management on teaching competency of secondary school teachers:**

Types of management were found to have significant influence on the teaching competency of secondary school teachers.

c) **Influence of locality on teaching competency of secondary school teachers:**

Locality was found to have significant influence on the teaching competency of secondary school teachers.

d) **Interaction of gender and types of management on teaching competency of secondary school teachers:**

Gender and types of management were found to have no significant interactional influence on the teaching competency of secondary school teachers".

e) **Interaction of gender and locality on teaching competency of secondary school teachers:**

Gender and locality were found to have no significant interactional influence on the teaching competency of secondary school teachers.

f) **Interaction of types of management and locality on teaching competency of secondary school teachers:**

Types of management and locality were found to have significant interactional influence on the teaching competency of secondary school teachers.

g) **Interaction of gender, types of management and locality on teaching competency of secondary school teachers:**

Gender, types of management and locality were found to have significant interactional influence on the teaching competency of secondary school teachers.

## Objective - 7: To find out the influence and interaction of Teaching Experience and Educational Qualification on Teaching Competency of Secondary School Teachers.

a) **Influence of teaching experience on teaching competency of secondary school teachers:**

Teaching experience was found to have significant influence on the teaching competency of secondary school teachers.

b) **Influence of educational qualification on teaching competency of secondary school teachers:**

Educational qualification was found to have significant influence on the teaching competency of secondary school teachers.

c) **Interaction of teaching experience and educational qualification on teaching competency of secondary school teachers:**

Teaching experience and educational qualification were found to have no significant interactional influence on the teaching competency of secondary school teachers.

## Objective - 8: To find out the influence and interaction of Gender, Types of Management and Locality on ICT Competency of Secondary School Teachers.

a) **Influence of gender on ICT competency of secondary school teachers:**
Gender was found to have no significant influence on the ICT competency of secondary school teachers.

b) **Influence of types of management on ICT competency of secondary school teachers:**
Types of management were found to have significant influence on the ICT competency of secondary school teachers.

c) **Influence of locality on ICT competency of secondary school teachers:**
Locality was found to have significant influence on the ICT competency of secondary school teachers.

d) **Interaction of gender and types of management on ICT competency of secondary school teachers:**
Gender and types of management were found to have no significant interactional influence on the ICT competency of secondary school teachers.

e) **Interaction of gender and locality on ICT competency of secondary school teachers:**
Gender and locality were found to have no significant interactional influence on the ICT competency of secondary school teachers.

f) **Interaction of types of management and locality on ICT competency of secondary school teachers:**
Types of management and locality were found to have no significant interactional influence on the ICT competency of secondary school teachers.

g) **Interaction of gender, types of management and locality on ICT competency of secondary school teachers:**
Gender, types of management and locality were found to have no significant interactional influence on the ICT competency of secondary school teachers.

**Objective - 9: To find out the influence and interaction of Teaching Experience and Educational Qualification on ICT Competency of Secondary School Teachers.**

a) **Influence of teaching experience on ICT competency of secondary school teachers:**

Teaching experience was found to have significant influence on the ICT competency of secondary school teachers.

b) **Influence of educational qualification on ICT competency of secondary school teachers:**

Educational qualification was found to have significant influence on the ICT competency of secondary school teachers.

c) **Interaction of teaching experience and educational qualification on ICT competency of secondary school teachers:**

Teaching experience and educational qualification was found to have significant interactional influence on the ICT competency of secondary school teachers.

## 5.3. Discussions of the Findings

The discussions on the major findings of the study are presented as follows:

### 5.3.1. Teaching Competency of Secondary School Teachers

i. The present study revealed that in the dimension of teaching competency, secondary school teachers of Nagaland have high competency in classroom management. This could be because teachers use a variety of learning activities to engage students, maintain their discipline, and cater to their needs on time, thus enabling them to establish a congenial classroom environment.

ii. The present study found a significant difference in the teaching competency of male and female secondary school teachers. Female secondary school teachers were found to have significantly higher teaching competency than their male counterparts. Similar findings were shown by Seferoglu (2005), Shivaprakash (2019), Parveen and Srivastava (2020), Hoovinbhavi (2021), Parveen et al. (2021), Paul and Jeyanthi (2024), and Kumar and Kayalvizhi (2024). However, it contradicts the findings

of Raju and Rao (2011), Ranjini (2012), Das and Nalinilatha (2017), Balyer (2017), Patel (2017), Rana and Shivani (2019), Balasubramaniam (2019), Srinivasan and Pugalenthi (2019), Ratheeswari (2020), Sheela and Rajendran (2020), Shobha (2022), and Kaur (2023). This could be because female teachers use different teaching approaches that emphasized collaborative learning, positive reinforcement and student-centeredness, and are more dedicated and motivated towards their profession.

iii. The present study found a significant difference in the teaching competency of government and private secondary school teachers. Private secondary school teachers were found to have significantly higher teaching competency than government secondary school teachers. This result is supported by the findings of Raju and Rao (2011), Jan (2016), Patel (2017), Moshahid and Hussain (2017), Shivaprakash (2019), Rana and Shivani (2019), Bindusha and Bindu (2020), Hoovinbhavi (2021) and Parveen et al. (2021). But it is contrary to the findings of Ranjini (2012), Kaur and Talwar (2014), Das and Nalinilatha (2017), Balasubramaniam (2019), Ratheeswari (2020), Shobha (2022), and Kaur (2023). The researcher assumed that it could be because, generally, private schools have better access to resources, infrastructure and facilities which contribute towards enhancing the teaching competency of private secondary school teachers.

iv. The present study revealed a significant difference in teaching competency of urban and rural secondary school teachers. Urban secondary school teachers were found to have significantly higher teaching competency than rural secondary school teachers. The result is in line with Sabu (2005), Raju and Rao (2011), Shivaprakash (2019), Rana and Shivani (2019), and Hoovinbhavi (2021). But, it is in contrast with the findings of Ranjini (2012), Patel (2017), Ratheeswari (2020), Bindusha and Bindu (2020) and Sheela and Rajendran (2020). This could be because urban secondary school teachers have more exposure to professional development opportunities and professional networks. It may also be because of the availability of better educational resources and infrastructure that have encouraged them to be more competent in teaching.

v. The present study revealed a significant difference in the teaching competency of secondary school teachers with different teaching experiences. This result is in agreement with the findings of Raju and Rao (2011), Patel (2017), Rana and Shivani

(2019), Parveen and Srivastava (2020), Hoovinbhavi (2021), Parveen et al. (2021), and Kumar and Kayalvizhi (2024). However, it is in contrast with the findings of Das and Nalinilatha (2017) and Ratheeswari (2020). In the further post-hoc t-test, significant differences were revealed between the teaching competency of secondary school teachers with teaching experience of 0-5 years and 6-10 years, 0-5 years and 11-15 years. Significant differences were also found between teachers with teaching experience of 0-5 years and 16 years and above, and 6-10 years and 16 years and above. The mean score for teachers with 0-5 years of teaching experience was greater than 6-10 years and 11-15 years of teaching experience. Moreover, the mean score of teachers with 0-5 years was higher than 16 years and above, and the mean score of teachers with 6-10 years of teaching experience exceeded 16 years and above teaching experience. However, between teachers with teaching experience of 6-10 years and 11-15 years, and 11-15 years and 16 years and above, no significant difference was revealed, and thus, there was no significant difference in their mean scores, either.

vi. The present study revealed a significant difference in teaching competency of secondary school teachers with different educational qualification. This findings is in tune with the results of Aziz and Akhtar (2014), Rana and Shivani (2019), Sheela and Rajendran (2020), and Hoovinbhavi (2021). However, it contradicts the results of Raju and Rao (2011), Ranjini (2012), Das and Nalinilatha (2017), and Bindusha and Bindu (2020). In the further post-hoc t-test, significant differences were revealed in the teaching competency of secondary school teachers with educational qualification of trained graduate and untrained graduate, as well as between untrained graduate and trained postgraduate, and untrained graduate and untrained postgraduate. The mean score of trained graduate was greater than that of untrained graduate. Further, the mean score of trained postgraduate was higher than untrained graduate, and untrained postgraduate mean score was higher than untrained graduate. However, no significant differences were found in the teaching competency of trained graduate and trained postgraduate, trained graduate and untrained postgraduate, and trained postgraduate and untrained postgraduate secondary school teachers and there was not much difference in their mean scores.

### 5.3.2. ICT Competency of Secondary School Teachers

i. The study revealed that in the dimension of ICT competency, secondary school teachers of Nagaland have high competency in ICT skill. It could be because of the digital era, which was further accelerated by the Covid-19 pandemic, which provides opportunities even more to use digital technology in every aspect of life, particularly in the education sector.

ii. The present study revealed no significant difference in the ICT competency of male and female secondary school teachers. Similar findings were reported by Nwalado and Obro (2014), Thakur and Chaudhury (2019), Mandal (2021), Isorena and Malangen (2022), Mijares (2022), and Reang and Mohalik (2023). But it is in contrast with the findings of Venumadhav and Sarsani (2022), Novela (2022), and Balasubramanian and Naveen (2024). This could be because, regardless of gender, teachers recognize the importance of ICT as it is essential in meeting the current demands of the educational system.

iii. The present study found a significant difference in the ICT competency of government and private secondary school teachers. Private secondary school teachers were found to have significantly higher ICT competency than government secondary school teachers. This result is in aligned with the findings of Venumadhav and Sarsani (2022). This could be because private schools offer pertinent ICT resources and facilities as well as motivate teachers to incorporate them into teaching learning process, which improves their proficiency with ICT tools over time.

iv. The present study found a significant difference in the ICT competency of urban and rural secondary school teachers. Urban secondary school teachers were found to have significantly higher ICT competency than rural secondary school teachers. This finding aligned with the results of Nwalado and Obro (2014), Joshi et al. (2021), Venumadhav and Sarsani (2022), and Syahrial et al. (2022). However, it opposed the report of Reang and Mohalik (2023). This could be because of the accessibility and availability of ICT in urban areas; teachers working there get more opportunities to use ICT both in and outside the school. Hence, urban teachers have good ICT usage experience and are more competent.

v. The present study found a significant difference in the ICT competency of secondary school teachers with respect to teaching experience. This result is in agreement with the findings of Joshi et al. (2021), Venumadhav and Sarsani (2022), and Mijares (2022). In the further post-hoc t-test, a significant differences were revealed in the ICT competency of secondary school teachers with teaching experience of 0-5 years and 6-10 years, 0-5 years and 11-15 years, 0-5 years and 16 years and above, and 6-10 years and 16 years and above respectively. Further, the mean score of 0-5 years was higher than 6-10 years, 11-15 years, and 16 Years and above. Moreover, the mean score of 6-10 years exceeded 16 years and above. However, no significant difference was found in the ICT competency of secondary school teachers with teaching experience of 6-10 years and 11-15 years, and 11-15 years and 16 years and above, and there was not much difference in their mean scores.

vi. The present study found a significant difference in the ICT competency of secondary school teachers concerning educational qualification. This result is supported by the findings of Isorena and Malangen (2022), and Venumadhav and Sarsani (2022). However, it contradicts with the findings of Mijares (2022). In the further post-hoc t-test, significant differences were revealed between the teaching competency of secondary school teachers with educational qualifications of trained graduate and trained postgraduate, as well as trained graduate and untrained postgraduate, untrained graduate and trained postgraduate, and untrained graduate and untrained postgraduate respectively. Further, the mean score of trained postgraduate teachers exceeded the score of trained graduates, untrained postgraduate teachers' mean score was greater than that of trained graduates, trained postgraduate teachers had a mean score higher than untrained graduates, and untrained postgraduate teachers had a greater mean than that of untrained graduate. However, no significant difference was found between trained graduate and untrained graduate, and trained postgraduate and untrained postgraduate secondary school teachers with regard to ICT competency, and there was not much difference in their mean scores.

### 5.3.3. Relationship between Teaching Competency and ICT Competency of Secondary School Teachers with respect to certain variables separately and in totality

A positive and significant relationship was found between the teaching competency and ICT competency of secondary school teachers with respect to male, female, private,

urban, rural, teaching experience of 0-5 years, 6-10 years and 11-15 years, and educational qualification of trained graduate, untrained graduate and untrained postgraduate. However, the result revealed a positive but insignificant relationship between teaching competency and ICT competency of secondary school teachers with respect to government secondary school teachers. It could be because although teachers are competent in teaching, obstacles such as a lack of resources, insufficient training, and lack of motivation might have prevented them from comprehensive use of ICT.

Similarly, a positive but insignificant relationship was revealed between the teaching competency and ICT competency of trained postgraduate secondary school teachers. It could be because of the individual differences among teachers; sometime trained postgraduate secondary school teachers with high teaching competency might be reluctant to use technology.

Further, negative and insignificant relationship was found between teaching competency and ICT competency of secondary school teachers with teaching experience of 16 years and above. The reason could be, even though they are competent in teaching with comprehensive practical knowledge, refined instructional techniques and effective classroom management, which they developed and acquired over the years, they nevertheless find it difficult to use ICT tools as many of them began their profession in an era when ICT was not very prevalent like today.

A positive and significant correlation between teaching competency and ICT competency of secondary school teachers in totality indicates that secondary school teachers who are more competent in ICT demonstrate more competence in teaching and vice versa. Both teaching competency and ICT competency are indispensable in enhancing the quality of the teaching-learning process, thereby fostering students' enduring learning experiences and preparing them for future challenges. Thus, teachers must possess both teaching and ICT competencies to be competent in their work and meet the expectations of the current educational system.

### 5.3.4. Influence and interaction of Gender, Types of Management, Locality, Teaching Experience and Educational Qualification on Teaching Competency of Secondary School Teachers

i. The present study revealed that the gender, types of management, locality, teaching experience and educational qualification significantly influence the teaching competency of secondary school teachers.

ii. The present study revealed that types of management and locality, and gender, types of management and locality have significant interactional influence on the teaching competency of secondary school teachers.

iii. The present study revealed that gender and types of management, gender and locality, and teaching experience and educational qualification have no significant interactional influence on teaching competency of secondary school teachers.

### 5.3.5. Influence and interaction of Gender, Types of Management, Locality, Teaching Experience and Educational Qualification on ICT Competency of Secondary School Teachers

i. The present study revealed that types of management, locality, teaching experience and educational qualification significantly influence the ICT competency of secondary school teachers.

ii. The present study revealed that gender has no significant influence on the ICT competency of secondary school teachers.

iii. The present study revealed that teaching experience and educational qualification have significant interactional influence on the ICT competency of secondary school teachers.

iv. The present study revealed that gender and types of management, gender and locality, types of management and locality, and gender, types of management and locality have no significant interactional influence on the ICT competency of secondary school teachers.

## 5.4. Educational Implications

Based on the findings of the present study, some educational implications are discussed below.

### 5.4.1. Teaching Competency

i. Secondary school teachers were found to have high competency in classroom management than in other dimensions of teaching competency. While competency in classroom management is essential, it is equally important for teachers to develop competencies in other areas, too. Therefore, Policymakers should implement continuous professional development programmes and initiatives for secondary school teachers, emphasizing a balanced skill set and empowering them to respond to the diverse needs of their students.

ii. The teaching competency of female teachers was found to be significantly higher than their male counterparts. The schools can encourage teachers to maintain reflective practices, such as keeping their teaching journals and participating in team teaching. Every teacher, irrespective of gender, should be motivated to increase their level of teaching competency by incorporating different and innovative teaching strategies in their classroom teaching.

iii. The teaching competency of private and urban secondary school teachers was significantly higher than that of their counterparts. This disparity indicates a need to address teachers' challenges in government and rural settings. The government should allocate additional financial assistance and support to under-resourced schools and schools situated in rural areas to provide equitable access to professional development opportunities, infrastructure and resources.

iv. Policymakers should ensure that every school have access to sufficient funds to purchase the equipment they need for innovative teaching practices.

v. The Department of School Education can organize professional development and capacity building programmes for secondary school teachers to improve their teaching competency.

vi. School administration should allocate resources and engage teachers to promote their teaching competency. Periodic workshops and seminars for teachers, facilitated by experts, to equip them with current information and best practices should be organized.

vii. Schools should foster a congenial environment where teachers feel appreciated and inspired to enhance their teaching competencies. Those teachers who use creative and innovative teaching strategies should be rewarded and recognized.

viii. Teachers should be given sufficient time to plan and prepare lessons, reflect on their teaching and collaborate with colleagues.

ix. Secondary school teachers irrespective of their gender, types of management, locality, teaching experience and educational qualification should keep up with the most recent advancements in their field by reading scholarly publications, attending conferences, seminars, workshops, webinars, training and related programmes and participating in ongoing learning to improve their teaching skills.

### 5.4.2. ICT Competency

i. Secondary school teachers were found to have high competency in ICT skills than in the other two dimensions of ICT competency. Policymakers should initiate and design holistic professional development programs such as workshops and seminars that cover ICT skills, knowledge (theoretical understanding) and maintenance. These dimensions collectively will enable teachers to access a wide range of resources and facilitate optimal performance.

ii. ICT competency of private and urban secondary school teachers was significantly higher than their counterparts. An equitable environment must be fostered where all teachers, regardless of their school's type or location, develop necessary ICT competencies. The government should prioritize funding and support to ensure equitable distribution of resources to bridge the gap between urban and rural schools and private and public schools.

iii. Schools, especially in rural areas and government sectors, need significant ICT infrastructure investments. So, the government should formulate policies to reduce the

disparity between rural and urban secondary schools in terms of access to ICT resources and training.

iv. The school can set up systems such as feedback mechanisms for teachers to provide feedback on their ICT-related experiences and difficulties.

v. The school authority should organize periodic training and workshops for teachers on the usage of different components of ICT in different educational activities, thus enhancing their level of competency in ICT.

vi. To enhance teachers' ICT competency, schools should implement peer-coaching and mentoring programmes that connect less ICT-competent teachers with more competent ones.

vii. School administration should take the necessary initiatives to enhance the ICT competency of the teachers and keep them updated with the latest technological developments. They should encourage and motivate the teachers to prepare their lesson plans integrating content, pedagogy, and technology.

viii. The Department of School Education should provide adequate funding to secondary schools to procure and maintain ICT equipment. It should also organize training programs for the teachers on ICT-related techniques.

ix. Secondary school teachers irrespective of their gender, types of management, locality, teaching experience and educational qualification should give effort to understand the significance of ICT in the teaching-learning process by attending different programmes, trainings, seminars, workshops and conferences and ensure to enhance their practical and functional knowledge and skills of ICT for better classroom transactions. They should also keep up to date with the latest developments in ICT and effectively plan their teaching and learning strategies by integrating ICT.

x. Stakeholders such as community people, alumni of the schools, and parents with ICT proficiency can offer their time as mentors to teachers and students. Local community centres can hold ICT training sessions for teachers for promoting digital competency.

## 5.5. Conclusion

Teaching and ICT competencies of teachers play a crucial role in effective teaching-learning, students' achievements, and in bringing about the overall reforms in the education system. They are profoundly vital in effectively and productively performing the tasks at schools, as it influences the effectiveness of teachers' work in providing quality learning, leading to the realization of quality education and holistic development of the students. Thus, teachers must be proficient in incorporating different teaching strategies and acquire the competency to integrate ICT into the teaching-learning process.

The present study attempted to comprehensively analyse the teaching and ICT competencies of secondary school teachers. The findings of the study confirmed that the secondary school teachers of Nagaland have high competency in classroom management and possess high competency in ICT skill. Furthermore, the findings of the study show that there exists a significant difference in the teaching competency of secondary school teachers of Nagaland in relation to gender, types of management, locality, teaching experience and educational qualification. Similarly, a significant difference was revealed in the ICT competency of secondary school teachers of Nagaland in relation to types of management, locality, teaching experience and educational qualification. However, no significant difference was revealed in the ICT competency of secondary school teachers of Nagaland in relation to gender.

Teachers who are proficient in both teaching and ICT competencies are better equipped to address the diverse learning needs of students, make learning more engaging and learner-centred, help students develop their abilities, and equip them with 21$^{st}$ century skills. In conclusion, the study highlighted the role of policymakers, school administration and concerned agencies in addressing the competency gaps and stresses the benefits of enriching professional development programmes that focus on enhancing the teaching and ICT competencies of secondary school teachers. Overall, the study emphasizes how teaching and ICT competencies of teachers are essential in achieving the desired quality of education.

## 5.6. Suggestions for Future Research

i. The present study was confined to secondary schools teachers only. Similar studies can be conducted for teachers working at elementary schools, higher secondary schools and colleges.

ii. A comparative study on teaching and ICT competencies of secondary school teachers can be conducted for two different states.

iii. The present study was conducted on a sample of 400 teachers from 3 districts. A large sample size from more districts may be considered for further research.

iv. Academic achievement of the students in relation to teaching and ICT competencies of secondary school teachers can be considered for further study.

v. Similar study can be conducted on teacher educators in teacher education colleges.

vi. Similar study can be conducted on B.Ed student teachers.

vii. The present study was conducted concerning the variables of gender, types of management, locality, teaching experience and educational qualification. Similar studies can be conducted by taking other variables like age, marital status, stream etc.

viii. Similar studies can be conducted in other states of India other than Nagaland.

# SUMMARY

## 1. Introduction

*"Teachers truly shape the future of our children - and, therefore, the future of our nation"* (National Education Policy, 2020, para.5.1).

Teachers are the creator of history, the builder of the country, the maker of the humanity, an architect of our future and a yardstick which measures the accomplishment and aspirations of the nation. The failure and success of the system rest on the teacher alone as success is ensured only if a teacher is well educated, knowledgeable, competent, and skilful and takes an interest in his profession. It is through the work of teachers that the value and potentialities of a nation are evaluated. The country's future relies on the standard of education provided in its schools and the attribute of education is intimately associated with the calibre of teaching delivered by teacher in the classroom (Sidhu, 1996). Therefore, a teacher is regarded as the most critical influencer in the education system.

Today, the world is experiencing a radical shift and rapidly contracting into a global village due to massive and immense advancements in technological, industrial, and scientific development, as well as explosion of knowledge, expectations, and population. This rapidly evolving scenario of the global world leads to a new demand for education system worldwide. The different dimensions of education have changed, ultimately revamping the practices and teaching strategies of teachers (Krishnamurthy and Lakshmi, 2010, p. 35). Education now focuses on supporting students in gaining new knowledge, skills, abilities, and attitudes necessary to secure their survival and success as individuals, community members, and citizens of the country. This poses teachers with more significant roles and responsibilities, and thus, they need to develop and enhance the required skills, knowledge, and abilities to perform their roles competently.

In today's world every educational institution needs teachers who are capable, competent, and technologically skilful to address the changing requirements of the educational system. Teachers must have the right values, awareness, attitude, skills, competencies, and knowledge to effectively impact the standard of education of the pupils at relevant stages. These are necessary to adapt to the changing scenario of education as they are the ones who are said to determine the destination of a nation. Therefore, teachers' teaching

and ICT competencies are indispensable to meet the demands of the present educational system.

## 2. Review of Literature

The researcher had reviewed 36 literature related to the teaching competency and 34 related to the ICT competency. Thus, all together the researcher had reviewed 70 related literatures for the present study.

The extensive review of the relevant literature revealed that although many researches were undertaken on teaching competency, most of the studies were in relation to teachers' emotional intelligence, self-efficacy, emotional maturity, sense of humour, and academic achievement of students only. No studies on teaching competency were found in relation to teachers' ICT competency. It also shows that minimal effort has been made on the influence of gender, types of management, locality, experience and educational qualification of secondary school teachers and their interaction upon teaching competency. Thus, these open much scope for further research as teaching competency is essential to be an effective and efficient teacher.

The examination of relevant literature further presents the concept that ICT is a fundamental instrument in education, and as such teachers' ICT proficiency is crucial in the modern educational process as the existence of technology is driving major transformations in education. It has been noted that majority of the studies on ICT were carried out in relation to awareness and the attitude of teachers about ICT. The available literature review also revealed that no study was found on ICT competency of teachers with the dimension of knowledge, skill and maintenance as a whole. Moreover, it was found that no such study had been undertaken on the combination of teaching and ICT competencies of teachers so far in the state of Nagaland. Hence, the investigator took up the present study, entitled "Teaching and ICT Competencies of Secondary School Teachers of Nagaland".

## 3. Significance of the Study

Teachers' competency, closely related to student's achievement, is seen as the primary source of all advancement in the education. It is crucial in ensuring that educational objectives are met. Competent teachers accept the additional responsibilities and try to advance their teaching knowledge and skills while working to enhance their school and

community significantly. They implement new instructional techniques to captivate students' interest and motivate them to learn, thus striving to become true professionals. The shift in educational approach from a behaviourist to a constructivist approach has also brought about a tremendous transition in the function of teachers from providers of information to guides who scaffold students' learning experiences. Thus, teacher's teaching and ICT competencies significantly influence the efficiency of teaching and learning process.

Today, the whole world is actively encouraging the utilization of ICT in the domain of education. The recent rise in epidemics and pandemics has also necessitated teachers to be prepared with high-quality alternative modes of education to use when the traditional and in-person learning environments are not feasible (National Education Policy, 2020). As such, schools and colleges worldwide are now integrating ICT to enable students to overcome the challenges of the educational atmosphere. However, the presence of technologies in educational institutions does not ensure the quality and effectiveness of the educational process. To achieve this, teachers must have ICT competency to integrate it into their regular teaching-learning process. Therefore, besides other teaching competencies, today's teachers need ICT competency too, as it has become an integral component in every teacher's profession to give digital-enhanced learning opportunities to students.

In the educational hierarchy, secondary education is the most crucial period that provides the base for lifelong learning (Chand & Prasad, 2017). Therefore, to give quality education to students, teachers at this stage need to be furnished with all the necessary abilities and skills to be competent in their teaching and well-versed in effectively utilizing ICT tools.

The present investigation has been initiated to examine the Teaching and ICT Competencies of Secondary School Teachers of the state of Nagaland. As apparent from the review of related literature, so far no investigation has been done particularly in the area of secondary school teachers' teaching and ICT competencies of the state. Therefore, investigator has decided to do the investigation on the teaching and ICT competencies of secondary school teachers of Nagaland.

## 4. Statement of the Problem

This study attempts to investigate the teaching and ICT competencies of secondary school teachers of Nagaland. The study aims to determine the teaching and ICT competencies of secondary school teachers in relation to their gender, types of management, locality, teaching experience and educational qualification. Thus, based on this, the statement of the problem under investigation is entitled **"Teaching and ICT Competencies of Secondary School Teachers of Nagaland"**.

## 5. Operational Definition of the Terms Used

Following are the operational definition of the terms used:

**Teaching Competency**:

Teaching Competency may be defined as an efficient teaching behaviour and skills of a teacher that brings about desirable changes in pupil's behaviour. In the present study it is related to eight major dimensions of teaching competency namely planning lessons, classroom management, interpersonal relationships, knowledge of the subject, development of teaching learning material, evaluation process during teaching learning, time management and competencies related to working with parents, community and other agencies.

**ICT Competency**:

ICT Competency can be defined as the proficiency of teachers in handling ICT devices (both hardware and software) for successful utilization in teaching-learning process. In the present study it is related to three dimensions namely knowledge, skills and maintenance. For the current study the investigator selected some selective ICT devices, such as computer/laptop/tablet, smart phone, printer, scanner, digital camera, LCD projector, MS-office application software, Google App, email, social media and internet.

**Secondary School Teachers**:

The term Secondary School Teachers in this study refers to those teachers teaching in classes 9 and 10 in different schools of Nagaland, affiliated with the Nagaland Board of School Education (NBSE).

## 6. Objectives of the Study

The objectives of the study are as follows:

1) To determine the teaching competency of secondary school teachers of Nagaland.
2) To determine the ICT competency of secondary school teachers of Nagaland.
3) To find out the difference in teaching competency of secondary school teachers with respect to gender, types of management, locality, teaching experience and educational qualification.
4) To find out the difference in ICT competency of secondary school teachers with respect to gender, types of management, locality, teaching experience and educational qualification.
5) To determine the relationship between teaching competency and ICT competency of secondary school teachers with respect to certain variables separately and in totality.
6) To find out the influence and interaction of gender, types of management and locality on teaching competency of secondary school teachers.
7) To find out the influence and interaction of teaching experience and educational qualification on teaching competency of secondary school teachers.
8) To find out the influence and interaction of gender, types of management and locality on ICT competency of secondary school teachers.
9) To find out the influence and interaction of teaching experience and educational qualification on ICT competency of secondary school teachers.

## 7. Hypotheses of the Study

Following are the hypotheses of the study:

1. There is no significant difference in teaching competency of secondary school teachers.
   1.1. There is no significant difference in teaching competency of secondary school teachers with respect to gender.
   1.2. There is no significant difference in teaching competency of secondary school teachers with respect to types of management.
   1.3. There is no significant difference in teaching competency of secondary school teachers with respect to locality.
   1.4. There is no significant difference in teaching competency of secondary school teachers with respect to teaching experience.

1.5. There is no significant difference in teaching competency of secondary school teachers with respect to educational qualification.

2. There is no significant difference in ICT competency of secondary school teachers.
   2.1. There is no significant difference in ICT competency of secondary school teachers with respect to gender.
   2.2. There is no significant difference in ICT competency of secondary school teachers with respect to types of management.
   2.3. There is no significant difference in ICT competency of secondary school teachers with respect to locality.
   2.4. There is no significant difference in ICT competency of secondary school teachers with respect to teaching experience.
   2.5. There is no significant difference in ICT competency of secondary school teachers with respect to educational qualification.

3. There is no significant relationship between teaching competency and ICT competency of secondary school teachers with respect to certain variables separately and in totality.

4. There is no significant influence and interaction of gender, type of management and locality on teaching competency of secondary school teachers.
   4.1. There is no significant influence of gender on teaching competency of secondary school teachers.
   4.2. There is there is no significant influence of types of management on teaching competency of secondary school teachers.
   4.3. There is no significant influence of locality on teaching competency of secondary school teachers.
   4.4. There is no significant interaction of gender and types of management on teaching competency of secondary school teachers.
   4.5. There is no significant interaction of gender and locality on teaching competency of secondary school teachers.
   4.6. There is no significant interaction of types of management and locality on teaching competency of secondary school teachers.
   4.7. There is no significant interaction of gender, types of management and locality on teaching competency of secondary school teachers.

5. There is no significant influence and interaction of teaching experience and educational qualification on teaching competency of secondary school teachers.
   5.1. There is no significant influence of teaching experience on teaching competency of secondary school teachers.
   5.2. There is no significant influence of educational qualification on teaching competency of secondary school teachers.
   5.3. There is no significant interaction of teaching experience and educational qualification on teaching competency of secondary school teachers.

6. There is no significant influence and interaction of gender, types of management and locality on ICT competency of secondary school teachers.
   6.1. There is no significant influence of gender on ICT competency of secondary school teachers.
   6.2. There is no significant influence of types of management on ICT competency secondary school teachers.
   6.3. There is no significant influence of locality on ICT competency of secondary school teachers.
   6.4. There is no significant interaction of gender and types of management on ICT competency of secondary school teachers.
   6.5. There is no significant interaction of gender and locality on ICT competency of secondary school teachers.
   6.6. There is no significant interaction of types of management and locality on ICT competency of secondary school teachers.
   6.7. There is no significant interaction of gender, types of management and locality on ICT competency of secondary school teachers.

7. There is no significant influence and interaction of teaching experience and educational qualification on ICT competency of secondary school teachers.
   7.1. There is no significant influence of teaching experience on ICT competency of secondary school teachers.
   7.2. There is no significant influence of educational qualification on ICT competency of secondary school teachers.
   7.3. There is no significant interaction of teaching experience and educational qualification on ICT competency of secondary school teachers.

## 8. Delimitation of the study

a) The study is delimited to Secondary School Teachers of Nagaland only.
b) The study is delimited to Teaching Competency and ICT Competency of secondary school teachers of Nagaland.
c) The study is delimited to Government and Private secondary schools affiliated to Nagaland Board of School Education (NBSE).

## 9. Variables of the Study

The variables of the study are Teaching Competency and ICT Competency. These variables are studied with respect to gender, types of management, locality, teaching experience and educational qualification.

## 10. Method

For the present investigation, the investigator employed the Descriptive Survey Method as this method is found to be most appropriate for studying the "Teaching and ICT Competencies of Secondary School Teachers of Nagaland".

## 11. Population

The population for the present research consists of all the secondary school teachers teaching in classes 9 and 10 in government and private secondary schools of Nagaland, affiliated with the Nagaland Board of School Education (NBSE).

## 12. Sample

a) **Selection of Schools**

Out of the total 16 administrative districts of Nagaland, the researcher selected 3 districts (approximately 20% of the total districts) for the present study randomly by lottery method, i.e., Kohima, Mon and Tseminyu. From the total 684 secondary schools in Nagaland, as per Nagaland Board of School Education, Kohima, Nagaland, Result Gazette (Provisional), High School Leaving Certificate Examination, 2023, a list of the schools in the selected districts was drawn out. Thus, out of the total 161 secondary schools across the 3 selected districts, 45 schools from Kohima, 30 from Mon and 5 from Tseminyu were chosen for the present study, which comes to approximately 50% of the total schools from each district. Therefore, the total number of secondary schools selected for the present study was

80. The district-wise distribution of secondary schools from the three districts is presented in Table 1.

**Table 1**

**Districts-wise total number of Government and Private Secondary Schools in Nagaland, affiliated with the Nagaland Board of School Education (NBSE)**

| Sl. No. | District | Total No. of Government and Private Secondary Schools |
|---|---|---|
| 1. | Kohima | 89 |
| 2. | Mokochung | 69 |
| 3. | Tuensang | 37 |
| 4. | Mon | 60 |
| 5. | Phek | 59 |
| 6. | Wokha | 41 |
| 7. | Zunheboto | 51 |
| 8. | Dimapur | 89 |
| 9. | Kiphire | 24 |
| 10. | Longleng | 18 |
| 11. | Peren | 34 |
| 12. | Noklak | 06 |
| 13. | Chumukedima | 75 |
| 14. | Niuland | 14 |
| 15. | Tseminyu | 12 |
| 16. | Shamator | 06 |
| **Total** | | **684** |

Source: Nagaland Board of School Education, Kohima, Nagaland. (2023). Result Gazette (provisional), High School Leaving Certificate Examination, 2023.

b) **Selection of Sample**

For the present research, a sample of 5 teachers from each schools were selected randomly and proportionately. Thus, 400 secondary school teachers from 80 secondary schools, from 3 districts of Nagaland i.e., Kohima, Mon and Tseminyu were selected using

Simple Random Sampling Technique (lottery method). Government and private were the two types of management from which the schools were selected. Sample distribution across different variables is shown in Table 2.

**Table 2**

**Distribution of Secondary Schools from 3 selected Districts**

| Sl. No. | District | Total no. of Secondary Schools | Total no. of Selected Secondary Schools |
|---|---|---|---|
| 1. | Kohima | 89 | 45 |
| 2. | Mon | 60 | 30 |
| 3. | Tseminyu | 12 | 05 |
| **Total** | | **161** | **80** |

**Table 3**

**Sample distribution across different Variables**

| Sl. No. | Category | Variables | Total | Grand Total |
|---|---|---|---|---|
| 1. | Gender | Male | 195 | 400 |
| | | Female | 205 | |
| 2. | Types of Management | Government | 135 | 400 |
| | | Private | 265 | |
| 3. | Locality | Urban | 250 | 400 |
| | | Rural | 150 | |
| 4. | Teaching Experience | 0-5 years | 163 | 400 |
| | | 6-10 years | 103 | |
| | | 11-15 years | 60 | |
| | | 16 years and above | 74 | |
| 5. | Educational Qualification | Trained Graduate | 129 | 400 |
| | | Untrained Graduate | 101 | |
| | | Trained Postgraduate | 98 | |
| | | Untrained Postgraduate | 72 | |

## 13. Tools for Data Collection

The investigator employed the following tools for the present study.

1. To measure the teaching competency of secondary school teachers, the investigator used Teacher's Teaching Competence Scale, constructed and standardized by Dr. Vimal Vidushy and Dr. Nand Kishor (2021).

2. To measure the ICT competency of secondary school teachers, the investigator used Self-Constructed tool; ICT Competency Scale for Secondary School Teachers.

## 14. Data Collection

A standardized scale on Teacher's Teaching Competence by Dr. Vimal Vidushy and Dr. Nand Kishor (2021) and the ICT Competency Scale for Secondary School Teachers developed by the investigator were employed for data collection.

The investigator personally visited each school and obtained permission from the heads of the institutions by explaining in detail the purpose of the study and the procedure for data collection. After obtaining approval, the investigator administered the tools to the selected teachers. They were given clear guidelines and instructions and were requested to read each statement carefully and give their valuable responses to all the items in the questionnaire by ticking against the appropriate response. Further, they were advised not to skip and leave any items unanswered. Teachers were also assured that the information obtained would remain confidential and utilized exclusively for the study. Necessary care was taken to avoid interfering with the teachers' academic schedules. In some schools, questionnaires were collected back with the assistance of some teachers, and in some, the investigator personally collected the questionnaires from teachers after a few days.

## 15. Statistical Techniques Used

The following statistical techniques were used to analysis the data.

a) Mean and Standard Deviation (SD) were computed to ascertain the status of secondary school teachers for the variables of teaching competency and ICT competency.

b) Pearson's Product Moment Correlation technique was applied to find the correlation between teaching competency and ICT competency.

c) A t-test was utilized to establish the differences in the teaching competency and ICT competency of secondary school teachers concerning gender, types of management and locality.

d) One-way ANOVA and Post-Hoc t-Test of mean and standard deviation was employed to analyze the mean of more than two groups within the same variable, namely, teaching experience and educational qualification.

e) Three-way ANOVA was employed to study the influence and interaction of gender, types of management, locality, teaching experience and educational qualification in relation to teaching competency and ICT competency of secondary school teachers.

## 16. Analysis of Data

After the data collection, the response sheets of the sample were assembled for coding, scoring and tabulation. Then SPSS V.20 (Statistical Package of Social Sciences) and the Microsoft Excel package were utilized for the statistical analysis of the data and interpretations were made accordingly. Tables and bar graphs were also used to present the analysis.

## 17. Major Findings of the Study

The major findings of the study are summarised objective-wise and presented as follows:

### Objective - 1: To determine the Teaching Competency of Secondary School Teachers of Nagaland.

The study revealed that in the dimension of teaching competency, secondary school teachers of Nagaland have high competency in classroom management.

### Objective - 2: To determine the ICT Competency of Secondary School Teachers of Nagaland.

The study revealed that in the dimension of ICT competency, secondary school teachers of Nagaland have high competency in ICT skill.

## Objective - 3: To find out the difference in Teaching Competency of Secondary School Teachers with respect to:

a) **Gender:**

It was found that there is a significant difference in the teaching competency of male and female secondary school teachers.

b) **Types of Management:**

It was found that there is a significant difference in the teaching competency of government and private secondary school teachers.

c) **Locality:**

It was found that there is a significant difference in the teaching competency of urban and rural secondary school teachers.

d) **Teaching Experience:**

It was found that there is a significant difference in the teaching competency of secondary school teachers with respect to teaching experience; 0-5 years, 6-10 years, 11-15 years and 16 years and above.

e) **Educational Qualification:**

It was found that there is a significant difference in the teaching competency of secondary school teachers with respect to educational qualification; trained graduate, untrained graduate, trained postgraduate and untrained postgraduate.

## Objective - 4: To find out the difference in ICT Competency of Secondary School Teachers with respect to:

a) **Gender:**

It was found that there is no significant difference in the ICT competency of male and female secondary school teachers.

b) **Types of Management:**

It was found that there is a significant difference in the ICT competency of government and private secondary school teachers.

c) **Locality:**

It was found that there is a significant difference in the ICT competency of urban and rural secondary school teachers.

d) **Teaching Experience:**

It was found that there is a significant difference in the ICT competency of secondary school teachers with respect to teaching experience; 0-5 years, 6-10 years, 11-15 years and 16 years and above.

e) **Educational Qualification:**

It was found that there is a significant difference in the ICT competency of secondary school teachers with respect to educational qualification; trained graduate, untrained graduate, trained postgraduate and untrained postgraduate.

**Objective - 5: To determine the relationship between Teaching Competency and ICT Competency of Secondary School Teachers with respect to certain variables separately and in totality.**

a) **Male:**

It was found that there is a positive and significant relationship between teaching competency and ICT competency of male secondary school teachers.

b) **Female:**

It was found that there is a positive and significant relationship between teaching competency and ICT competency of female secondary school teachers.

c) **Government:**

It was found that there is a positive but insignificant relationship between teaching competency and ICT competency of government secondary school teachers.

d) **Private:**

It was found that there is a positive and significant relationship between teaching competency and ICT competency of private secondary school teachers.

e) **Urban:**

It was found that there is a positive and significant relationship between teaching competency and ICT competency of urban secondary school teachers.

f) **Rural:**

It was found that there is a positive and significant relationship between teaching competency and ICT competency of rural secondary school teachers.

g) **0-5 years Teaching Experience:**

It was found that there is a positive and significant relationship between teaching competency and ICT competency of secondary school teachers with teaching experience of 0-5 years.

h) **6-10 years Teaching Experience:**

It was found that there is a positive and significant relationship between teaching competency and ICT competency of secondary school teachers with teaching experience of 6-10 years.

i) **11-15 years Teaching Experience:**

It was found that there is a positive and significant relationship between teaching competency and ICT competency of secondary school teachers with teaching experience of 11-15 years.

j) **16 years and above Teaching Experience:**

It was found that there is a negative and insignificant relationship between teaching competency and ICT competency of secondary school teachers with teaching experience of 16 years and above.

k) **Trained graduate:**

It was found that there is a positive and significant relationship between teaching competency and ICT competency of trained graduate secondary school teachers.

l) **Untrained graduate:**

It was found that there is a positive and significant relationship between teaching competency and ICT competency of untrained graduate secondary school teachers.

m) **Trained postgraduate:**

It was found that there is a positive but insignificant relationship between teaching competency and ICT competency of trained postgraduate secondary school teachers.

n) **Untrained postgraduate:**

It was found that there is a positive and significant relationship between teaching competency and ICT competency of untrained postgraduate secondary school teachers.

0) **Variables in totality:**

It was found that there is a positive and significant relationship between teaching competency and ICT competency of secondary school teachers in totality.

## Objective - 6: To find out the influence and interaction of Gender, Types of Management and Locality on Teaching Competency of Secondary School Teachers.

a) **Influence of gender on teaching competency of secondary school teachers:**

Gender was found to have significant influence on the teaching competency of secondary school teachers.

b) **Influence of types of management on teaching competency of secondary school teachers:**

Types of management were found to have significant influence on the teaching competency of secondary school teachers.

c) **Influence of locality on teaching competency of secondary school teachers:**

Locality was found to have significant influence on the teaching competency of secondary school teachers.

d) **Interaction of gender and types of management on teaching competency of secondary school teachers:**

Gender and types of management were found to have no significant interactional influence on the teaching competency of secondary school teachers".

e) **Interaction of gender and locality on teaching competency of secondary school teachers:**

Gender and locality were found to have no significant interactional influence on the teaching competency of secondary school teachers.

f) **Interaction of types of management and locality on teaching competency of secondary school teachers:**

Types of management and locality were found to have significant interactional influence on the teaching competency of secondary school teachers.

g) **Interaction of gender, types of management and locality on teaching competency of secondary school teachers:**

Gender, types of management and locality were found to have significant interactional influence on the teaching competency of secondary school teachers.

## Objective - 7: To find out the influence and interaction of Teaching Experience and Educational Qualification on Teaching Competency of Secondary School Teachers.

a) **Influence of teaching experience on teaching competency of secondary school teachers:**

Teaching experience was found to have significant influence on the teaching competency of secondary school teachers.

b) **Influence of educational qualification on teaching competency of secondary school teachers:**

Educational qualification was found to have significant influence on the teaching competency of secondary school teachers.

c) **Interaction of teaching experience and educational qualification on teaching competency of secondary school teachers:**

Teaching experience and educational qualification were found to have no significant interactional influence on the teaching competency of secondary school teachers.

## Objective - 8: To find out the influence and interaction of Gender, Types of Management and Locality on ICT Competency of Secondary School Teachers.

a) **Influence of gender on ICT competency of secondary school teachers:**
Gender was found to have no significant influence on the ICT competency of secondary school teachers.

b) **Influence of types of management on ICT competency of secondary school teachers:**
Types of management were found to have significant influence on the ICT competency of secondary school teachers.

c) **Influence of locality on ICT competency of secondary school teachers:**
Locality was found to have significant influence on the ICT competency of secondary school teachers.

d) **Interaction of gender and types of management on ICT competency of secondary school teachers:**
Gender and types of management were found to have no significant interactional influence on the ICT competency of secondary school teachers.

e) **Interaction of gender and locality on ICT competency of secondary school teachers:**
Gender and locality were found to have no significant interactional influence on the ICT competency of secondary school teachers.

f) **Interaction of types of management and locality on ICT competency of secondary school teachers:**
Types of management and locality were found to have no significant interactional influence on the ICT competency of secondary school teachers.

g) **Interaction of gender, types of management and locality on ICT competency of secondary school teachers:**
Gender, types of management and locality were found to have no significant interactional influence on the ICT competency of secondary school teachers.

**Objective - 9: To find out the influence and interaction of Teaching Experience and Educational Qualification on ICT Competency of Secondary School Teachers.**

a) **Influence of teaching experience on ICT competency of secondary school teachers:**

Teaching experience was found to have significant influence on the ICT competency of secondary school teachers.

b) **Influence of educational qualification on ICT competency of secondary school teachers:**

Educational qualification was found to have significant influence on the ICT competency of secondary school teachers.

c) **Interaction of teaching experience and educational qualification on ICT competency of secondary school teachers:**

Teaching experience and educational qualification was found to have significant interactional influence on the ICT competency of secondary school teachers.

## 18. Discussions of the Findings

The discussions on the major findings of the study are presented as follows:

### 18.1. Teaching Competency of Secondary School Teachers

i. The present study revealed that in the dimension of teaching competency, secondary school teachers of Nagaland have high competency in classroom management. This could be because teachers use a variety of learning activities to engage students, maintain their discipline, and cater to their needs on time, thus enabling them to establish a congenial classroom environment.

ii. The present study found a significant difference in the teaching competency of male and female secondary school teachers. Female secondary school teachers were found to have significantly higher teaching competency than their male counterparts. Similar findings were shown by Seferoglu (2005), Shivaprakash (2019), Parveen and Srivastava (2020), Hoovinbhavi (2021), Parveen et al. (2021), Paul and Jeyanthi (2024), and Kumar and Kayalvizhi (2024). However, it contradicts the findings

of Raju and Rao (2011), Ranjini (2012), Das and Nalinilatha (2017), Balyer (2017), Patel (2017), Rana and Shivani (2019), Balasubramaniam (2019), Srinivasan and Pugalenthi (2019), Ratheeswari (2020), Sheela and Rajendran (2020), Shobha (2022), and Kaur (2023). This could be because female teachers use different teaching approaches that emphasized collaborative learning, positive reinforcement and student-centeredness, and are more dedicated and motivated towards their profession.

iii. The present study found a significant difference in the teaching competency of government and private secondary school teachers. Private secondary school teachers were found to have significantly higher teaching competency than government secondary school teachers. This result is supported by the findings of Raju and Rao (2011), Jan (2016), Patel (2017), Moshahid and Hussain (2017), Shivaprakash (2019), Rana and Shivani (2019), Bindusha and Bindu (2020), Hoovinbhavi (2021) and Parveen et al. (2021). But it is contrary to the findings of Ranjini (2012), Kaur and Talwar (2014), Das and Nalinilatha (2017), Balasubramaniam (2019), Ratheeswari (2020), Shobha (2022), and Kaur (2023). The researcher assumed that it could be because, generally, private schools have better access to resources, infrastructure and facilities which contribute towards enhancing the teaching competency of private secondary school teachers.

iv. The present study revealed a significant difference in teaching competency of urban and rural secondary school teachers. Urban secondary school teachers were found to have significantly higher teaching competency than rural secondary school teachers. The result is in line with Sabu (2005), Raju and Rao (2011), Shivaprakash (2019), Rana and Shivani (2019), and Hoovinbhavi (2021). But, it is in contrast with the findings of Ranjini (2012), Patel (2017), Ratheeswari (2020), Bindusha and Bindu (2020) and Sheela and Rajendran (2020). This could be because urban secondary school teachers have more exposure to professional development opportunities and professional networks. It may also be because of the availability of better educational resources and infrastructure that have encouraged them to be more competent in teaching.

v. The present study revealed a significant difference in the teaching competency of secondary school teachers with different teaching experiences. This result is in agreement with the findings of Raju and Rao (2011), Patel (2017), Rana and Shivani

(2019), Parveen and Srivastava (2020), Hoovinbhavi (2021), Parveen et al. (2021), and Kumar and Kayalvizhi (2024). However, it is in contrast with the findings of Das and Nalinilatha (2017) and Ratheeswari (2020). In the further post-hoc t-test, significant differences were revealed between the teaching competency of secondary school teachers with teaching experience of 0-5 years and 6-10 years, 0-5 years and 11-15 years. Significant differences were also found between teachers with teaching experience of 0-5 years and 16 years and above, and 6-10 years and 16 years and above. The mean score for teachers with 0-5 years of teaching experience was greater than 6-10 years and 11-15 years of teaching experience. Moreover, the mean score of teachers with 0-5 years was higher than 16 years and above, and the mean score of teachers with 6-10 years of teaching experience exceeded 16 years and above teaching experience. However, between teachers with teaching experience of 6-10 years and 11-15 years, and 11-15 years and 16 years and above, no significant difference was revealed, and thus, there was no significant difference in their mean scores, either.

vi. The present study revealed a significant difference in teaching competency of secondary school teachers with different educational qualification. This findings is in tune with the results of Aziz and Akhtar (2014), Rana and Shivani (2019), Sheela and Rajendran (2020), and Hoovinbhavi (2021). However, it contradicts the results of Raju and Rao (2011), Ranjini (2012), Das and Nalinilatha (2017), and Bindusha and Bindu (2020). In the further post-hoc t-test, significant differences were revealed in the teaching competency of secondary school teachers with educational qualification of trained graduate and untrained graduate, as well as between untrained graduate and trained postgraduate, and untrained graduate and untrained postgraduate. The mean score of trained graduate was greater than that of untrained graduate. Further, the mean score of trained postgraduate was higher than untrained graduate, and untrained postgraduate mean score was higher than untrained graduate. However, no significant differences were found in the teaching competency of trained graduate and trained postgraduate, trained graduate and untrained postgraduate, and trained postgraduate and untrained postgraduate secondary school teachers and there was not much difference in their mean scores.

## 18.2. ICT Competency of Secondary School Teachers

i. The study revealed that in the dimension of ICT competency, secondary school teachers of Nagaland have high competency in ICT skill. It could be because of the digital era, which was further accelerated by the Covid-19 pandemic, which provides opportunities even more to use digital technology in every aspect of life, particularly in the education sector.

ii. The present study revealed no significant difference in the ICT competency of male and female secondary school teachers. Similar findings were reported by Nwalado and Obro (2014), Thakur and Chaudhury (2019), Mandal (2021), Isorena and Malangen (2022), Mijares (2022), and Reang and Mohalik (2023). But it is in contrast with the findings of Venumadhav and Sarsani (2022), Novela (2022), and Balasubramanian and Naveen (2024). This could be because, regardless of gender, teachers recognize the importance of ICT as it is essential in meeting the current demands of the educational system.

iii. The present study found a significant difference in the ICT competency of government and private secondary school teachers. Private secondary school teachers were found to have significantly higher ICT competency than government secondary school teachers. This result is in aligned with the findings of Venumadhav and Sarsani (2022). This could be because private schools offer pertinent ICT resources and facilities as well as motivate teachers to incorporate them into teaching learning process, which improves their proficiency with ICT tools over time.

iv. The present study found a significant difference in the ICT competency of urban and rural secondary school teachers. Urban secondary school teachers were found to have significantly higher ICT competency than rural secondary school teachers. This finding aligned with the results of Nwalado and Obro (2014), Joshi et al. (2021), Venumadhav and Sarsani (2022), and Syahrial et al. (2022). However, it opposed the report of Reang and Mohalik (2023). This could be because of the accessibility and availability of ICT in urban areas; teachers working there get more opportunities to use ICT both in and outside the school. Hence, urban teachers have good ICT usage experience and are more competent.

v. The present study found a significant difference in the ICT competency of secondary school teachers with respect to teaching experience. This result is in agreement with the findings of Joshi et al. (2021), Venumadhav and Sarsani (2022), and Mijares (2022). In the further post-hoc t-test, a significant differences were revealed in the ICT competency of secondary school teachers with teaching experience of 0-5 years and 6-10 years, 0-5 years and 11-15 years, 0-5 years and 16 years and above, and 6-10 years and 16 years and above respectively. Further, the mean score of 0-5 years was higher than 6-10 years, 11-15 years, and 16 Years and above. Moreover, the mean score of 6-10 years exceeded 16 years and above. However, no significant difference was found in the ICT competency of secondary school teachers with teaching experience of 6-10 years and 11-15 years, and 11-15 years and 16 years and above, and there was not much difference in their mean scores.

vi. The present study found a significant difference in the ICT competency of secondary school teachers concerning educational qualification. This result is supported by the findings of Isorena and Malangen (2022), and Venumadhav and Sarsani (2022). However, it contradicts with the findings of Mijares (2022). In the further post-hoc t-test, significant differences were revealed between the teaching competency of secondary school teachers with educational qualifications of trained graduate and trained postgraduate, as well as trained graduate and untrained postgraduate, untrained graduate and trained postgraduate, and untrained graduate and untrained postgraduate respectively. Further, the mean score of trained postgraduate teachers exceeded the score of trained graduates, untrained postgraduate teachers' mean score was greater than that of trained graduates, trained postgraduate teachers had a mean score higher than untrained graduates, and untrained postgraduate teachers had a greater mean than that of untrained graduate. However, no significant difference was found between trained graduate and untrained graduate, and trained postgraduate and untrained postgraduate secondary school teachers with regard to ICT competency, and there was not much difference in their mean scores.

## 18.3. Relationship between Teaching Competency and ICT Competency of Secondary School Teachers with respect to certain variables separately and in totality

A positive and significant relationship was found between the teaching competency and ICT competency of secondary school teachers with respect to male, female, private, urban, rural, teaching experience of 0-5 years, 6-10 years and 11-15 years, and educational qualification of trained graduate, untrained graduate and untrained postgraduate. However, the result revealed a positive but insignificant relationship between teaching competency and ICT competency of secondary school teachers with respect to government secondary school teachers. It could be because although teachers are competent in teaching, obstacles such as a lack of resources, insufficient training, and lack of motivation might have prevented them from comprehensive use of ICT.

Similarly, a positive but insignificant relationship was revealed between the teaching competency and ICT competency of trained postgraduate secondary school teachers. It could be because of the individual differences among teachers; sometime trained postgraduate secondary school teachers with high teaching competency might be reluctant to use technology.

Further, negative and insignificant relationship was found between teaching competency and ICT competency of secondary school teachers with teaching experience of 16 years and above. The reason could be, even though they are competent in teaching with comprehensive practical knowledge, refined instructional techniques and effective classroom management, which they developed and acquired over the years, they nevertheless find it difficult to use ICT tools as many of them began their profession in an era when ICT was not very prevalent like today.

A positive and significant correlation between teaching competency and ICT competency of secondary school teachers in totality indicates that secondary school teachers who are more competent in ICT demonstrate more competence in teaching and vice versa. Both teaching competency and ICT competency are indispensable in enhancing the quality of the teaching-learning process, thereby fostering students' enduring learning experiences and preparing them for future challenges. Thus, teachers must possess both teaching and ICT competencies to be competent in their work and meet the expectations of the current educational system.

### 18.4. Influence and interaction of Gender, Types of Management, Locality, Teaching Experience and Educational Qualification on Teaching Competency of Secondary School Teachers.

i. The present study revealed that the gender, types of management, locality, teaching experience and educational qualification significantly influence the teaching competency of secondary school teachers.

ii. The present study revealed that types of management and locality, and gender, types of management and locality have significant interactional influence on the teaching competency of secondary school teachers.

iii. The present study revealed that gender and types of management, gender and locality, and teaching experience and educational qualification have no significant interactional influence on teaching competency of secondary school teachers.

### 18.5. Influence and interaction of Gender, Types of Management, Locality, Teaching Experience and Educational Qualification on ICT Competency of Secondary School Teachers

The present study revealed that types of management, locality, teaching experience and educational qualification significantly influence the ICT competency of secondary school teachers.

i. The present study revealed that gender has no significant influence on the ICT competency of secondary school teachers.

ii. The present study revealed that teaching experience and educational qualification have significant interactional influence on the ICT competency of secondary school teachers.

iii. The present study revealed that gender and types of management, gender and locality, types of management and locality, and gender, types of management and locality have no significant interactional influence on the ICT competency of secondary school teachers.

## 19. Educational Implications

Based on the findings of the present study, some educational implications are discussed below.

### 19.1 Teaching Competency

i. Secondary school teachers were found to have high competency in classroom management than in other dimensions of teaching competency. While competency in classroom management is essential, it is equally important for teachers to develop competencies in other areas, too. Therefore, Policymakers should implement continuous professional development programmes and initiatives for secondary school teachers, emphasizing a balanced skill set and empowering them to respond to the diverse needs of their students.

ii. The teaching competency of female teachers was found to be significantly higher than their male counterparts. The schools can encourage teachers to maintain reflective practices, such as keeping their teaching journals and participating in team teaching. Every teacher, irrespective of gender, should be motivated to increase their level of teaching competency by incorporating different and innovative teaching strategies in their classroom teaching.

iii. The teaching competency of private and urban secondary school teachers was significantly higher than that of their counterparts. This disparity indicates a need to address teachers' challenges in government and rural settings. The government should allocate additional financial assistance and support to under-resourced schools and schools situated in rural areas to provide equitable access to professional development opportunities, infrastructure and resources.

iv. Policymakers should ensure that every school have access to sufficient funds to purchase the equipment they need for innovative teaching practices.

v. The Department of School Education can organize professional development and capacity building programmes for secondary school teachers to improve their teaching competency.

vi. School administration should allocate resources and engage teachers to promote their teaching competency. Periodic workshops and seminars for teachers, facilitated by experts, to equip them with current information and best practices should be organized.

vii. Schools should foster a congenial environment where teachers feel appreciated and inspired to enhance their teaching competencies. Those teachers who use creative and innovative teaching strategies should be rewarded and recognized.

viii. Teachers should be given sufficient time to plan and prepare lessons, reflect on their teaching and collaborate with colleagues.

ix. Secondary school teachers irrespective of their gender, types of management, locality, teaching experience and educational qualification should keep up with the most recent advancements in their field by reading scholarly publications, attending conferences, seminars, workshops, webinars, training and related programmes and participating in ongoing learning to improve their teaching skills.

### 19.2. ICT Competency

i. Secondary school teachers were found to have high competency in ICT skills than in the other two dimensions of ICT competency. Policymakers should initiate and design holistic professional development programs such as workshops and seminars that cover ICT skills, knowledge (theoretical understanding) and maintenance. These dimensions collectively will enable teachers to access a wide range of resources and facilitate optimal performance.

ii. ICT competency of private and urban secondary school teachers was significantly higher than their counterparts. An equitable environment must be fostered where all teachers, regardless of their school's type or location, develop necessary ICT competencies. The government should prioritize funding and support to ensure equitable distribution of resources to bridge the gap between urban and rural schools and private and public schools.

iii. Schools, especially in rural areas and government sectors, need significant ICT infrastructure investments. So, the government should formulate policies to reduce the

disparity between rural and urban secondary schools in terms of access to ICT resources and training.

iv. The school can set up systems such as feedback mechanisms for teachers to provide feedback on their ICT-related experiences and difficulties.

v. The school authority should organize periodic training and workshops for teachers on the usage of different components of ICT in different educational activities, thus enhancing their level of competency in ICT.

vi. To enhance teachers' ICT competency, schools should implement peer-coaching and mentoring programmes that connect less ICT-competent teachers with more competent ones.

vii. School administration should take the necessary initiatives to enhance the ICT competency of the teachers and keep them updated with the latest technological developments. They should encourage and motivate the teachers to prepare their lesson plans integrating content, pedagogy, and technology.

viii. The Department of School Education should provide adequate funding to secondary schools to procure and maintain ICT equipment. It should also organize training programs for the teachers on ICT-related techniques.

ix. Secondary school teachers irrespective of their gender, types of management, locality, teaching experience and educational qualification should give effort to understand the significance of ICT in the teaching-learning process by attending different programmes, trainings, seminars, workshops and conferences and ensure to enhance their practical and functional knowledge and skills of ICT for better classroom transactions. They should also keep up to date with the latest developments in ICT and effectively plan their teaching and learning strategies by integrating ICT.

x. Stakeholders such as community people, alumni of the schools, and parents with ICT proficiency can offer their time as mentors to teachers and students. Local community centres can hold ICT training sessions for teachers for promoting digital competency.

## 20. Conclusion

The present study attempted to comprehensively analyse the teaching and ICT competencies of secondary school teachers. The findings of the study confirmed that the secondary school teachers of Nagaland have high competency in classroom management and possess high competency in ICT skill. Furthermore, the findings of the study show that there exists a significant difference in the teaching competency of secondary school teachers of Nagaland in relation to gender, types of management, locality, teaching experience and educational qualification. Similarly, a significant difference was revealed in the ICT competency of secondary school teachers of Nagaland in relation to types of management, locality, teaching experience and educational qualification. However, no significant difference was revealed in the ICT competency of secondary school teachers of Nagaland in relation to gender. In conclusion, the study highlighted the role of policymakers, school administration and concerned agencies in addressing the competency gaps and stresses the benefits of enriching professional development programmes that focus on enhancing the teaching and ICT competencies of secondary school teachers. Overall, the study emphasizes how teaching and ICT competencies of teachers are essential in achieving the desired quality of education.

## 21. Suggestions for Future Research

i. The present study was confined to secondary schools teachers only. Similar studies can be conducted for teachers working at elementary schools, higher secondary schools and colleges.

ii. A comparative study on teaching and ICT competencies of secondary school teachers can be conducted for two different states.

iii. The present study was conducted on a sample of 400 teachers from 3 districts. A large sample size from more districts may be considered for further research.

iv. Academic achievement of the students in relation to teaching and ICT competencies of secondary school teachers can be considered for further study.

v. Similar study can be conducted on teacher educators in teacher education colleges.

vi. Similar study can be conducted on B.Ed. student teachers.

vii. The present study was conducted concerning the variables of gender, types of management, locality, teaching experience and educational qualification. Similar studies can be conducted by taking other variables like age, marital status, stream etc.

viii. Similar studies can be conducted in other states of India other than Nagaland.

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# Appendix – I

**Teachers' Teaching Competence Scale by Dr. Vimal Vidushy and Dr. Nand Kishor (2021)**

**General Information about the Teacher**

Please fill in the following basic information.

1. Name (optional) : _____
2. Name of the school : _____
3. District : _____

4. Gender: Please tick (✓)
   a. Male ☐
   b. Female ☐

5. Management type: Please tick (✓)
   a. Government ☐
   b. Private ☐

6. Locality: Please tick (✓)
   a. Urban ☐
   b. Rural ☐

7. Teaching experience: Please tick (✓)
   a. 0 - 5 years ☐
   b. 6 -10 years ☐
   c. 11-15 years ☐
   d. 16 years and above ☐

8. Educational Qualification: Please tick (✓)
   a. Trained Graduate ☐
   b. Untrained Graduate ☐
   c. Trained Post Graduate ☐
   d. Untrained Post Graduate ☐

## INSTRUCTIONS:

On the following pages 35 statements concerning teacher's teaching competence have been given. Kindly read each statement carefully and decide your response on anyone of the given Five responses alternatives, viz., **Most of the time, Often, Sometimes, Rarely** and **Not at all** and put a [√] mark in the appropriate cell □ of the alternative which describes you the best. Kindly do reply to all the 35 statements. Be assured that your responses will be kept confidential.

| Sl.No. | Statement | Response | | | | |
|---|---|---|---|---|---|---|
| | | Most of the time | Often | Some-times | Rarely | Not at all |
| 1. | I plan the lesson keeping in mind the objectives of the lesson. | | | | | |
| 2. | I plan activities and guide pupils to learn by doing. | | | | | |
| 3. | I plan and guide pupils in accomplishing innovative activities. | | | | | |
| 4. | I select the content to be taught according to the age of my students. | | | | | |
| 5. | I adopt new strategies to cater the needs of pupils. | | | | | |
| 6. | I am fully thorough in construction of objectives and test items in difficulty levels. | | | | | |
| 7. | I plan strategies to deal with tough topics. | | | | | |
| 8. | I am able to provide wide range of variety of learning activities to pupils. | | | | | |
| 9. | I consider needs and interests of pupils in the preparation of relevant supporting materials at low cost and no cost. | | | | | |
| 10. | My focus while teaching is towards whole class and not towards a section of class. | | | | | |
| 11. | Group dynamics of my class is always in my knowledge. | | | | | |
| 12. | I encourage faculty interaction for better academic growth. | | | | | |

| Sl.No. | Statement | Response | | | | |
|---|---|---|---|---|---|---|
| | | Most of the time | Often | Some-times | Rarely | Not at all |
| 13. | According to me, Evaluation criteria should not pressurize the abilities of the pupils. | | | | | |
| 14. | I use different types of evaluation techniques. | | | | | |
| 15. | I make pupils realize the significance of graded assignments for evaluation. | | | | | |
| 16. | I think pupils progress should always be discussed with the parents. | | | | | |
| 17. | I take out time to deal with parental queries. | | | | | |
| 18. | I never comment on any particular part of society. | | | | | |
| 19. | While teaching, developing the feeling of unity among pupils is my main concern. | | | | | |
| 20. | I manage time and space properly for the display of teaching learning materials. | | | | | |
| 21. | I invite new practices innovated by others and implement such novel concepts in teaching. | | | | | |
| 22. | I always try to keep pupils alert and enthusiastic. | | | | | |
| 23. | I encourage students to fabricate relevant content with appropriate methodology. | | | | | |
| 24. | I think parents' role is very important in the education of the child. | | | | | |
| 25. | I adopt appropriate remedial measures. | | | | | |
| 26. | I encourage maximum participation of pupils in my class. | | | | | |
| 27. | New topics are always based on previous knowledge of pupils in my class. | | | | | |
| 28. | I give due weightage to classroom observation for evaluation. | | | | | |

| Sl.No. | Statement | Response | | | | |
|---|---|---|---|---|---|---|
| | | Most of the time | Often | Some-times | Rarely | Not at all |
| 29. | I always come on time so that my pupils also follow punctuality and regularity. | | | | | |
| 30. | I apply the assessment criteria of the activities as established in the subject curriculum. | | | | | |
| 31. | I attend and respond clearly to questions asked by pupils in my class. | | | | | |
| 32. | I design and relate the classroom content to the real-life situations. | | | | | |
| 33. | I appreciate the creative ability of the pupils in preparation of suitable teaching materials. | | | | | |
| 34. | I use questioning technique to develop critical awareness among pupils. | | | | | |
| 35. | I use different strategies after identifying learning difficulties of pupils. | | | | | |

# Appendix – II

## ICT Competency Scale for Secondary School Teachers

### General Information about the Teacher

Please fill in the following basic information.

1. Name (optional) : _____
2. Name of the school : _____
3. District : _____

4. Gender: Please tick (✓)
   a. Male ☐
   b. Female ☐

5. Management type: Please tick (✓)
   a. Government ☐
   b. Private ☐

6. Locality: Please tick (✓)
   a. Urban ☐
   b. Rural ☐

7. Teaching experience: Please tick (✓)
   a. 0 - 5 years ☐
   b. 6 -10 years ☐
   c. 11-15 years ☐
   d. 16 years and above ☐

8. Educational Qualification: Please tick (✓)
   a. Trained Graduate ☐
   b. Untrained Graduate ☐
   c. Trained Post Graduate ☐
   d. Untrained Post Graduate ☐

## INSTRUCTIONS:

Kindly read each statement carefully and answer by ticking (✓) against the appropriate response from any of the given three (3) response alternatives **Yes, Can't Say** and **No** which describes you the best. Please do not skip and leave any statement unanswered.

| Sl. No. | Statement | Response | | |
|---|---|---|---|---|
| | | **Yes** | **Can't say** | **No** |
| 1. | I know how to start and end windows. | | | |
| 2. | I know how to locate application programs like Word and Excel in computers. | | | |
| 3. | I know how to operate a digital camera. | | | |
| 4. | I know how to transfer documents or files from mobile to computers. | | | |
| 5. | I know how to print from a selected printer other than the default. | | | |
| 6. | I am aware of the Information Technology (IT) Act of India. | | | |
| 7. | I am aware of intellectual property rights and creative commons. | | | |
| 8. | I know how to set up hardware equipments like a keyboard, mouse, scanner and printer. | | | |
| 9. | I know how to do simple editing using MS Word. | | | |
| 10. | I know how to set margins/bullets/numbers/paragraphs in word documents. | | | |
| 11. | I know how to produce charts and graphs for data analysis using MS Excel. | | | |
| 12. | I know how to prepare a basic PowerPoint presentation. | | | |
| 13. | I know how to insert a text box and modify the colours of text, lines and spaces on a PPT slide. | | | |
| 14. | I know how to use Google docs to work on documents online. | | | |
| 15. | I know how to save files in Google drive. | | | |
| 16. | I know how to download files from the internet and save them. | | | |
| 17. | I am aware of an educational role of social media like Facebook/Instagram/Twitter/YouTube etc. | | | |

| Sl. No. | Statement | Response | | |
|---|---|---|---|---|
| | | Yes | Can't say | No |
| 18. | I know how to surf the internet as an information resource in the teaching-learning process. | | | |
| 19. | I am aware of different educational websites. | | | |
| 20. | I know how to use ICT to record students' attainment, progress and needs. | | | |
| 21. | I know how to use a mobile phone for teaching-learning process. | | | |
| 22. | I can open and close an applications and programs in computers. | | | |
| 23. | I can insert and eject external drives like hard drive/CD/Pen drive. | | | |
| 24. | I can use tool bar to edit documents by selecting font size and style. | | | |
| 25. | I can use the print option to print the desired pages of the documents. | | | |
| 26. | I can use a touchpad/mouse to select and move items on the screen efficiently. | | | |
| 27. | I can backup files and folders into various media types like CD-RW/USB/Hard Drive etc. | | | |
| 28. | I can search and select a file on computers. | | | |
| 29. | I can use MS Word programme to create a new document, name, rename and save it. | | | |
| 30. | I can rearrange slides within the PowerPoint presentation. | | | |
| 31. | I can copy the data or file from a hard drive/CD/Pen drive to a computers. | | | |
| 32. | I can create and save a document or file in different formats like JPEG/GIF/BMP/PDF etc. | | | |
| 33. | I can install and run anti-virus software on computers. | | | |
| 34. | I can set up a login password on computers. | | | |
| 35. | I use social networking site like Facebook/Instagram/Twitter/ YouTube etc. to communicate and connect with friends, colleagues, family members and students. | | | |
| 36. | I can operate an email account. | | | |
| 37. | I can use an Excel sheet. | | | |

| Sl. No. | Statement | Response | | |
|---|---|---|---|---|
| | | Yes | Can't say | No |
| 38. | I can incorporate word art/pictures/clipart/equations/symbols/data/charts into documents. | | | |
| 39. | I can use LCD projector for PowerPoint presentations. | | | |
| 40. | I can take online class. | | | |
| 41. | I can access an internet site via its website address. | | | |
| 42. | I can use search engines to find information. | | | |
| 43. | I can copy and save text and images from website. | | | |
| 44. | I maintain dust free environment for personal ICT equipment. | | | |
| 45. | I avoid keeping things on computers. | | | |
| 46. | I scan my mobile phone regularly. | | | |
| 47. | I update the latest version of apps on my mobile phone. | | | |
| 48. | I never leave computers or mobile phone plugged in after the battery is fully charged. | | | |
| 49. | I never overfill the paper tray and use quality cartridges to keep the printer in good condition. | | | |
| 50. | I clean the keyboard and screen of the computers at least once a week. | | | |
| 51. | I maintain a backup for important files and data on the computers. | | | |
| 52. | I make sure to uninstall unused software from the computers. | | | |
| 53. | I check and empty the recycle bin on the computers. | | | |
| 54. | I update the operating system of the computers whenever I receive a notification. | | | |
| 55. | I organise files on the computers systematically. | | | |
| 56. | I avoid overloading the internal storage of my mobile phone. | | | |
| 57. | I always update antivirus software whenever the update is available. | | | |
| 58. | I use antivirus scans on my computers. | | | |

| Sl. No. | Statement | Response | | |
|---|---|---|---|---|
| | | Yes | Can't say | No |
| 59. | I change the password of my devices from time to time. | | | |
| 60. | I always clean up the browsed history on the computers. | | | |

# Appendix – III

## Paper Presentations

8th International Multidisciplinary Conference

International Council for Education, Research and Training (ICERT)

Gandhi Memorial National College Ambala Cantt

"Emerging Trends & Challenges in Humanities, Education, Science and Social Sciences"

March 25, 2023

**Certificate of Presentation**

ICERT

This is to certify that **Mrs Thronlem Jorlim Konyak, Research Scholar, Department of Teacher Education, Nagaland University, Kohima Campus** has actively participated and presented a research paper entitled **"ICT Competency of Secondary School Teachers in Kiphire District, Nagaland"** at the 8th International Multidisciplinary Conference on "Emerging Trends & Challenges in Humanities, Education, Science and Social Sciences" held on March 25, 2023 at Auditorium, Gandhi Memorial National College, Ambala Cantt jointly organised by Gandhi Memorial National College, Ambala Cantt & ICERT.

**Conference Committee**

Certificate No. 8IMC/414

Date of Issue : March 25, 2023

**Dr. S.K. Singhmar**
Chairman ICERT

**Dr Rohit Dutt**
Principal
G.M.N College, Ambala Cantt

**Organizing Secretary**
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Assistant Professor, Dept Of Management,
G.M.N College, Ambala Cantt

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Dr. Rakesh Kumar
Assistant Professor, Dept Of Political Science
G.M.N College, Ambala Cantt

**Co ordinator**
Dr. Shikha Jaggi
Assistant Professor, Dept of Zoology,
G.M.N College, Ambala Cantt

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Indian Council of Social Science Research

Azadi Ka Amrit Mahotsav

**SALT CHRISTIAN COLLEGE OF TEACHER EDUCATION**

DIMAPUR : NAGALAND

INDIAN COUNCIL OF SOCIAL SCIENCE RESEARCH

*Sponsored*

NATIONAL SEMINAR

*on*

RECENT TRENDS AND FUTURE PERSPECTIVES OF TEACHER EDUCATION IN 2047

**Certificate**

This is to certify that Prof./Dr./Mr./Mrs. Thronlem Jorlim Konyak, Research Scholar ..... of Department of Teacher Education, Nagaland University ..... has served as Chairperson /Resource Person /participated/presented a paper entitled Google Classroom As A Tool For Teaching And Learning ..... in the ICSSR Sponsored National Seminar on **"Recent Trends and Future Perspectives of Teacher Education in 2047"** organized by the Department of Pedagogy of Science, Salt Christian College of Teacher Education, Dimapur , Nagaland on 4th & 5th August, 2022.

Dr. M. PANGER LONGCHAR
Director
SCC & SCCTE
Dimapur, Nagaland

Dr. K. JAGADEESH
Convenor & Organizing Secretary
Principal (i/c)
SCCTE, Dimapur, Nagaland

# NAGALAND UNIVERSITY

*(A Central University Established by an Act of Parliament, 35/1989)*

**Department of Teacher Education**
**School of Humanities & Education**
**Kohima Campus, Meriema - 797 004**

## *Certificate of Participation*

This is to certify that Mr./Mrs./Ms./Dr./Prof. Thronlem Torlim Konyak Department of Teacher Education, N.U.: Kohima has participated/Presented a paper entitled Integration of ICT in teaching-learning process and NEP 2020 in the **National Seminar on Social Transformation in India 2.0 and NEP-2020** held from 21st to 22nd April, 2022 organised by Department of Teacher Education, School of Humanities & Education, Nagaland University, Kohima Campus, Meriema, Nagaland-797 004.

| Prof. A.K.Mishra | Prof. Bano Yetsuvi | Prof. P.K.Pattnaik | Dr.Rashmi |
|---|---|---|---|
| *Pro-Vice Chancellor* | *Dean* | *Head* | *Convener* |
| *Kohima Campus* | *School of Humanities and Education* | *Dept. of Teacher Education* | |

Cert. No. NSU/IC/RHEMA/2022/077

**International Conference**
**ON**
## Revamping Higher Education with Multidisciplinary Approach
**(INQUEST-2022)**
**Organized by**

**NETAJI SUBHAS UNIVERSITY, JAMSHEDPUR, JHARKHAND**

*Certificate*

This is to certify that Prof./Dr./Mr./Ms. Thronlem Torlim Konyak, Research Scholar, Department of Teacher Education, Nagaland University contributed as Chief Guest/ Guest of Honour/ Keynote Speaker/ Guest/ Resource Person/ Participant / Official/ Volunteer in the International Conference on **"Revamping Higher Education with Multidisciplinary Approach"** held on 16th and 17th December, 2022. He/ She participated / Contributed / Presented Paper entitled Teacher's Teaching Competency with reference to NEP-2020

We appreciate the participation and contribution for the International Conference.

| Organizing Secretary | Keynote Speaker | Registrar |
|---|---|---|
| INQUEST,2022 | INQUEST,2022 | Netaji Subhas University |

# Appendix – IV

# Paper Publications

मध्य भारती

MADHYA BHARTI
(UGC CARE Group-1, Multi disciplinary)

CERTIFICATE OF PUBLICATION

This is to certify that the article entitled

**ICT COMPETENCY OF SECONDARY SCHOOL TEACHERS IN KIPHIRE DISTRICT, NAGALAND**

Authored By

**Thronlem Jorlim Konyak**
Ph.D. Research Scholar, Department of Teacher Education, Nagaland University, Kohima Campus,Meriema

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