

**DIGITAL LITERACY, TECHNOLOGICAL INTEGRATION AND
LEARNERS' AUTONOMY IMPACTING ENGLISH LANGUAGE LEARNING
AMONG HIGHER SECONDARY SCHOOL STUDENTS 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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I, Hiketo Wotsa, hereby declare that the Thesis entitled ***“Digital Literacy, Technological Integration, and Learners’ Autonomy Impacting English Language Learning among Higher Secondary School Students of Nagaland”*** is a result of my original research work prepared under the supervision of Dr. Sushil Kumar Singh, Associate Professor, Department of Teacher Education, Nagaland University, Kohima Campus, Meriema.

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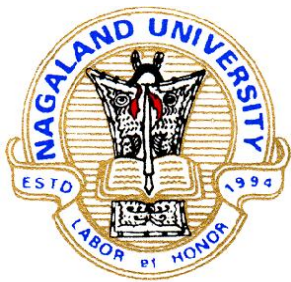
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CERTIFICATE

This is to certify that Mr. Hiketo Wotsa, bearing Registration No. Ph.D./TED/00675 from the Department of Teacher Education, has completed his Ph.D. Thesis entitled ***“Digital Literacy, Technological Integration, and Learners’ Autonomy Impacting English Language Learning among Higher Secondary School Students of Nagaland”***, under my supervision and guidance in partial fulfilment of the requirement for the degree of Doctor of Philosophy in Education.

This is his original work and has not been submitted earlier in part or in full, for the 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.

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TABLE OF CONTENTS

	Page No.
DECLARATION	i
CERTIFICATE OF PLAGIARISM CHECK	ii
CERTIFICATE	iii
ACKNOWLEDGEMENT	iv
CONTENTS	v-ix
LIST OF TABLES	x-xiii
LIST OF FIGURES	xiv
LIST OF ABBREVIATIONS	xv-xvii

Sl.No.	CHAPTER-I INTRODUCTION	Page No.
1	Conceptual Framework	1
1.1	Digital Literacy	2
1.1.1	Theoretical Framework of Digital Literacy	2
1.1.2	Components of Digital Literacy	3
1.1.3	Factors Influencing Digital Literacy	4
1.1.4	Consequences of Digital Literacy	6
1.2	Technological Integration	7
1.2.1	Theoretical Framework of Technological Integration	7
1.2.2	Components of Technological Integration	8
1.2.3	Factors Influencing Technological Integration	10
1.2.4	Significances of Technological Integration	10
1.3	Learners' Autonomy	12
1.3.1	Theoretical Framework of Learners' Autonomy	12
1.3.2	Components of Learners' Autonomy	14
1.3.3	Factors Influencing Learners' Autonomy	15
1.3.4	Consequences of Learners' Autonomy	17

1.4	English Language Learning	18
1.4.1	Theoretical Framework of English Language Learning	19
1.4.2	Components of English Language Learning	21
1.4.3	Factors Influencing English Language Learning	23
1.4.4	Significance of English Language Learning	25
1.5	Integrated Theoretical Framework: Digital Literacy, Technological Integration, Learners' Autonomy, and English Language Learning	26
1.5.1	Relationships among Digital Literacy, Technological Integration, Learners' Autonomy, and English Language Learning	30
1.5.2	Interrelationship among Digital Literacy, Technological Integration, Learners' Autonomy, and English Language Learning	33
1.6	Higher Secondary Education of Nagaland	34
1.6.1	English in Indian Education System	36
1.6.2	Language System in Nagaland	37
1.6.3	NEP 2020: Digital Initiatives in Nagaland	41
1.6.4	NEP 2020 on English Language Education	43
1.6.5	NCF and NCFTE on English Language Education	45
1.7	Significance of the Study	47
1.8	Statement of the Problem	48
1.9	Operational Definitions	48
1.10	Objectives of the Study	49
1.11	Research Questions/Hypotheses Research Questions	49
1.12	Delimitation of the Study	51
1.13	Variables	51
	CHAPTER – II	
	REVIEW OF THE LITERATURE	
2.1	Review related to Digital Literacy	53
2.2	Studies done on Technological Integration	64
2.3	Studies done on Learners' Autonomy	78
2.4	Studies done on English Language Learning	91
2.5	Studies related to Digital Literacy, Technological Integration, Learners' Autonomy and English Language Learning	103
2.6	Summary of the Literature Review	116

2.7	Studies related to Digital Literacy, Technological Integration,	124
	Learners' Autonomy and English Language Learning	
2.8	Research Gaps	126
	CHAPTER – III RESEARCH METHODOLOGY	
3.1	Research Method	128
3.2	Sample Design	129
3.3	Tools of Data Collection	134
3.3.1	Digital Literacy Scale	134
3.4.1	Technological Integration Scale	138
3.5	Learners Autonomy Scale	141
3.6	Administration and Scoring	144
3.7	Techniques of Data Analysis	145
	CHAPTER – IV ANALYSIS AND INTERPRETATION	
4.1	Role of Digital Literacy, Technological Integration, and Learners' Autonomy in the improvement in English Language Learning	147
4.1.1	Role of Digital Literacy in the improvement of English Language Learning	147
4.1.2	Role of Technological Integration in the Improvement of English Language Learning	153
4.1.3	Role of Learners' Autonomy in the improvement of English Language Learning	157
4.2	Status of Digital Literacy, Technological Integration, and Learners' Autonomy	163
4.2.1	Status of Digital Literacy	163
4.2.2	Status of Technological Integration	165
4.2.3	Status of Learners' Autonomy	
4.3	Levels of Digital Literacy, Technological Integration, Learner Autonomy, and English Language Learning	168
4.4	English Language Learning of Male and Female Students	171
4.5	English Language Learning of Rural and Urban Area Students	173

4.6	English Language Learning of Students Studying in Science, Arts, and Commerce streams	175
4.7	English Language Learning of Students studying in Government and Private Schools	177
4.8	English Language Learning of students with regard to the Levels of Digital Literacy	178
4.9	English Language Learning of Students with regards to the Levels of Technological Integration	180
4.10	English Language Learning of students with regards to the Levels of Learners' Autonomy	182
4.11	Interaction effect of Digital Literacy and Technological Integration on the English Language Learning	183
4.12	Interaction effect of Technological Integration and Learners' Autonomy on the English Language Learning	185
4.13	Interaction effect of Digital Literacy and Learners' Autonomy on the English Language Learning	187
4.14	Relationship between English Language Learning and Digital Literacy	189
4.15	Relationship between English Language Learning and Technological Integration	190
4.16	Relationship between English Language Learning and Learners' Autonomy	191
4.17	Relationship of Digital Literacy, Technological Integration, and Learners' Autonomy with English Language Learning	192
	CHAPTER – V FINDINGS, CONCLUSIONS, RECOMENDATIONS AND SUGGESTIONS	
5.1	Findings	193
5.2	Conclusions	200
5.3	Recommendations	203
5.4	Suggestions for Further Research	204

	SUMMARY	
1.	Introduction	1
2.	Review of Literature	2
3.	Significance of the Study	5
4.	Statement of the Problem	6
5.	Operational Definitions	6
6.	Objectives of the Study	7
7.	Research Questions / Hypotheses	8
8.	Delimitation of the Study	9
9.	Variables	9
10.	Research Method	10
11.	Sample and Sampling Technique	10
12.	Tools of Data Collection	10
13.	Techniques of Data Analysis	11
14.	Findings	12
15.	Conclusion	19
16.	Recommendations	22
17.	Suggestions for Further Research	23
	BIBLIOGRAPHY	
1-2	Data Collection Permission Letter	
3	DIGITAL LITERACY SCALE (DLS)	
4	TECHNOLOGICAL INTEGRATION SCALE (TLS)	
5	LEARNER AUTONOMY SCALE (LAS)	
6	Paper Presentation	
7	Paper Publication	
8	Book Chapter	
9	Plagiarism Report	
Table No.	LISTS OF TABLES	Page No.

2.1	Summary of the studies related to Digital Literacy	60
2.2	Summary of the studies related to Technological Integration	72
2.3	Summary of the studies related to Learners' Autonomy	85
2.4	Summary of the studies related to English Language Learning	98
2.5	Studies related to Digital Literacy, Technological Integration, Learners' Autonomy and English Language Learning	106
3.1	The status of higher secondary school students' stream-wise	130
3.2	List of Schools	131
3.2.2	Dimension wise distribution of items of Digital Literacy	136
3.2.3	Reliability Index of Digital Literacy Scale	138
3.3.4	Norms for Interpretation of Levels of Digital Literacy.	138
3.4.1	Dimension wise distribution of items of Technological Integration	140
3.4.2	Reliability Index of Technological Integration Scale	141
3.4.3	Norms for Interpretation of Levels of Technological Integration Scale	141
3.5.1	Dimension wise distribution of items of Technological Integration	143
3.5.2	Reliability Index of Learners Autonomy scale	144
3.5.3	Norms for Interpretation of Levels of Learners Autonomy Scale	144
4.1.1	Summary Table of Key Themes of Digital Literacy by Teachers and Principals	151
4.1.2	Summary Table of Key Themes of Technological Integration by Teachers and Principals	156
4.1.3	Summary Table of Key Themes of Learners Autonomy by Teachers and Principals	160
4.2.1	Mean, Median, Mode, S.D, Minimum and Maximum of Technical Skills, Information Literacy, Media Literacy and Communication Skills	163

4.2.2	Mean, Median, Mode, S.D, Minimum and Maximum of Digital Tools and Resources, Pedagogical Approaches, Assessment and Feedback and Professional Development.	165
4.2.3	Mean, median, mode, S.D, Minimum and Maximum of Goal Setting, Self-Directed Learning, Metacognition and Motivation	166
4.3.1	Percentage wise of Levels of Digital Literacy	168
4.3.2	Percentage wise of Levels of Technological Integration	169
4.3.3	Percentage wise of Levels of Learner Autonomy	170
4.3.4	Mean, S.D, Range, Minimum and Maximum of English Language Learning Scores	171
4.4.1	Frequency and Percentage in the English Language Learning Scores of Male and Female Students	171
4.4.2	Significance of difference in English Language Learning Scores of Male and Female Students	172
4.5.1	Frequency and Percentage in the English Language Learning Scores of Students residing in Rural and Urban Areas	173
4.5.2	Significance of difference in the English Language Learning Scores of Students residing in Rural and Urban Areas	174
4.6.1	Frequency and Percentage in the English Language Learning Scores of Students studying in Science, Arts, and Commerce Streams	175
4.6.2	Mean and S. D in the English Language Learning Scores of Students Studying in Science, Arts, and Commerce Streams	175
4.6.3	Significance of difference in English Language Learning Scores Students studying in Science, Arts, and Commerce Streams	176
4.7.1	Frequency and Percentage in the English Language Learning Scores of Students studying in Government and Private Schools	177
4.7.2	Significance of difference in the English Language Learning Scores of Students studying in Government and Private Schools	177

4.8.1	Mean and S.D of the English Language Learning Scores of students with regard to the levels of Digital Literacy	178
4.8.2-a	Summary of ANOVA on English Language Learning Scores of students with regard to the levels of Digital Literacy	179
4.8.2-b	Result of post-Hoc t-Test on English Language Learning of students with regard to the levels of Digital Literacy	180
4.9.1	Mean and S.D in the English Language Learning Scores of Students with regard to the levels of Technological Integration	181
4.9.2	Summary of ANOVA on English Language Learning Scores of students with regard to the levels of Technological Integration	181
4.10.1	Comparison of Mean and S.D in the English Language Learning Scores of students with regard to the levels of Learners' Autonomy	182
4.10.2	Summary of ANOVA on English Language Learning Scores of students with regard to the levels of Learners' Autonomy	183
4.11.1	Mean of Digital Literacy and Technological Integration on the English Language Learning Scores	183
4.11.2	Summary of two-way ANOVA on Interaction effect of Digital Literacy and Technological Integration on the English Language Learning Scores	184
4.12.1	Mean of Technological Integration and Learners' Autonomy on the English Language Learning Scores	185
4.12.2	Summary of two-way ANOVA on Interaction effect of Technological Integration and Learners' Autonomy on the English Language Learning Scores	186
4.13.1	Mean of Digital Literacy and Learners' Autonomy on the English Language Learning Scores	187
4.14.1	Mean and S.D of English Language Learning and Digital Literacy	189
4.14.2	Relationship between English Language Learning and Digital Literacy	189

4.15.1	Mean and S.D of English Language Learning and Technological Integration	190
4.15.2	Relationship between English Language Learning and Technological Integration	190
4.16.1	Mean and S.D of English Language Learning and Learners' Autonomy	191
4.16.2	Relationship between English Language Learning and Learners' Autonomy	191
4.17.1	Multiple Correlation of Digital Literacy, Technological Integration, and Learners' Autonomy with English Language Learning	192

Fig. No	LISTS OF FIGURES	Page No.
1	Integrated Theoretical Framework: Digital Literacy, Technological Integration, Learner Autonomy, and English Language Learning	29
2	Map of Nagaland	39
3	Flow Chart of Sample	133
4.3.1	Percentage wise of Levels of Digital Literacy	168
4.3.2	Percentage wise of Levels of Technological Integration	169
4.3.3	Percentage wise of Levels of Learner Autonomy	170
4.4.1	Frequency and Percentage in the English Language Learning Scores of Male and Female Students	172
4.5.1	Frequency and Percentage in the English Language Learning Scores of Students residing in Rural and Urban Areas	173
4.6.1	Frequency and Percentage in the English Language Learning Scores of Students studying in Science, Arts, and Commerce Streams	175
4.7.1	Frequency and Percentage in the English Language Learning Scores of Students studying in Government and Private Schools	177

	LIST OF ABBREVIATION
UNESCO	United Nations Educational, Scientific and Cultural Organization
ICT	Information and Communication Technology
TAM	Technology Acceptance Model
UTAUT	Unified Theory of Acceptance and Use of Technology
DOI	Diffusion of Innovations
SAMR	Substitution, Augmentation, Modification, and Redefinition
TPACK	Technological Pedagogical Content Knowledge
SDT	Self-Determination Theory
ZPD	Zone of Proximal Development
LAD	Language Acquisition Device
DLS	Digital Literacy Scale
TIS	Technological Integration Scale
LAS	Learners' Autonomy
NBSE	Nagaland Board of School Education
CBSE	Central Board of School Education
CISCE	Council for Indian School Certificate Examinations
RTE	Right to Education
NECTAR	North East Centre for Technology Application and Reach
NU	Nagaland University
NEP	National Education Policy
SWAYAM	Study Webs of Active-Learning for Young Aspiring Minds.
SLEC	State Level Executive Committee
DIKSHA	Digital Infrastructure for Knowledge Sharing
MeitY	Ministry of Electronics and Information Technology
ELT	English Language Teaching
ELL	English Language Learning
NCF	National Curriculum Framework
NCFTE	National Curriculum Framework for Teacher Education
DISHA	District Development Coordination and Monitoring Committees
NDLM	National Digital Literacy Mission
PMGDISHA	Pradhan Mantri Gramin Digital Saksharta Abhiyan

GPU	Graphics Processing Unit
EFL	English Foreign Language
CML	Computer Mediated Learning
USA	United State of America
AI	Artificial Intelligence
AR	Augmented Reality
VR	Virtual Reality
NPTEL	National Programme on Technology Enhanced Learning
GDP	Gross Domestic Product
UK	United Kingdom
OECD	Organisation for Economic Co-operation and Development
IoT	Internet of Things
COVID-2019	Coronavirus Disease 2019
STEM	Science, technology, engineering, and mathematics
ML	Machine Learning
CALL	Computer Assisted Language Learning
PBL	Project-based learning
L1	first language
CEFR	Common European Framework of Reference for Languages
CLIL	Content and Language Integrated Learning
EoR	Ecology of Resources
DCP	digital collaboration platforms
EST	Elementary School Teacher
DST	digital story telling
MALL	Mobile- Assisted Language Learning
Hr.	Higher
Sec.	Secondary
GHSS	Government Higher Secondary School
St.	Saint
UGC	University Grant Commission
N	Number of samples
DF	Degrees of Freedom

S. D	Standard Deviation
ANOVA	Analysis of Variance
SPSS	Statistical Package for social science
MS	Microsoft
PDF	Portable Document Format
BBC	British Broadcasting Corporation
S. E	Standard Error
SS	Sum of Squares
MS	Mean Square

CHAPTER-I

INTRODUCTION

English is often regarded as the global lingua franca, pivotal in communication, education, and professional development. As societies evolve, so do the demands placed on language learners, particularly in educational settings. In Nagaland, located in the northeastern region of India, higher secondary school students are no exception to this evolving linguistic landscape.

Language is a vehicle of articulation of thoughts and notions. It enables our inner hidden feelings and emotions to find a way out and channelizes those through verbal or non-verbal cues or clues. Language provides identity to the speaker by means of associating him/her with the symbols used for speaking in the same community. It serves as a medium of construction of knowledge. Thus, language has a special place in human life. According to Bloch and Trager, when vocal sounds that are produced by the individuals attach some meanings as per a culture or social system, it becomes a language for that society or social system (Baruah, 2006).

According to Jespersen, language is used for the conveyance of our ideas and emotions. It gives an impetus for transmitting beliefs (Jespersen, 1904). According to Dwight Bolinger, language is a special attribute of human beings that joins various civilizations. Thus, it connects human societies like a thread.

Emphasizing the role of language in human life, Batley et al. (1993), in a report for UNESCO, mentioned that language education is a continuous process of life, and it is meant for life. Language is a crucial aspect of human accomplishment.

1. Conceptual Framework

In an era where digital technologies play a pivotal role in global communication, having digital literacy is paramount for accessing vast online language resources and interactive tools. Technological integration, as emphasized by educational researcher Puente (2010), ensures that technology is not just an add-on but an integral part of the learning process. Educators in Nagaland can provide engaging, interactive, and immersive language learning experiences by incorporating technology effectively in English language classrooms. Additionally,

fostering learner autonomy, as advocated by researchers like Benson (2011), empowers students to take charge of their language-learning journeys. This approach is crucial, as it encourages self-motivation and helps learners adapt to various language acquisition opportunities presented by digital resources and tools. Together, digital literacy, technological integration, and learner autonomy create a dynamic, effective learning environment for English language learners in Nagaland, equipping them with the skills they need for success in an interconnected, digital world.

1.1 Digital Literacy

Digital literacy is more than just knowing how to use a computer or navigate the internet. At its core, it is the blend of technical skills, critical thinking, and ethical awareness needed to thrive in today's digital world. According to Kammer and Hays (2023), digital literacy involves the ability to communicate, evaluate, and interpret digital information, as well as to navigate websites and understand the significance of these skills in everyday life. This perspective was echoed by Paul Gilster (1997), who first emphasized that digital literacy is about understanding and using information in multiple formats from a wide variety of sources, especially as presented via computers and the internet. It requires both cognitive and technical skills to understand and use information from diverse sources presented via computers. (Anjaiah, 2016).

According to Farias-Gaytan et al. (2023), in educational settings, fostering digital literacy is seen as essential for preparing students and professionals to participate fully in society and the workforce, bridging the digital skills gap that persists in many communities. Ultimately, digital literacy is not a static skill set but a dynamic and evolving competency, shaped by ongoing technological advances and the changing needs of society (Kammer and Hays, 2023; Farias-Gaytan et al., 2023).

1.1.1 Theoretical Framework of Digital Literacy

Digital literacy, as a concept, has evolved significantly over the past few decades. Initially centered on basic computer skills, it now encompasses a broader set of competencies required to navigate the increasingly digital world. The

theoretical foundation of digital literacy is grounded in multiliteracies theory (Cazden et al., 1996), which emphasizes the diversity of literacy practices shaped by culture, context, and technology. This view says that literacy is no longer just being able to read and write in print. It also means being able to understand, create, and share information using digital and multimedia platforms. Bawden (2008) expands on this, identifying digital literacy as the ability to effectively find, evaluate, use, and create information using digital technologies. He emphasizes key components such as information literacy, ICT skills, media literacy, and critical thinking, showing that digital literacy is both a technical and cognitive process. Jenkins et al. (2009) further offer a participatory framework, suggesting that digital literacy involves social engagement, collaboration, and the ability to contribute content within digital environments. This view aligns with constructivist learning theories, which propose learners should construct knowledge through active involvement with content and digital tools. Collectively, these theories situate Digital literacy as a dynamic and context-dependent set of skills that not only empower individuals to interact with digital content but also enable meaningful participation in a digitally driven society.

1.1.2 Components of Digital Literacy

According to Reddy et al. (2023), Digital literacy includes a number of key literacies such as information, computer, media, communication, visual, and technological. Each of these components contributes to a person's capacity to locate, analyze, evaluate, and create information using digital tools. These components were adopted from (Reddy et al., 2021; Reddy et al., 2022). They are:

Information Literacy: It is the ability to locate, access, and critically evaluate information from various sources. In today's digital age, this means knowing how to use search engines, digital libraries, and databases, as well as being able to judge the credibility and relevance of online content. Information literate individuals can distinguish between reliable and unreliable sources, avoid misinformation, and synthesize information for personal, academic, or professional use.

Computer Literacy: It refers to a person's proficiency in using computers and related technologies. This includes basic skills such as operating a computer, managing files, using productivity software (like word processors and spreadsheets), and

understanding how to troubleshoot common technical issues. It forms the foundation for engaging with more complex digital tasks and platforms.

Media Literacy: It is the capacity to access, analyze, evaluate, and create messages in a variety of forms, including text, images, audio, and video. It involves understanding how media messages are constructed, recognizing bias or manipulation, and being able to produce content that communicates ideas clearly and ethically. It is essential for participating in social media, interpreting news, and engaging with digital storytelling.

Communication literacy: Communication literacy involves using digital tools to interact, collaborate, and share information with others. This includes skills such as composing emails, participating in online forums, using instant messaging apps, and engaging in video conferencing. Effective communication literacy also requires understanding digital etiquette, privacy considerations, and the ability to adapt messages for different audiences and platforms.

Visual literacy: It is the ability to interpret, understand, and create visual content. In the digital context, this means making sense of infographics, charts, diagrams, and images, as well as designing visual materials that effectively convey information. It helps individuals decode visual messages and use visuals to enhance communication and learning.

Technological literacy: It encompasses the knowledge and ability to use, manage, and assess a range of digital technologies. This includes understanding how various devices, software, and applications work, staying updated with technological advancements, and making informed choices about adopting new tools. It supports adaptability and lifelong learning in an ever-evolving digital landscape.

1.1.3 Factors Influencing Digital Literacy

Digital literacy is shaped by a combination of individual, social, and contextual influences. Understanding the factors that influence Digital literacy is crucial for designing effective educational strategies and fostering meaningful participation in the digital age. Key influences identified by the various studies include the following:

Socioeconomic Status: Socioeconomic background plays a significant role in digital literacy. Students from families with higher income, better parental

education, or greater social capital are typically more exposed to technology and digital tools. This expanded exposure fosters familiarity, motivation, and confidence in digital environments (Rui and Attan, 2024; Lukáč et al., 2025).

Access to Technology: Regular and reliable access to devices such as computers, tablets, and smartphones as well as high-speed internet is a major determinant of digital literacy. Those with better access tend to develop stronger skills, as they have more opportunities for practice and exploration (Rui and Attan, 2024). Merely providing digital tools is not sufficient, however, effective educational support and purposeful integration are needed for meaningful skill development (Lukáč et al., 2025).

Educational Interventions and School Environment: Programs that explicitly teach digital literacy skills, either as stand-alone courses or integrated into the curriculum, have a clear positive impact. Innovative teaching methods, ongoing instructional support, and a culture of digital experimentation in schools help students acquire and refine their digital competencies (Rui and Attan, 2024; Rong and Yang, 2024).

Technical and Cognitive Skills: A person's technical proficiency, including basic computer operation and effective use of software, is foundational for digital literacy. However, cognitive skills such as critical thinking, media analysis, and information evaluation are even more influential. The ability to critically assess digital content and navigate complex online environments is increasingly recognized as the dominant factor behind strong digital literacy (Dewi et al., 2021).

Demographic and Cultural Factors: Demographic characteristics, including age, gender, educational attainment, and cultural or community norms, influence digital literacy levels (Del Pilar Arias López et al., 2023; Koch and Fehlmann, 2024). Younger individuals or those with higher education often exhibit greater digital proficiency, though generational gaps and rural/urban divides remain (Hussain and Phulpoto, 2024; Sharma, 2024). Cultural attitudes toward technology and institutional support structures also play a moderating role (Dalle et al., 2024).

Motivation and Attitudes: Individual attitudes toward technology, such as interest, confidence, and perceived usefulness, affect the willingness to engage with digital tools. Learners motivated to experiment, solve problems, and seek information online are more likely to develop advanced digital skills over time (Rong and Yang, 2024; Xu et al., 2025).

Social Environment and Peer Influence: Social contexts, including peer networks and family members, can either accelerate or hinder digital literacy development. Sharing knowledge, troubleshooting together, or participating in digital communities supports skill growth. Parental engagement, especially in early years, offers foundational support (Xu et al., 2025; Rui and Attan, 2024).

1.1.4 Consequences of Digital Literacy

The growing prominence of digital literacy brings with it a force of significant consequences, profoundly shaping individuals and society. On the positive side, a strong foundation in digital literacy undeniably empowers learners, opening up avenues for enhanced academic performance, self-motivation, and critical thinking (Ibrahim and Aldawsari, 2023). Students who are digitally savvy can access a vast universe of information, engage in rich, interactive learning experiences, and collaborate with peers across geographical boundaries, fostering a more dynamic and personalized educational journey (Ertmer and Ottenbreit-Leftwich, 2010). This proficiency also builds crucial 21st-century skills highly valued in the workforce, preparing individuals for an increasingly digitalized job market and lifelong learning. Furthermore, it cultivates informed citizens, enabling individuals to critically evaluate information, participate in civic discourse, and even manage personal finances more effectively (Buckle, 2024; Voogt and Roblin, 2022). However, the flip side of this digital coin presents considerable challenges. A lack of digital literacy can lead to significant disadvantages, exacerbating existing educational and socio-economic inequalities, often referred to as the "digital divide." Students with low digital literacy may struggle to access online educational resources, participate in collaborative learning environments, or even communicate effectively in a technology-driven world (Kloza, 2023; Allvia, 2024). This can hinder academic progress and limit future opportunities (Herrera, 2025). Moreover, the digital landscape, while rich with information, also teems with misinformation, disinformation, and online risks like cyberbullying or fraud (Gunadi et al., 2023). Without robust digital literacy skills, individuals are more vulnerable to these harms, struggling to discern credible sources or protect their online privacy (Bandura and Leal, 2024; Mishra, 2025). Therefore, while the benefits are immense, the consequences of uneven

digital literacy necessitate careful attention to ensure equitable and safe participation for all.

1.2 Technological Integration

Technological integration involves weaving digital tools and resources into everyday processes to enhance productivity, creativity, and problem-solving across learning or professional environments. Rather than using technology as a one-off or isolated intervention, integration encourages its routine and meaningful use to meet specific goals (Rathore and Sonawat, 2015). For instance, teachers might blend interactive media, cloud-based platforms, or advanced applications to deepen understanding and foster richer learning experiences. The process is guided by the principle that technology should serve as a bridge to curricular outcomes, supporting traditional methods rather than replacing them outright (Ruiz, 2025).

Technological integration extends beyond simple access to devices; it focuses on how thoughtfully they are used to enable collaboration, support critical thinking, and empower learners or teams to achieve more (Wikipedia, 2025). For this reason, successful integration is marked by seamlessness, technology becomes as natural and essential as a pen or notebook, accessible to all and tailored to diverse needs (Lavanya, 2025).

1.2.1 Theoretical Framework of Technological Integration

The Technology Acceptance Model, introduced by Davis (1989), centers on the idea that two beliefs, perceived usefulness and perceived ease of use are primary drivers of whether educators and students embrace new technology. In schools, when teachers recognize that a digital tool can enhance instruction and do not find it difficult to use, they are more inclined to adopt it in their teaching practice. Expanding on TAM, Venkatesh et al. (2003) developed the Unified Theory of Acceptance and Use of Technology (UTAUT), which incorporates additional factors such as social influence and facilitating conditions. This model underscores how the willingness of educators to implement technology depends not only on personal attitudes but also on the encouragement from peers, organizational support, and the availability of training or resources. Diffusion of Innovations Theory (DOFT) (Rogers, 2003) provides a broader sociological perspective on how new

ideas and technologies are propagated within educational institutions. Adoption is seen as a process, with early adopters and champions playing crucial roles in setting examples for their colleagues. The model highlights how relative advantage, compatibility, and opportunities for trial all shape how quickly educational technologies are embraced. Puentedura's SAMR model 2006, offers a practical lens for evaluating the depth of Technological Integration. SAMR stands for Substitution, Augmentation, Modification, and Redefinition. At the lower end, technology replaces existing practices with functional improvements (e.g., typing instead of writing by hand), while the upper levels enable fundamentally new and transformative learning experiences, such as creative multimedia collaborations that would be impossible without digital tools (Puentedura, 2013). The Technological Pedagogical Content Knowledge (TPACK) framework (Mishra and Koehler, 2006) argues that the most effective Technological Integration occurs when teachers possess balanced expertise in three areas: content knowledge (the subject), pedagogical knowledge (teaching methods), and technological knowledge (digital tools). TPACK stresses the importance of merging these domains, ensuring that technology use meaningfully intersects with pedagogy and content to support deeper student learning. These theories help in explaining not only the practical implementation of technology but also the complex interactions between educational, social, and pedagogical factors that are essential for significant, sustainable enhancements in teaching and learning.

1.1.2 Components of Technological Integration

Integrating technology into educational environments is no longer a mere option, it has become a foundational practice that redefines how teaching and learning occur (Rogers, 2000). To implement technology effectively, it is essential to understand the key components that influence and shape this integration. These components form a holistic framework that ensures meaningful and sustainable technological use in academic settings.

Digital Tools and Resources: The availability of adequate infrastructure, such as high-speed internet, digital devices, and reliable technical support, is the bedrock of any successful Technological integration initiative. Without it, even well-intentioned efforts falter. As emphasized by Ertmer and Ottenbreit-Leftwich (2010), the presence

of functional hardware and software, together with stable connectivity, creates the material conditions required for instructional technology to thrive.

Professional Development: Teachers play an integral role in the integration process, acting as the bridge between technology and students. Their beliefs, skills, and confidence in using digital tools significantly impact the quality of implementation. Ongoing professional development that goes beyond one-time training sessions and instead offers continuous, context-specific support enables educators to embed technology naturally into their pedagogy (Koehler & Mishra, 2009).

Pedagogical Approaches: Technology should not be used for its own sake; rather, it needs to align with pedagogical goals. When technology complements instructional strategies supporting student-centered learning, promoting collaboration, and encouraging critical thinking, it adds real value (Børte and Lillejord, 2024). The Technological Pedagogical Content Knowledge (TPACK) framework encapsulates this alignment, emphasizing the intersection of content expertise, pedagogical methods, and technological proficiency (Mishra & Koehler, 2006).

Leadership and Institutional Support: Administrative leadership and institutional vision significantly influence the success of technological integration. When school leaders actively promote digital literacy and provide clear goals and resources, they cultivate a culture of innovation (Tagscherer and Carbon, 2023). Fullan (2016) remarks that transformational leadership is essential in creating an environment where technology is not only available but used meaningfully to support educational outcomes.

Student Engagement and Equity: Another essential component is the extent to which technology enhances student engagement and equitable access to learning opportunities. Integrative strategies should strive to bridge the digital divide, ensuring all learners, regardless of socioeconomic background, benefit from digital innovations (Ahuja, 2023). According to Warschauer and Matuchniak (2010), addressing issues of access and inclusion is vital in creating equitable and impactful learning environments.

Assessment and Feedback: Lastly, regular assessment of Technological Integration helps identify what works and what requires adjustment. Feedback from students and teachers, usage data, and performance metrics provide valuable insights into the effectiveness of digital tools and practices. As stated by Puentedura (2010), employing frameworks like SAMR (Substitution, Augmentation, Modification, Redefinition) enables institutions to evaluate their progress toward transformative use

of technology.

1.2.3 Factors Influencing Technological Integration

Our individual beliefs and self-efficacy (Bandura, 1986) profoundly shape user competency and willingness to engage with the technology itself. Moreover, robust organizational support and accessible infrastructure (Hew & Brush, 2007) are crucial, enabling genuine pedagogical or process alignment and ultimately determining whether integration truly flourishes or falters. Fostering upon the above core components, the success of technological integration often hinges on a delicate interplay of influencing factors:

Individual Beliefs and Attitudes: People's personal perceptions of technology's usefulness, their enthusiasm, or their apprehension significantly dictate their willingness to engage (Ertmer & Ottenbreit- Leftwich, 2010). A positive mindset can be a powerful driver.

Perceived Usefulness and Ease of Use: Drawing from the Technology Acceptance Model (Davis, 1989), if a technology is seen as genuinely beneficial and relatively simple to operate, its adoption rate tends to be much higher. Conversely, complex or seemingly irrelevant tools face considerable resistance.

Time and Resources: The availability of dedicated time for learning and experimentation, along with access to necessary financial and material resources, directly impacts the depth and breadth of integration (Tsotetsi, 2021).

Peer Influence and Collaboration: According to Zamiri and Esmaeili (2024), the experiences and practices of colleagues and peers can powerfully shape an individual's readiness to adopt new technologies. Collaborative learning opportunities often accelerate integration.

Curriculum/Workflow Demands: The pressure of existing curricula or workflow requirements can either necessitate technological solutions or leave little room for experimentation, thereby influencing the pace and nature of integration (Stach et al., 2021).

1.2.4 Significances of Technological Integration

The significance of technological integration is far more than just adopting new

tools, it's about unlocking profound possibilities for growth, efficiency, and human potential. The true value lies in how technology, when thoughtfully woven into our activities, can fundamentally change how we learn, how we work, and how we connect, often in ways that traditional methods simply cannot achieve. It's akin to moving from drawing with charcoal to painting with a full palette of vibrant colours the possibilities for expression and impact are vastly expanded (Iansiti and West, 1997; Ahmad et al., 2024). Below are the reason why effective technological integration truly matters:

Enriching Learning and Boosting Productivity: At its heart, well-integrated technology acts as a powerful enhancer (Panakaje et al., 2024). In educational settings, it can transform passive learning into active exploration, allowing students to engage with complex concepts through simulations, virtual labs, or interactive multimedia (Bit et al., 2024). In professional environments, it streamlines workflows, automates repetitive tasks, and facilitates rapid data analysis, ultimately freeing up valuable human capital for more creative and strategic endeavors (Paudel, 2024).

Igniting Engagement and Motivation: There is an undeniable allure to interactive and dynamic experiences (Manuel, 2025). Technology, when skilfully integrated, can capture attention and foster a deeper sense of involvement (Sharma, 2023). For learners, this might mean personalized feedback, gamified activities, or collaborative projects that transcend the physical classroom walls. For professionals, it could involve intuitive interfaces that make complex tasks feel manageable, or collaborative platforms that encourage shared problem-solving (Mertala et al., 2023; Stefanic, 2025).

Democratizing Access to Information and Resources: One of the most transformative significances is the unparalleled access technology provides to a vast ocean of knowledge (Ashikuzzaman, 2023). Geographical barriers diminish as online libraries, open educational resources, and global databases become readily available (Bates, 2015). This means that individuals, regardless of their immediate physical location, can connect with expertise, research, and diverse perspectives, levelling the playing field and fostering continuous learning beyond institutional confines (Hilton, 2021).

Cultivating Essential 21st-Century Skills: The world we live in is increasingly digital and interconnected (Kemp, 2025). Effective technological integration isn't just

about using tools; it's about developing critical skills like digital literacy, computational thinking, problem-solving, critical analysis of information, and effective online collaboration (Blume (2019). By providing authentic opportunities to navigate digital environments, analyze data, and communicate across platforms, we prepare individuals to thrive in complex, rapidly evolving professional and social landscapes (Yu et al., 2024).

Enabling Personalization and Differentiation: Every individual learns or works differently. Technology offers an incredible capacity to tailor experiences to unique needs and preferences. Adaptive learning platforms can adjust content difficulty based on real-time performance, while diverse digital tools allow for multiple pathways to demonstrate understanding or complete tasks (Rose and Meyer, 2002).

1.3 Learners' Autonomy

Learner autonomy has increasingly gained attention as a vital component of meaningful and lasting education. As contemporary pedagogy gradually moves away from traditional models centered on teacher-led instruction, emphasis is now placed on creating learning environments where students are actively involved in directing their educational journeys. Within this evolving educational landscape, learner autonomy stands out as a transformative concept that fosters independent thinking, self-motivation, and deeper engagement (Little, 2006; Vázquez, 2016).

Well defined by Holec (1981) as the ability and readiness of learners to take charge of their own learning, autonomy includes setting personal learning goals, choosing effective strategies, monitoring one's own progress, and evaluating outcomes. However, autonomy does not suggest total independence or learning in isolation. Rather, it thrives within a dynamic balance between structured support and learner freedom. As Little (1991) explains, autonomous learners often rely on both instructor guidance and peer interaction to refine their approaches and gain confidence. Autonomy in this sense is a skill that can be nurtured over time, especially when learners are given the space and support to gradually assume responsibility.

1.3.1 Theoretical Framework of Learners' Autonomy

These foundational frameworks provide the intellectual structure for understanding why autonomy is critical for deep, meaningful learning and how it can

be cultivated. The primary theoretical pillars supporting learner autonomy are constructivism, *Self-Determination Theory*, and sociocultural learning theories.

Learners' Autonomy is an expression of constructivist learning theory. Constructivism emphasizes that learners are not passive vessels waiting to be filled with knowledge, but are active agents who build, or "construct," their own understanding through experience and interaction with their environment (Qi, 2012; Wang (2011). Early educational philosophers like John Dewey emphasized learning through experience and problem-solving, ideas that place the learner at the center of the educational process (Qi, 2012). This perspective naturally aligns with autonomy, as it presupposes that for learning to be effective, individuals must be mentally and actively engaged, taking initiative and making connections for themselves. The goal within this framework is to foster independent thinkers who can build their own understanding through active learning experiences (Chatterjee, 2016)

Self-Determination Theory (SDT), by Deci and Ryan (2000) proposes that all humans have three innate psychological needs that are essential for motivation and well-being: Autonomy, the need to feel in control of one's own behaviors and goals. Competence, the need to feel capable and effective in one's actions. Relatedness, the need to feel a sense of belonging and connection with others (Lee, 2025; Hoose, 2020). According to SDT, when these needs are met, particularly the need for autonomy, individuals are more likely to be intrinsically motivated, meaning they engage in activities for the inherent satisfaction and interest rather than for external rewards or pressures (Cherry, 2024; Lee, 2025).

Sociocultural learning theories, particularly the work of Vygotsky and Cole (1978), highlight the crucial role of social interaction in cognitive development. Vygotsky's concept of the Zone of Proximal Development (ZPD) is especially relevant. The ZPD refers to the gap between what a learner can accomplish independently and what they can achieve with guidance from a more knowledgeable other, such as a teacher or a peer (McLeod, 2025). This concept is foundational to developing autonomy because it provides a model for how independence is built. Through a process known as scaffolding, the instructor provides support that is gradually withdrawn as the learner's competence grows (Main, 2023). This guided practice within the ZPD allows the learner to internalize skills and strategies, eventually enabling them to perform the task autonomously (Cherry, 2024)

Collectively, constructivism, Self-Determination Theory, and Vygotsky's

sociocultural theory offer a well-rounded understanding of learner autonomy. They highlight that autonomy is both motivational and developmental, driven by intrinsic needs, built through active learning, and supported by social interaction (Deci & Ryan, 2000; Vygotsky and Cole, 1978). This integrated perspective positions autonomy as essential for nurturing students into motivated, independent, and lifelong learners.

1.3.2 Components of Learners' Autonomy

Learners' autonomy is more than a learner's independence, it is a blend of self-direction, reflective practice, and constructive collaboration. Learners' Autonomy empowers students to become active participants in their educational journey, giving them the tools to navigate beyond simply following instructions toward meaningful self-governance in learning (Reinders and White, 2011). The development of Learners' Autonomy can be understood through several interconnected components, each contributing to a strong and dynamic process.

Goal Setting and Planning: A defining characteristic of autonomous learners is their ability to set personal, meaningful learning goals. By taking initiative to define their learning objectives, students gain a sense of direction and purpose in their educational endeavors. This planning phase encourages learners to identify their interests, pinpoint strengths and areas for growth, and organize their efforts to maximize outcomes (Xu, 2024; Ochoa, 2025).

Self-Directed Learning: Autonomous learners develop, select, and apply diverse strategies tailored to different contexts. This includes choosing suitable study methods, managing time effectively, and seeking resources as needed. Self-regulation, the ability to monitor progress, adjust strategies, and remain motivated is critical for autonomy, fostering resilience when faced with challenges (Melvina and Julia, 2021; Ochoa, 2025).

Motivation and Evaluation: Reflection is at the heart of autonomy. Learners regularly assess their progress, critically evaluate outcomes, and adjust plans accordingly. This reflective loop transforms experiences into deep, personalized knowledge. Students who cultivate habits of self-assessment are more likely to sustain motivation, recognize success, and address gaps in understanding (Little, 2006; Xu, 2024).

Metacognition: Learners' autonomy integrates several interconnected

dimensions. Cognitive autonomy: capacity to make decisions about learning content and processes, enabling independent thinking and critical analysis (Ochoa, 2025; Melvina and Julia, 2021). Affective autonomy: emotional resilience, intrinsic motivation, and confidence, all of which fortify students' determination to persist in learning (Melvina and Julia, 2021). Behavioural autonomy: active management of actions such as resource seeking, time management, and participation in collaborative situations (Ngath et al., 2024).

Social and Collaborative Engagement: While autonomy often evokes images of individualized learning, genuine autonomy also involves active collaboration. Autonomous learners value opportunities to exchange ideas, learn from peers and mentors, and contribute meaningfully to group tasks (Cullen and Oppenheimer, 2024). This social dimension enriches understanding, balances self-direction with interdependence, and reflects real-world learning environments (Melvina and Julia, 2021).

Teacher's Role and Supportive Environment: Autonomy flourishes when teachers act as facilitators rather than authoritative sources. By encouraging learner agency, providing structured opportunities for choice, and modelling reflective practices, educators help sustain an environment where autonomy can grow (Little, 2006; Ngath et al., 2024).

1.3.3 Factors Influencing Learners' Autonomy

The concept of Learners' Autonomy centers on students' ability to manage their own learning, make informed decisions, and take responsibility for their educational growth. Multiple factors, both internal and external, interact to influence the development and expression of autonomy (Tran and Vuong, 2022).

A) Internal Factors

Motivation and Attitude: A learner's internal willpower and personal drive are essential. Students who are intrinsically motivated driven by a genuine interest in learning tend to exhibit higher autonomy. On the other hand, those who lack confidence or believe they are incapable may avoid taking responsibility for their learning, which hampers autonomy (Kemala, 2016; Nguyen et al., 2024; Al-Khasawneh et al., 2024).

Psychological Aspects: Elements such as anxiety, self-efficacy, and self-

regulation shape how willing and capable students are to take control of their learning. Self-efficacy, or belief in one's abilities, fosters persistence and resilience, helping learners navigate new challenges and adapt to setbacks (Tran and Vuong, 2022; Al-Khasawneh et al., 2024).

Learning Strategies: The use of cognitive (e.g., summarizing, organizing information) and metacognitive strategies (e.g., planning, monitoring progress) makes a notable difference. Students who proactively employ these approaches tend to structure and assess their own learning more effectively (Trinh, 2024; Al-Khasawneh et al., 2024).

B| External Factors

Teacher's Role and Teaching Methods: Teachers are central to nurturing autonomy. Approaches that encourage active participation, provide constructive feedback, and gradually transfer responsibility to students can help learners become more self-directed. When teaching is too prescriptive or "spoon-feeding," it can restrain autonomy (Basri, 2020).

Learning Environment: The setting in which learning occurs, including physical resources, access to technology, and the broader school climate serves as a foundation or barrier to autonomy (Ngath and Eong, 2024; Xu, 2024). Supportive and resource-rich environments cultivate independence, while restrictive or resource-poor settings may limit learners' abilities to experiment, explore topics, and self-pace their studies.

Parental and Social Support: Families, peers, and community attitudes play a key role. Encouragement from parents, interactions with supportive peers, and a culture that values self-directed learning all contribute to students' confidence and motivation to manage their own learning (Ngath and Eong, 2024; Kemala, 2016; Josephine et al., 2025).

Cultural Norms and Expectations: Local cultural values around education can either promote or hinder learner autonomy. In some contexts, passive learning is expected, while in others, independence and initiative are encouraged. The interaction of expectations between teachers and students concerning roles and responsibilities also matters (Basri, 2020; Ngath and Eong, 2024).

1.3.4 Consequences of Learners' Autonomy

Developing autonomy in learners holds comprehensive effects that extend far beyond the confines of classroom walls. When students are encouraged to take charge of their own educational journey, the results can be transformative, shaping not just academic outcomes, but also mindset and social development (Boud, 2012).

Improved Academic Achievement: Autonomous learners typically demonstrate stronger academic performance. These students are able to set personal learning goals, manage their time effectively, and seek out resources to deepen their understanding. Contemporary research has shown a positive link between autonomy and subject mastery, including improvements in high-stakes exam performance and a greater willingness to tackle challenging assignments (Megalokonomou and Goulas, 2021; Cullen and Oppenheimer 2024; Ng et al., 2011).

Enhanced Motivation: The act of making meaningful choices in their education increases learners' intrinsic motivation. Students who feel empowered in this way show a greater commitment to learning tasks, are more persistent in overcoming academic challenges, and often invest more time in their studies (Jehanghir et al., 2023; McCombs, 2012).

Development of Self-Regulation: Autonomy fosters skills such as self-reflection, self-assessment, and goal-setting. These abilities help students monitor their progress and adapt their strategies, a foundation for becoming lifelong learners (Aldosari and Alsager, 2023).

Boosted Confidence and Self-Esteem: Through taking ownership of their learning, students build a strong sense of self-worth. They grow more confident in their capacities and are less likely to be discouraged by setbacks, as they learn to view challenges as opportunities for growth rather than insurmountable obstacles (Meenakshi, 2016).

Greater Resilience: Autonomous students tend to develop grit and resilience. These qualities enable them to persist in the face of difficulties and to rebound from failure with determination and optimism (Jehanghir et al., 2023; Namaziandost et al., 2024).

Enhanced Social Interaction: Fotiadou et al., (2017) reveals that increased Learners' Autonomy can positively influence peer and tutor interactions, particularly

in settings such as distance education. As students become more responsible for their own learning, they often participate more actively in academic discussions and collaborations.

Preparation for Independent Learning Fostering autonomy sets the stage for students to transition smoothly into roles that demand independent learning whether in higher education, professional environments, or personal development. It empowers them with the habits and mindsets needed to adapt to new learning situations across their lifespan (Aldosari and Alsager, 2023).

Well-being and Engagement: There are notable links between autonomy in learning and students' overall well-being. When students perceive that they have agency, their engagement and enthusiasm for education tend to rise, which can lead to improved mental health and satisfaction with their learning experience (Cullen and Oppenheimer, 2024).

Though most consequences of Learners' Autonomy are positive, it is important to acknowledge potential challenges. Not all students will initially possess the skills or mindsets needed to thrive in autonomous learning environments. Some may need structured support as they adjust to greater independence. Educators play a crucial role in scaffolding this transition and ensuring that autonomy does not become synonymous with isolation or lack of guidance (Kumar, 2025; Meenakshi, 2016)

1.4 English Language Learning

Language learning, whatever way it occurs, in a naturalistic manner or an instructed context, takes time and is a laborious process (Ellis, 2008). English language learners are those whose primary language is one other than English (Diaz-Rico, 2013). Often, a language difference may lead to difficulty in speaking, reading, and writing in the English language and poor overall academic achievement (Bowman-Perrott et al., 2010).

English language learning revolves around developing communicative competence, which equips learners to understand, use, and express themselves effectively in the English language (Vorwerk, 2015). This concept strongly emphasizes meaningful communication, encouraging learners to use real-life language through listening, speaking, reading, and writing. It incorporates a balanced approach to skill development, focusing on grammar, vocabulary, and cultural understanding

within authentic language situations. Moreover, it recognizes the importance of creating a motivating and culturally inclusive environment where learners take ownership of their language journey and are encouraged to set and achieve their language learning goals (Hossain, 2024; Shaddad and Jember, 2024).

1.4.1 Theoretical Framework of English Language Learning

English language learning is a multi-faceted journey, shaped by a blend of psychological, social, and contextual factors (Zhao et al. (2024). A strong theoretical framework not only guides effective teaching but also enables learners to understand their own progress (Alabi, 2024). Integrating key theories provides a holistic approach, supporting a range of learners in diverse environments.

A] Foundational Theories of Language Acquisition

Behaviourist Theory: Skinner, (1957) proposes that language learning stems from habit formation through imitation, practice, and reinforcement. Learners mimic what they hear, and positive reinforcement from teachers and peers encourages repetition and mastery (Hulatt and Freitas, 2022).

Nativist Theory: This theory, which was advocated by Noam Chomsky, emphasizes that individuals are born with an inherent sense to acquire language, which is as the result of an inbuilt "Language Acquisition Device" (LAD). This internal mechanism allows learners to grasp complex grammatical structures that would be difficult to learn solely through imitation (Vetter and Howell, 1971).

Cognitive Theory: This theory, propagated by Jean Piaget, views language acquisition as an integral component of cognitive development. As children go through developmental stages, they construct meaning, with language developing concurrently with their understanding of the environment (McLeod, 2018). Learning activities are structured around problem-solving and discovery, with language acquisition deeply intertwined with other cognitive processes (Pakpahan and Saragih, 2022).

Interactionist (Sociocultural) Theory: Vygotsky, (1978), emphasize that language learning happens in a social context. Through interactions with teachers, peers, and the broader community, learners internalize language and develop communicative competence. Collaborative projects, group discussions, and meaningful real-world communication form the heart of the classroom, highlighting

that learning is a shared, social experience. (McLeod, 2018; Mahn and John-Steiner, 2012).

B| Modern Extensions and Integrated Approaches

Input Hypothesis (Krashen): Stephen Krashen's Input Hypothesis (1982) maintains that learners acquire a new language best when they are exposed to what he calls "comprehensible input" that is, language that is slightly beyond their current level of understanding (often described as "i+1"). Krashen argues that if learners are placed in environments where they hear or see meaningful and understandable language in relevant context, they will naturally absorb new vocabulary, grammar, and language structures over time (Krashen, 1982).

Output Hypothesis (Swain): While Krashen focused primarily on input, Merrill Swain (1985) highlighted the equally important role of output. According to Swain's Output Hypothesis, learners deepen their command of a language when they are given regular opportunities to produce it through speaking, writing, or dialogue. The act of producing language forces learners to process linguistic forms more carefully and grapple with what they do or do not know. Furthermore, Swain suggested that output has a "pushed" function. When learners attempt to express complex ideas, they are often pushed to re-organize or refine their language choices. This process leads to increased fluency and accuracy, especially when followed by meaningful feedback from teachers or peers (Swain, 1993). Thus, a classroom rich in both interaction and corrective support helps students become more conscious of their language limitations and encourages them to self-correct and improve.

Eclectic and Task-Based Approaches: There is increasing recognition that no single theory or method can address the wide range of learner backgrounds, needs, and contexts. That is why many educators today adopt an eclectic approach drawing on multiple theoretical frameworks and adjusting them according to what works best in a given classroom situation (Larsen-Freeman, 2000). Closely related to eclecticism is the task-based approach, which organizes instruction around real-world tasks rather than isolated linguistic elements. These tasks such as writing an email, planning a trip, or conducting a survey require learners to use English purposefully and collaboratively. Task-based learning encourages autonomy, communication, and problem-solving, aligning well with modern understandings of how languages are acquired effectively

(Ellis, 2003).

These modern approaches enrich English Language Learning by balancing input and output, emphasizing the learner's active role, and tailoring instruction to a variety of real-world needs. They reflect a more human-centered understanding of language development one that bridges theory and practice while acknowledging learners as unique individuals navigating an ongoing journey of discovery.

1.4.2 Components of English Language Learning

Achieving competency in English depends on a combination of interconnected components (Ernst-Slavit and Mulhern, 2003). Each component contributes to enhancing a learner's ability to comprehend, use, and value the language in authentic settings. Rather than existing in isolation, these components actively interact in every classroom and discussion, promoting both preciseness and fluency.

A) Core Language Skills

English, like most languages, is centered on four foundational skills:

Listening: This is where much of our language acquisition begins. This receptive skill involves understanding spoken English, picking up on sounds, rhythms, intonation, and meaning (Richards, 2008). Effective listening is the gateway for new vocabulary and grammar structures, forming the base for accurate language use (Singca, 2024).

Speaking: As a productive skill, speaking allows learners to put knowledge into practice by expressing thoughts, sharing ideas, and interacting. Pronunciation, fluency, and intonation are refined through regular conversation and oral practice (Bygate et al., 2013).

Reading: Through reading being a receptive skill, learners engage with written language, expanding vocabulary, understanding sentence structure, and developing comprehension strategies such as skimming and scanning (Grabe and Stoller, 2013).

Writing: Writing as a productive skill requires organizing ideas logically and using correct grammar and vocabulary. It enhances creative and formal expression ranging from text messages to academic essays (Hyland, 2003).

B) Linguistic Elements

While the four primary language skills listening, speaking, reading, and writing form the foundation of English proficiency, they are supported by essential linguistic subsystems. These components work behind the scenes to enhance fluency, comprehension, and effective communication (Singca, 2024).

Vocabulary: Knowing a wide range of words and phrases empowers learners to express ideas more precisely. Vocabulary includes both everyday words and specialized terminology needed for academic or professional contexts (Nation, 2001).

Grammar: This backbone of language refers to the rules governing how words combine to form sentences. Grammar is crucial for clarity and correctness in both speech and writing Ur and Swan (2011).

Pronunciation: Accurate pronunciation includes mastery of individual sounds, but also the broader patterns of stress, rhythm, and intonation that define spoken English. As learners become more attuned to these features, their speaking becomes more intelligible and natural to native and non-native listeners alike (Gilbert, 2008).

Spelling: Especially important in writing, spelling supports accuracy and helps prevent misunderstandings. Strong spelling skills support confidence in writing and overall language accuracy (Cook and Cook, 2014).

C) Structural Components

A deeper understanding of English goes beyond just acquiring basic vocabulary and forming sentences, it involves grasping how the language is built from the inside out. These building blocks, known as the structural components of language, form the core of how English functions and is applied in communication. Together, they help learners move from simple language use to more precise, appropriate, and effective expression (Kim-Rich and Curwood, 2022).

Phonology: Phonology deals with the sound system of a language. In English, this includes everything from individual sounds (called *phonemes*) to broader patterns like stress, intonation, and rhythm. For language learners, understanding phonology is key to both clear pronunciation and accurate listening comprehension. Mispronouncing a single sound can change the meaning of a word (e.g., “ship” vs. “sheep”), making phonological awareness an essential skill in oral communication

(Yule, 2020).

Morphology: Morphology focuses on the structure of words, how they're formed and how they change to express different meanings. English words often consist of smaller units called *morphemes*, such as roots, prefixes (e.g., *un-*, *pre-*), and suffixes (e.g., *-ing*, *-ness*). Understanding morphology helps learners decode unfamiliar words and express grammatical meanings like tense, number, or comparison (Fromkin et al., 2018).

Syntax: Syntax refers to the set of rules that govern how words are arranged into phrases and sentences. English has a relatively fixed word order (typically subject–verb–object), and the placement of words heavily influences meaning. Mastery of syntax allows learners to construct coherent and grammatically accurate statements, which are crucial for writing clearly and speaking effectively (Finegan, 2015).

Semantics: Semantics is the study of meaning in language, how words, phrases, and sentences convey intended messages. It involves understanding synonyms, antonyms, word relationships, and broader concepts like literal and figurative meanings. A strong grasp of semantics equips learners with the ability to interpret content accurately and use language that expresses their ideas with precision (Murphy, 2010).

Pragmatics: Pragmatics deals with how language is used in real-world contexts. It teaches learners how to select the appropriate tone, formality level, and expressions based on the situation. For example, knowing when to say “Could you please help me?” versus “Help me out!” depends on Pragmatic understanding. This also includes interpreting implied meanings, idioms, humor, and cultural references skills that are essential for meaningful interaction in English-speaking environments (Yule, 2020).

1.4.3 Factors Influencing English Language Learning

Learning the English language is a deeply personal and socially embedded journey, shaped by a mosaic of internal and external factors. These influences can energize learners, present challenges, or create pathways to greater proficiency and confidence (Mahmoudi, 2015).

A] Internal Factors

Motivation and Attitude: Motivation acts as a driving force for learners. When individuals are intrinsically motivated or possess a positive attitude toward English, they're more likely to persist through challenges and enjoy the learning process. In contrast, students lacking confidence or interest may find it harder to make progress (Respati et al., 2022; Jaheer et al., 2024).

Psychological Traits and Emotional State: Elements such as anxiety, self-esteem, and risk-taking tendencies play a significant role. Learners with high anxiety often hesitate to use English, while those with strong self-efficacy and willingness to experiment generally advance more quickly. Emotional barriers like shyness or fear of making mistakes can hamper communication, but supportive classroom environments help to mitigate these effects (Jaheer et al., 2024; Nijat et al., 2019).

Cognitive Abilities and Aptitude: Intelligence, memory, and language aptitude, our capacity to pick up new systems and patterns, affect how swiftly and thoroughly someone acquires English. Some people grasp new structures or expand their vocabulary more quickly because of their cognitive strengths (Qiao, 2024; Mirhadizadeh, 2016).

Age and Previous Experience: Age is often linked to language flexibility, younger learners may develop native-like pronunciation more easily, while older students bring valuable strategies and life experiences to their studies. Prior exposure to English or other languages also shapes the learning trajectory (Deshmukh, 2024).

B| External Factors

Family and Socioeconomic Background: Support at home, including exposure to English and encouragement from family, can boost learners' progress. Socioeconomic status often determines access to tutoring, quality schools, or resources like books and media, which directly influence language outcomes (Zhao et al., 2024; Tawfiq, 2020).

Educational Environment and Teaching Methods: The classroom climate, size, curriculum design, and teacher expertise all play vital roles. Classrooms that foster collaboration, creative activities, and real-life communication build confidence and skill. Quality teaching methods, engaging materials, and constructive feedback help students develop fluency and accuracy (Tran et al., 2024; Respati et al., 2022).

Peer and Community Influence: Interaction with classmates, friendships with

native speakers, and participation in culturally diverse communities expose learners to more authentic English and varied perspectives. These social exchanges promote practical usage and cultural understanding, both crucial for genuine proficiency (Samiei, 2025; Tawfiq, 2020; Ozfidan et al. (2014).

Cultural and Sociocultural Context: Attitudes towards English within the learner's society whether seen as prestigious, necessary for success, or a foreign imposition shape motivation and effort. Cultural expectations surrounding classroom behavior, group work, and communication styles also play a role in how effectively one learns (Samiei, 2025; Tawfiq, 2020).

1.4.4 Significance of English Language Learning

Learning English, for many, is far more than just acquiring another skill; it's a profound, often life-altering transformation. The consequences of English language learning are like recognizing the powerful ripple effect a single stone can create in a vast pond. Proficiency in English opens doors, connects worlds, and empowers individuals in myriad ways, extending its influence across personal, academic, professional, and even societal spheres (Ball, 2024).

Expanded Educational Horizons and Opportunities: One of the most immediate and impactful consequences is the unparalleled access to global knowledge and higher education. English serves as the dominant language of academia, research, and scientific publication (Crystal, 2003). For learners, this means being able to pursue studies at international universities, access a vast array of online courses, engage with cutting-edge research, and participate in global academic discourse (Di Bitetti and Ferreras, 2016).

Enhanced Career Prospects and Economic Mobility: In an increasingly globalized economy, English proficiency has become a vital asset for career advancement. It often serves as the lingua franca in international business, diplomacy, tourism, and various professional sectors (Graddol, 2006). Individuals fluent in English are typically more competitive in the job market, have opportunities for international assignments, and can participate in global talent pools, potentially leading to improved economic standing and mobility (Ucl, 2023).

Facilitated Cross-Cultural Communication and Understanding: English acts as a powerful bridge between diverse cultures and linguistic backgrounds. Proficiency

allows individuals to communicate directly with people from around the world, fostering greater cultural understanding, empathy, and collaboration (Kirkpatrick, 2007).

Unrestricted Access to Information and Entertainment: A significant portion of the world's digital content, including websites, news media, scientific journals, films, music, and literature, is produced in English. Learners who acquire English proficiency gain direct access to this immense reservoir of information and entertainment without relying on translations (Crystal, 2003).

Cognitive Benefits and Mental Flexibility: Beyond purely linguistic gains, learning a second language, particularly English, has been linked to various cognitive advantages. Research recommends that it can enhance cognitive flexibility, problem-solving skills, multitasking abilities, and even delay the onset of age-related cognitive decline (Bialystok et al., 2012).

Personal Growth and Increased Confidence: The process of mastering English often leads to profound personal growth. Overcoming the challenges inherent in language learning can boost self-esteem, improve self-efficacy, and cultivate resilience (Dörnyei, 2014). Learners often report feeling more confident, more open to new experiences, and more connected to the wider world as their English skills develop. It's a journey that builds not just language, but character (Ball, 2024).

1.5 Integrated Theoretical Framework: Digital Literacy, Technological Integration, Learners' Autonomy, and English Language Learning

The foundation of this integrated framework lies Constructivism and Sociocultural Learning Theory (Qi, 2012; Vygotsky, 1978; Wang, 2011). These theories emphasizes that learners are not passive receivers but active architects of their own understanding. Knowledge is built as learners engage with their surroundings, collaborate with others, and experiment with new ideas and tools. This active process is fundamental to each of the following domains:

Digital Literacy: where individuals don't just consume but actively create, evaluate, and share information using digital tools (Jenkins et al., 2009).

Technological Integration: which, at its best, facilitates dynamic, active learning experiences impossible without digital engagement (Puentedura, 2013).

Learner Autonomy: where individuals take initiative in their learning journey,

actively making choices and connections (Chatterjee, 2016).

English Language Learning: which occurs most effectively through active engagement, social interaction, and constructing meaning (Vygotsky, 1978; Swain, 1985).

Beyond foundational theory, the practical implementation and use of tools are enlightened by models such as the Technology Acceptance Model (TAM) (Davis, 1989), the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003), and Diffusion of Innovations Theory (DOI) (Rogers, 2003). These frameworks help explain the factors that either encourage or discourage the adoption of digital tools, highlighting perceived usefulness, ease of use, social influences, and institutional support as keydrivers. Not only does this shape the success of Technological integration, but it also impacts Digital Literacy, since embracing technology is a prerequisite for building digital skills. Moreover, it influences Learners' Autonomy by either expanding or restricting the choices available for independent digital exploration. The same is true in English Language Learning, where these models clarify how digital tools are introduced and adopted, consequently shaping learners' exposure, practice, and engagement.

The drive for self-direction is deeply illuminated by Self-Determination Theory (SDT) (Deci & Ryan, 2000). SDT highlights that the needs for autonomy, competence, and understanding are fundamental for intrinsic motivation. This theory is a cornerstone for understanding learners' autonomy as intrinsically motivated learners are more likely to take charge of their learning. Its relevance extends to digital literacy (motivation to explore digital tools), technological integration (learners' willingness to engage with integrated technology), and English language learning (intrinsic desire to communicate and master the language, as suggested by integrative motivation).

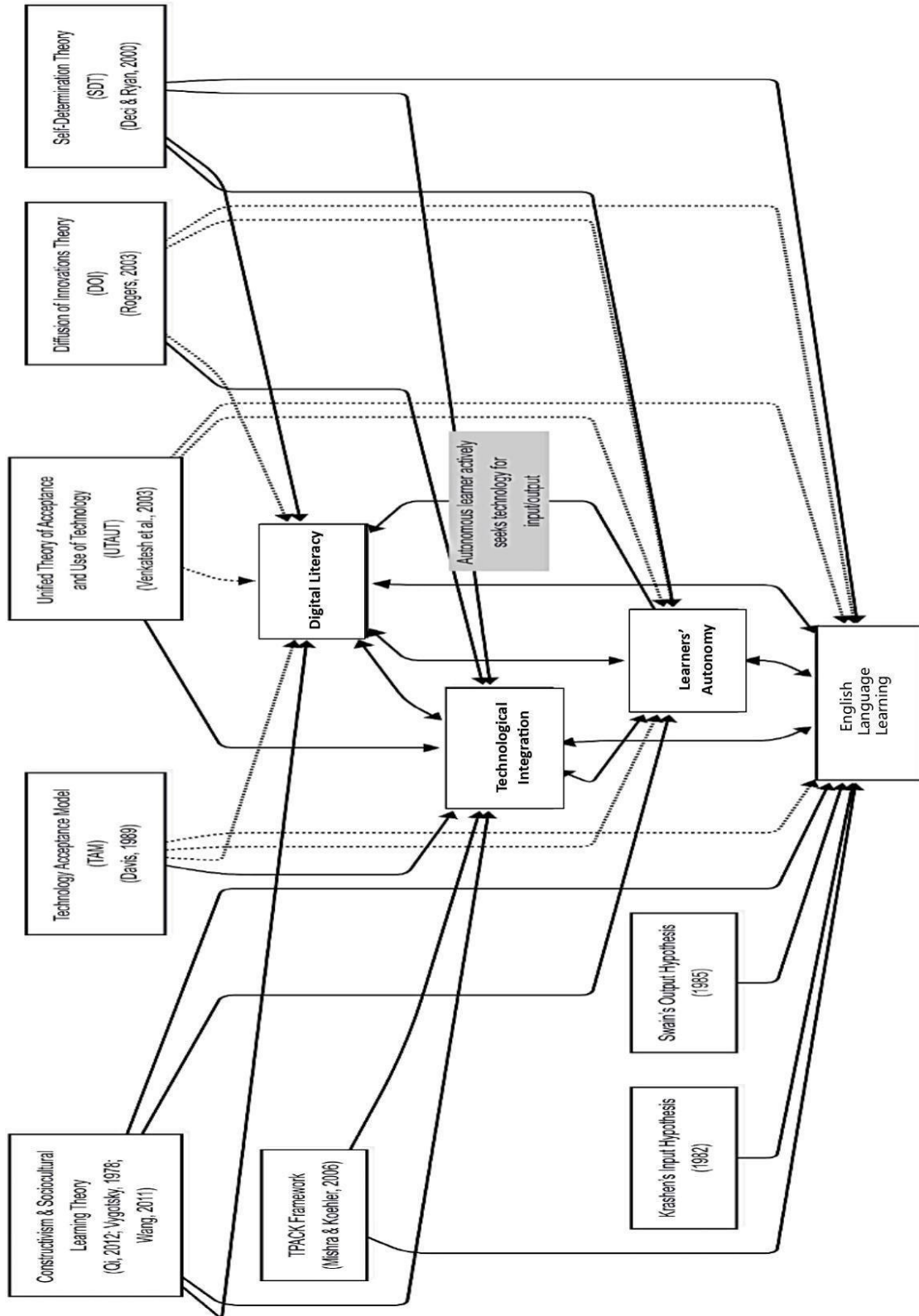
Finally, the distinctions of English language learning are further enlightened by theories like Krashen's Input Hypothesis (1982), emphasizing comprehensible input, and Swain's Output Hypothesis (1985), highlighting the importance of language production. These theories underscore that effective language acquisition isn't passive. This directly connects to technological integration, as digital tools can provide rich comprehensible input (e.g., authentic videos, interactive exercises) and facilitate meaningful output opportunities (e.g., online discussions, collaborative writing). An autonomous learner, driven by SDT, has a potential to actively seek out such

technological tools to maximize their input and output, thereby fostering their own digital literacy in the process. The TPACK framework (Mishra & Koehler, 2006) then brings the educator's role into sharp focus, asserting that effective technological integration in English language learning requires teachers to merge their content, pedagogical, and technological knowledge to empower learners.

Overall, this integrated theoretical framework advances that effective digital literacy is cultivated through technological integration that supports learners' autonomy, all of which are critical for successful English language learning. These theories are not isolated islands but interconnected continents, showing how individuals actively construct knowledge, are motivated by core psychological needs, and flourish through social interaction and meaningful technological engagement to achieve linguistic proficiency. It's a holistic view, reflecting the complex, dynamic reality of learning in our contemporary world.

Figure 1

Integrated Theoretical Framework: Digital Literacy, Technological Integration, Learner Autonomy, and English Language Learning



1.5.1 Relationships among Digital Literacy, Technological Integration, Learners' Autonomy, and English Language Learning

Digital Literacy and Technological Integration: Teachers with strong digital literacy skills are consistently found to be more adept and confident in integrating digital tools and platforms into their teaching (Chakraborty et al., 2025; Ramli and Arsad, 2023). This affiliation is particularly apparent in STEM and language-learning contexts, where the ability to conceptualize, create, and share digital content enhances both instructional quality and learner engagement (Chan et al., 2025; Nurhidayat et al., 2023). Multiple studies highlight that digital literacy is not merely a technical skill set, but also encompasses the capacity to evaluate information, adapt to new digital environments, and collaborate online. These attributes are foundational for effective classroom technological integration (Ramli and Arsad, 2023; Chan et al., 2025). Meaningful technological integration also cultivates digital literacy through daily practice. As teachers and learners interact with new technologies, they expand their digital skill sets and adapt to evolving classroom demands (Nurhidayat et al., 2023).

Technological Integration and Learners' Autonomy: When technology is thoughtfully embedded into instruction, it can serve as a powerful means for promoting student independence and self-regulation. Digital platforms, educational applications, and collaborative tools enable learners to access resources, make decisions about their learning paths, and set personal goals outside of traditional classroom constraints (Lengkanawati and Wirza, 2021; Lestari and Nugraheni, 2022; Ajmal et al., 2024). Technology empowers learners by offering opportunities for both structured and open-ended activities, fostering skills such as time management, goal-setting, and self-assessment. Real-time feedback and adaptive learning tools such as learning management systems and mobile apps encourage students to monitor their progress, receive personalized support, and adjust strategies to suit their individual needs. This flexibility not only supports diverse learning styles but also nurtures a sense of responsibility and ownership over the learning process (Lestari and Nugraheni, 2022; Kul, 2023). Autonomy tends to flourish in environments where students can engage with authentic resources, collaborate beyond classroom boundaries, and access timely guidance from teachers. However, studies also cautions that technology alone does not guarantee autonomy; effective teacher facilitation, access to resources, and a

supportive school culture remain pivotal to realizing its potential (Lengkanawati and Wirza, 2021; Ajmal et al., 2024; Kencana, 2025).

Learner Autonomy and English Language Learning: Students who actively take responsibility for their own learning, setting goals, monitoring progress, and seeking opportunities to practice tend to achieve higher levels of English language learning. Autonomy enables learners to approach English not just as a subject but as a personal journey of growth and engagement (Treesattayanmunee and Baharudin, 2024; Fernanda and Munir, 2023; Dafei, 2007). Learners exhibiting greater autonomy demonstrated by self-directed behaviors and a willingness to take charge perform better on assessments of English skills (Fernanda and Munir, 2023). Although the correlation is sometimes described as modest, autonomy remains a statistically meaningful predictor of language achievement, contributing to improved self-confidence, willingness to communicate, and persistence in overcoming challenges (Namaziandost et al., 2024; Soliman and Gorospe, 2024). Teachers play a crucial role by fostering autonomy-supportive climates, encouraging student choice, and modelling reflective practices (Liu, 2023). However, autonomy's impact can be mediated by factors like motivation, teacher guidance, and access to resources (Parcon and Talimodao, 2024).

Digital Literacy and Learners' Autonomy: Digital literacy serves as a key driver for autonomy in learning, equipping students with both the confidence and competence to take charge of their educational journeys. When learners are skilled at navigating digital platforms, finding and evaluating information, and using digital tools creatively, they become more self-reliant and proactive in their studies (Kara and Mede, 2023). Enhancement of digital skills not only increased students' ability to participate in online education, but also boost their motivation and capacity to set their own goals and monitor their progress (Feng and Liu, 2024). Digital literacy is understood as far more than a set of technical skills. It encompasses critical thinking, collaborative engagement, and information management capacities that reinforce effective autonomous learning (Ting, 2015). As learners become more comfortable with digital tools, they move from passive consumption to active creation and meaningful participation in digital communities (Ying, 2024).

Digital Literacy and English Language Learning: Digital literacy, understood

as the ability to locate, evaluate, create, and communicate information using digital tools, has been shown to significantly enrich the language acquisition process. Learners with strong digital literacy skills are better positioned to access a diverse range of authentic language resources, engage in interactive tasks, and develop greater autonomy in their learning journey (Burgos and Anthony, 2024; Maguire, 2024; Hanh, T. T. M. (2024). Digital platforms and multimedia materials motivate students, foster engagement, and create opportunities for real-time communication, key components for practicing and refining English skills in meaningful ways (Hutagalung, 2024). Exposure to digital storytelling, discussion forums, and language learning apps allows learners to practice English in dynamic, culturally relevant settings. Enhanced information management, collaboration, and digital content creation further support communicative competence and overall language proficiency (Gizem, 2024). (Triana, 2025; Ekaningsih and Kurnia, 2022) confirms at least a moderate correlation between students' digital literacy and their English communicative competence, indicating that gains in one area often reinforce the other. However, unpredictability in this relationship, pointing to disparities in technology access and digital skills as ongoing challenges (Alakrash et al., 2022).

Technological Integration and English Language Learning: Embedding technology into English classrooms offers learners richer, more authentic opportunities to engage with language in diverse contexts. The use of digital platforms, educational software, and online resources can heighten student motivation, foster interactive learning, and enhance key language skills; reading, writing, listening, and speaking (Quamer and Sabahat, 2024; Asare et al., 2023). Technology not only makes abundant, authentic materials readily available, such as videos, podcasts, and articles but also enables individualized and adaptive instruction that considers learners' preferences and progress (Rintaningrum, 2023). Digital assessment tools and mobile applications, for instance, allow learners to practice English with immediate feedback, set personal learning goals, and participate in virtual collaborations that simulate real-world communication. Furthermore, technology facilitates learner autonomy and cultural exposure, as students can explore topics, cultures, and accents far beyond their immediate environment (Quamer and Sabahat, 2024). Effective integration depends on equitable access to technology, teacher training, and ongoing support (Pawar and Patil, 2024).

1.5.2 Interrelationship among Digital Literacy, Technological Integration, Learners' Autonomy, and English Language Learning

Digital Literacy, which extends beyond mere technical skills to encompass the critical ability to effectively find, evaluate, use, and create information within digital environments (Bawden, 2008; Jenkins et al., 2009). Technological integration, which serves as the primary mechanism through which digital literacy is applied and further cultivated. It represents the purposeful and meaningful embedding of digital tools into educational practices to enhance or transform learning experiences (Puentedura, 2013). Theories such as the Technology Acceptance Model (Davis, 1989) and UTAUT (Venkatesh et al., 2003) underscore that the *acceptance* and *effective use* of technology depend on individuals' perceptions of its usefulness and ease of use, perceptions inherently tied to their developing digital literacy. When technology is integrated effectively, it provides the authentic contexts necessary for learners to practice and deepen their digital skills. The TPACK framework (Mishra & Koehler, 2006) further stresses that educators must skilfully blend technological, pedagogical, and content knowledge to ensure integration truly supports learning, rather than just adding digital window dressing.

The role of learner autonomy is crucial in this interconnected system. Rooted in constructivist principles (Qi, 2012; Wang, 2011) and profoundly illuminated by Self-Determination Theory (Deci & Ryan, 2000), learner autonomy emphasizes an individual's capacity and willingness to take charge of their own learning. Autonomous learners are intrinsically motivated to seek knowledge and make choices about their learning path, which naturally extends to their engagement with digital tools (Krulj et al., 2024). They are more likely to actively leverage integrated technology for their learning, thereby fostering their own digital literacy. On the other hand, effective technological integration can empower learners with choices and resources, nurturing their autonomy (Mohebbi, 2024).

Finally, English language learning serves as a significant context where the interconnectedness of these elements becomes strikingly apparent. Modern English language acquisition is no longer confined to traditional classrooms; it thrives on digital exposure and interaction (Dia, 2024). Digital literacy enables learners to access vast amounts of comprehensible English input (Krashen, 1982) through online media, authentic texts, and global communities. Technological integration provides the

platforms for this exposure and facilitates opportunities for meaningful output (Swain, 1985) through virtual discussions, collaborative writing, and interactive exercises. Importantly, learners' autonomy drives individuals to actively seek out and utilize these digital resources for English practice, tailoring their learning journey to their unique needs and interests (Little, 1991).

In essence, these four domains exist in a powerful, self-reinforcing cycle. Enhanced digital literacy facilitates more effective technological integration. Well-integrated technology empowers and supports learner autonomy. Autonomous learners proactively engage with integrated technology, further developing their digital literacy, all of which synergistically contribute to more robust and effective English language learning.

1.6 Higher Secondary Education of Nagaland

Higher secondary education in Nagaland unveils a unique and complex educational landscape, distinct from much of mainland India, deeply influenced by the state's socio- cultural realities and inherent challenges. This crucial stage, typically encompassing Classes 11 and 12, serves as a pivotal bridge for young Nagas, preparing them for the fiercely competitive world of higher education and future careers. While a significant number of schools fall under the umbrella of the Nagaland Board of School Education (NBSE), some are in Central Board of School Education (CBSE) and the Council for Indian School Certificate Examinations (CISCE), offering students varied curricular pathways (Sinha et al. 2019). Students at this level generally opt for traditional streams like science, arts, or commerce, mirroring national trends, yet their learning environment is shaped by distinct local factors. In urban centers like Kohima and Dimapur, higher secondary schools often boast better physical infrastructure, more consistent access to electricity, and relatively superior internet connectivity, providing a somewhat advantageous environment for digital learning resources (NagaEd, 2023; Dutta and Niranjana, 2023). However, as one moves into the more remote, hilly districts, these amenities become scarcer, presenting a stark digital divide that impacts access to online content, virtual labs, and other technology-enhanced learning tools (Khan and Ahmad, 2024; Gandhi and Umair, 2025). This means that while some students engage with modern digital tools, many others still largely rely on traditional textbooks and classroom instruction.

The learning environment within these higher secondary classrooms is often a fascinating blend of conventional and emerging practices. Traditionally, teaching methodologies have leaned towards teacher-centric approaches, with a significant emphasis on textbook knowledge and preparing students for board examinations, which can sometimes inadvertently promote rote learning (Rahmatillah, 2019). However, there's a growing awareness and a gradual, albeit challenging, shift towards more interactive, learner-centric pedagogies, especially as educators attempt to integrate the principles of skill-based and experiential learning championed by broader national educational reforms (Chakraborty, 2025). The inherent linguistic diversity within the classroom is a persistent and compelling feature. Students, even within the same school, may come from different tribal backgrounds, speaking distinct mother tongues, relying on Nagamese as a common conversational medium, and learning English as a compulsory subject and often the medium of instruction for other subjects (Times and Times, 2023; Morung Express, 2021). This multilingual tapestry means that English language learning classrooms are inherently heterogeneous, requiring teachers to possess exceptional linguistic adaptability and strategies to manage varying proficiency levels effectively (Morung Express, 2021). The teacher-student ratio, particularly in government schools in less accessible areas, can also be a challenge, limiting individual attention and the scope for highly personalized learning experiences. While government initiatives are working to train teachers in new methods, the gap in consistent professional development remains a hurdle (Domta, 2025).

A significant driving force shaping the learning environment of higher secondary students in Nagaland is their palpable ambition and strong desire for upward mobility. English proficiency, in particular, is overwhelmingly perceived not just as an academic subject, but as a critical gateway an essential skill for cracking entrance exams to universities outside Nagaland, securing better-paying jobs, and effectively participating in the global economy (Times and Times, 2023; Longchar, 2025). This high instrumental motivation often compels students to seek out any available resources, be it supplementary textbooks, community learning groups, or even informal digital channels, to bolster their English skills. However, access to quality libraries, well-equipped science laboratories, and consistent digital learning resources can vary dramatically between urban and rural schools, exacerbating existing disparities in educational opportunities (Dutta and Niranjana, 2023). Peer influence is

significant, and students often engage in collaborative learning, especially when preparing for examinations. Community life and religious institutions also play an understated yet vital role, often acting as informal support systems for academic pursuits and reinforcing the value of education (Hughes et al. 2016; Li 2025; Zhu et al. 2025). Understanding this delicate balance between traditional learning contexts, evolving pedagogical demands, the persistent digital divide, and the profound aspirations of students is crucial for any meaningful investigation into how digital literacy, technological integration, and learners' autonomy interact to impact English language learning outcomes among higher secondary students in Nagaland.

1.6.1 English in Indian Education System

The story of English in India's education system is a captivating narrative, one that begins not with mutual agreement but with the intricate dynamics of colonial power and evolves into a complex contemporary role deeply intertwined with aspiration and opportunity. Its historical genesis can be largely traced back to the British East India Company's pragmatic need for a cadre of local administrators and interpreters. However, it was Lord Thomas Babington Macaulay's infamous "Minute on Indian Education" in 1835 that truly cemented English's foundational, albeit controversial, place. His vision was to cultivate "a class of persons, Indian in blood and color, but English in taste, in opinions, in morals, and in intellect" (Bhattacharya, 2022; Mondal, 2024). This wasn't merely about linguistic instruction; it was a deliberate policy to introduce Western knowledge and culture, thereby shaping an elite class that would act as intermediaries between the British rulers and the vast Indian populace. Consequently, English became the language of administration, law, and higher education, gradually becoming synonymous with social status and access to influential positions within the colonial structure. The establishment of universities in Calcutta, Bombay, and Madras in 1857, with English as the medium of instruction, further solidified its academic dominance (Murthy, 2018). This historical imposition, despite its colonial undertones, inadvertently provided a common linguistic platform in a subcontinent teeming with hundreds of languages and dialects, facilitating interregional communication among the educated elite and even, ironically, fostering the nascent stages of Indian nationalism (Deccan Herald, 2025).

As India transitioned into independence in 1947, the role of English became a

subject of fervent national debate. Despite the strong nationalist sentiment favouring indigenous languages, particularly Hindi, the sheer linguistic diversity of the newly independent nation made it practically impossible to immediately replace English as a common link language for administration, higher judiciary, and interstate communication (Drishti IAS, 2022; Wikipedia, 2025). Jawaharlal Nehru, recognizing this pragmatic necessity, advocated for English to continue as an "associate official language" alongside Hindi, a status formally enshrined by the Official Languages Act of 1963 (Wisdom Library, 2024). This decision reflected a strategic compromise, acknowledging English's deep roots in the administrative and educational machinery while respecting linguistic pluralism. Thus, English didn't merely survive, it evolved.

In contemporary India, English has transcended its colonial origins to become a vital, almost indispensable, component of the education system, acting as a powerful tool for aspiration and social mobility. It remains the dominant medium of instruction in a significant number of private schools and nearly all higher education institutions, particularly in fields like science, technology, engineering, and medicine (Babu and Swarnalatha, 2017; Borooah, 2021). This is not just about academic convenience, proficiency in English is widely perceived as a non-negotiable prerequisite for accessing competitive professional courses, securing lucrative employment opportunities, and navigating the globalized economy. Highet, 2022; Deccan Herald, 2025). For countless individuals from diverse socio-economic backgrounds, particularly those striving to break cycles of poverty, English education represents a tangible "ladder of mobility," promising access to better prospects and a pathway to the burgeoning middle class (Highet, 2022). While debates persist regarding its potential to perpetuate educational inequalities or marginalize regional languages, there is an undeniable, strong parental and societal demand for English-medium education (Sharma, 2020). This deep-seated demand ensures its continued prominence, effectively positioning English not merely as a language subject but as a crucial gateway to information, innovation, and global connectivity within India's educational landscape (Yayasan, 2025).

1.6.2 Language System in Nagaland

Nestled in the hills of Northeast India, Nagaland is a state celebrated for its remarkable ethnic, linguistic, and cultural diversity. Home to around two million

people, the vast majority of Nagaland's population is tribal, with 17 major recognized Naga tribes and numerous sub-tribes, each contributing their own distinct languages, customs, and traditions to the state's vibrant social fabric (Rawan, 2024; Wikipedia, 2025). The Naga tribes, such as Angami, Ao, Chakhesang, Chang, Khiamniungan, Konyak, Lotha, Phom, Pochury, Rengma, Sangtam, Sumi, Tikhir, Yimkhiung, and Zeliang. Considering the rich diversity of the languages spoken in Nagaland, Sachdeva (2001) mentions that without any doubt Nagaland is "one of the most complex sociolinguistic settings in the entire world." The languages spoken in Nagaland are mutually related to the 'Tibeto-Burman family' and include English and Nagamese for communicative purposes, and together, Nagaland is home to 19 recognized languages: Konyak, Phom, Chang, Khiamniungan, Yimkhiung, Sangtam, Tikhir, Ao, Lotha, Sema, Pochury, Nzonkhwe, Nthenyi, Tenyidie, Zeme, Liangmai, Khezha, Chokri, and Kuki, making it one of the most linguistically diverse regions in India. This rich linguistic heritage, while a source of immense cultural pride, also presents unique challenges for communication and education within the state (Rhakho, 2025).

English occupies a special place in Nagaland sociolinguistic landscape. In 1967, the state assembly declared English as the official language, a pragmatic decision that acknowledged the absence of a common indigenous language and the need for a unifying medium. Today, English is not only the language of administration but also the sole medium of instruction across all levels of education in Nagaland, from primary schools to higher education institutions (Belho, 2022).

Figure 2 Map of Nagaland



Alongside English, Nagamese, a creole based on Assamese, acts as the lingua franca for daily interactions, bridging the communication gap between speakers of different tribal languages (The Indian Express, 2023). Despite the centrality of English in public life and education, the state's linguistic diversity remains both a treasure and a challenge. Many indigenous languages historically lacked written scripts, and efforts to document and preserve these languages have only recently gained momentum, often relying on oral traditions and the wisdom of elders (Rhakho, 2025).

Nagaland's educational journey is shaped by its unique demographic and cultural realities. Over 85% of the population resides in rural areas, where traditional ways of life remain strong and access to modern infrastructure can be limited. The

state has made significant progress in expanding educational opportunities and raising literacy rates—reaching about 80%, according to the 2011 Census, which is higher than the national average. The establishment of the Nagaland Board of School Education (NBSE) in 1973 and Nagaland University in 1994 marked important milestones, helping to standardize curricula and expand access to higher education (SATHEE, 2025). Yet, challenges persist, especially in remote and tribal areas where schools often face inadequate infrastructure, limited resources, and a shortage of qualified teachers (Sanyu, 2022; Yadav, 2024). The UNESCO State of Education Report (2021) highlighted that government schools in Nagaland are often under-resourced and struggle to meet Right to Education (RTE) standards, with many lacking basic amenities like libraries and reliable electricity (Yadav, 2024).

English language education in Nagaland is both an opportunity and a complex undertaking. On one hand, English proficiency is seen as a gateway to higher education, employment, and global engagement, making it a highly valued skill among Naga youth and their families (Times and Times, 2023). The state's decision to use English as the medium of instruction reflects both the practical need for a common language and the aspirations of its people to connect with broader national and international communities. On the other hand, the effectiveness of English language teaching is often hampered by limited exposure to the language outside formal schooling, teacher shortages, and the dominance of traditional, teacher-centered pedagogies (Raikhel, 2025). Many students encounter English primarily in the classroom, which can result in challenges with fluency, comprehension, and confidence in real-world communication (Yadav, 2024).

Despite the challenges, Nagaland has shown resilience and innovation in its approach to education. Initiatives like the Nagaland Education Project—NECTAR, supported by the World Bank, aim to enhance classroom teaching, improve learning outcomes, and strengthen teacher training, particularly in government schools (Yadav, 2024). Efforts to promote digital literacy and integrate technology into classrooms are also underway, though infrastructure gaps and connectivity issues remain significant obstacles, especially in remote areas (Sanyu, 2023). At the same time, there is a growing movement to document and revitalize indigenous languages, ensuring that cultural identity is preserved even as English continues to play a central role in education and public life (Galla, 2016; Rhakho, 2025).

1.6.3 NEP 2020: Digital Initiatives in Nagaland

The National Education Policy (NEP) 2020 marks a transformative chapter in India's educational landscape, with digital literacy and Technological Integration at its core. Recognizing the urgent need to bridge educational divides and equip students with 21st-century skills, NEP 2020 envisions an education system that is holistic, flexible, and deeply rooted in digital empowerment. The policy's emphasis on digital literacy, critical thinking, and problem-solving is not merely aspirational but is being systematically embedded into the curriculum at all levels, starting from primary education and extending through higher secondary and beyond (NagaEd, 2023). This digital thrust is particularly significant for geographically and socio-economically diverse states like Nagaland, where traditional barriers such as remoteness and lack of infrastructure have historically limited access to quality education (Shitsucha, 2025).

In Nagaland, the implementation of NEP 2020 has catalyzed a wave of educational reforms tailored to local needs and realities. The state government, in alignment with national directives, has launched the Nagaland Education Project, a comprehensive initiative aimed at integrating digital resources into classrooms across urban and rural areas (Shitsucha, 2025). This includes the deployment of multimedia content, interactive software, and e-learning platforms such as SWAYAM, which provide students even in the most remote villages, access to high-quality courses and learning materials. The project also emphasizes the use of mobile learning, leveraging the widespread availability of smartphones to deliver educational content through apps like BYJU'S and Khan Academy, thereby democratizing access to learning resources (Shitsucha, 2025).

The NEP 2020's mandate for Technological Integration is further reflected in the structural and curricular reforms underway in Nagaland's schools. The adoption of the 5+3+3+4 educational structure, as well as the introduction of vocational and skill-based courses, is designed to make learning more relevant and future-oriented (NagaEd, 2023a). Schools are now being equipped with digital infrastructure high-speed internet, digital devices, and smart classrooms to facilitate interactive and personalized learning experiences. Teachers are undergoing extensive training to develop digital pedagogical skills, ensuring they can effectively harness technology to engage students and foster digital citizenship (NagaEd, 2023). The State Level Executive Committee (SLEC) has played a pivotal role in coordinating these reforms,

conducting workshops and awareness campaigns for educators and communities to ensure a smooth transition to the new policy environment (NextSkills360, 2024).

One of the most notable outcomes of these reforms has been the proliferation of virtual classrooms and online assessments, especially during and after the COVID-19 pandemic. Platforms like Google Classroom, Zoom, and Microsoft Teams have become integral to teaching and learning, enabling continuity of education when physical classrooms were inaccessible (Shitsucha, 2025). The Nagaland State Resource Centre's initiative to distribute smartphones preloaded with educational content has further empowered students in remote areas, reducing dependence on traditional textbooks and classroom setups. These digital interventions have not only enhanced academic performance but have also fostered greater learner autonomy, as students are now able to access, review, and engage with learning materials at their own pace (NagaEd, 2023).

Nationally, NEP 2020's digital vision is being realized through large-scale initiatives such as SWAYAM, DIKSHA, and the National Digital Library, which collectively aim to provide equitable access to quality educational resources across the country (Department of School Education & Literacy, 2022). The policy's focus on digital infrastructure is matched by investments in teacher training and the development of digital content, ensuring that both educators and learners are equipped to thrive in a technology-rich educational environment. In the Northeast, and Nagaland in particular, the Ministry of Electronics and Information Technology (MeitY) has intensified efforts to boost digital literacy and technical education through programs like "Innovation NE Week," which fosters collaboration, innovation, and entrepreneurship among students and educators (Morung Express, 2025).

Despite these advances, challenges persist. Nagaland's unique geography and socio-economic context pose obstacles to the universal implementation of digital education. Issues such as inconsistent internet connectivity, limited access to devices, and varying levels of digital readiness among teachers and students must be addressed to fully realize the NEP's vision (Joshi et al. 2024). Nevertheless, the state's commitment to overcoming these hurdles through collaborative efforts and innovative solutions is evident in the ongoing reforms and the active engagement of stakeholders at all levels.

Ultimately, NEP 2020 has set in motion a comprehensive transformation of India's educational system, with digital literacy and Technological Integration at its

heart. In Nagaland, these reforms are not only bridging long-standing educational gaps but are also preparing students for a dynamic, digital future. By fostering digital citizenship, enhancing access to quality resources, and empowering both teachers and learners, NEP 2020 is poised to create a more inclusive, effective, and future-ready education system in Nagaland and across India.

1.6.4 NEP 2020 on English Language Education

The National Education Policy (NEP) 2020 has ushered in a new era for English language education in India, reflecting a nuanced understanding of the country's linguistic diversity and the global significance of English. Unlike previous policies, NEP 2020 does not position English as a measure of intelligence or as a compulsory medium of instruction but recognizes its practical importance as an international language and a tool for global communication and access to knowledge (Ministry of Human Resource Development, Government of India, 2020; Gupta & Chatterjee, 2022). The policy's approach is rooted in the belief that proficiency in English, alongside Indian languages, is essential for equipping students with 21st-century skills and preparing them for participation in a globalized world (Rakshit, 2023).

One of the most significant features of NEP 2020 is its reinforcement of the "Three Language Formula," which has been a part of India's language education policy for decades. According to the policy, students are expected to learn three languages during their school years: two of these must be native Indian languages, and the third can be English or any language of the learner's choice (Ahmed, 2023). This formula is intended to promote multilingualism, cognitive flexibility, and cultural awareness, while also ensuring that English remains accessible as a linking language for higher education and international engagement (Gupta & Chatterjee, 2022; Ansari, 2023). Importantly, NEP 2020 provides flexibility in the implementation of this formula, allowing states, schools, and students to make choices that reflect local needs and preferences, and explicitly states that no language will be imposed on any student or region (Wikipedia contributors, 2025; Ministry of Human Resource Development, Government of India, 2020).

The policy also recommends that, wherever possible, the medium of instruction until at least Grade 5, and preferably till Grade 8 and beyond, should be the home

language, mother tongue, local language, or regional language (Ministry of Human Resource Development, Government of India, 2020; Ansari, 2023). However, NEP 2020 is clear that this is an advisory guideline, not a mandate, and that English will continue to be taught as a subject at all levels. The rationale behind this recommendation is grounded in educational research suggesting that children learn best when taught in their first language during their formative years, but also benefit from early exposure to English, which supports later academic and professional opportunities (Gupta & Chatterjee, 2022; Porecha (2025). The policy encourages the use of a bilingual approach in classrooms, allowing teachers to use both the home language and English to explain concepts, thereby supporting comprehension and language development (Rakshit, 2023).

NEP 2020 also places a strong emphasis on the quality and relevance of English language teaching. The policy envisions English classrooms that are activity-based, communicative, and focused on real-life language use, moving away from rote memorization and grammar- translation methods (Gupta & Chatterjee, 2022). This aligns with global best practices in English language teaching (ELT), which prioritize communicative competence, critical thinking, and the integration of technology to make learning more engaging and effective (Rakshit, 2023). The policy calls for the development of high-quality learning materials in English and Indian languages, including textbooks, workbooks, digital content, and supplementary resources such as plays, poems, and magazines (Ministry of Human Resource Development, Government of India, 2020).

Another notable aspect of NEP 2020 is its recognition of the need for teacher training and professional development in English language education. The policy advocates for continuous capacity-building programs that equip teachers with the pedagogical skills and digital literacy required for modern ELT classrooms (Rakshit, 2023). This is particularly important in rural and underserved areas, where access to qualified English teachers and resources has historically been limited (Kumar, 2024). By investing in teacher education and leveraging digital platforms, NEP 2020 aims to bridge these gaps and ensure equitable access to quality English language instruction across the country.

Furthermore, NEP 2020 acknowledges the role of English in higher education and the workforce, recognizing that proficiency in English opens doors to academic, professional, and international opportunities (Ansari, 2023; Chhina, 2024). The policy

balanced approach seeks to foster multilingualism without undermining the importance of English, positioning it as a tool for empowerment rather than exclusion. This is reflected in the policy's support for the teaching of foreign languages, including English, at the secondary level based on students' interests and aspirations (Gupta & Chatterjee, 2022).

NEP 2020 marks a significant shift in English language education in India by promoting a flexible, inclusive, and learner-centered approach. It recognizes the value of English as a global language while affirming the importance of mother tongues and regional languages in early education. Through its emphasis on multilingualism, communicative teaching methods, teacher training, and digital integration, the policy aims to prepare students for success in a rapidly changing world, ensuring that English language education is both accessible and meaningful for all learners (Ashokkumar et al. 2024).

1.6.5 NCF and NCFTE on English Language Education

Beyond the National Education Policy (NEP) 2020, India's approach to English language education has been shaped by a series of government policies and curricular frameworks that reflect the country's unique linguistic diversity, social realities, and evolving educational goals. While NEP 2020 has brought renewed attention to language policy, it is important to recognize the foundational role played by earlier initiatives such as the National Curriculum Framework (NCF) and the National Curriculum Framework for Teacher Education (NCFTE), as well as ongoing schemes and state-level adaptations that continue to influence how English is taught and learned across the country.

Recent policies like the National Curriculum Framework (NCF) 2023 and the National Curriculum Framework for Teacher Education (NCFTE) have brought a fresh, thoughtful perspective to English language education in India, building on the vision of NEP 2020 but also going further in practical and classroom-focused ways. The NCF 2023, for instance, is not just a policy document but a roadmap for how schools can nurture multilingualism, cultural awareness, and global readiness, all while making sure English is taught in ways that are meaningful and accessible for every student (Murugesan and Kumar, 2024).

One of the most striking aspects of the NCF 2023 is its strong emphasis on

multilingualism, which is woven into the very structure of school education. The framework affirms the three- language formula, ensuring that by the time students reach age 15, they will have academic proficiency in at least three languages, with English typically being one of them (Sharma, 2023). The NCF lays out that the first language (R1) should be the one most familiar to the child, usually the mother tongue or home language so that the earliest stages of learning are rooted in comfort and understanding. English can be chosen as the second language (R2) or even the third (R3), depending on state and school preferences, but the framework is clear that two out of these three languages must be native to India (Van Riezen, 2023). This approach doesn't push English as a replacement for Indian languages, but rather as a bridge, one that connects students to the wider world while also grounding them in their own culture and identity.

Another key aspect of the NCF 2023 is its realistic, child-centered approach to language learning. Instead of rote memorization, the framework encourages activity-based, experiential learning, where English is taught through stories, play, projects, and real-life communication (Bhansali, 2024; Raj, 2025). The aim is for students to become comfortable using English in practical situations, not just in exams, but in conversations, creative expression, and problem-solving. The NCF also recognizes the importance of early exposure: it recommends that students achieve independent reading and writing skills in their first language by Grade 3, in their second language (which could be English) by Grade 6, and in the third language by Grade 9, with academic proficiency in all three by Grade 10 (Sharma, 2023). This gradual, layered approach helps students build confidence and fluency in English without feeling overwhelmed.

Beyond curriculum design, the NCF 2023 also highlights the crucial role of teachers. This is where the National Curriculum Framework for Teacher Education (NCFTE) comes in. The NCFTE calls for a complete rethink of how teachers are prepared for the classroom, especially when it comes to teaching English in India's diverse, multilingual settings. It emphasizes that teachers need more than just language proficiency, they need to be skilled in modern, interactive, and inclusive teaching methods that can engage students from all backgrounds (Venkanna, 2025). The NCFTE advocates for ongoing professional development, reflective practice, and the integration of digital tools so that teachers can create dynamic English classrooms that go far beyond textbooks and grammar drills.

Both frameworks also recognize the challenges faced by students and teachers in rural or under-resourced areas, where access to quality English education has historically lagged behind. The NCF and NCFTE encourage the use of digital resources, open-access content, and blended learning models to help bridge these gaps (Raj, 2025). They also stress the importance of assessment for learning using feedback and formative assessment to support students' growth in English, rather than relying solely on high-stakes exams.

Perhaps most importantly, these policies reflect a broader vision of what language education should achieve. The NCF 2023 and NCFTE see English not just as a subject, but as a tool for communication, creativity, and critical thinking, a way for students to connect with the world, pursue higher education, and access new opportunities (National Steering Committee for National Curriculum Frameworks, 2023). At the same time, they are careful to ensure that English does not overshadow India's rich linguistic heritage. By promoting multilingualism, cultural pride, and global engagement side by side, these frameworks are helping to create a generation of learners who are at home in both their local communities and the wider world (Sivakumar and Vanitha, 2024).

1.7. Significance of the Study

The needs and significance of digital literacy, technology integration, and learner autonomy are crucial in English language learning among higher secondary school students in Nagaland. As the region's educational landscape adapts to the demands of the digital age, these factors hold immense value in shaping a comprehensive and practical learning experience. The study provides insights into bridging the digital divide among students. Students who develop autonomy in their education can take control of their learning and apply it to various subjects and situations. The study help educators encourage autonomy in their teaching practices.

The study is needed to enhance English language learning outcomes among higher secondary school students in Nagaland. Improved English language skills significantly impact students' educational and career prospects, making them more competitive in a globalized job market. By addressing the specific needs and challenges of Nagaland's educational system, the study improves it, by making it more aligned with the requirements of the digital age and globalized society.

In conclusion, this study enhances English language learning outcomes among higher secondary school students in Nagaland by addressing digital literacy, technological integration, and learners' autonomy. The benefits extend to students, educators, parents, policymakers, and the overall educational system, fostering a more technologically proficient, independent, and thriving generation of learners in Nagaland.

1.8. Statement of the Problem

The present study focuses on the English language learning of higher secondary school students. The study has identified the current status of digital literacy and technology integration in English language learning with higher secondary school students. The study compares the English language learning of higher secondary school students concerning their gender, locale, stream, and management and the different levels of digital literacy skills, technological integration, and learners' autonomy. The study further studies the relationship between English language learning and digital literacy skills, technical integration, and learners' autonomy. With this intention, the topic was entitled as, “Digital Literacy, Technological Integration, and Learners’ Autonomy Impacting English Language Learning among Higher Secondary School Students of Nagaland.”

1.9. Operational Definitions

Digital Literacy Skills: This refers to the skills, knowledge, and competencies related to using digital technologies effectively for learning and communication in the English language. In this study it was assessed by administering the Digital Literacy Scale developed by the researcher.

Technological Integration: It refers to the ways of incorporating technology into English language learning activities. In this study it was assessed by using the Technological Integration Scale administered to learners, and interview schedules for teachers, and heads of the institutions.

Learners’ Autonomy: This relates to the student’s ability to take responsibility for learning, set goals, and make independent decisions regarding their English language learning using digital tools and resources. In the present study, it was assessed

by using the Learners' Autonomy Scale.

English Language Learning: It refers to acquiring the skills and knowledge necessary to effectively understand, communicate, read, write, and interact in the English language. In the present study the annual marks obtained by the students in the English subject were taken as English language learning.

Higher Secondary School Students: The students studying in 11th and 12th classes are known as higher secondary school students. In the present study, 12th-class students were taken as the subjects of study.

1.10. Objectives of the Study

The present study focuses on the following objectives:

- i. To analyze the role of digital literacy, technological integration, and learners' autonomy in the English language learning of higher secondary school students concerning gender, locale, stream, and management.
- ii. To study the current status of digital literacy, technological integration, learners' autonomy and English language learning in higher secondary school of Nagaland.
- iii. To assess the level of digital literacy skills, technological integration, learners' autonomy, and English language learning among higher secondary school students.
- iv. To analyse the main effect and interaction effects of digital literacy, technological integration, and learners' autonomy on English language learning of higher secondary school students.
- v. To study the relationship of digital literacy, technological integration, and learners' autonomy with English language learning.

1.11. Research Questions/Hypotheses Research Questions

Q1 How do digital literacy, technological integration, and learners' autonomy improve English language learning outcomes among higher secondary school students in Nagaland?

Q2 What is the current status of digital literacy, technological integration, learners' autonomy and English language learning in higher secondary schools of Nagaland?

Q3 What is the level of digital literacy, technological integration, learners' autonomy, and English language learning among higher secondary school students?

Hypotheses

H₀₁ Male and female students do not differ significantly in their English language learning.

H₀₂ Rural and urban students do not differ significantly in their English language learning.

H₀₃ Science, arts, and commerce students do not differ significantly in their English language learning.

H₀₄ Government and private school students do not differ significantly in their English language learning.

H₀₅ There is no significant difference in the English language learning of students with respect to different levels of digital literacy.

H₀₆ There is no significant difference in the English language learning of students with respect to different levels of technological integration.

H₀₇ There is no significant difference in the English language learning of students with respect to different levels of learners' autonomy.

H₀₈ Digital literacy and technological integration do not have a significant interaction effect on the English language learning of students.

H₀₉ Technological integration and learners' autonomy do not have significant interaction effect on the English language learning of students.

H₀₁₀ Digital literacy and learners' autonomy do not have significant interaction effect on the English language learning of students.

H₀₁₁ There is no significant relationship between English language learning and digital literacy.

H₀₁₂ There is no significant relationship between English language learning and technological integration.

H₀₁₃ There is no significant relationship between English language learning and learners' autonomy.

H₀14 Digital literacy, technological integration, and learners' autonomy have no significant conjoint relationship with English language learning.

1.12. Delimitation of the Study

- i. The study was delimited to students of class 12 only.
- ii. The study was delimited to English subject teachers teaching at higher secondary schools only.
- iii. The study was also delimited to the Heads of the institutions of higher secondary schools.

1.13. Variables

- a. Independent Variables
 - Digital literacy
 - Technological integration
 - Learners' autonomy
- b. Dependent Variable
 - English language learning
- c. Demographic Variables
 - Gender
 - Management
 - Streams
 - Locale.

CHAPTER – II

REVIEW OF THE LITERATURE

A review of the literature provides a comprehensive overview of existing research and scholarly discussions relevant to the present study. This chapter aims to familiarize readers with the theoretical foundations and empirical findings that inform the research problem, offering critical insights into prior work and established knowledge in the field. By systematically examining previous studies, this review identifies prevailing trends, key debates, and methodological approaches, thereby situating the current research within the broader academic context. The literature review not only highlights significant contributions and influential theories but also uncovers gaps and inconsistencies in existing research, which the present study seeks to address.

Review of literature is essential for several reasons. First, it enables the researcher to gain an in-depth understanding of the chosen research problem and its scholarly context. The literature review helps to verify assumptions, refine research questions, and develop a suitable theoretical framework and methodology for the study. By critically analyzing and synthesizing existing work, the review demonstrates the researcher's familiarity with the topic and ensures that the study builds upon and contributes to ongoing academic conversations. Furthermore, it helps identify gaps, unresolved issues, and areas of controversy in the literature, guiding the direction of the current research and justifying its significance. Ultimately, the review of literature establishes the foundation for the study, ensuring coherence between the research problem, objectives, and methodological choices.

This study's literature review focuses on examining themes and issues surrounding the Digital Literacy, Technology Integration, Learners' Autonomy and English Language Learning of higher secondary school students. Resources such as books, journals, websites, articles, dissertation and thesis were consulted.

In this chapter the reviewed research works in India and abroad has been classified into different main headings according to the variables, which is given below:

2.1 Review related to Digital Literacy

Studies conducted in India

Sahu (2019) conducted a focused study on students within the discipline of library and information science at Pt. Ravishankar Shukla University, shedding light on moderate levels of digital literacy. Sahu observed that while a significant portion of students could engage with basic digital searching and information retrieval, they were notably less proficient when it came to scrutinizing the credibility of information and performing more advanced digital tasks. Recognizing these gaps, Sahu recommended updates to the curriculum, as well as more hands-on, practical training to bridge digital divides within higher education, especially as digital resources become integral to academic pursuits. Similarly, Krishnamurthy and Shettappanavar (2019) studied on female postgraduate students. Their findings also revealed that while foundational digital operations were generally well understood, there existed clear deficits in skills related to advanced information analysis and secure internet practices. In response, the authors advocated for gender-responsive digital literacy policies, stressing their necessity particularly within postgraduate and STEM education domains to empower women in a digital- first world.

Afzal (2022) produced a comparative study between India and the United States, highlighting that digital literacy levels are not independent of the quality and reach of infrastructure. According to Afzal, urban populations in India are nearing their American counterparts in digital goods adoption, but significant disparities persist in rural settings, largely due to sporadic connectivity and limited access to digital tools. This highlighted the need for more inclusive and robust infrastructural investments in India, drawing lessons from established American digital ecosystems. Srivastava (2022) further examined the state of digital access. The analysis demonstrated that while nearly all internet users in India connect through mobile devices, a reflection of the country's mobile-first trajectory true digital skills remain elusive for much of the population, particularly those from rural or underprivileged backgrounds. Srivastava reported that despite progress in building infrastructure, only about 20% of users showed the capacity for effective digital engagement be it for education, employment, or communication. The researcher underscored that achieving digital inclusion involves much more than distributing devices; it requires equipping people to use those

devices as tools for genuine empowerment, learning, and advancement.

The issue of persistent barriers was explored by Rana (2022), who identified several interconnected factors; age, region, limited awareness, gender, and socioeconomic standing that systematically hinder digital literacy in many Indian states. While acknowledging the progress driven by flagship initiatives like the Digital India Mission, Rana recommended targeted strategies to address the distinct needs of women, older adults, and those in less developed states, in order to bridge the urban-rural digital chasm. Echoing this, Goel et al. (2021) evaluated the impacts of digital literacy programs such as DISHA and NDLM, reporting positive shifts in confidence, employability, and empowerment among participants but underlining that support must be customized for different demographic segments to ensure truly inclusive outcomes.

ASER (2023) survey assessed digital skills among rural youth, providing one of the most comprehensive overviews in the recent timeline. While widespread smartphone access was observed, there was a consistent shortfall in measurable digital proficiency. Many rural adolescents exhibit high self-confidence in their digital abilities, but when put to test, significant gaps emerged in fundamental domains such as data management, safety, and critical information evaluation. These findings revealed that perceived digital confidence often outstrips actual capability, raising crucial questions about how well rural education prepares youth for digital participation.

In parallel, studies by Kunal and Dhillon (2023) and Rana et al. (2023) examined the ramifications of the National Education Policy (NEP) 2020. Both sets of findings emphasized the policy essentially aims to instil digital literacy as a foundational skill for all Indian students. The NEP drove integration of digital competencies across curricula, promoted teacher upskilling, and advocated for equitably distributed technology in schools. As a result, Kunal and Dhillon (2023) noted, students were not only becoming more adept at using digital tools but were also being encouraged to develop critical thinking, collaborative abilities, and ethical judgment in their digital conduct a holistic view supported by practical evidence from classrooms.

Yet, digital divides along teacher and geographic lines persist. Adeppa (2025) focused on Indian educators, revealing a clear divide: urban teachers tend to be more comfortable leveraging digital platforms in their classrooms, whereas rural teachers

continue to face obstacles related to inadequate training and infrastructural gaps. This inconsistency, in turn, fuels unequal student experiences and reinforces longstanding educational inequities.

Government efforts to reduce these disparities remain robust. National initiatives like Digital India, NDLM, PMGDISHA, and associated schemes have attempted to bring digital capabilities to millions, often through innovative public-private partnerships and localized training modules. Nag and Meher (2025) explored the efficacy of such programs, finding that while millions, particularly in rural areas, have benefited from basic digital skills training, lingering issues of infrastructure deficits, gender disparities, and socioeconomic obstacles prevent the benefits from being evenly distributed. Rani (2025) synthesized much of this progress and its challenges by showing how major government campaigns have increased digital participation, yet disparities remain evident along state and gender lines. These observations tie closely with Bansall (2024), who noted that digital literacy rates had climbed to 37% by late 2024, propelled largely by inventive outreach programs and expanded state-led interventions, even as social and economic barriers continued to create visible divides.

Bhutada and Kumar (2025), expanding on survey findings, reported that while nearly two-thirds of rural teens had access to smartphones, only 80% could perform simple functions like setting alarms or searching YouTube. Deep gender and regional biases persist, particularly in central and eastern states, underlining that device availability alone cannot overcome entrenched divides.

On the technology and policy front, Kumar et al. (2025) celebrated India surpassing 34,000 GPUs in national compute capacity a technological leap heavily connected to investments in digital literacy that are expected to democratize advanced AI and research applications. Mehta (2024) documented government successes in reaching the underserved, especially through programs like PMGDISHA and Digital India, which significantly improved access to critical services and financial inclusion by expanding low-cost internet and targeted rural training. Even so, Thekkumbad (2025) emphasized that more needs to be done to equalize device distribution and broadband access, noting that the vision of universal digital literacy will require networks and platforms robust even in India's remotest areas. Finally, as Bhattacharya (2025) points out, digital literacy is today inextricably linked with social mobility and economic opportunity: with only 38% of Indian households being digitally literate, the

push for universal digital literacy is not just an educational imperative, but a fundamental development strategy for the nation's future.

Studies conducted in Abroad

Godwin-Jones (2018) investigated into the changing face of digital literacy within global English as a Foreign Language (EFL) classroom, moving beyond basic Information and Communication Technology (ICT) skills toward fostering critical, creative, and ethical engagement with digital media. His exploration underscored not just the utility of technology, but its crucial role in nurturing learner autonomy, intercultural competence, and collaborative skills. He advocated expanding EFL curricula to ensure students could critically assess and ethically use digital resources, thus equipping them for meaningful participation in a rapidly globalizing digital community. As digital methods became more prevalent, Poonguzhali (2019) provided concrete evidence on the effectiveness of Computer Mediated Learning (CML) in teaching English grammar, particularly to eighth-grade students. Her research demonstrated that students using CML outperformed their peers taught through traditional methods, not only in mastering English grammar but also in enhancing their understanding of key learning objectives. Significantly, the CML approach proved effective regardless of variables like gender, socioeconomic background, or academic qualification highlighting the inclusive potential of thoughtfully designed digital pedagogies. Recognizing the diversity within English Language Learners (ELLs), Yuan et al. (2019) drew attention to pedagogical frameworks that honor cultural identities and empower ELLs as both consumers and producers of digital information. Grounded in sociocultural learning theory and critical theory, this review synthesized various studies and concluded that digital literacies, when approached through a culturally responsive lens, transform ELLs into active participants in their education and broader digital society.

In a similar disposition, multimedia's motivational effect in language learning was documented by Bimo et al. (2021). The study found that the inclusion of audio-visual resources not only helped teachers in their instructional delivery but also heightened student engagement and attentiveness. The integration of multimedia, therefore, was positioned as a catalyst for both language acquisition and greater classroom participation. The relationship between digital skills and specific literacy

areas was explored by Alakrash and Razak (2021). The findings indicated that students were most likely to deploy digital tools for vocabulary acquisition and least likely for reading comprehension. Meanwhile, teachers largely used digital resources for general pedagogical tasks rather than specialized literacy instruction, pointing to areas where additional training might further align teaching practices with evolving digital trends.

Turning to broader educational systems, Son and Park (2017) explored digital integration within EFL classrooms using surveys and interviews, finding that both teachers and students made regular use of technology for project work, communication, and research. This widespread uptake contributed to not only language improvement but also advanced critical thinking and intercultural awareness. Yet, disparities in digital competence and access remained, echoing international calls for more equitable support and resource allocation. Similarly, Park and Son (2020) investigated Korean EFL teachers' perceptions and practical uses of digital literacy in secondary schools. The study uncovered a keen awareness among teachers of digital literacy's significance, but also a persistent sense of being underprepared, mostly due to limited institutional support and a dearth of targeted professional training. Teachers who overcame these barriers noticed palpable gains in student engagement and learning outcomes, driving home the importance of ongoing professional development in digital pedagogy.

Mental wellbeing and social capital emerged as salient outcomes of digital skills in populations outside of schools. Lee (2024) analyzed how digital literacy impacted life satisfaction among Korean adults aged over 65. The results were illuminating: older adults who received digital literacy training reported higher satisfaction and social connectedness. Nevertheless, broader competency rates remained low in this demographic, recommending that while progress was evident, much work is needed to ensure inclusive digital access as populations age. Cheong et al. (2025) shifted the lens to public health, emphasizing that eHealth literacy encompassing the ability to locate and critically interpret digital health information directly correlates with improved self-care and proactive health behaviors. Their review found that public health outcomes, especially among marginalized and multilingual communities, benefited greatly from tailored digital campaigns and interventions.

Li et al. (2024) found that a worker's educational attainment, hands-on experience, and exposure to IT training played instrumental roles in raising workplace digital literacy. In response, policy reforms have increasingly targeted the need for

standardized upskilling as part of broader workforce modernization efforts ensuring global competitiveness across industries and sectors. Cao et al. (2023) demonstrated that intensive digital literacy training for teachers led to more effective classroom integration of technology and, ultimately, better student achievement. Their cross-national study firmly linked investment in teacher professional development to improved adaptation and classroom outcomes at a national level.

Building on the understanding of how digital skills are fostered, Jiang (2024) conducted a sweeping literature review on digital literacy for foreign language teachers in Chinese universities, synthesizing insights from 72 academic articles. He identified four interwoven dimensions national, institutional, team, and individual that drive meaningful improvements in teacher digital literacy. Here, both structural supports (like policy and organizational backing) and intrinsic individual motivation were key, advocating for a balanced, multidimensional strategy for teacher upskilling.

The COVID-19 pandemic reshaped global digital expectations virtually overnight. Pan et al. (2025) traced accelerated digital literacy growth during the widescale shift to online learning and services, observing that secondary students outperformed their primary-school counterparts, though variability in skill development increased. While overall improvement was marked, these shifts widened the digital divide among learners, especially those lacking initial access or support.

The threat of misinformation looms large in the digital age, prompting studies like that of Siani and Gennari (2025), who found that focused curricula around fake news detection and critical analysis substantially equipped secondary students to better recognize and counter misinformation online. This not only fostered resilience but also cultivated citizenship skills necessary for informed democratic participation. Curriculum design that mirrors real-world needs is increasingly recognized as central to digital literacy advancement. Chan and Sung (2025) found that students in Hong Kong especially valued coursework that embedded authentic, hands-on digital tasks, connecting classroom learning with practical challenges and expectations outside school. Their research advocates for ongoing curricular renewal to ensure relevance and responsiveness to an ever-evolving digital landscape. Fraillon (2024) evaluated digital literacy among 133,000 eighth-grade students spanning 35 education systems. His findings highlighted significant disparities with nearly half underperforming in key competencies such as information evaluation and independent technology use reveals that digital divides persist even within digitally advanced regions. He called

for urgent systemic reforms toward embedding digital skills, citizenship, and problem-solving in educational systems to better prepare youth.

Digital divides are not restricted to the young. Studies like Bandura and Leal (2022) observed that, on a global scale, women remain significantly underrepresented in digital and tech fields. Persistent competency gaps traced to economic and social factors prompted interventions like coding bootcamps and targeted mentoring, which have started to move the needle toward more inclusive, gender-sensitive digital education. Guiding these international efforts, Vuorikari and Kluzer (2022) detailed the ambitious EU DigComp framework and 2030 Digital Compass, which serve as policy beacons for member nations aiming for a 70% digital literacy rate. These multi-level strategies are lauded as benchmarks for comprehensive digital policy, promoting inclusive approaches that address disparities faced by women, older adults, and migrants.

Zakir et al. (2025) further substantiated the academic benefits of digital literacy, showing that students' proficiency predicted success in self-guided learning, autonomy, and academic performance. Their findings lend forceful support to curricular approaches that integrate peer mentoring and promote informal, self-directed learning models.

Table 2.1
Summary of the studies related to Digital Literacy

Sl.no	Authors and Year	Major Focus	Major Findings
1.	Son and Park (2017)	Digital literacy integration in Australian EFL classrooms.	Frequent digital tool use enhances language skills, critical thinking, intercultural awareness and access disparities noted.
2.	Godwin-Jones (2018)	Digital literacy in global EFL classrooms.	Shift beyond ICT skills to critical, creative, ethical use promotes learner autonomy, intercultural competence, and collaboration.
3.	Sahu (2019)	Digital literacy among library science students in India.	Moderate literacy, poor advanced skills, recommended curriculum updates and practical training.
4.	Poonguzhali (2019)	Computer mediated learning (CML) in English grammar.	CML improved grammar across demographics over traditional methods and inclusive pedagogy potential.
5.	Yuan et al. (2019)	Digital literacy impact on ELL learners	Culturally responsive digital literacy empowers ELLs transforms students into active learners.
6.	Krishnamurthy & Shettappanavar (2019)	Digital literacy among female postgraduates.	Foundational digital skills were found to be good, advanced analysis and secure practices lacking, called for gender-responsive policies.

7.	Park and Son (2020)	Korean EFL teachers' perceptions of digital literacy.	Teachers recognize importance but feel undertrained. Training boosts student engagement and outcomes.
8.	Bimo et al. (2021)	Multimedia's role in language learning.	Audio-visual aids increase teacher effectiveness and student engagement.
9.	Goel et al. (2021)	Digital literacy program impacts in India.	Positive effects on confidence, employability; need tailored support for demographics.
10.	Alakrash and Razak (2021)	Students and teachers' use of digital tools in language learning.	Students use digital tools mostly for vocabulary; teachers for general tasks; reading skills lag.
11.	Srivastava (2022)	Digital skills and mobile use in India.	High mobile access but low digital proficiency, true digital inclusion requires skills.
12.	Rana (2022)	Barriers to digital literacy in India.	Age, region, gender, socioeconomic status affect literacy and in need targeted strategies.
13.	Afzal (2022)	Comparative digital literacy India vs USA.	Urban India closing gap with US. However, rural lag due to connectivity and device access.
14.	Bandura and Leal (2022)	Global gender gaps in digital literacy.	Persistent socio-economic digital gaps. Coding and mentoring programs help.
15.	Vuorikari and Kluzer (2022)	EU DigComp and Digital Compass.	Inclusive approaches targeting women, seniors, migrants with 70% literacy goal by 2025.
16.	Cao et al. (2023)	Teacher digital literacy training impacts	Training improves technology integration and student results.

17.	Kunal and Dhillon (2023)	NEP 2020's digital literacy emphasis.	Promotes digital skills, ethical judgment. Aims for equitable tech access.
18.	ASER (2023)	Rural youth digital skills in India.	High smartphone access but low proficiency and confidence often overstated.
19.	Rana et al. (2023)	Effects of NEP 2020 on student digital literacy in India.	Digital literacy instruction strengthens operational skills, critical thinking, collaboration, and ethics, preparing students for lifelong learning in digital environments.
20.	Bansall (2024)	Indian digital literacy rates and disparities.	Digital literacy rose to 37% by late 2024 through outreach and state-led projects, but socio-economic rural-urban divides remain.
21.	Jiang (2024)	Digital literacy enhancement for Chinese university teachers.	Need multi-level support. National, institutional, team, and individual.
22.	Mehta (2024)	Government digital literacy programs in India.	Programs improve access to services. Rural training increases inclusivity.
23.	Li et al. (2024)	Workplace digital literacy in China.	Education, experience, IT training boost skills and policies support standardization.
24.	Lee (2024)	Digital literacy effect on life satisfaction among older adults in Korea.	Training boosts life satisfaction but overall competency remains low.
25.	Frailon (2024)	Global student digital literacy disparities.	Half below proficiency and need systemic educational reforms.

26.	Bhutada and Kumar (2025)	Rural teens' smartphone use in India	High access but only 80% perform basic digital tasks. Biases remain.
27.	Chan and Sung (2025)	Course-based digital literacy assessments in Hong Kong.	Students prefer authentic, real-world digital tasks. In need for curricular innovation.
28.	Pan et al. (2025)	Pandemic effect on student digital literacy.	Digital divides widen; older students are more proficient and varied growth rates.
30.	Siani and Gennari (2025)	Fake news detection education.	Improves secondary students' misinformation recognition and digital citizenship.
31.	Bhattacharya (2025)	Digital literacy and social mobility in India	38% household's literate, key for economic development.
32.	Kumar et al. (2025)	India's national compute capacity increase	Huge GPU growth linked to digital literacy investment eventually boosts AI research.
33.	Nag and Meher (2025)	Effectiveness of Indian digital literacy initiatives	Millions trained but infrastructure, gender, and socioeconomic challenges remain.
34.	Cheong et al. (2025)	eHealth literacy and public health	Higher digital health literacy links to better care and tailored outreach for minorities.
35.	Adeppa (2025)	Teacher digital literacy divide in India	Urban-rural divide. Rural teachers lack training and infrastructure.
36.	Thekkumbad (2025)	Digital infrastructure for universal literacy in India	Stressed need to further equalize device distribution and broadband, especially in remote/rural regions; inclusion needs ongoing focus.

37.	Zakir et al. (2025)	Academic benefits of digital literacy	Digital skills linked to better self-guided learning, autonomy, and performance.

2.2. Studies done on Technological Integration Studies conducted in India

Sharma (2021) revealed that Indian teachers were increasingly adopting information and communication technologies (ICT) to make classrooms more dynamic and student-centered, promoting innovative teaching practices nationwide. Das and Roy (2021) study demonstrated the power of collaborative writing tools such as Google Docs, where 70 students engaged over ten weeks showed marked improvement in coherence, grammar, and creativity through peer feedback and real-time interaction, underscoring how online platforms support critical thinking and teamwork effectively. Similarly, Jain and Mehta (2021) implemented a flipped classroom model with 90 students, combining video lectures and online quizzes as homework with interactive, discussion-based class time, resulting in higher student engagement and better comprehension; teachers noted students came better prepared and participated more actively. In line with these innovations, Rao (2021) conducted a six-week YouTube-based pronunciation program with 60 engineering students, where pre- and post-intervention assessments revealed significant improvement in pronunciation accuracy, confirming that video content is an engaging and accessible supplementary learning tool.

Bose (2022) compared synchronous live classes with asynchronous recorded content involving 100 college students, showing improvements in reading and writing across both groups but greater gains in speaking and listening for the synchronous learners, who also expressed a preference for real-time interaction and instant clarification. Pandya and Joshi (2022) studied English language teaching in Gujarat through multimedia tools, interactive software, and online resources, finding they notably enhanced student engagement and facilitated differentiated instruction and collaborative learning; however, limited access to devices and insufficient teacher training in rural schools posed significant barriers, emphasizing the need for ongoing professional development and infrastructural investments. Complementing these findings, Dey and Banerjee (2022) ran a six-week podcast listening program with sixty high school students that led to significant improvements in accents and intonation comprehension, while students appreciated the accessibility and engaging nature of podcasts. Sen and Ghosh (2022) observed that using Augmented Reality (AR) apps with forty students improved vocabulary retention and recall beyond traditional methods; the novelty and interactivity made learning more appealing. Menon and

Thomas (2022) incorporated gamified digital activities into the curriculum across a semester involving five teachers and 150 students, which elevated engagement, vocabulary acquisition, and retention rates teachers reported heightened enthusiasm during gamified sessions.

Choudhury and Dasgupta (2023) quasi-experimental research with 60 students using e-books over 12 weeks reported increased reading frequency and improved comprehension; students valued the accessibility and variety available. Chakraborty (2023) leveraged Virtual Reality (VR) simulations with 30 high school students for immersive English conversations, finding enhanced listening comprehension, situational vocabulary, and elevated student confidence in real-world communication. Meanwhile, Singh and Kaur (2023) showcased the benefits of AI chatbots used by 40 undergraduates for conversational English practice, noting improvements in speaking fluency and diminished anxiety, as chatbots provided personalized, low-pressure environments conducive to language development. These innovative applications underscore a growing trend toward personalized, technology-facilitated language learning.

Parallel to pedagogical advances, overarching educational reforms increasingly emphasize technology integration. According to Tyagi (2023), digital education under the National Education Policy (NEP) significantly improved access during disruptions like the COVID-19 pandemic, with platforms such as DIKSHA and virtual labs democratizing content availability for even remote students, advancing national digital education objectives. Supporting this perspective, Ghosh (2023) placed technology at the core of educational reform, advocating a blended approach that combines online and experiential learning, promotes regional language e-content, and establishes the National Educational Technology Forum to guide digital curriculum development and policy innovation. Meanwhile, Ragothaman et al. (2023) highlighted how technology integration has transformed Indian education by enabling digital classrooms and adaptive AI-powered tools that personalize learning. Importantly, even students in remote areas benefit from online platforms, though infrastructural gaps and urban- rural divides remain significant challenges. The study stresses that effective teacher training and strong cybersecurity policies are vital to ensuring equitable benefits and creating an inclusive, high-quality educational environment.

Further research by Misra (2023) explored the shaping of Indian higher education through digital technology, emphasizing how institutional readiness, policy

frameworks, and government initiatives influence efficiency and expanded learning opportunities. However, barriers such as faculty resistance, resource shortages, and patchy policy implementation persist, signaling the necessity of aligning policies closely with ground realities for successful technology integration. Pritam and Shaikh (2024) investigation into regional disparities found urban schools exhibit more advanced technological integration than rural areas, primarily due to differences in infrastructure and connectivity. Their study stresses that strategic infrastructure investment and comprehensive teacher development programs are critical to bridging this gap and securing equitable learning for all students.

At the higher education level, Seth et al. (2024) underscored the impact of programs like SWAYAM and NPTEL in broadening access to quality education through online platforms. Post-pandemic, universities have widely adopted virtual classrooms, including online proctoring, to maintain educational continuity. The incorporation of AI and learning analytics further enables personalized experiences, supported by government-backed digital infrastructure initiatives that prepare Indian higher education for future demands. Jasola (2025) also emphasized India's use of advanced technologies, including artificial intelligence, machine learning, and virtual reality, to address educational inequalities. AI-driven platforms tailor learning support, particularly for rural students previously lacking access to quality faculty and resources, suggesting a potential revolution in educational outcomes through sustained technology adoption.

Mishra et al. (2025) reported on the broader socioeconomic context, showing that India's digital economy constitutes over 13% of GDP, with education technology being a significant contributor. The expansion of digital platforms alongside the digitization of traditional sectors illustrates how technology underpins not just learning but national economic and social transformation. Das (2024) reinforced the vital importance of ongoing teacher training in integrating emerging technologies into pedagogical practice, enabling educators to employ educational technology innovatively and effectively, thus fostering more engaging learning environments.

Studies conducted Abroad

Malone (2017) sets the stage by emphasizing that true innovation in international education requires more than just using existing digital tools, genuine

progress occurs when educators move beyond mere applications and embrace immersive, collaborative approaches. Rather than settling for students blogging or engaging with social media platforms, Malone advances that transformative results come from integrating technology with well-crafted pedagogical strategies that foster cross-border connections and technological fluency as central components of global learning outcomes. The paper exposes the challenges of resistance to change and uneven technological infrastructure encountered in study abroad settings, urging a rethinking of how technology can genuinely empower learning rather than simply provide convenience.

Building on similar concerns, Durbidge (2018) explores how technology shapes the experiences of study abroad participants with a keen focus on second-language acquisition. The study reveals that students who incorporated digital tools into their research, communication, and language practice routines exhibited heightened motivation and improved conversational prowess in their target languages. The study points out that while digital connections boost engagement, an over-dependence on technology for comfort can sometimes displace meaningful in person's socialization, which is critical for immersive language development. This research ultimately argues that intentional guidance and educational support are required to help students strike a healthy balance between digital interactions and real-world, intercultural learning.

Alam et al. (2025) highlight the exponential growth of digital technology use in global educational settings, detailing the adoption of interactive whiteboards, cloud-based learning environments, and augmented or virtual reality applications. Surveying educators and students across 48 countries, the study reveals that digital integration not only increases student participation and flexible teaching methods, but also broadens access to educational opportunities, especially for previously underserved populations. Government-led investments in the UK, USA, China, and several other nations serve as powerful catalysts for this trend. Still, the findings do not understate ongoing hurdles, digital divides remain, as do concerns around excessive screen time, the need for comprehensive teacher training, and persistent inequalities tied to geography and resources. Similarly, Hidayat and Firmanti (2024) provide a focused analysis of the Indonesian context, examining how digital tools are shaping mathematics classrooms. The study demonstrates a clear uptick in conceptual understanding, student collaboration, and problem-solving when these technologies are implemented

thoughtfully and purposefully. What emerges as a recurring theme, however, is the critical role of sustained professional development and the provision of equitable resources to ensure that digital adoption results in widespread, lasting benefits. Without strategic support, they warn that quality of instruction could become fragmented and uneven.

Siyam et al. (2025) echo this sentiment in their cross-regional evaluation of technology-driven professional development programs for teachers in the Middle East and Europe. The study concludes that targeted, ongoing professional development meaningfully boosts teachers' confidence and increases their frequency of digital tool use, which translates directly into improved classroom experiences for students. The research emphasizes that the greatest impact occurs when training is tailored to specific contexts and sustained over time, whereas single-session workshops rarely shift entrenched habits.

The massive disruption caused by the 2020 pandemic is central in Sharma's (2025) analysis. Sharma (2025) chronicles how lockdowns forced overseas education to rapidly adopt virtual learning methodologies, hybrid classes, and a vast array of digital student services. Within two years, personalized online tools, remote laboratory access, and interactive simulations shifted from being experimental supplements to mainstream essentials. For many overseas students, this transition facilitated seamless access to global educational content while simultaneously developing the digital skills that modern economies increasingly demand. Importantly, student feedback collected in this period highlighted newfound independence and a significant sense of convenience though the study also acknowledges that these rapidly changing circumstances required constant adaptation and resilience on the part of both students and educators.

OECD (2022) offers more granular insights into the conditions under which technology use benefits student outcomes. The report finds that regular, well-structured application of digital tools in classrooms is correlated with improvements in student performance, particularly in digital literacy and collaborative skill building. It also issues a caution, when technology use is unfocused or excessive, student achievement can actually suffer. The research highlights the importance of grounding all digital integration in sound pedagogical practice, ensuring robust teacher preparation, and engaging in regular assessment of outcomes so adjustments can be made. Timotheou et al. (2022) emphasize that ICT (Information and Communication

Technology) can enhance learning opportunities and engagement worldwide but caution that the pandemic has dramatically widened gaps where infrastructure or teacher capacity is inadequate. Their review calls for long-term, strategic investments into both digital infrastructure and ongoing teacher professional development as non-negotiable pillars for achieving genuinely inclusive impact with technology.

Sam (2024) brings attention to the particular dynamics at play in Cambodian universities, where technological infrastructure has seen notable improvement. However, the findings reveal that the most meaningful gains in student learning occurred when technology investments were paired with focused teacher upskilling initiatives and comprehensive changes to curriculum design. Institutions that invested across all three domains reported measurable improvements in learner outcomes, but challenges related to digital equity and access remain particularly acute among under-resourced rural colleges.

Haleem et al. (2022) discuss the global proliferation of smart devices and Internet of Things (IoT) systems within international classrooms, highlighting the benefits of differentiated instruction, flexible syllabi, and data-driven assessment. Not only do these digital advances allow educators to personalize learning pathways, but they also empower families to remain engaged with their children's progress in real time. Nevertheless, issues related to equitable device access and maintaining high levels of student engagement amid potentially screen-saturated environments still demand inventive solutions. Abedi (2023) draws attention to the disconnect between national or institutional policy goals regarding technology and the lived reality within classrooms. Teachers, as frontline users of digital tools, often value these innovations but face hurdles such as institutional inertia and insufficient ongoing training. The findings stress that genuine, system-wide adoption of educational technology depends on regular stakeholder engagement, responsive professional support, and a willingness to adapt approaches based on practical feedback.

Shauk (2025) picks up the narrative in the context of developing countries, noting that increased network capacity and the falling cost of devices have opened up online and blended learning to many new schools. The most prominent trends include the rise of artificial intelligence-assisted learning, microlearning platforms, and enhanced global resource sharing, all of which help close gaps in access and opportunity. However, Shauk also argues that digital literacy initiatives must rapidly evolve to match the pace of technological change or risk leaving the most vulnerable

learners behind. Chasokela (2025) examines integrated EdTech as a lever for boosting critical skills in sub-Saharan Africa. The study finds that project-based, technology-supported instruction strengthens critical thinking, creativity, and students' confidence. However, the challenge remains to maintain high levels of teacher proficiency and guarantee equitable technology access and distribution, especially in environments with limited resources.

Aggarwal (2023) conducted a longitudinal study with 60 Canadian EFL learners using adaptive learning platforms over six months. Through pre- and post-assessments and learning analytics, the study found that adaptive technologies effectively identified individual learning gaps and provided personalized support, resulting in improved vocabulary and grammar skills. The research emphasized the need for ongoing teacher training to maximize benefits. Kaur et al. (2023) conducted a mixed-methods study with 100 Malaysian EFL students. Their findings reveal that integrating digital tools does improve engagement and access, but also highlight persistent obstacles in device availability and varying levels of digital literacy. The research recommends focused policies and interventions designed to bridge these gaps, allowing technology-driven benefits to reach all EFL learners equitably. Lee (2023) echoes the importance of innovative platforms, having explored South Korean university students' use of metaverse environments for English language study. The study found that immersive, collaborative learning contexts within the metaverse sparked increased engagement, more speaking practice, and enhanced confidence in communication. However, technical skill requirements and platform usability were cited as ongoing concerns, suggesting that even the most advanced tools must be implemented thoughtfully. Shadiev et al. (2023) investigated into the risks and challenges associated with digital technology in English classrooms. Through a series of in-depth interviews with 30 EFL teachers, the research uncovered recurrent anxieties about technical failures, insufficient training, and the potential risk of alienating students from authentic communicative practice. Comprehensive professional development, together with reliable technical support, is emphasized as key to alleviating these concerns and nurturing effective, dynamic digital classrooms. Turning attention to advanced technological interventions, Hsu (2024) studied the cognitive and emotional dynamics among 120 Taiwanese EFL students engaged in virtual reality-based English learning. By combining surveys and interviews, the study found that the immersiveness of VR environments heightened engagement, motivation, and willingness to communicate,

while reducing traditional anxieties linked to language use. Notably, students reported deriving greater enjoyment from VR experiences than from standard classroom instruction, although the study also underscores the necessity of robust technical support and pedagogical adaptation for the effects to be sustained.

Chen (2020) and Lee and Park (2020) further illuminate the transformative potential of augmented reality (AR) in language education. Chen's quasi-experimental study with 80 Chinese secondary school students demonstrated that AR-enhanced materials bolstered both vocabulary retention and learner motivation. The multimodal aspects of AR, such as interactive images and audio made vocabulary more meaningful and memorable. Lee and Park expand on this by showing that their experimental group of 60 Korean high school students responded positively to dynamic, contextual AR applications, which in turn boosted motivation and willingness to participate actively in English lessons. However, they caution that not all AR tools are created equal, the absence of genuine interactivity is seen as a shortcoming that must be addressed in future app designs.

Table 2.2**Summary of the studies related to Technological Integration**

Sl.no	Authors and Year	Major Focus	Major Findings
1.	Malone (2017)	Innovation in international education technology use.	Advocates for integration beyond basic ICT, promoting cross-border collaboration and technological fluency; highlights resistance to change and infrastructure gaps.
2.	Durbidge (2018)	Technology in study abroad language learning.	Digital tools boost motivation and language skills, but overreliance can hinder in-person interaction; stresses balanced, guided tech use for intercultural growth.
3.	Chen (2020)	Augmented reality for vocabulary acquisition (China).	AR materials significantly improve vocabulary learning and retention through multimodal engagement.
4.	Lee and Park (2020)	AR applications in Korean high schools for English.	Dynamic, interactive AR improves student motivation and participation; designs must prioritize genuine interactivity.
5.	Das and Roy (2021)	Collaborative writing with Google Docs in India.	Ten-week intervention with 70 students improved writing coherence, grammar, and creativity via real-time, collaborative feedback using technology.
6.	Jain & Mehta (2021)	Flipped classroom model in Indian context.	Combining video lectures and online quizzes with interactive in-person classes heightened engagement and comprehension; teachers observed better preparedness.

7.	Rao (2021)	YouTube-based pronunciation program in India.	Six-week program with engineering students showed significant pronunciation gains; video content proved engaging and accessible for language learning.
8.	Sharma (2021)	Indian teachers' adoption of ICT.	Teachers increasingly use ICT, creating more dynamic, student-centered classrooms and driving innovation nationwide.
9.	Bose (2022)	Synchronous vs. asynchronous digital learning in India.	Both modes improved reading/writing, but synchronous classes led to better speaking/listening and were preferred for real-time feedback.
10.	Dey and Banerjee (2022)	Podcasts for listening comprehension in Indian schools.	Six-week podcast program boosted accent and intonation skills; students found format accessible and engaging.
11.	Haleem et al. (2022)	Smart devices and IoT in international classrooms.	Tech fosters individualized instruction and assessment; requires balancing engagement and screen time, especially for families.
12.	Menon and Thomas (2022)	Gamification in Indian English curriculum.	Integration of gamified digital activities improved engagement, vocabulary, and retention; teachers noted more enthusiastic participation.
13.	OECD (2022)	Technology and student outcomes in global schools.	Structured digital use improves literacy/collaboration; unstructured or excessive use can reduce achievement; calls for balanced, pedagogical adoption.
14.	Pandya and Joshi (2022)	Multimedia and interactive tech in English language	Digital tools enhanced engagement, differentiation, and collaboration, but infrastructure and teacher

		teaching (India).	training shortages limited use, especially in rural areas.
15.	Sen and Ghosh (2022)	Augmented reality (AR) in vocabulary learning (India).	Use of AR apps led to higher vocabulary retention and recall, with students enjoying interactive, novel learning experiences.
16.	Timotheou et al. (2022)	Global ICT integration during/post-pandemic.	Tech expands opportunity, but infrastructure and teacher gaps increased post-pandemic; urges continued investment and PD.
17.	Abedi (2023)	Policy vs. tech realities in classrooms (Finland/Europe)	Teachers welcome tech, but adoption is hindered by institutional support and lack of training; stakeholder engagement is critical.
18.	Aggarwal (2023)	Personalized tech via adaptive learning platforms (Canada).	Adaptive platforms help identify and address learning gaps, leading to better language learning outcomes; teacher training vital.
19.	Choudhury and Dasgupta (2023)	E-books and reading development (India).	Twelve-week quasi-experiment showed increased reading frequency and comprehension; students appreciated e-book accessibility and variety.
20.	Chakraborty (2023)	VR simulations for English conversations (India).	VR boosted listening, situational vocabulary, and confidence in communication among high school students.
21.	Ghosh (2023)	Technology at the heart of Indian educational reform.	Emphasizes blended, online-experiential learning, regional language e-content, and institutional policy forums for sustainable innovation.

22.	Kaur et al. (2023)	Digital tech in EFL equity (Malaysia).	Tech raises engagement, but device/access gaps persist; targeted interventions are needed for equitable language learning gains.
23.	Lee (2023)	Metaverse for university English learning (Korea).	Metaverse platforms enhance engagement and skills, but technical difficulties require careful implementation and support.
24.	Ragothaman et al. (2023)	Impact of tech integration, digital classrooms, and AI (India).	Digital and AI-driven tools personalize education, benefiting even remote students, though infrastructure and training gaps persist.
25.	Shadiev et al. (2023)	Risks/challenges of digital tech in English classrooms (Europe).	Concerns over tech failures and insufficient PD; comprehensive professional development and support critical for success.
26.	Singh & Kaur (2023)	AI chatbots for English fluency (India).	Use of AI chatbots led to improved speaking fluency and reduced language anxiety; provided personalized, low-pressure practice.
27.	Tyagi (2023)	Tech in NEP and digital education access (India).	Platforms like DIKSHA and virtual labs facilitated equitable content access during COVID-19, helping reach remote learners.
28.	Misra (2023)	Digital technology shaping Indian higher education.	Technologies expand opportunities, but progress is stalled by faculty resistance, resource limitations, and policy-practice disconnects.
29.	Das (2024)	Teacher training for technology integration (India).	Ongoing professional development is essential for effective edtech use, enabling creative, engaging teaching practices.

30.	Hidayat and Firmanti (2024)	Digital tech in Indonesian math classrooms.	Thoughtful integration improves conceptual understanding and collaboration, but long-term success hinges on sustained professional development and resource equity.
31.	Hsu (2024)	Virtual reality (VR) for EFL in Taiwan.	VR boosts motivation, engagement, and confidence in English communication; requires pedagogical and technical scaffolding.
32.	Pritam and Shaikh (2024)	Regional disparities in tech integration (India).	Urban schools adopt tech more fully; bridging urban-rural gaps requires targeted infrastructure and teacher development.
33.	Sam (2024)	EdTech and curricular redesign in Cambodian Universities.	Teacher upskilling and infrastructure investment yield the biggest learning gains, though rural colleges face strong equity barriers.
34.	Seth et al. (2024)	Online platforms and AI in Indian higher education.	Initiatives like SWAYAM/NPTEL and virtual classrooms, plus analytics and AI, facilitate continuity, equity, and personalization post-pandemic.
35.	Alam et al. (2025)	Growth of digital tech in global education.	Interactive platforms and AR/VR increase engagement and access, but divides and equity issues linger; highlights global progress and persistent challenges.
36.	Chasokela (2025)	EdTech for STEM skills in Sub-Saharan Africa.	Project-based tech learning boosts creativity and confidence; significant equity and teacher proficiency challenges remain.
37.	Jasola (2025)	AI and immersive tech access for addressing educational Inequalities.	AI/ML/VR foster personalized learning, particularly benefiting rural and under- resourced students, and narrowing achievement gaps.

38.	Mishra et al. (2025)	EdTech's contribution to India's digital economy.	Education technology significantly fuels economic growth and modernizes traditional sectors by increasing access and participation.
39.	Sharma (2025)	Virtual learning adoption in international higher education post-Pandemic.	Pandemic accelerated virtual/hybrid learning, promoting student autonomy and digital competence worldwide; adaptability was key.
40.	Shauk (2025)	Cost, access, and tech trends in developing countries.	Lower device costs expanded blended learning, but urgent digital literacy programs still needed to avoid deepening inequity.
41.	Siyam et al. (2025)	Teacher PD in Middle East/Europe for digital Integration.	Continuous, context-specific training increases teacher confidence and digital tool adoption; one-off workshops less effective.

2.3. Studies done on Learners' Autonomy

Studies Conducted in India

Saleem (2016) provides early qualitative insight from a sample consisting of 10 language teachers and 60 undergraduate students. The research, grounded in interviews, classroom observations, and reflective essays, underscores how an encouraging classroom climate paired with creative assignments and decision-making opportunities empowers students to take initiative. Here, teachers' transition was from sole authorities to facilitators, a theme echoed repeatedly in subsequent studies. Priyanka (2017) action research involving 45 high school students from Karnataka extends these findings, demonstrating that engaging students in task design and reflection fosters self-regulation, motivation, and improved language skills. Importantly, teacher facilitation is seen as crucial, particularly when students are in large or mixed-ability classrooms. Rajalakshmi (2017) also highlights the role of Information and Communication Technology (ICT) in fostering learner autonomy by promoting independent learning processes, emphasizing the accelerating impact of technological developments on autonomy in the language classroom.

Rao (2018) further adds to this trajectory by examining 50 English majors in Hyderabad through portfolio-based assessment. His case study reveals that portfolios enhance self-evaluation skills and responsibility for learning, essential facets of autonomy. Meanwhile, Mehta (2018), through a quasi-experimental design with 80 students in Mumbai, compares traditional instruction with autonomy-supportive teaching. Significantly, the group exposed to autonomy-supportive methods showed notable gains in self-directed learning and English proficiency, reinforcing the effectiveness of nurturing learner independence.

Padmanabha (2019) focused on secondary school students in Bengaluru across two urban English-medium schools, utilizing surveys, teacher observations, and focus groups. This investigation revealed that classroom routines and reflection practices played a substantial role in building autonomy. Students given opportunities to self-assess and reflect became more motivated and goal-oriented, honing self-regulation skills throughout the semester. The study affirms the critical importance of teacher facilitation that encourages responsibility while gradually transferring more control to learners. Das (2019), in an action research project at a Kolkata college, similarly

demonstrated that learners developed enhanced self-regulation and engagement when autonomy strategies, including collaborative and self-chosen tasks, were introduced over a semester.

Awan (2020) examined 85 students from two technical colleges in Hyderabad using a mixed- methods approach through surveys and observation logs focusing on digital resources and self- paced modules. Findings pointed to improved self-engagement and adaptability but also highlighted unequal access to devices as a barrier, underscoring the necessity for targeted investment in resource-limited contexts. At the same time, Singh (2020) survey of 200 engineering students in Tamil Nadu confirmed the positive link between the use of language learning apps and online resources and higher levels of learner autonomy alongside better language outcomes.

Gupta and Gupta (2023) conducted research emphasizing institutional roles, showing that flexible curricula combined with robust teacher training stimulated creativity and lifelong learning within autonomous environments. Their findings echo the importance of not just individual learner agency, but systemic administrative support and peer mentoring as integral to fostering sustainable learner autonomy. Similarly, Mote and Kumar (2023) surveyed 155 tertiary-level EFL students post-pandemic, finding that strategy use, especially metacognitive strategies, correlated significantly with perceived autonomy, supporting the hypothesis that autonomy is closely intertwined with deliberate learning strategies and institutional backdrop.

Padmavathi et al. (2024) researched 150 college students in Tamil Nadu through questionnaires and reflective logs focused on project-based assignments and choice. Their work demonstrated meaningful increases in creativity and independent research when students received timely and consistent teacher feedback. This reinforces earlier findings by Priyanka (2017) and Padmanabha (2019) regarding the dual role of autonomy and teacher scaffolding. Mehta et al. (2024) added faculty perspectives from major Maharashtra universities, clarifying that while autonomy is generally supported by educators, constraints such as inadequate training and resources limit its effective implementation. Their results stress the significance of sustained institutional backing for successful autonomy practices.

Priyadharsini (2025) studied 120 undergraduates from three technical universities in Tamil Nadu using a mixed-methods framework, balancing gender and discipline for diverse perspectives. The data indicate that granting students more choice and control over tasks elevates motivation and confidence but also affirm that

structured teacher assistance remains vital, especially for students unfamiliar with self-directed learning. The study aptly concludes that fostering autonomy is most successful when there is a harmonious balance between providing learner freedom and ongoing scaffolding.

Prasad (2025) similarly measured the impact of combining digital tools with classroom instruction for language learning autonomy. His work revealed that students showed improved self-direction and skills, particularly when digital access and clearly structured tasks were in place, underscoring the necessity for deliberate instructional design alongside technological integration. Madhavi (2025) investigation with 55 private university undergraduates in Andhra Pradesh also highlights how digital self-introduction projects and incremental tasks helped even digitally naive students develop autonomy and confidence, provided that clear guidelines and support were given.

Gupta and Mishra (2022) explored the role of e-learning platforms with 120 undergraduates from public universities in Uttar Pradesh, finding that digital environments aid self-paced learning, but constant motivation and instructor interaction remain key to sustaining engagement, especially over extended online courses. Kumar (2022) similarly captures student perceptions of autonomy among 120 English learners in Delhi, noting that while learners value autonomy, systemic constraints such as exam-oriented curricula limit genuine self-directed efforts. His mixed-methods study advocates integrating project-based learning and reflective practices to enhance autonomy, aligning closely with findings from Padmavathi et al. (2024) and Priyadharsini (2025).

Parab (2019) conducted a study on 120 university students attending multi-level English classes in Maharashtra reinforces the value of innovative, student-centered lesson design and flexible teacher roles in promoting sustainable autonomy across diverse classrooms. Patel and Sharma (2021) examined 30 secondary school students in Gujarat through a qualitative lens, finding that while increased control over learning materials boosted motivation and confidence, barriers such as limited resources and rigid classroom structures impeded autonomy development.

Studies Conducted Abroad

Liu (2015) investigated into the relationship between gender, proficiency,

strategy use, and learner autonomy among EFL students in Taiwan. The study revealed that gender, area of study, and language proficiency all significantly impacted learners' use of strategies, with cognitive and metacognitive strategies demonstrating the strongest correlation with autonomy. This early work situates autonomy as intertwined with both demographic and academic variables, laying a foundational understanding of the complexities influencing independent learning behaviors. Fotiadou et al. (2017) conducted a notable survey of 100 postgraduate distance learners, demonstrating significant links between frequent tutor-student and peer interactions and an increase in learner autonomy. Their findings underscore that autonomy not only facilitates self-awareness and adaptability but is also sustained and nourished through robust social learning dynamics and community engagement in remote educational settings. Yasmin and Sohail (2017) explored Pakistani university teachers' beliefs regarding learner autonomy, finding a general consensus that autonomy facilitated language success and greater learning achievement, particularly for students who embraced self-directed studying. During this period, Zakaria et al. (2017) investigated the relationship between learner autonomy and strategy use among Japanese language learners in Malaysia, finding that moderate strategy use correlated significantly with autonomy, thus reinforcing that strategic awareness and application are key drivers of one's capacity for autonomous learning. Szocs (2017) offered a unique perspective from Hungary, comparing beliefs between teachers and learners. Teachers were strong proponents of motivation and the importance of learner self-analysis as requisite elements for fostering autonomy. However, learners demonstrated limited familiarity with these concepts and often perceived their academic environments as unsupportive of independent practices revealing a disconnect that persisted in many educational traditions around the world.

Zhong (2018) qualitative inquiry in New Zealand focused on EFL students' use of technology-mediated classrooms as autonomy-supportive spaces. Her work highlighted the essential roles of goal-setting, material selection, and decision-making as central to the cultivation of learner independence. Similarly, Nguyen (2021) research in Vietnam tested the effects of Computer-Assisted Language Learning (CALL) on autonomy and found that the experimental cohort exhibited substantial growth in strategy use and intrinsic motivation, a result not mirrored in the control group, emphasizing the transformative potential of digital integration in language learning.

Almusharraf (2018) conducted interviews with EFL teachers and their students in Saudi Arabia, concluding that explicit strategy instruction and greater intercultural awareness promoted autonomous vocabulary acquisition. These findings converged with other contemporary studies, confirming that teacher-facilitated metacognitive guidance empowers learners to adopt and sustain self-directed study habits, both inside and outside classroom contexts. Hadi and Guo (2020) researched on Afghan EFL learners at Shaikh Zayed University echoed these themes, illuminating learners' preference for metacognitive strategies such as selective attention, as well as affective means to manage stress, further underscoring the value of emotional resilience alongside strategic resourcefulness.

Iamudom and Tangkiengsirisin (2020) investigated 200 EFL learners from Thai public and international schools, and they found public school participants to exhibit higher autonomy, favoring compensation strategies, while their international peers leaned towards cognitive approaches. Tran (2020) mixed-methods research in Ho Chi Minh City examined attitudes toward autonomy in vocabulary learning and revealed an existing gap between what learners cognitively, affectively, and behaviorally aspired to and what they practiced in reality. Chinpakdee (2020) two-phase study of Thai secondary school teachers concluded that while educators expressed positive views on autonomy, their classroom practices lagged behind their attitudes, though strategy-based instructional approaches still yielded measurable gains in fostering autonomy among their students.

Nguyen et al. (2021) expanded this work, surveying an even larger cohort of 1,565 students, and reinforced the finding that autonomy perceptions vary greatly according to exposure to metacognitive skills training and unique academic backgrounds, making a compelling case for differentiated and context-aware autonomy interventions. Ludwig and Tassinari (2021) research centered on online language education amid the COVID-19 pandemic, illuminating the central role of sustained teacher interaction and participatory classroom decision-making in boosting student autonomy during the turmoil of sudden digital transitions. The digital context was further interrogated by Adanir and Güven (2023), who proposed a scale measuring self-control, self-reflection, self-interaction, and self-motivation among 903 university students; their findings affirmed the reliability of this tool for appraising autonomy in online learning and the primacy of self-monitoring as a predictor of successful independent engagement.

Rahmat and Ismail (2023) employed mixed methods with Malaysian tertiary learners to explore online learning's impact on autonomy. While digital platforms enhanced students' self-regulation and ability to locate resources, they also uncovered challenges related to diminished motivation and time management for some individuals, highlighting that technology is most effective in promoting autonomy when matched with timely scaffolding and structure. Hanh (2023) worked with 30 EFL students in a Thai Nguyen University gifted class, deploying project-based learning (PBL) over four weeks. Results showed that PBL markedly enhanced autonomous skills like motivation, confidence, and language proficiency, and the author provided clear, practical insights for EFL teachers aiming to integrate autonomy-supportive pedagogies.

Chong and Reinders (2022) added a global perspective in their review that analyzed 61 empirical studies, revealing that a majority relied on quantitative, survey-based research methods, though a steady trend toward mixed-method and quasi-experimental designs was observed. Their synthesis stressed teacher mediation, institutional climate, and localized interventions as especially pivotal for fostering meaningful and durable autonomy, especially in higher education contexts across Asia. Zenouzagh et al. (2023) carried out a study involving 40 EFL university students, dividing them into text-based and multimodal computer-mediated writing groups to examine learner autonomy, engagement, and satisfaction. Pre- and post-intervention measures, conversation logs, and essays showed that text-based participants developed significantly higher autonomy and cognitive engagement, while those in multimodal settings experienced greater emotional and social engagement. These results highlighted the importance of not just the presence of technology, but the specific online modality in shaping how autonomy evolves and manifests in actual practice.

Expanding the scope of contextual influences, Van Nguyen and Habók (2021) developed and validated a Learner Autonomy Perception Questionnaire with a sweeping sample of 1,565 Vietnamese students across seven different institutions. Their advanced statistical validation affirmed the tool's accuracy in reflecting actual autonomy levels, and their findings emphasized that discipline and learning context substantially influence how independence is fostered—thus interventions to support autonomy should always be contextually tailored. Wahid et al. (2025) addressed digital literacy, metacognitive skills, and higher-order thinking among EFL learners, using structural equation modelling to link digital literacy directly to autonomy while also

showing that self-reflection and independent decision-making significantly enhance student self-regulation. Their results decisively advocate integrating digital and metacognitive training as essential pillars in curriculum development for nurturing autonomy and lifelong learning. Chetouane (2022) mixed-methods doctoral thesis on Algerian university English departments provided further richness, revealing that beliefs and practices surrounding autonomy are shaped not only by individual agency but also by institutional culture, discipline, and wider societal expectations. The findings supported the notion that autonomy is most robust when interpreted as both a goal and a responsibility shared across personal, academic, and social domains. Trung Tin (2025) focused on the rapidly growing influence of AI in language education by observing 4th-year EFL students at Nguyen Tat Thanh University. Via both interviews and survey data, the study found that integrating AI tools fostered higher independence, flexible work pacing, and better personal study management, yet also identified persistent challenges tied to digital inequality. The findings reveal AI as a key component in the emerging narrative of supporting and expanding learner autonomy, provided digital divides are addressed in reform efforts.

Table 2.3
Summary of the studies related to Learners' Autonomy

Sl.no	Author and year	Major Focus	Major Findings
1.	Liu (2015)	Relationship between gender, proficiency, strategy use, and learner autonomy among EFL students in Taiwan.	Gender, study area, and proficiency significantly impact strategy use; cognitive and metacognitive strategies correlate strongly with autonomy.
2.	Saleem (2016)	Classroom climate, assignments, and decision-making in autonomy development.	Teachers acting as facilitators and using creative assignments empowered students to take initiative.
3.	Fotiadou et al. (2017)	Survey of postgraduate distance learners on interactions and autonomy.	Frequent tutor-student and peer interactions increase autonomy, facilitating self-awareness and adaptability in remote learning.
4.	Priyanka (2017)	Task design and reflection in high school student autonomy.	Student-driven task design and reflection improved self-regulation and language skills, with teacher facilitation particularly vital in diverse classrooms.
5.	Rajalakshmi (2017)	ICT for independent language learning	Technology use accelerated the development of learner autonomy by promoting independent learning.
6.	Szocs (2017)	Comparing teacher and learner beliefs about autonomy in Hungary.	Teachers emphasize motivation and self-analysis but learners are less familiar and environment is unsupportive.

7.	Yasmin and Sohail (2017)	Pakistani university teachers' beliefs on learner autonomy.	Teachers believe autonomy facilitates language success; learners who study autonomously achieve better outcomes.
8.	Zakaria et al. (2017)	Relationship between learner autonomy and strategy use among Japanese language learners in Malaysia.	Moderate strategy use correlated significantly with autonomy, key for learner independence.
9.	Almusharra f (2018)	Interviews about vocabulary learning strategies in Saudi Arabia.	Explicit strategy instruction and intercultural awareness advanced autonomous vocabulary acquisition.
10.	Mehta (2018)	Comparison of traditional and autonomy-supportive Teaching.	Autonomy-supportive methods resulted in notable gains in self-directed learning and English proficiency.
11.	Rao (2018)	Portfolio-based assessment and learner Autonomy.	Portfolios enhanced students' self- evaluation skills and responsibility for their learning, supporting autonomy.
12.	Zhong (2018)	Qualitative study on technology-mediated classrooms fostering autonomy in EFL learners in New Zealand.	Goal-setting, material selection, and decision-making are central to fostering learner independence.
13.	Das (2019)	Autonomy-focused strategies in college education.	Collaborative and self-chosen tasks improved students' self-regulation and engagement.

14.	Padmanabha (2019)	Classroom routines and reflection in secondary schools.	Classroom routines and reflection fostered motivation and self-regulation, with teacher facilitation guiding gradual transfer of learning responsibility.
15.	Parab (2019)	Student-centered lesson design and flexible teacher roles.	Student-centered lessons and adaptable teacher roles effectively fostered autonomy in university classes.
16.	Awan (2020)	Digital resources and self-paced modules in technical colleges.	Digital tools improved engagement and adaptability, but unequal access was a barrier, highlighting needs in under-resourced settings.
17.	Hadi and Guo (2020)	Vocabulary strategies among Afghan EFL learners.	Metacognitive and affective strategies prevalent to manage learning and stress.
18.	Iamudom and Tangkiengsirisin (2020)	EFL learners' strategy use in Thai public and international schools.	Public school students exhibited higher autonomy; different strategy preferences between groups.
19.	Chinpakdee (2020)	Teachers' beliefs and implementation of autonomy in Thai secondary schools.	Positive beliefs but limited classroom promotion; strategy-based instruction helped foster autonomy.
20.	Singh (2020)	Language apps/online resources and engineering student autonomy	Technology use correlated with higher autonomy and better language outcomes for engineering students.

21.	Tran (2020)	Attitudes toward autonomy in vocabulary learning in Ho Chi Minh City.	There is a gap between learners' attitudes and actual autonomous behaviors.
22.	Ludwig and Tassinari (2021)	Online language learning during COVID-19 and impact on autonomy.	Teacher interaction and shared decision-making increased autonomy amid digital transition.
23.	Nguyen (2021)	Effect of CALL on autonomy among Vietnamese learners.	Experimental group showed greater strategy use and intrinsic motivation; control group no change.
24.	Nguyen et al. (2021)	Learner autonomy perception across multiple Vietnamese universities.	Perceptions vary with metacognitive exposure and academic background.
25.	Patel and Sharma (2021)	Student control in Gujarat English Classrooms.	Student control boosted motivation, but access and structural barriers still inhibited autonomy development.
26.	Van Nguyen and Habók (2021)	Developed learner autonomy perception questionnaire in Vietnam for large sample.	Tool valid; discipline and context influence autonomy perceptions.
27.	Chetouane (2022)	Contextual understandings of learner autonomy in Algerian universities.	Autonomy shaped by personal, academic, and social factors; responsibility emphasized.
28.	Chong and Reinders (2022)	Global review of learner autonomy studies.	Majority survey-based; emphasis on teacher mediation and institutional culture.
29.	Gupta and Mishra (2022)	E-learning platforms and undergraduate autonomy	Digital learning supports self-pacing, though ongoing motivation and instructor

			guidance are crucial for sustaining autonomy over time.
30.	Kumar (2022)	Perceptions of autonomy in exam-driven English learning in Delhi	Students value autonomy, but systemic and curricular constraints limit opportunities for self-direction. Project work and reflection are recommended.
31.	Adanir and Güven (2023)	Scale measuring self-control, reflection, and motivation in online university learners.	Scale reliable; self-monitoring critical for independent engagement.
32.	Gupta and Gupta (2023)	Institutional factors, curriculum and teacher training in fostering autonomy	Institutional support, teacher training, and flexible curricula encouraged creativity, lifelong learning, and robust autonomy.
33.	Hanh (2023)	Project-based learning (PBL) to promote autonomy in EFL students in Vietnam.	PBL enhanced motivation, confidence, and proficiency; recommendations given for teachers.
34.	Mote and Kumar (2023)	Learning strategies and autonomy post-pandemic	Metacognitive strategies strongly correlated with higher perceived autonomy among EFL tertiary students.
35.	Rahmat and Ismail (2023)	Impact of online learning on Malaysian tertiary learners' autonomy.	Digital platforms improved self-regulation; motivation and time management challenges exist.
36.	Zenouzagh et al. (2023)	Comparing text-based and multimodal computer-mediated writing on autonomy.	Text-based group had higher autonomy and cognitive engagement; multimodal had emotional engagement.

37.	Trung Tin (2025)	AI tools' impact on learner autonomy in Vietnam.	AI increased independence and flexible pacing; digital inequality a limitation.
38.	Mehta et al. (2024)	Faculty views on autonomy-promoting practices	Faculty support autonomy, but lack of training/resources limits success, making institutional support essential.
39.	Padmavathi et al. (2024)	Project-based assignments and feedback for autonomy	Project-based assignments and feedback enhanced creativity and independence, with curriculum adjustments supporting varying readiness for autonomy.
40.	Prasad (2025)	Digital tools and instructional design for language autonomy	Structured digital tasks and clear frameworks improved student self- direction and skills in language learning.
41.	Priyadharsini (2025)	Student choice, control, and teacher scaffolding	More choice/control improved motivation, but ongoing teacher support proved crucial, especially for less experienced learners.
42.	Wahid et al. (2025)	Digital literacy and metacognitive skills impact on learner autonomy.	Digital literacy boosts autonomy; reflection and decision-making enhance self-regulation.

2.4. Studies done on English Language Learning

Studies Conducted in India

Parab (2015) stressed the transformative potential of learner-oriented autonomy in language classrooms. Reviewing classroom practices and literature, the study found that student-centered methods where teachers become facilitators, support more relevant and effective learning. Yet, the study flagged considerable roadblocks, such as large class sizes, infrastructural inadequacies, and the prevalence of exam-focused teaching cultures, all of which impede true learner autonomy. Parab argued that these obstacles could be countered through targeted teacher development and institutional reforms, fostering classroom environments where students take charge of their learning journeys. George (2016) delved into pedagogical approaches and the myriad socio-economic disparities that shape English language learning in India. Through a nuanced examination, the research pinpointed communicative and learner-centric strategies, especially when paired with technological integration as critical to bridging urban-rural and socio-economic divides. Research highlighted the necessity for culturally relevant teaching and for multi-stakeholder collaboration to ensure language education addresses both local realities and equity. Sravani and Babu (2018) contributed to this

growing body of research by comparing pedagogical styles in Andhra Pradesh. Their classroom-based study found that communicative, student-centered techniques outstripped rote memorization and grammar-translation approaches, driving better student engagement and more robust language skills. The study advocated a pivot toward interactive, learner-driven instruction echoing emphasis on context-aware and responsive pedagogy.

Baig and Singh (2019) brought attention to the larger ecosystem of English instruction across schools and higher education. Their policy analysis discerned entrenched gaps in resources especially stark in rural areas and found that language policy, curriculum design, and teacher professional development fundamentally shaped classroom realities. They suggested that communicative and task-based instruction, strengthened by ongoing teacher training and learner-friendly assessment, could narrow inequalities, and called for more student-led interaction and assessment reforms to create a more enabling ecosystem. Similarly, Kumari (2020) focused on

secondary schools, identifying specific hurdles like limited vocabulary, inadequate practice opportunities, and notably, the shortage of qualified teachers. Classroom observations and structured interviews underlined a clear need for context-aware teaching, remedial classes, and structured teacher workshops, reinforcing the consensus on the pivotal role of faculty development and learner-centric strategies. Sabharwal (2021) investigated English as a medium of instruction in Indian education, stressing that students from affluent backgrounds and private institutions enjoyed disproportionate benefits such as better English proficiency and career prospects while those from scheduled castes and rural communities struggled with persistent barriers. The study highlighted the urgency of bridging this socio-linguistic divide to ensure both academic and professional mobility for all. Meanwhile, Toppo (2021) centered on English learning experiences in Hindi-medium schools in Jharkhand. Surveys and interviews with students and teachers revealed a mixture of best-practice-aligned beliefs such as the value of motivation and communication and lingering misconceptions around grammar and pronunciation. While the overarching attitude was supportive of second-language acquisition, outdated or debilitating beliefs still lingered, underscoring the need for focused interventions to modernize language beliefs in line with effective practice.

Wotsa and Yadav (2023) focused to identify the specific reading strategies used by Grade 9 students in Dimapur, Nagaland, when reading English texts. The major findings indicate that students generally employ similar, interactive reading strategies, with most strategies falling under average. A key finding was that students relied heavily on their cognitive thinking skills while reading. Sahoo and Padhi (2023) examined digital integration in urban and semi-urban Indian classrooms. Findings showed that educational apps and online materials could significantly amplify student engagement and language skill acquisition. However, the research also warned against deepening digital divides and called for sustained infrastructure investment and teacher digital literacy programs to ensure technology benefits were equitably distributed. Vincy and D'Souza (2023) undertook a systematic review analyzing the landscape in Tamil Nadu through policy documents, government reports, and research articles. Their work identified low levels of English usage in and outside the classroom, insufficient teacher training, and a persistent urban-rural gulf. The study recommended broad reforms in teacher education, richer textbooks, and a shift from achievement tests to proficiency-based assessments, aligning with earlier studies that

called for systemic, context-sensitive improvements across teacher preparation and curricular design.

Subramanian (2023) took a historical and sociological lens, chronicling how colonial legacies embedded English deeply in education, and examining the continued intertwining of language with societal aspirations and mobility. The study outlined major ongoing challenges including the coexistence of nearly 20,000 dialects, urban-rural gaps in classroom resources, and persistent deficiencies in teacher training. While English remains a vehicle for upward mobility, the study stressed on the importance of respecting local languages and cultures within pedagogy. Singh and Halim (2023) surveyed a cross-section of teachers and students to gauge the effects of corrective feedback in English classrooms. Their findings demonstrated that timely, formative feedback enhanced both fluency and accuracy, spurring greater learner participation and self-correction. Yet, infrastructural disparities most acute in rural regions emerged as a barrier, leading to a call for enhanced, widespread teacher training and better access to digital resources.

Rajaniprashanth (2024) shone a light on multilingual Indian classrooms, exploring the practical challenges arising from students' diverse linguistic backgrounds. Through observations and interviews, the study found that translanguaging, allowing students to use multiple languages in class, contextualized learning, and culturally tailored materials fostered greater engagement and skill development. The research ultimately advocated tailoring curricula and teacher training to reflect and harness linguistic diversity, ensuring inclusivity and maximizing English learning outcomes. Joshi et al. (2024) charted the historical rise of English-medium instruction, revealing deep social and geographic inequalities, with urban and upper-caste students having much greater access. This study argued for bilingual approaches and targeted resource allocation, seeking to redress these injustices and promote an education system grounded in justice and equity.

The technological advances permeating language education were also point out by Selvaraj et al. (2024), who conducted an experimental study among nursing college students. Participants using computer-assisted language learning (CALL) tools demonstrated greater proficiency and autonomy compared to those in traditional classrooms. The research established, through statistical analysis, that digital resources when combined with self-directed strategies can enable learners to take ownership of their progress, thus resonating calls for greater investment in ICT infrastructure and

digital literacy for both students and teachers.

Thomas (2024) addressed the modernization of English learning across India, focusing on shifting classroom roles, the influence of slang, and the growing ubiquity of English in everyday life. Drawing from extensive surveys and teacher interviews. The study observed that English has evolved from a second language to one with near-native importance in many homes and workplaces. This rise is traced to globalization, media exposure, and rapid technological uptake, though concerns about inequity and indigenous language preservation were also noted. The research called for adaptive strategies that balance local identities with the pragmatics of English acquisition. Trivedi and Pandya (2024) examined the paradigm shift in teaching practices, recording a clear move from traditional rote instruction to more communicative and learner-centered approaches. Through class case reports and a synthesis of multiple studies, they documented innovations such as flipped classrooms, personalized and project-based learning, and technology integration. The teachers role has shifted to that of facilitator and guide, further supporting student autonomy and cultural exchange. The review emphasized continued in-service training and the continuous refinement of curriculum to address the heterogeneous needs of Indian learners. Kumar (2024) specifically spotlighted rural challenges, detailing the psychological, linguistic, and institutional barriers inhibiting English learning in under-resourced schools. Teacher interviews and classroom visits revealed that a lack of qualified instructors, scarce educational resources, and unsupportive environments were significant hurdles. Kumar recommended targeted capacity-building, resource development, and community engagement as realistic interventions to transform rural English education.

Suar et al. (2025) delivered a comprehensive assessment of prospective English teachers in Odisha, uncovering systemic inadequacies in both language and pedagogical competency, with average scores of only 42% in language and 46% in pedagogy. The study found these weaknesses to be widespread across institutions, rather than tied to individual colleges, and noted that overreliance on outdated grammar-translation methods, scarce ICT usage, and poor infrastructure was endemic. The researchers emphasized the urgent need for faculty development, innovative teaching methods, and increased ICT integration in teacher education programs, echoing many earlier recommendations for comprehensive, system-wide reform.

Studies Conducted Abroad

Kruk (2017) explored the burgeoning use of mobile devices among advanced English as a Foreign Language (EFL) learners. Through in-depth interviews, the study found that learners often took a proactive approach to leveraging their smartphones for accessing learning materials and practicing English independently, underscoring a shift toward greater learner autonomy and the growing influence of mobile technology on language acquisition. Building on this, Mohtar et al. (2022) provided a systematic review of mobile learning across English language classes in various educational contexts. This research not only charted the trajectory of mobile learning's acceptance and efficacy within formal and informal settings but also emphasized that, despite the progress made in integrating mobile platforms, there remained a noticeable gap in research regarding the most effective pedagogical practices for middle-aged learners. Additionally, the study emphasized that effective technology integration requires ongoing reflection from teachers to move beyond surface-level adoption, pushing for dynamic strategies that fully harness technology's potential.

Janjić and Coventry (2025) offered a critical snapshot of the United Kingdom language learning environments, investigating both the extent of technology adoption and its pedagogical alignment. While most classrooms were well-equipped and teachers made frequent use of digital devices, their survey and evaluation results indicated that these technological advancements did not always translate seamlessly into enhanced language learning outcomes. The researchers highlighted the importance of not just having the technology in place, but also ensuring its use aligns with sound language teaching principles a sentiment echoed in several contemporaneous studies.

Pérez-Jorge et al. (2025) revealing that these technologies offer immersive, personalized learning experiences that significantly boost vocabulary acquisition, motivation, and engagement. However, the practical effectiveness of such tools hinged on adequate teacher training and ensuring all learners had equal access, highlighting persistent equity challenges in technology-integrated classrooms. In parallel, Schorr et al. (2024) reviewed 40 empirical studies, identifying that AR, especially marker-based mobile applications, was highly effective for contextual vocabulary acquisition. They stressed that AR produced the best results when blended thoughtfully with traditional instructional methods. Correspondingly, Khan et al. (2023) researched with Saudi EFL

students directly tested AR's effectiveness through a mixed-methods approach and observed marked improvements in students' vocabulary, as well as positive attitudes toward using such technology for learning. These findings indicate a rapidly growing acceptance of AR as a credible and engaging supplement to established methods.

Tahimic and Baloran (2025) conducted research among Indian STEM college students, developing and validating a nuanced scale of English learning motivation with six dimensions: effort, challenge, commitment, external support, career relevance, self-regulation, and attitudes. The study recommended high overall motivation among students, influenced equally by intrinsic interests and extrinsic drivers such as career opportunities. Interestingly, analysis uncovered that gender can subtly shape the distribution of motivational sources, and motivation did not significantly differ between students at public and private institutions. Similarly, Fitri and Alawiyah (2023) delved into the influence of first language (L1) transfer, revealing how positive and negative language interference varies according to linguistic similarities, learner age, anxiety, and motivation. Older learners, in particular, were more susceptible to interference, reinforcing the idea that customized strategies are necessary to support diverse linguistic backgrounds and learner profiles.

Yassin (2024), focusing on Saudi students, demonstrated that YouTube-based English instruction led to significant improvements in listening and speaking skills compared to traditional approaches. Through a combination of statistical analysis and qualitative insights, the study made a compelling case for integrating multimedia platforms into mainstream curricula. Further contextualizing the digital transformation, Peng et al. (2023) integrated established theoretical models with empirical surveys to analyze the behavioural drivers behind mobile learning (M-learning) adoption among over 1,400 university students. The results pointed out that the perceived convenience, curiosity, and self-efficacy relating to mobile apps directly influenced students' willingness to engage with digital English learning resources. These findings not only reinforce the value of M-learning for English acquisition but also call attention to the psychological and logistical factors supporting its effective use.

Netz (2021) documented the experiences of German university students who participated in study abroad programs. These learners reported not only improvements in their self-perceived English proficiency and cross-cultural self-efficacy but also a notable reduction in anxiety, particularly among those traveling abroad for the first

time. The study's longitudinal design emphasized both immediate and lasting impacts, pointing to the transformative power of fully immersive language experiences. Building on this, Ovchinnikova et al. (2024) surveyed thousands of students across Europe, examining how confidence and proficiency with English and other languages influenced the likelihood of studying abroad and choosing specific countries. Both sets of findings reinforced the idea that language proficiency diminishes barriers and broadens opportunities, while anxiety constricts students to familiar settings.

Köylü and Tracy-Ventura (2022) focused on learners studying English as a Lingua Franca (ELFSA) in multilingual European study-abroad contexts. Their work showed that spontaneous, low-anxiety interactions fostered by diverse, multinational settings promoted similar or even greater gains in speaking and writing fluency compared to traditional classroom environments, underpinning the rising appeal of international study for language acquisition. Meanwhile, Çınar and Altay (2025) compared university students in Spain and Turkey, some of whom participated in exchange programs. They found that study abroad experiences significantly reduced speaking anxiety, particularly through structured language tasks and peer support further affirming the mental health and performance benefits of immersion.

Turdiyeva (2023) reviewed international and Kazakhstani studies to argue for the motivational and cognitive benefits of interactive technologies, highlighting their potential to foster critical thinking and learner engagement. However, she noted ongoing challenges such as unequal resource distribution and the need for continued investment in teacher development. Chung and Lo (2025) added that mobile apps, when used alongside real-world immersion during study abroad, extended opportunities for independent practice and feedback significantly improving speaking and listening skills, particularly in post-pandemic educational settings.

Fisher et al. (2024) reviewed the effectiveness of flipped learning for English acquisition in Australia and Vietnam, documenting advances in self-regulation, motivation, and fluency, but noting ambiguous impacts on core reading skills. Pérez-Jorge et al. (2025) echoed the promise of immersive technologies while emphasizing that their success depends on robust teacher support and organized, equitable access. Complementary to these, Higuchi et al. (2023) utilized advanced quantitative methods to confirm that study abroad experiences can boost English proficiency by up to 38% over domestic studies, strongly advocating for immersive approaches.

Table 2.4**Summary of the studies related to English Language Learning**

Sl. No	Authors and Years	Major Focus	Major Findings
1.	Parab (2015)	Learner autonomy in language classrooms.	Student-centered, facilitator roles improve relevance and effectiveness; barriers include large classes, infrastructure, exam culture. Teacher development and institutional reform suggested.
2.	George (2016)	Pedagogical & socio-economic factors in Indian English learning.	Communicative and learner-centric strategies, especially with technology, bridge divides; emphasizes culturally relevant teaching and multi-stakeholder collaboration for equity.
3.	Kruk (2017)	Mobile device uses among EFL advanced learners.	Learners take initiative using smartphones for independent English study; highlights growing learner autonomy.
4.	Sravani & Babu (2018)	Comparative pedagogical styles in Andhra Pradesh.	Communicative, student-centered techniques boost engagement and skills over rote and grammar-translation. Advocates context-aware, interactive pedagogy.
5.	Baig & Singh (2019)	English instruction policy across schools & higher education.	Resource gaps, especially rural; communicative and task-based methods, teacher training, and assessment reform can reduce inequalities.
6.	Kumari (2020)	Barriers in secondary school English learning.	Limited vocabulary, practice, and teacher shortages; recommends remedial classes, teacher

			workshops, and learner-centric, context-aware teaching.
7.	Netz (2021)	Study abroad impact on German university English learners.	Study abroad boosts self-perceived proficiency, self-efficacy, reduces anxiety—especially for first-timers.
8.	Sabharwal (2021)	English as medium of instruction and social mobility in India.	Privileged students benefit from English, while rural and marginalized groups face barriers; urgent need to bridge socio-linguistic and opportunity gaps.
9.	Toppo (2021)	Beliefs about English learning in Hindi-medium schools, Jharkhand.	Motivation and communication valued, but misconceptions remain; calls for interventions to modernize beliefs and align with effective practices.
10.	Köylü & Tracy-Ventura (2022)	English as Lingua Franca in study abroad.	Spontaneous, multicultural interactions boost speaking/writing fluency, sometimes exceeding classroom gains.
11.	Mohtar et al. (2022)	Review of mobile learning in English language contexts.	Charted adoption of mobile learning; effective integration needs teacher reflection. Noted research gaps especially for middle-aged learners.
12.	Fitri & Alawiyah (2023)	L1 (first language) transfer and English learning.	Positive/negative transfer shaped by similarity, age, and motivation; older learners more susceptible and custom strategies needed.
13.	Higuchi et al. (2023)	Quantitative impact of study abroad vs.	Study abroad can increase English proficiency up to 38%

		domestic learning on English proficiency.	more than domestic studies; immersive experiences strongly encouraged.
14.	Wotsa and Yadav (2023)	To identify and analyze the reading strategies.	Most students heavily utilized their cognitive thinking skills while reading.
15.	Khan et al. (2023)	AR for Saudi EFL learners.	AR enhances vocabulary and student attitudes; growing acceptance as an engaging supplement.
16.	Peng et al. (2023)	Student behavioral drivers of English mobile learning adoption.	Engagement tied to perceived convenience, curiosity, self-efficacy; highlights psychological/logistical factors supporting M-learning.
17.	Sahoo & Padhi (2023)	Digital integration in urban/semi-urban classrooms in India.	Apps and online materials boost engagement; digital divides persist. Calls for infrastructure and teacher digital literacy programs to ensure equitable benefits.
18.	Singh & Halim (2023)	Effects of corrective feedback in English teaching (India).	Formative feedback improved fluency and accuracy, but rural infrastructure deficits persist. Widespread teacher training and digital resources required.
19.	Subramanian (2023)	Impact of colonial legacies on English in Indian education.	English aids mobility but challenges arise from dialect diversity, resource gaps, and teacher training deficiencies; respects local languages in pedagogy.
20.	Turdiyeva (2023)	Benefits and resources challenges of interactive tech for	Interactive tech supports critical thinking, but resource disparity and training are ongoing issues.

		English learning (Kazakhstan focus).	
21.	Vincy & D’Souza (2023)	English education in Tamil Nadu (policy/empirical review).	Low English use, poor teacher training, urban–rural divide; recommends teacher education reforms, rich materials, proficiency-based assessment.
22.	Fisher et al. (2024)	Flipped learning for English in Australia and Vietnam.	Boosts self-regulation, motivation, and fluency, but ambiguous for reading gains.
23.	Joshi et al. (2024)	Historical/social inequalities in English-medium Instruction.	Urban and upper-caste students have more access; recommends bilingual approaches, targeted resources for justice and equity.
24.	Kumar (2024)	Challenges in rural English teaching in India.	Lacks qualified teachers and resources; capacity-building, resource enhancement, and community action recommended.
25.	Ovchinnikova et al. (2024)	Cross-European student survey on study abroad and language proficiency.	Higher proficiency diminishes barriers to study abroad, anxiety favours familiar settings.
26.	Rajaniprashan th (2024)	Multilingual classrooms in India.	Translanguaging and tailored content foster learning; advocates curriculum and teacher training that reflects linguistic diversity.
27.	Schorr et al. (2024)	Augmented reality (AR) in vocabulary Acquisition.	AR, especially blended with traditional teaching, supports contextual vocabulary learning.
28.	Selvaraj et al. (2024)	Use of computer- assisted language learning (CALL) among nursing students.	CALL tools increase proficiency and autonomy versus traditional teaching; calls for ICT investment and digital literacy for all.

29.	Thomas (2024)	Modernization, slang, and globalization's impact on English learning in India.	English's status has risen with globalization/media; new strategies needed to balance local identity and widespread English use.
30.	Trivedi and Pandya (2024)	Paradigm shift toward communicative and tech-integrated practices in India.	Flipped, project-based, and personalized learning rise; ongoing teacher training and curriculum refinement vital.
31.	Yassin (2024)	YouTube-based English instruction for Saudi students.	Significantly boosts listening and speaking over traditional methods; multimedia integration is effective.
32.	Çınar & Altay (2025)	Study abroad's impact on anxiety (Spain, Turkey)	Structured language tasks and peer support mitigate speaking anxiety in exchange students.
33.	Chung & Lo (2025)	Mobile and real-world immersion for post-pandemic English learning.	Apps plus immersion boost speaking and listening skills, enabling greater independent practice and feedback.
34.	Janjić & Coventry (2025)	Technology adoption in UK language Classrooms.	Tech is frequent but doesn't always yield outcomes; alignment with sound pedagogy is necessary.
35.	Pérez-Jorge et al. (2025)	Effectiveness of immersive, personalized tech in language learning.	Technologies improve motivation, engagement, vocabulary; effectiveness hinges on teacher training and equitable access.
36.	Suar et al. (2025)	Teacher competencies in Odisha.	Poor language and pedagogical skills, outdated methods, low ICT use, weak infrastructure; urgent need for faculty development and ICT integration.

37.	Tahimic & Baloran (2025)	Motivation in English learning among Indian STEM students	Both intrinsic and extrinsic factors influence high motivation; motivational sources subtly shaped by gender.

2.5 Studies related to Digital Literacy, Technological Integration, Learners' Autonomy and English Language Learning

Studies Conducted in India

Mahapatra (2020) saw Indian EST teachers benefit from focused digital training, displaying unique growth in integrating technology based on personal and contextual factors. Kumar et al. (2022) connected the use of ICT tools to broad improvements in English skills, yet flagged that improper or unplanned technology use, often due to low teacher proficiency, may risk hindering progress.

Sharma and Sharma (2023) in Bihar detailed persistent gaps in digital access and skills among both teachers and students, arguing that collaborative strategies and more robust digital training

are needed for successful policy implementation. Kumar (2023) used a conceptual lens to tie English proficiency and digital literacy to global communication and effective resource use, while cautioning against inequities and misinformation. Madhavi et al. (2023) demonstrated that Indian students learning with ICT and AI tools showed marked improvement in spoken English, outperforming peers in more traditional environments. Roy and Putatunda (2023) addressed how AI and evolving web technologies drive Indian higher education to adopt student-centered, interdisciplinary, and tech-enhanced models, propelled by new policies.

Rawal (2024) took a critical look at the digital divide in Indian schools, finding that infrastructure and especially teacher training were central to closing opportunity gaps, rather than mere access to devices. Nair and Yunus (2021) pinpointed digital storytelling as a highly effective approach to boost student engagement and speaking skills across educational contexts. Hema and Gandhimathi (2025) mapped global trends, key authors, and frameworks in Mobile-Assisted Language Learning, underlining ongoing innovation and the importance of international collaboration.

Joice and Deepa (2024) reinforced that experimental and technology-driven learning environments in South India reduced anxiety and improved language proficiency by integrating real-time feedback and multimedia resources.

Wotsa and Yadav (2025) findings revealed that teachers possessed high levels of both technology integration skills and teaching self-efficacy. However, the study concluded that there was no significant relationship between these two variables, showing that a teacher's proficiency with technology doesn't directly influence their self-confidence in teaching.

Studies Conducted in Abroad

Ajideh (2016) illuminated how platforms like wikis, blogs, and educational software empowered learners in Iran to set goals and collaborate, even if accessibility issues lingered. Jose (2016) introduced the Ecology of Resources model in India, showing that blending digital and linguistic skill-building in authentic contexts fostered both autonomy and lifelong learning. Kammerer et al. (2012) reported that confidence in navigating digital sources translated to greater engagement and language gains. Ting (2015) found that engineering students, when guided to link outside digital skills to formal curriculum, became more capable of independent research and data collection directly supporting learner autonomy. Reinders and White (2016) similarly emphasized that intentional, scaffolded tech use, coupled with ongoing reflection, cultivates vital autonomous skills in diverse classrooms.

Barczyk and Li (2017) noted that blended learning environments helped Polish students personalize goals and deepen their English, while Lin and Warschauer (2017) showed that blogging fueled self-initiative and communicative skill among American ELLs. Saito and Akiyama (2017) described how Japanese learners, empowered by digital intercultural exchanges, developed strong autonomy selecting discussion topics and adjusting their learning approaches based on digital feedback. Baturay and Daloğlu (2018) observed Turkish university students who, by using online portfolios and communication tools, became far more resourceful and active in managing language tasks. Zhong (2018) offered a rich case from New Zealand, where technology-mediated learning allowed an EFL student to evolve their confidence and willingness to independently pursue English.

Tseng and Huh (2019) highlighted among Korean students that advanced

digital skills equate to proactive language management. Students could set their learning agenda, engage in digital peer networks, and achieve better linguistic outcomes. Lahpai (2019) in Myanmar found high digital literacy and positive attitudes among teachers and students, noting regional divides but strong, shared engagement in digital language learning. In the transnational context, Areepattamannil and Santos (2019) leveraged the PISA dataset to show that ICT competence and autonomy influenced adolescent attitudes toward science, with direct implications for English literacy.

Ajmal et al. (2020) demonstrated that in Pakistan, students' confidence and motivation flourished when classrooms blended digital and traditional tools, enabling independent goal- setting and progress tracking. Chen and Chen (2018) reported that mobile learning in Taiwan offered flexibility and immediate feedback, nudging responsibility toward learners and increasing motivation. Baturay and Daloğlu (2018) further noted that portfolio integration in digital EFL writing courses drove active ownership and collaboration.

Ali (2022) documented Malaysian engineering students leveraging tools like Grammarly and Google Translate alongside social platforms to support metacognitive and collaborative writing, showing strong digital strategy adoption. Chekhratova et al. (2022) explored blended self- and peer-assessment in English classes, discovering that improving digital and reflective skills in tandem deepened both learning efficacy and independence. Naseer et al. (2022) revealed that Pakistani undergraduates with higher digital literacy adopted more resourceful strategies, driving more autonomous English learning, especially during the pandemic.

Hong (2023) found that Chinese college students using e-textbooks and online resources rapidly expanded vocabulary through self-directed approaches, underscoring that digital literacy fuels independent study but also varies from student to student. Sim and Ismail (2023)

synthesized international literature, highlighting that while teachers saw promise in digital tools, obstacles like inadequate training and technical support were widespread, prompting a call for systematic digital upskilling.

Zeng (2023) surveyed high schoolers, observing moderate self-management despite eagerness to learn, signaling that digital skills alone do not ensure autonomy, intentional nurturing by educators is key. Prasetya (2024) focused on Indonesian online language learners and found that digital skills strongly shaped academic

success, with technical and time-management issues proving difficult unless addressed by adaptive course design.

Consoli et al. (2024) emphasized that simply adding technology is not enough, its impact on engagement and skills depends on pedagogical alignment, as measured by the Technology Integration Quality Scale. Burgos and Anthony (2024) described how IT students' digital literacy enabled not just wider access but also more autonomous, practical English use, advocating digital training as institutional culture. Jegadeesan (2025) illustrated that platforms, apps, and AI let learners tailor their paths and build confidence although equity challenges and the need for reflective policy remain. Pratiwi and Waluyo (2023) showed in Indonesia that digital tools like Google Forms and Quizizz bolstered not just skills but also self-reliance and critical thinking.

Feng and Liu (2024) documented, through direct interviews, that higher digital literacy enhances EFL learners' motivation, autonomy, and performance, fuelling the call for targeted upskilling. Maahs et al. (2025) turned to teachers working with adult migrant English learners in Europe, who observed that digital skills sharply increased learner independence, though scaffolding and ongoing teacher support remained crucial. Indriani et al. (2024) concluded that digital technologies, when integrated with socio-cultural and cognitive learning frameworks, inspired experimentation and autonomy, provided they fit within sound curriculum design. Kaewkamnerd et al. (2024) reported among Thai EFL students that technology driven by CEFR-CLIL frameworks increased autonomy and language gains, especially in receptive skills.

Melliti and HENCHIRI (2024) in Tunisia explored higher education, noting that while many students sought independent learning outside class, limitations in infrastructure and training curbed the potential of technology to support autonomy in daily lessons. Wu and Lambenicio (2022) found, surveying Chinese college students, that while tech usage was somewhat irregular and digital literacy only moderate, mastery of English still depended on active and sustained technological engagement.

Table 2.5

**Summary of studies related to Digital Literacy, Technological Integration,
Learners' Autonomy and English Language Learning**

Sl.no	Author and Year	Major Focus	Major Findings
1.	Kammerer et al. (2012)	The relationship between digital literacy, engagement, and language study.	Students' digital literacy in navigation and synthesis increased confidence and initiative in language study. Technology bridges skills, but requires continuous, contextual support.
2.	Ajideh (2015)	The transformative effect of digital platforms on student autonomy in language learning.	Digital platforms like wikis and blogs fostered autonomy by helping learners set goals, collaborate, and reflect. Digital engagement is a clear pathway to increased learner agency.
3.	Ting (2015)	Linking students' outside-school digital literacy with formal curriculum learning.	A negotiated learning approach successfully leveraged students' digital skills. This led to significant improvements in their learning autonomy for web research and data collection.
4.	Jose (2016)	Modern workplace literacy demands using the Ecology of Resources (EoR) model.	The EoR model fosters authentic learning, promoting linguistic and technological proficiency. It enhances learner autonomy and social engagement in blended learning environments.

5.	Reinders and White (2016)	Building autonomous skills through digital platforms paired with learner training.	Digital platforms, with intentional training, help students develop goal- setting and reflective habits. Educators should diversify resources for student- centered learning.
6.	Lahpai (2019)	Learners' and teachers' views and skills related to digital literacies in English classrooms.	Both students and teachers showed positive attitudes and high proficiency in digital literacy, particularly in searching the internet. Strong digital engagement supports language learning.
7.	Singh et al. (2019)	Students' perception and adoption of digital collaboration platforms (DCP) in higher education.	Students' positive attitudes toward DCP were influenced by perceived usefulness, interactivity, and cost- effectiveness. These factors significantly impact their intention to use the platforms.
8.	Tseng and Huh (2019)	The digital literacy- autonomy link among Korean university learners.	Advanced digital skills empowered students to independently seek and manage language input. Digitally literate learners showed greater ease in pursuing interests and enriching proficiency.
9.	Mahapatra (2020)	How three Indian EST teachers evolved in their use of digital technology after training.	Teachers showed unique growth in using technology, influenced by motivation, support, and student engagement. Professional development is crucial for

			integrating tech effectively.
10.	AK and S (2021)	What a critical digital literacy manifests in university language classrooms.	Students engaged functionally with technology but lacked a critical stance on digital dependency. The study advocates using imaginative texts to foster deeper critical literacy skills.
11.	Melvina et al. (2021)	EFL teachers' perspectives on technology's capacity to promote autonomy.	Technology-rich environments let students independently choose activities and self-monitor progress, increasing motivation. Challenges like access and confidence require effective professional development for teachers.
12.	Nair and Yunus (2021)	The impact of digital storytelling (DST) in enhancing students' speaking abilities.	A systematic review found DST to be a valuable, engaging teaching approach. It consistently helps students significantly improve their communication and speaking skills.
13.	Ali (2022)	How engineering students used digital platforms to complete English writing tasks.	Students used tools like Grammarly and WhatsApp to monitor writing and collaborate. This demonstrated strong digital literacy and effective use of metacognitive, cognitive, and social strategies.
14.	Chekhmatova et al. (2022)	Integrating digital literacy and media literacy through self and peer assessments.	Improving digital skills alongside reflective assessment practices positively influenced

			learning effectiveness and independence. Thoughtful incorporation of these techniques supports deeper student engagement.
15.	Kumar et al. (2022)	The significance of integrating ICT tools into English language teaching.	While ICT offers benefits, improper integration can hinder learning. Many teachers lack proficiency, highlighting the need for purposeful, well-planned technology use in classrooms.
16.	Naseer et al. (2022)	How digital literacy fosters autonomous English learning among university students.	Increased digital proficiency improved grammar, vocabulary, and fluency. The shift to independent learning during the pandemic strengthened confidence, self-regulation, and academic achievement.
17.	Wu and Lambencio (2022)	How EFL learners incorporate technology and digital skills to develop core English abilities.	Students engaged with technology sporadically and had moderate digital literacy. Genuine language mastery requires strengthening learners' digital competencies, an area needing more research.
18.	Hong (2023)	What a digital literacy and e- resources support autonomous English learning for non-English majors.	Digital tools significantly boosted independent study, with learners expanding vocabulary up to 190 words weekly. Varied usage patterns influenced autonomy in unique

			ways.
19.	Kara and Mede (2023)	Shifts in digital literacy and readiness for learner autonomy in online classes.	The study found notable gains in both digital and autonomous skills after several months of online classes. Students developed a more positive attitude toward self-directed learning.
20.	Kumar (2023)	The intertwined roles of English proficiency and digital literacy.	English is a key global tool on digital platforms, while digital literacy enables critical information evaluation. The study notes challenges like unequal access and is information.
21.	Madhavi et al. (2023)	How ICT and AI tools enhance students' spoken English skills.	The technology-enhanced group outperformed the traditional group in speaking tests. The study highlights the positive impact of digital and AI tools on improving communication abilities.
22.	Pratiwi and Waluyo (2023)	The impact of digital tools on learner autonomy in English language classes.	Digital tools like Google Form and Quizizz made learners more autonomous, increasing their self- reliance and metacognitive strategies. Thoughtful tech integration fosters learner autonomy.
23.	Roy and Putatunda (2023)	The impact of emerging technologies on higher education pedagogy in India.	The research highlights a shift towards constructivist, student-centered learning models. Policies like NEP 2020 are

			pushing for technology-enhanced, activity-based approaches.
24.	Sharma and Sharma (2023)	How digital literacy influences the rollout of the New Education Policy 2020.	The study found a persistent gap in digital skills, with teachers and students struggling with technology. It suggests targeted training and collaboration could improve policy success.
25.	Sim and Ismail (2023)	English language teachers' experiences and responses to using digital tools.	Teachers viewed digital tools positively but faced challenges like limited training and institutional support. The review highlights an urgent need for ongoing professional development and resources.
26.	Zeng (2023)	The intersection of digital literacy and learner autonomy among high school students.	Students showed moderate digital skills but this didn't necessarily translate to greater independence. Educators need to nurture both digital skills and personal agency for development.
27.	Ajmal et al. (2024)	Autonomy development in Pakistani English classrooms, spotlighting digital platforms.	Students exposed to technology became more confident and independent. Blending digital and traditional methods, along with self-regulation, is ideal for fostering autonomy.
28.	Burgos and Anthony	The nexus between digital literacy and English	Digital literacy boosts access to resources and autonomy.

	(2024)	proficiency among IT students.	Participants cited multimedia platforms as critical, advocating for institution-led digital training programs to maximize benefits.
29.	Consoli et al. (2024)	How technology integration quality impacts student engagement and digital competencies.	Skillful blending of technology with pedagogy, not just frequency, increases engagement and digital literacy. The study emphasizes subtle integration of digital tools for English learning.
30.	Feng and Liu (2024)	The impact of learners' digital literacy on engagement with online English instruction.	Higher digital literacy led to greater confidence and motivation, impacting academic outcomes. The research points to the need for digital upskilling in modern language curricula.
31.	Indriani et al. (2024)	How digital technology influences English writing skills in higher education.	Digital tools foster active learning and autonomy, making students more willing to experiment with language. Effective implementation relies on balancing innovation with pedagogical best practices.
32.	Joice and Deepa (2024)	How integrating digital tools can enhance English language skills among second language learners.	Technology-driven methods, like virtual classrooms, significantly improved learners' language abilities and reduced speaking anxiety. The study highlights a powerful approach for student-centered learning environments.

33.	Kaewkam nerd et al. (2024)	How technology influences learner autonomy and English skills among Thai EFL students.	Technology use positively linked with autonomy and improvements in reading, writing, and listening. Students preferred interactive tools, advocating tech integration to strengthen language learning.
34.	Melliti and Henchiri (2024)	Technology-enhanced learner autonomy within Tunisia's higher education.	Students pursue independent learning, but classroom tech use is limited by infrastructure gaps. The study emphasizes improving professional development and infrastructure to support autonomous learning.
35.	Prasetya (2024)	Challenges Indonesian students face in student-centered online English learning.	Students faced technical problems and struggled with time management. Active participation and enhanced digital literacy boosted success, recommending tailored tutorials and interactive modules for improvement.
36.	Rawal (2024)	The complexities of the digital divide within Indian schools.	Access to technology alone is insufficient; effective use by teachers is key. The study links teacher training to resource availability and equitable classroom opportunity.
37.	Hema and Gandhimathi (2025)	How mobile learning has transformed language education.	A bibliometric analysis of 398 articles mapped publication trends, authors, and collaborations in Mobile-

			Assisted Language Learning (MALL), and envisions future directions.
38.	Wotsa and Yadav (2025)	The relationship between teachers' technology integration skills and their teaching self-efficacy.	The teacher's proficiency with technology doesn't necessarily impact their overall self-efficacy in the classroom.
39.	Jegadeesan (2025)	The transformative role of digital technologies in fostering learner autonomy.	Digital tools like AI platforms foster autonomy through personalized, interactive experiences. Equity in access remains a challenge, calling for inclusive digital policies and an ethical approach.
40.	Maahs et al. (2025)	Teachers' perceptions of digital technology use for promoting autonomy.	Students with strong digital skills progressed independently, while others needed scaffolding. Tailored strategies and ongoing support are needed to help all learners use digital tools.
41.	Melliti and Henchiri (2025)	Technology-enhanced learner autonomy within Tunisia's higher education.	Students pursue independent learning, but classroom tech use is limited by infrastructure gaps and low digital skills. The study emphasizes improving infrastructure and professional development.

2.6 Summary of the Literature Review

The researcher reviewed 37 works of literature related to Digital Literacy, 41 related to Technological Integration, 42 related to Learners' Autonomy, 37 related to English Language Learning, and 41 studies related to relationship between Digital Literacy, Technological Integration, Learners' Autonomy and English Language Learning. Thus, the researcher reviewed 198 related works of literature for the present study.

A) Digital Literacy

Sahu (2019) advocated for curriculum updates and practical training to enhance digital skills in higher education. Similarly, Krishnamurthy and Shettappanavar (2019) advocated for gender-responsive digital literacy policies to empower women in STEM fields. Afzal (2022) indicated that digital literacy is closely tied to infrastructure quality. Urban populations in India are approaching American levels of digital adoption, but rural areas lag due to connectivity issues and limited access to digital tools. Srivastava (2022) echoed these findings, noting that while mobile internet access is widespread, true digital skills remain elusive, particularly for those from rural or disadvantaged backgrounds. Only about 20% of users demonstrated effective digital engagement, highlighting the need for comprehensive training beyond mere device distribution.

Rana (2022) explored barriers to digital literacy, identifying factors such as age, region, gender, and socioeconomic status. Despite initiatives like the Digital India Mission, Rana recommended targeted strategies to address the unique needs of women and marginalized groups. Goel et al. (2021) evaluated digital literacy programs like DISHA and NDLM, reporting positive outcomes in confidence and employability but emphasizing the need for personalized support to ensure inclusivity.

The ASER (2023) survey on rural youth revealed widespread smartphone access but significant gaps in digital proficiency. Many rural adolescents overestimated their digital skills, raising concerns about the effectiveness of education in preparing them for digital participation. Kunal and Dhillon (2023) and Rana et al. (2023) examined the National Education Policy (NEP) 2020, which aims to embed digital literacy across curricula. They noted improvements in students' digital tool usage and critical thinking skills, although disparities in teacher training and geographic access persisted, as

highlighted by Adeppa (2025).

Nag and Meher (2025) found that while many benefited from basic training, infrastructure deficits and gender disparities continued to hinder equitable access. Rani (2025) summarized the progress and challenges, noting that while digital participation has increased, disparities remain along state and gender lines. Bansall (2024) reported a rise in digital literacy rates to 37% by late 2024, driven by outreach programs, yet social and economic barriers persist.

Bhutada and Kumar (2025) highlighted that while two-thirds of rural teens had smartphone access, only 80% could perform basic functions, indicating deep-rooted biases in digital literacy. Kumar et al. (2025) celebrated advancements in national computing capacity linked to digital literacy investments, while Mehta (2024) documented successes in reaching underserved populations through targeted programs. However, Thekkumbad (2025) emphasized the need for improved device distribution and broadband access to achieve universal digital literacy.

Godwin-Jones (2018) and Poonguzhali (2019) explored digital literacy in English as a Foreign Language (EFL) classroom, advocating for curricula that foster critical engagement with digital media. Yuan et al. (2019) emphasized culturally responsive pedagogies for English Language Learners, while Bimo et al. (2021) documented the motivational effects of multimedia in language learning. Alakrash and Razak (2021) found that students primarily used digital tools for vocabulary acquisition, indicating areas for further training.

Son and Park (2017) and Park and Son (2020) examined digital integration in EFL classrooms, noting disparities in digital competence among teachers and students. Lee (2024) analyzed the impact of digital literacy on life satisfaction among older adults, while Cheong et al. (2025) highlighted the importance of eHealth literacy for improved health outcomes. Li et al. (2024) and Cao et al. (2023) linked workplace digital literacy to educational attainment and effective classroom technology integration, respectively.

Jiang (2024) synthesized literature on digital literacy for foreign language teachers, advocating for a multidimensional approach to teacher upskilling. The COVID-19 pandemic accelerated digital literacy growth, as noted by Pan et al. (2025), but also widened existing divides. Siani and Gennari (2025) emphasized the need for curricula focused on misinformation detection, while Chan and Sung (2025) advocated for authentic digital tasks in education. Fraillon (2024) called for systemic reforms to

embed digital skills in educational systems.

Bandura and Leal (2022) highlighted the underrepresentation of women in digital fields, prompting interventions like coding bootcamps. Vuorikari and Kluzer (2022) detailed the EU's DigComp framework, aiming for a 70% digital literacy rate by 2030. Zakir et al. (2025) demonstrated that digital literacy predicts academic success, supporting curricular approaches that promote self-directed learning.

B) Technological Integration

Sharma (2021) observed teachers moving beyond traditional classroom methods, using ICT to energize lessons and nurture innovation. Das and Roy (2021), enabled peer feedback and real-time collaboration among students, leading to notable improvements in writing coherence, creativity, and grammar. Similarly, Jain and Mehta (2021) found the flipped classroom model with video lectures assigned as homework and in-class time dedicated to interaction greatly enhanced student participation and preparation. Rao (2021) demonstrated that YouTube-based pronunciation programs boosted accuracy among engineering students, while Dey and Banerjee (2022) reported that podcast lessons significantly improved high schoolers' accent and intonation comprehension. Menon and Thomas (2022) highlighted that adding gamified digital activities to English courses heightened motivation and vocabulary retention, resonating findings from Sen and Ghosh (2022), who saw that AR applications enhanced vocabulary learning through interactivity and novelty.

Bose (2022) revealed that while both modes improved reading and writing, live sessions produced greater gains in speaking and listening. Students preferred the immediacy of interaction and clarification in synchronous settings. Lee (2023) in South Korea observed that metaverse-based English classes promoted collaborative and confident communication, though some technical challenges remained. Choudhury and Dasgupta (2023) found that e-books fostered increased reading and comprehension, while Chakraborty (2023) showed how VR simulations helped high schoolers practice English more confidently in immersive conversational settings. Singh and Kaur (2023), focusing on AI chatbots, noted that personalized support in a low-pressure digital environment substantially improved students' spoken English while reducing anxiety.

Pandya and Joshi (2022) documented the positive impact of multimedia and interactive platforms on engagement and collaboration in Gujarat, but pointed out the

persistent gaps in device access and teacher digital fluency, especially in rural areas a sentiment echoed by Pritam and Shaikh (2024). Alam et al. (2025) confirmed that interactive whiteboards, cloud-based learning, and AR/VR applications expand opportunities and engagement, especially for previously underserved groups. Yet, digital divides tied to geography, resources, and teacher preparedness remain widespread, as does concern over excessive screen time and equitable support (Kaur et al., 2023; Sam, 2024).

Das (2024) and Aggarwal (2023) stress the necessity of ongoing professional development to help educators harness adaptive learning platforms and digital resources effectively. Without targeted skill-building, as Abedi (2023) found, even the best-designed technologies may be underutilized due to faculty hesitation or lack of institutional encouragement. Siyam et al. (2025) endorse these findings, demonstrating that context-specific teacher training programs especially those that are constant and long-term are more successful in changing day-to-day teaching practice than one-off workshops.

COVID-19 was an inflection point, forcing even the most traditional educational systems to shift rapidly towards digital modalities (Tyagi, 2023; Sharma, 2025). National platforms like DIKSHA and virtual labs dramatically improved access during lockdowns, democratizing content and supporting remote and rural learners (Tyagi, 2023; Ragothaman et al., 2023; Seth et al., 2024). The adoption of tools like SWAYAM and NPTEL has opened universities to high-quality online courses, including virtual proctoring and learning analytics, and Jasola (2025) notes that AI-powered support now helps rural learners access resources that were previously out of reach.

Ghosh (2023) and Misra (2023) describe these shifts as part of a broader vision for blended and experiential learning, with robust digital infrastructure and policy frameworks paramount for success. However, studies stress the reality on the ground: infrastructural disparities, patchy implementation, and occasional faculty resistance must be continually addressed to translate strategic vision into classroom reality (Misra, 2023; Pritam & Shaikh, 2024; Ragothaman et al., 2023).

OECD (2022), Haleem et al. (2022), and Timotheou et al. (2022) caution that the positive impact of digital integration hinges on thoughtful management, ongoing assessment, and authentic engagement; unfocused or excessive tech usage can dampen results. Targeted integration has also powered differentiated instruction (Hidayat &

Firmanti, 2024) and project- based approaches fostering higher-order skills such as creativity and critical thinking (Chasokela, 2025).

Aggarwal (2023) longitudinal work demonstrates that adaptive platforms reliably pinpoint and remediate individual learning gaps, while Hsu (2024) and Chen (2020) show that VR and AR promote engagement and language retention. Mishra et al. (2025), Malone (2017), Durbidge (2018), Shauk (2025), and Chasokela (2025) reinforce the notion that educational technology now sits at the heart of broader socio-economic transformation, supporting not only traditional academic outcomes but also national economic growth, social equity, and future workforce readiness.

C] Learners' Autonomy

Saleem (2016) found that when teachers shifted from authoritarian roles to facilitators, student ownership and active participation flourished, a theme Priyanka (2017) reiterates through action research showing that reflection and engaging students in designing tasks can further self-regulation and language skill growth, especially when teachers guide students through challenges in mixed-ability groups. Likewise, Rajalakshmi (2017) highlighted the role those emerging technologies, notably ICT, played in advancing autonomy by facilitating independent learning.

Rao (2018), utilizing portfolio-based assessments, showed how English majors developed self- evaluation skills and more responsibility for their own learning, core attributes of autonomy. Mehta (2018) provided compelling evidence that autonomy-supportive classroom approaches meaningfully outperformed traditional methods, students exposed to this approach became better self-directed learners and gained in language proficiency. Padmanabha (2019) and Das (2019) emphasized the pivotal roles of routine classroom reflection, self-assessment practices, and collaborative, student-chosen tasks in building motivation, self-regulation, and engagement.

Awan (2020) reported that self-paced modules and digital resources enhanced adaptability and self-engagement among technical students, yet pointed out that equitable device access remained a major barrier. Singh (2020) validated this link between the use of language learning apps, online resources, and both heightened autonomy and improved English proficiency. Gupta and Gupta (2023) extended these findings into institutional policy, identifying the synergistic effect of flexible curricula, ongoing teacher training, and peer mentoring in cultivating lifelong learning and creativity alongside learner agency. Mote and Kumar (2023) show that autonomy is

closely tied not just to individual will but also to institutional culture and structured support.

Padmavathi et al. (2024) and Mehta et al. (2024) showcased that timely, consistent teacher feedback paired with opportunities for independent project-based learning boosted student creativity and initiative. Mehta et al. (2024) stressed that while most educators are philosophically supportive of autonomy, the absence of adequate training and resources often limits its effective adoption. Priyadharsini (2025) and Prasad (2025) drew on mixed-methods data to underline that learner motivation and confidence improve when more students are given meaningful choices paired with structured support particularly for learners new to autonomous learning or technology-rich environments. Madhavi (2025) found that even digitally inexperienced undergraduates could thrive under autonomy-focused, scaffolded digital projects, provided they received clear guidance.

Gupta and Mishra (2022) and Kumar (2022) revealed that, while digital platforms foster self-paced learning and autonomy, continual instructor interaction and project-based approaches are essential for maintaining focus and combating systemic constraints like exam-oriented curricula. Similarly, Parab (2019) and Patel and Sharma (2021) highlighted that well-designed, student-centered lessons and flexible teacher approaches foster sustainable autonomy even in resource-limited classrooms.

Liu (2015) and Zakaria et al. (2017) found in East Asia that autonomy is deeply influenced by demographics, proficiency, and strategic awareness, with gender, discipline, and language experience all shaping how strategies drive independent action. Szocs (2017) and Yasmin and Sohail (2017) revealed disconnects between teacher beliefs and learner experiences, while teachers uniformly value motivation and self-reflection for autonomy, learners are often less aware or supported in putting these ideas into practice. Fotiadou et al. (2017) contributed by showing how robust social learning dynamics like frequent tutor and peer interaction nourish autonomy, especially in distance education.

Zhong (2018) and Nguyen (2021) found that technology-mediated and computer-assisted environments supported goal-setting, material selection, and decision-making especially for students exposed to explicit strategy training and digital scaffolding. Almusharraf (2018) and Hadi and Guo (2020) underscored the impact of metacognitive instruction and intercultural awareness for autonomous

vocabulary learning and emotional resilience, respectively. Studies from Iamudom and Tangkiengsirisin (2020), Tran (2020), and Chinpakdee (2020) further highlighted that public school settings and strategy-focused teaching move the needle on autonomy, though gaps between aspirations and classroom realities persist.

Ludwig and Tassinari (2021), Adanir and Güven (2023), and Rahmat and Ismail (2023) studies demonstrated that the specific nature of online interaction from teacher mediation and classroom decision-making to self-monitoring and motivational scaffolding critically determines the degree and durability of student independence.

Hanh (2023) and Nguyen et al. (2021) continued this line of inquiry, affirming that direct instruction in metacognitive skills and project-based learning can markedly enhance autonomy when matched to students' backgrounds and academic disciplines.

Van Nguyen and Habók (2021) validated a tool measuring autonomy across diverse contexts, finding that discipline and institution specific factors deeply influence outcomes. Chong and Reinders (2022) synthesized empirical literature, arguing that teacher mediation, institutional culture, and context-sensitive intervention are key for fostering autonomy. Chetouane (2022) and Wahid et al. (2025) reinforced that autonomy is best viewed as a shared responsibility nurtured by institutional and societal frameworks, and that digital literacy and higher-order thinking are now central to any robust autonomy curriculum. Trung Tin (2025) reveals that, while AI offers new freedoms and management tools for students, persistent digital divides highlight the need for equitable digital reforms.

D) English Language Learning

Parab (2015) and George (2016), highlight the transformative potential of learner-centered and communicative approaches, especially when educators act more as facilitators than traditional instructors. While these approaches foster more relevant and meaningful engagement, they face entrenched challenges: overcrowded classrooms, infrastructure shortfalls, teacher shortages, and an exam-focused culture often hinder broad adoption (Kumari, 2020). Multiple studies argue that these systemic barriers can be addressed through targeted teacher development, curricular reforms, and institutional support (Baig and Singh, 2019; Vincy and D'Souza, 2023; Suar et al., 2025).

Baig and Singh (2019), Sabharwal (2021), Subramanian (2023), and Joshi et al. (2024) noting that students in urban areas or more privileged backgrounds benefit

greatly from superior instruction, resources, and mobility, while rural, scheduled caste, or government-school students contend with pronounced disadvantages. The research consistently points to the need for resource redistribution, bilingual or translanguaging pedagogies, and education policies rooted in social justice to address these deep-seated divides (Rajaniprashanth, 2024).

Classroom-based investigations (Sravani and Babu, 2018; Singh and Halim, 2023) consistently show that communicative, interactive techniques drive greater language gains compared to rote or translation-based methods. Yet, widespread gaps in teacher training, overreliance on outdated pedagogies, and inadequate digital literacy training hinder progress (Suar et al., 2025; Vincy & D'Souza, 2023). Targeted upskilling, better infrastructure, and a shift toward ongoing, context-sensitive teacher workshops are frequently advocated (Kumari, 2020; Sahoo & Padhi, 2023; Suar et al., 2025).

Sahoo and Padhi (2023) and Selvaraj et al. (2024) document the benefits of educational apps, CALL tools, and digital materials, reporting that these resources can boost engagement, motivation, proficiency, and learner autonomy especially when paired with self-regulation practices. However, the digital transformation also risks widening inequalities, necessitating sustained investments in teacher digital literacy and equitable infrastructure (Sahoo & Padhi, 2023; Selvaraj et al., 2024). Vincy & D'Souza (2023) and Trivedi & Pandya (2024) further recommend major reforms in textbooks and assessments to align with new technological realities.

Toppo (2021), Rajaniprashanth (2024), and Subramanian (2023) point out that the coexistence of countless dialects and varied classroom beliefs requires curricula that celebrate diversity and empower teachers to use translanguaging and context-relevant materials, fostering deeper inclusivity and engagement. The influence of English as a status symbol and its connection to upward mobility persists, even as efforts continue to infuse respect for local languages and identities (Subramanian, 2023; Thomas, 2024). Wotsa and Yadav (2023) states that most students heavily utilized their cognitive thinking skills while reading.

Kruk (2017), Mohtar et al. (2022), Schorr et al. (2024), Pérez-Jorge et al. (2025), and Yassin (2024) all highlight the growing effectiveness of mobile devices, augmented reality (AR), and multimedia platforms in fostering motivation, vocabulary acquisition, and learner autonomy, as long as access and teacher training are not overlooked. Peng et al. (2023), in particular, link the psychological drivers of digital

adoption such as curiosity and self-efficacy to the embrace of mobile English learning. However, Janjić and Coventry (2025) caution that mere technology access doesn't guarantee pedagogical impact; success depends on alignment with sound teaching practices.

Tahimic and Baloran (2025), Fitri and Alawiyah (2023), and Trivedi and Pandya (2024) parse the factors underpinning motivation and highlight the nuanced influence of age, gender, and first-language transfer on language outcomes and engagement.

The study abroad experience stands out as a powerful catalyst for language development, lowering anxiety and bolstering communicative confidence (Netz, 2021; Ovchinnikova et al., 2024; Köylü & Tracy-Ventura, 2022; Çınar & Altay, 2025; Higuchi et al., 2023). Flipped classrooms, as explored by Fisher et al. (2024), also promote self-regulation and autonomy, though gains in core reading skills are mixed.

2.7 Studies related to Digital Literacy, Technological Integration, Learners' Autonomy and English Language Learning

Mahapatra (2020), Kumar et al. (2022), and Sharma and Sharma (2023), highlighted that focused digital training for teachers significantly enhances their ability to integrate technology meaningfully in the classroom. Yet, they also caution that insufficient training or ad hoc tech adoption can hinder progress, with gaps in access and skills widespread among both teachers and students. Rawal (2024), who emphasizes that bridging India's educational digital divide hinges more on effective teacher preparation and robust infrastructure than device distribution alone.

Roy and Putatunda (2023) discuss how new frameworks, including increased AI and web technology integration, are pushing institutions toward student-centered, interdisciplinary, and activity-based models. Hema and Gandhimathi (2025) further highlight the rise of mobile-assisted language learning globally, pointing to an era of rapid innovation and widespread collaboration. Within classrooms, practical studies such as Madhavi et al. (2023) and Joice and Deepa (2024) demonstrate that technology-driven and experimental approaches, whether incorporating AI, mobile apps, or real-time feedback with multimedia can substantially boost students' spoken English skills, reduce anxieties, and create engaging, student-centered environments. Nair and Yunus (2021) share similar findings, affirming digital storytelling's capacity to foster

speaking confidence and classroom participation.

Wotsa and Yadav (2025) find that a teacher's proficiency with technology doesn't necessarily translate into greater confidence in their teaching practice, advocating that self-efficacy and tech skills, while related, are distinct. Adeppa (2025) reveals continued imbalances, with urban educators far more at ease using digital platforms than their rural counterparts.

Kammerer et al. (2012) and Ting (2015) revealed that students' confidence in using digital sources led to improved engagement and language skills. Ajideh (2016) and Jose (2016) showed that using platforms like wikis or blended resource models fosters both learner autonomy and practical language use, even as accessibility issues persist.

Reinders and White (2016) and Barczyk and Li (2017) established that reflective and scaffolded tech integration, such as through blogs, portfolios, or blended learning, significantly deepens critical thinking and learner agency. Similarly, Lin and Warschauer (2017), Saito and Akiyama (2017), and Baturay and Daloğlu (2018) described how collaborative online environments, blogging, and communication apps encourage self-directed language exploration and intercultural learning.

Tseng and Huh (2019) and Lahpai (2019) note that advanced digital skills are tied to greater linguistic success, autonomy, and positive attitudes toward English. Areepattamannil and Santos (2019) found that ICT competence directly supports students' enjoyment and confidence not only in science but also in language learning. Ajmal et al. (2020), Chen and Chen (2018), and Baturay and Daloğlu (2018) reports similar gains in student motivation, self-monitoring, and collaborative skills, especially when traditional and digital approaches are blended.

Ali (2022) illustrates how Malaysian students use a mix of platforms like Grammarly and WhatsApp for collaborative writing. Chekhratova et al. (2022) observed that enhanced digital and reflective skills go hand-in-hand in improving learning outcomes and independence. Likewise, Naseer et al. (2022) and Pratiwi and Waluyo (2023) confirm that higher digital literacy encourages resourcefulness and autonomy, particularly during the pandemic's shift to independent learning.

Hong (2023) and Zeng (2023) found that while digital tools spur vocabulary growth and moderate self-management, intentional support from educators is needed for these skills to truly translate into independence. Prasetya (2024) and Consoli et al. (2024) highlight the importance of aligning tech use with sound pedagogy and adaptive

design, moving beyond frequency of device use.

Maahs et al. (2025), Indriani et al. (2024), Kaewkamnerd et al. (2024), Melliti and Henchiri (2024), Wu and Lambencio (2022), Sim and Ismail (2023), Burgos and Anthony (2024), Jegadeesan (2025), and Feng and Liu (2024) all reinforce that effective technological integration especially when tailored to learners' diverse backgrounds and supported by training remains fundamental to nurturing both autonomy and language achievement.

2.8 Research Gaps

Despite a growing body of literature addressing digital literacy, technological integration, and the development of learners' autonomy, substantive gaps persist particularly when these domains intersect in the context of English language learning among higher secondary students in Nagaland. Much of the prevailing research is national in focus, frequently centred around urban and rural divides, and fails to adequately account for the distinctive social, infrastructural, and cultural realities that shape educational experiences in the Northeastern region of India and Nagaland in Particular. For instance, while the proliferation of smartphones and digital devices has been widely documented, relatively little is known about the depth and authenticity of digital engagement among Nagaland's adolescents, or how their digital self-perceptions compare with actual proficiency. The influence of tribal identity, cultural norms, and socio-economic factors coupled with persistent gender disparities in access to and confidence with technology remains largely unexplored in this setting.

Moreover, although policy frameworks advocate for robust technology integration and emphasize the importance of digital skills, empirical investigations into how such policies translate into practical classroom applications within Nagaland are exceptionally limited. The preparedness of teachers, their ongoing professional development, and their confidence to effectively utilize digital pedagogies are recurrent themes in the literature, yet few studies directly examine how these factors play out in the schools of Nagaland particularly in relation to English Language Learning. The role of teacher mediation in scaffolding both digital skill acquisition and the cultivation of learner autonomy in these classrooms is another area that remains insufficiently investigated.

The question of Learners' autonomy highlighted globally as a crucial

determinant of language acquisition further stresses the need for locally grounded research. The intersection of linguistic diversity, institutional support (or its absence), and the use of technology in learning could result in distinct ways students take ownership of their education in Nagaland, patterns which have not been meaningfully examined to date. Students' readiness to engage in self-directed learning, the support structures (both digital and human) that enable or inhibit such engagement, and the potential disparities arising from the so-called digital divide are aspects that warrant systematic exploration.

Additionally, most extant research approaches digital literacy, technology integration, and learner autonomy as isolated constructs; there is a notable absence of studies that conceptualize and empirically investigate their interconnectedness, particularly as it relates to student outcomes in English language learning. This lack of holistic and intersectional inquiry is especially pronounced in the context of Nagaland, where educational realities are mediated by a complex interplay of multilingualism, socio-cultural identity, and aspirations for social mobility. There is also a pressing need for longitudinal or comparative studies, which could illuminate how changes in digital competence and instructional technology use might foster or hinder the development of learner autonomy and language proficiency over time.

In conclusion, significant research gaps endure at the nexus of digital literacy, technological integration, and autonomous learning within the unique socio-educational settings of Nagaland, justifying the need for research that not only uncovers region-specific challenges and opportunities but also provide valuable insights aimed at bridging these divides. Keeping all these in consideration the investigator took up the present study, entitled "Digital Literacy, Technology Integration, and Learners' Autonomy Impacting English Language Learning among Higher Secondary School Students of Nagaland."

CHAPTER – III

RESEARCH METHODOLOGY

This present chapter discusses the conceptual research design and techniques that are being used in the current study. Research finds current information, evaluates theories and methodologies, reflects a thorough investigation, recalls established theories and procedures in light of recently acquired facts, and applies them to a particular choice. Research is not just a technique; it is an investigation into the creation of new knowledge or the imaginative use of previously acquired knowledge. It is a well-structured, methodical study with a distinct objective or central research question. The ultimate goal is to produce novel concepts, methods, and understandings that advance a particular topic or subject. Every investigation needs a practical method that allows the researcher to collect and evaluate data in order to solve the research question. The significance of investigation lies in its ability to uncover new information and push the boundaries of existing knowledge. It comprises a rigorous, deliberate investigation guided by a well-defined research question or objective. Researchers employ a range of techniques, such as surveys and experiments.

Research is systematic quest for knowledge that is characterized by disciplined enquiry. Efficient and effective approach to expand knowledge is the conduct of special planned and structured investigations (Busha and Harter 1980).

3.1 Research Method

In the present study descriptive research method was used. Keeping in view the objectives of the study different designs were employed to conduct this research. To study the role and as well as status of different variables of the study exploratory design was utilized. In order to analyze the main effects and interactional effects of independent variables on the dependent variables ex-post-facto design was used. To study the relationship of independent variables with dependent variable correlational design was used.

3.2 Sample Design

Population: Population is defined as the totality of objects under consideration, which can be specified in terms of an entity or defined characteristics of the entity. The population of this study covers the students, teachers, and heads of institutions of Higher Secondary Schools in Nagaland.

NBSE: As per the NBSE (2023-24) report, in NBSE (Nagaland Board of School Education), there are about 188 higher secondary schools in total; the number of teachers employed in higher secondary schools is 1,463, with 671 teachers employed in government higher secondary schools and 835 teachers used in private higher secondary schools (Nagaland Statistical Handbook 2024). Enrollment of students in higher secondary schools of Nagaland is 37,639 students, from which 10,201 are enrolled in government higher secondary schools, and the remaining 26,742 students are enrolled in private higher secondary schools (Samagra Shiksha Annual Report, 2023-24). The total number of higher secondary school students in Nagaland currently studying in 12th standard is approximately 21,329, according to the official report of NBSE HSSLC examination statistic 2024.

CBSE: In Nagaland, there were approximately 2,000 CBSE higher secondary school students. No senior secondary schools exist in the six districts: Zunheboto, Tuensang, Kiphire, Shamator, Noklak, and Tseminyu.

ICSE: Currently, there were only 33 ICSE higher secondary school students in Nagaland, with only Arts stream.

In all there were approximately 23,362 class 12th higher secondary school students studying in Nagaland.

Sample and Sampling Technique: Sampling is the process by which a relatively small number of individuals, objects, or events are selected to represent the whole population's traits and characteristics.

The researcher used multistage sampling to select the sample for the study. In the first stage, six districts (Chumoukedima, Dimapur, Kohima, Mon, Mokokchung, and Tuensang) were selected randomly out of 17 districts of Nagaland.

In the second stage, 29 higher secondary schools were selected from 6 districts, proportionate to the population of the students in each district, focusing on their board, streams, management, locale and gender.

In the third and final stage, 1500 students were selected, where 967 students

were from private higher secondary schools and 533 were from government higher secondary schools. Each head of the selected institution (government as well as private) and two teachers teaching English subject per school were included in the sample of the study i.e., 58 teachers.

This selected sample 1500 was 6.42% of the total population which is too high then the recommended sample i.e., 3.84% by Kothari (2004; Creswell 2014) and online sample calculator software like SurveyMonkey and Raosoft.

For example, using the standard sample size formula for proportions:

$$\text{Sample size} = \frac{\frac{z^2 \times p(1-p)}{e^2}}{1 + \left(\frac{z^2 \times p(1-p)}{e^2 N} \right)}$$

<https://www.surveymonkey.com/mp/sample-size-calculator/>

Table 3.1
The status of higher secondary school students' stream-wise

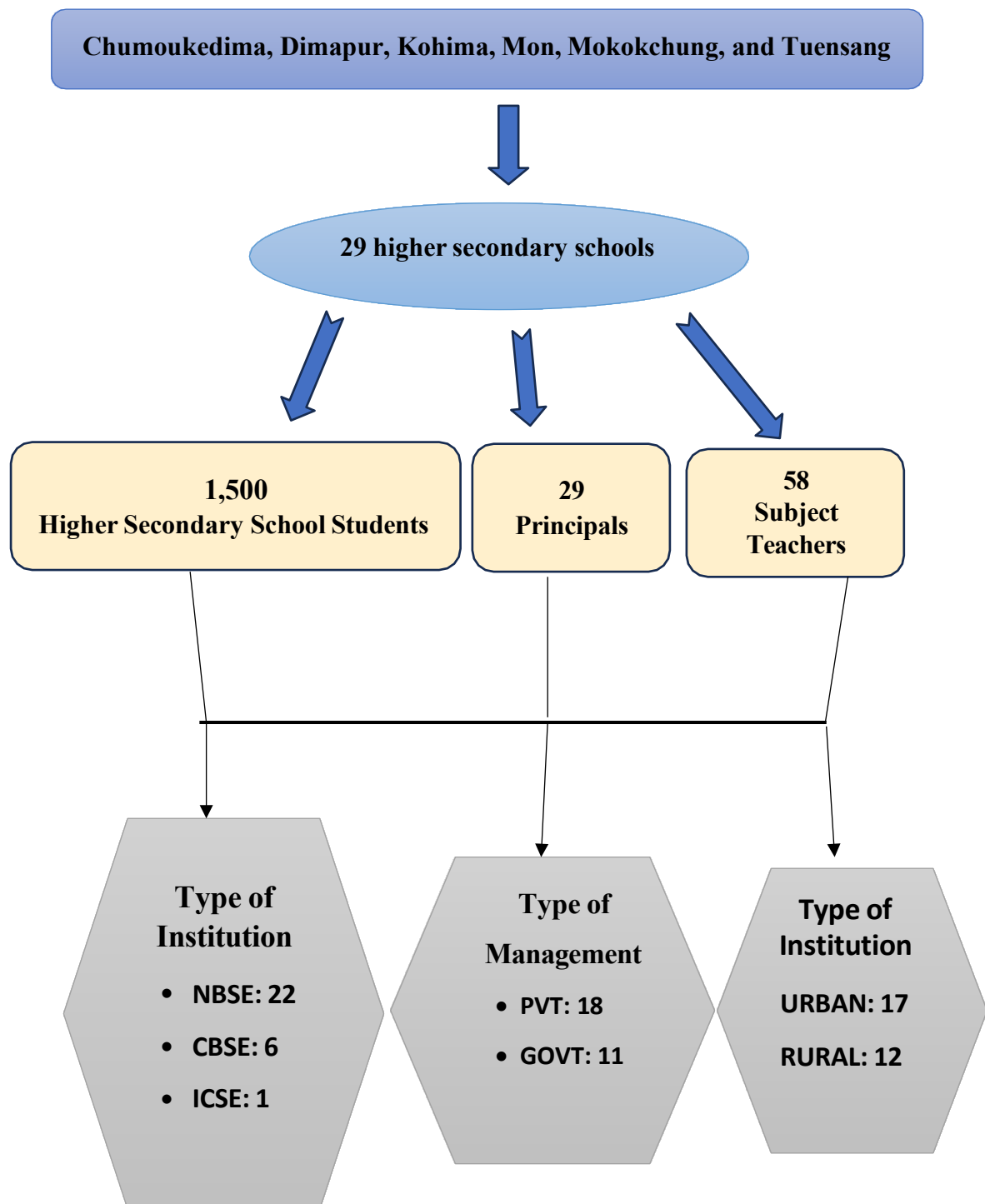
District	Government			Private			No. of CBSE Senior Secondary Schools	No. of ISCE Senior Secondary Schools
	Arts	Commerce	Science	Arts	Commerce	Science		
Dimapur	2	0	1	29	13	12	8	0
Chumoukedima	4	0	0	20	5	9	3	0
Kohima	7	3	2	27	02	8	3	0
Mokokchung	5	1	2	13	1	1	1	1
Mon	6	0	1	5	0	1	1	0
Tuensang	4	1	1	3	0	1	0	0
Total	28	5	7	97	21	32	16	1

Table 3.2
List of Schools

Sl. No	Name of the schools	Type of Institution			Type of management		Locality	
		NBSE	CBSE	ICSE	Pvt	Govt.	Urban	Rural
Dimapur								
1.	Maple School		C		P		U	
2.	Christian Hr. Sec. School	N			P		U	
3.	Honili Hr. Sec School	N			P			R
4.	Holy Cross Higher Secondary School	N			P		U	
5.	Kendriya Vidyalaya, Rangapahar Cantt.		C			G		R
6.	Don Bosco Hr. Sec. school	N			P		U	
7.	GHSS Nagarjan		C			G		R
8.	Kendriya Vidyalaya Sewak		C			G	U	
9.	Vidhya Bhawan	N			P			R
Total		5	4		6	3	5	4
Kohima								
10.	G. Rio School,		C		P		U	
11.	Grace hr. sec school	N			P		U	
12.	Vinyuzo Hr. Sec	N			P		U	
13.	Modern Hr. Sec	N			P		U	
14.	St. Mary cathedral	N			P			R
15.	Alderville Hr. Sec School, Jotsoma	N			P			R
16.	Jawahar Navodaya Vidyalaya, Yekukie,		C			G		R
17.	GHSS Dr. N Kire	N				G		R
Total		6	2		6	2	4	4

Chumoukedima								
18.	GHSS Singrijan	N				G		R
19.	Patkai Hr. Sec School	N			P			R
20.	Carmel Hr. Sec School	N			P		U	
21.	GHSS Purana Bazaar	N				G	U	
Total		4			2	2	2	2
Mon								
22.	GHSS Tobu	N				G		R
23.	GHSS Town Mon D	N				G	U	
24.	St John Hr. Sec	N			P		U	
Total		3			1	2	2	1
Tuensang								
25.	St John Hr. sec	N			P		U	
26.	GHSS	N				G		R
Total		2			1	1	1	1
Mokukchung								
27.	Jubilee Memorial Hr. Sec. School			I	P		U	
28.	Queen Mary Hr. Sec School.	N			P		U	
29.	MGHSS	N			P	G	U	
Total		2		1	2	1	3	

Figure 3.
Flow Chart of Sample



3.3 Tools of Data Collection

The following three tools were used by the researcher for data collection. All three tools were developed and standardized by the investigator. The description of the tools is given ahead.

1. Digital Literacy Scale
2. Technological Integration Scale
3. Learners Autonomy Scale

The English language learning of the students has been taken from the scores of the students in the English subject. The obtained scores of students in the English subject in the annual examination of 11th class have been considered as English language learning in the present stage.

The researcher administered a semi-structured interview schedule on the Heads of the institutions and the teachers to gather qualitative insights into their experiences, challenges, and suggestions related to digital literacy, technology integration, and English language learning according to the needs of the objectives of the study.

3.3.1 Digital Literacy Scale

Examining digital literacy among secondary school students assists educators and policymakers in determining how to effectively prepare young people for the digital world they will encounter in higher education, the workforce, and society in general. Moreover, by examining this population, researchers can assess the efficacy of various teaching approaches, curriculum designs, and interventions (Kilag et al., 2023). The use of secondary school students as a study group is supported by empirical investigations, theoretical frameworks, and educational policies (Reddy et al., 2023). Journals, books, internet sources, encyclopedia, and other available literature were consulted to construct the items about the digital literacy that can be experienced by the individual while pursuing the study.

A total number of 30 items were constructed in the first draft of the scale. These items covered four different types (dimensions) of Digital Literacy, i.e., Technical Skills, Information Literacy, Media Literacy, and Communication Skills.

Technical Skills: Technical skills are obtained through the practice and mastery of physical or digital tasks (Indeed, 2025). In the workplace, technical skills are technical procedures or practical tasks that are simple to observe, quantify, and measure. The skills are tangible, particular, and usually teachable, such as typing 50 words per minute or changing tires (Roselina, 2009).

Information Literacy: Information literacy is defined as the ability to find, assess, organize, use, and transmit information in all of its forms, particularly in situations requiring decision-making, problem-solving, or knowledge acquisition. In today's digital age, information literacy needs people to be able to access and create information using information and communication technologies and their applications (Information Literacy, 2023).

Media Literacy: Media literacy is being able to apply critical thinking skills to the messages, signs, and symbols presented by mass media. It enables us to make better decisions about what we read, watch, and listen to, allowing us to become smarter, more discerning members of society (Vinney, 2024). Individuals who gain media literacy abilities can better grasp the messages they encounter, make educated decisions, and participate in meaningful discussions about the media's impact on themselves and society as a whole (Hattani, 2019).

Communication Skills: Communication skills are crucial in the digital era, where rapid technological advancements have transformed communication. Effective communication requires a holistic approach that combines technical proficiency with interpersonal competence, critical thinking, and ethical awareness. By embracing digital literacy, cultivating interpersonal skills, and promoting responsible digital citizenship, individuals and organizations can navigate the evolving digital landscape with confidence, proficiency, and integrity, connecting, collaborating, and thriving (Sushmita, 2024).

Some of the items are in positive form while others are in negative form. Experts' help was also sought to construct the items for the scale.

A) Item format and Try Out of the Scale

After preparing the preliminary draft of the scale, it was decided to have a five-point Likert scale. For the present scale of Digital Literacy, the respondents were supposed to tick the best possible response out of the five options: strongly agree,

agree, neutral, disagree, and strongly disagree. Items of the scale depicted the intensity of the digital literacy skills felt by the subjects, for whom numbers were assigned according to the degree or intensity to differentiate the magnitude of digital literacy on that particular item. Thus, 5,4,3,2, and 1 scores were allocated to the response for strongly agree, agree, neutral, disagree, and strongly disagree, respectively, in the case of positive items. On the other hand, scores were allocated as 1,2,3,4, and 5 to the responses for strongly disagree, disagree, neutral, agree, and strongly agree, respectively, for the negative items.

The first try-out of the scale was administered to 20 subjects to determine and resolve the ambiguity or abstruseness of items. Based on the outcomes and feedback of the try-out, the items were modified.

B| Validity and Reliability Validity

To ensure the face validity and content validity of the scale, it was distributed to 20 experts of the field of education, teacher education, and psychology. On the basis of the expert feedback and the suggestions on 10 items, 4 items were modified, and 6 were deleted. Some new items suggested by the experts were also incorporated into the existing list of items. With this incorporation, the total number of 24 items was finalized in the second draft. The second draft of the scale was again mailed to some higher secondary teachers as subject experts and to some professors from teacher education institutes. After incorporating their suggestions, the final draft of the scale was prepared after determining the face validity, content validity, and accuracy of all the 24 items of the scale.

C| Distribution of items in the final format of scale

Different items of the final draft of the scale are focused on four dimensions of Digital Literacy, i.e., technical skills, information literacy, media literacy, and communication skills. The dimension-wise distribution of the items of the scale is given in the following Table-3.3.2

Table – 3.3.2
Dimension wise distribution of items of Digital Literacy

Sl. No.	Dimension	Type of Items	No. of Items	Item Sub-Total	Total
1	Technical Skills,	Positive	1, 3, and 4	3	5
		Negative	2 and 5	2	
2	Information Literacy,	Positive	6,7,8, and 10	4	6
		Negative	9 and 11	2	
3	Media Literacy	Positive	12, 13, 14, 15, and 17	5	7
		Negative	16, and 18	2	
4	Communication Skills	Positive	19, 20, 22, and 24	4	6
		Negative	21 and 23	2	
Total Items					24

D] Reliability

To find out the reliability of the Digital Literacy scale, it was administered to 200 subjects. The Split- Half reliability and Test-Retest method was used by the investigator. The Split-Half reliability was found out by the odd and even items. The odd-numbered items were put in one group, and the even- numbered items were put in another group. For the Test, Retest, the scale was administered on a sample of 200 students, and after 30 days, it was again administered on the same sample. The correlation coefficient was calculated for the reliability of the whole test and the split-half reliability coefficient was found to be 0.76, whereas the Test-Retest reliability coefficient came out to be 0.72.

Table 3.3.3
Reliability Index of Digital Literacy Scale

Sl. No	Reliability	N	Reliability Index
1	Split - half	200	0.76
2	Test-Retest	200	0.72

The Test-retest reliability coefficient of scale and the split-half reliability coefficient of scale were significant at 0.01 level of significance.

E] Norms

For the Digital Literacy Scale, norms in the form of z-scores have been prepared for students. The list of consolidated z-scores have been prepared as given in the following table:

Table 3.3.4
Norms for Interpretation of Levels of Digital Literacy.

Sl. No	Raw Scores of Range	z-scores of Range	Grade	Level of Digital Literacy
1	24 – 65	Below -0.43	C	Low
2	65 – 78	-0.43 to +0.43	B	Average
3	78 – 120	Above +0.43	A	High

The above given categorization is based on the normal probability curve (Garrett, 1969). The range 24-120 was divided into 3 equal parts, and corresponding Z-scores were computed.

3.4.1. Technological Integration Scale

The investigator, understanding the need for a suitable tool to study the Technological Integration of

the students, has decided to construct and standardize a scale to measure the same. To build a scale, the investigator has collected a variety of information related to Technological Integration resources from books, journals, websites, blogs, technology experts, and so on. 30 items were constructed in the first draft of the scale. These items covered four different types (dimensions) of Technological Integration,

i.e., Digital Tools and Resources, Pedagogical Approaches, Assessment and Feedback, and Professional Development.

A) Item Format

After preparing the preliminary scale draft, it was decided to have a five-point Likert scale. For the present scale of Technological Integration, the respondents were supposed to tick the best possible response out of the five options: strongly agree, agree, neutral, disagree, and strongly disagree. Items of the scale depicted the intensity of the Technological Integration skills felt by the subjects, for whom numbers were assigned according to the degree or intensity to differentiate the magnitude of Technological Integration on that particular item. Thus, 5,4,3,2, and 1 scores were allocated to the response for strongly agree, agree, neutral, disagree, and strongly disagree, respectively, in the case of positive items. On the other hand, scores were allocated as 1,2,3,4, and 5 to the responses for strongly disagree, disagree, neutral, agree, and strongly agree, respectively, for the negative items.

B) Try out of the Scale

The scale was administered to 20 subjects to try out and determine the ambiguous or abstruse items. These experts were requested to give their opinion regarding the suitable and efficacy of the different items in this scale.

C) Validity

The validity of the scale was established through face validity and content validity. These form of validity is based upon the judgment of several subject experts, and the actual subject matter studied. This analysis is rational as well as judgmental. The help of subject expert and eminent educationists with long standing experience, in the field of education was sought for this purpose the scale was given to experts of different higher education departments and institutions including professors from Nagaland University, Teacher education college principals, and even the higher secondary school Principals. The investigator gave the questionnaire to 20 experts mentioned above. Who responded with their feedback, it was decided to modify 10 items, whereas, 6 items were deleted. Some new items suggested by the experts were also incorporated into the existing list of items. With this incorporation, the total

number of items in the second draft of the scale was 24.

D] Distribution of items in the final format of scale

Different items of the final scale cover four different types of Technological Integration, i.e., Digital Tools and Resources, Pedagogical Approaches, Assessment and Feedback, and Professional Development, as given below in table-3.4.1

Table – 3.4.1
Dimension wise distribution of items of Technological Integration

Sl.no	Dimension	Type of items	No. of Items	Sub Total	Total
1	Digital Tools and Resources	Positive	1, 2, 4, 5, and 6	5	6
		Negative	3	1	
2	Pedagogical Approaches	Positive	8, 9, 10, and 11	4	6
		Negative	7, and 12	2	
3	Assessment and Feedback	Positive	13, 14, 16, 17, 18, and 19	6	8
		Negative	15, and 20	2	
4	Professional Development	Positive	21, 22, 23 and 24	4	4
		Negative	nil	0	
Total					24

E] Reliability

Reliability is one of the most important characteristics of a tool which denotes how consistently and accurately a tool measures. The reliability of scale was calculated by Split-Half reliability and Test- Retest method. For the Split-half method, the scale was divided into odd and even items. The odd number items were put in one group and the even number items were put in another group. For Test- Retest, the scale was

administered on a sample of 200 families and after 30 days it was again administered on the same sample. The coefficient correlation was calculated for the reliability of both tests. The reliability coefficient of the scale is given in Table 3.4.2

Table 3.4.2
Reliability Index of Technological Integration Scale

Sl. No	Reliability	N	Reliability Index
1	Split - half	200	0.78
2	Test-Retest	200	0.88

The Test-retest reliability coefficient of scale and the split-half reliability coefficient of scale were significant at 0.01 level of significance.

F] Norms

For the Technological Integration Scale, norms in the form of z-scores have been prepared for students. The list of consolidated z-scores have been prepared as given in the following table:

Table 3.4.3
Norms for Interpretation of Levels of Technological Integration Scale

Sl. No	Raw Scores of Range	z-scores of Range	Grade	Level of Technological Integration
1	24 – 65	Below -0.43	C	Low
2	65 – 78	-0.43 to +0.43	B	Average
3	78 – 120	Above +0.43	A	High

The above given categorization is based on the normal probability curve (Garrett, 1969). The range 24-120 was divided into 3 equal parts, and corresponding Z-scores were computed.

3.5. Learners Autonomy Scale

To construct a learners autonomy scale, the investigator has referred and consulted by going books, Journals, internet sources, encyclopaedia, and other available literature that can be experienced by the individual while pursuing the study. 36 items were constructed in the first draft of the scale under four different types (dimensions) of Learners' Autonomy, i.e., Goal Setting, Self-Directed Learning, Metacognition, and Motivation.

A] Item Format

After preparing the preliminary scale draft, it was decided to have a five-point Likert scale. For the present scale of Learners' Autonomy, the respondents were supposed to tick the best possible response out of the five options: strongly agree, agree, neutral, disagree, and strongly disagree. Items of the scale depicted the intensity of the Learners' Autonomy felt by the subjects, for whom numbers were assigned according to the degree or intensity to differentiate the magnitude of Learners' Autonomy on that particular item. Thus, 5,4,3,2, and 1 scores were allocated to the response for strongly agree, agree, neutral, disagree, and strongly disagree, respectively, in the case of positive items. On the other hand, scores were allocated as 1,2,3,4, and 5 to the responses for strongly disagree, disagree, neutral, agree, and strongly agree, respectively, for the negative items.

B] Try out of the Scale

The scale was administered to 20 subjects to try out and determine the ambiguous or abstruse items. Based on their feedback, the items were modified.

C] Validity

To determine the face validity and content validity of the scale, the scale was distributed to 20 experts in education, teacher education, and psychology. Who responded with their feedback, it was decided to modify 7 items, whereas, 6 items were deleted. Some new items suggested by the experts were also incorporated into the existing list of items. With this incorporation, the total number of items in the second draft of the scale was 30.

The second draft of the scale was again mailed to some subject expert higher secondary teachers and assistant professors from teacher education institutes. After their approval, the final draft of the scale was prepared by determining the face, content validity, and consistency of all the 30 items of the scale.

D] Distribution of items in the final format of scale

Different items of the final scale cover four different types of Learners Autonomy, i.e., Technical Skills, Information Literacy, Media Literacy, and Communication Skills, as given below in table- 3.5.1

Table – 3.5.1
Dimension-wise Distribution of Items of Technological Integration

Dimension-wise Distribution of Items of Technological Integration					
Sl.no	Dimension	Type of items	No. of Items	Sub Total	Total
1	Goal Setting	Positive	1, 3, 5, 6, and 7	5	7
		Negative	2 and 4	2	
2	Self-Directed Learning	Positive	8, 9, 10, and 12	4	6
		Negative	11 and 13	2	
3	Metacognition	Positive	14, 16, 18, 19, 20 and 21	6	8
		Negative	15, and 17	2	
4	Motivation	Positive	22, 23, 25, 26, 27 and 29	6	9
		Negative	24, 28 and 30	3	
Total					30

E] Reliability

With the help of test-retest and split-half methods, the reliability of the Learners Autonomy scale was administered to 200 students. The test – retest method was administered to a sample of 200 students and after 30 days, it was again administered to the same sample. For the Split-Half reliability was found out by the odd and even

items. The odd number items were put in one group and the even number items were put in another group. The reliability coefficient of the scale is given in Table 3.5.2

Table 3.5.2
Reliability Index of Learners Autonomy scale

Sr. No	Reliability	N	Reliability Index
1	Split - half	200	0.80
2	Test-Retest	200	0.78

The Test-retest reliability coefficient of scale and the split-half reliability coefficient of scale were significant at 0.01 level of significance.

F] Norms

For the Learners Autonomy scale, norms in the form of z-scores have been prepared for students. The list of consolidated z-scores have been prepared in the following table:

Table 3.5.3
Norms for Interpretation of Levels of Learners Autonomy Scale

Sr. No	Range of Scores	z-scores of Range	Grade	Learners Autonomy
1	30 – 81	below -0.43	C	Low
2	81 – 99	-0.43 and +0.43	B	Average
3	99 – 150	above +0.43	A	High

The above given categorization is based on the normal probability curve (Garrett, 1969). The range 30-150 was divided into 3 equal parts and corresponding Z-scores were computed.

3.6. Administration and Scoring

- i. The questions provided on the paper is suitable to extract the answers as per the study.
- ii. There is no time constrain to complete the answer. Respondents are requested

to give their response at their convenience.

- iii. Before administering the scale, confidentiality of responses must be assured to the respondents.
- iv. The respondents should be informed that the questions are structured to know the individual difference attitude and perception to different conditions and not to find their weaknesses and strengths, and no items hold correct or incorrect answer.
- v. Respondents must be informed that all items are mandatory and no items should be left unattempt.

3.7. Techniques of Data Analysis

After the data collection, the response sheets from the selected sample were organised for coding, scoring, and tabulation. Statistical analysis was carried out using SPSS version 28 and MS Excel and the findings were interpreted accordingly.

The Researcher used descriptive statistics i.e. mean, median, standard deviation, and frequency distributions to understand the data related to digital literacy, technology integration, learner autonomy, and English language learning scores.

Inferential Statistics such as t-tests, ANOVA, and Two-way ANOVA, were used to compare English Language Learning among students on the basis of gender, locale, stream, management, Digital Literacy, Technological Integration, and Learners Autonomy. Additionally, the correlation coefficient was employed to examine relationships between variables.

The interview transcripts were analysed thematically to identify recurring themes and patterns to explore the perceptions of teachers and Principals of higher secondary schools concerning the role of digital literacy, technology integration, and learners' autonomy in the English language learning of students.

CHAPTER – IV

ANALYSIS AND INTERPRETATION

The analysis and interpretation of the data has been presented below according to the research questions and hypothesis testing with the help of the following headings:

- 4.1 Role of Digital Literacy, Technological Integration, and Learners' Autonomy in the Improvement in English Language Learning
- 4.2 Status of Digital Literacy, Technological Integration, and Learners' Autonomy
- 4.3 Level of Digital Literacy, Technological Integration, and Learners' Autonomy, and English Language Learning
- 4.4 English Language Learning of Male and Female Students
- 4.5 English Language Learning of Rural and Urban Area Students
- 4.6 English Language Learning of Students Studying in Science, Arts, and Commerce Streams
- 4.7 English Language Learning of Students Studying in Government and Private Schools
- 4.8 English Language Learning of Students with Regards to the Level of Digital Literacy
- 4.9 English Language Learning of Students with Regards to the Level of Technological Integration
- 4.10 English Language Learning of Students with Regard to the Level of Learners' Autonomy
- 4.11 Interaction Effect of Digital Literacy and Technological Integration on the English Language Learning
- 4.12 Interaction Effect of Technological Integration and Learners' Autonomy on the English Language Learning

- 4.13 Interaction Effect of Digital Literacy and Learners' Autonomy on the English Language Learning
- 4.14 Relationship between English Language Learning and Digital Literacy
- 4.15 Relationship between English Language Learning and Technological Integration
- 4.16 Relationship between English Language Learning and Learners' Autonomy
- 4.17 Relationship of Digital Literacy, Technological Integration, and Learners' Autonomy with English Language Learning.

4.1 Role of Digital Literacy, Technological Integration, and Learners' Autonomy in the Improvement of English Language Learning

Content analysis is a flexible and systematic approach that helps researchers examine various forms of communication in an objective and repeatable way. While it began as a method focused mainly on counting and describing visible content, as described by Berelson (1952), it has since grown to encompass a much wider range of materials and purposes. According to Krippendorff (2019), content analysis is essentially about drawing reliable and meaningful conclusions from texts or other types of data by carefully considering the context in which they appear. This makes it a valuable tool for studying not only written documents, but also images, audio recordings, and other media.

Content analysis on the role of Digital Literacy, Technological Integration, and Learners' Autonomy in the improvement of English Language Learning has been done from the semi-structured interview conducted on teachers and principals of higher secondary schools in seven districts of Nagaland. Specific key themes were identified and elaborated as per the need of the question.

4.1.1 Role of Digital Literacy in the improvement of English Language Learning

The following is a content analysis on the role of Digital Literacy in the improvement of English Language Learning focusing on the specific key themes, namely perceptions and attitudes, the importance of Digital Literacy, digital resources used, assessment, challenges, suggestions, support needs, and overall reflections on

both the teachers and principals.

1. Teachers' Perspectives:

a) Perceptions and Attitudes

- i. Most teachers believe Digital Literacy makes learning more engaging and meaningful. Students show better interest when exposed to digital resources like authentic videos, interactive apps, and online articles.
- ii. Teachers observed that DL fosters independent learning, critical analysis, and creativity among students.
- iii. Teachers noted DL allows students to explore real-world English through news articles, blogs, and podcasts, promoting real-time language acquisition.
- iv. DL is perceived not only as essential for English learning but also for helping students make informed decisions, evaluate information, and use the internet responsibly.
- v. Teachers from traditional teaching environments acknowledged DL as necessary, calling for curriculum upgrades and institutional changes to avoid stagnation.

b) Importance of Digital Literacy in Teaching Context

- i. Teachers emphasized the need for Digital Literacy to be an integral part of the curriculum to foster autonomy and deeper understanding.
- ii. Teachers mentioned Digital Literacy has broadened their teaching strategies and helps meet diverse student learning needs.
- iii. While some teachers admitted being new to Digital Literacy, they still acknowledged its importance for both teaching efficacy and student empowerment.

c) Digital Resources Used

- i. Tools commonly used are Google, YouTube, Grammar apps, Google Slides, PDFs, audio-visual resources, online dictionaries (Oxford, Cambridge), interactive tools like Wordwall, Grammarly, and Quizlet.
- ii. Utilization of MS Office tools and e-resources like TataEd, BBC

Languages, and Prezi indicates a shift toward a multimodal learning approach.

d) Assessment of Students' Digital Literacy

- i. Students generally show advanced digital skills, comparable to global peers, especially in urban or better-equipped schools.
- ii. Assessment methods include online quizzes, assignments, projects, self-assessment questionnaires, and observation of digital behavior.
- iii. However, Digital Literacy levels vary widely, with some students lacking access to devices and internet connectivity, especially those from economically disadvantaged backgrounds.

e) Challenges in Promoting Digital Literacy

- i. Lack of digital infrastructure (computers, projectors, internet connectivity) and teaching materials in many schools, especially government institutions.
- ii. Socioeconomic barriers prevent many students from accessing personal digital devices.
- iii. Overcrowded classrooms and insufficient time limit effective Technological Integration.
- iv. Resistance to change and lack of digital skills among some teachers hinder adoption.
- v. Concerns about digital safety, privacy, and equitable access.
- vi. Traditional teaching methods still dominate, limiting the use of technology.

f) Suggestions and Recommendations

- i. Call for more practical, interactive tools, phonetic resources, and e-libraries (Smart Classrooms & AV Aids).
- ii. Emphasis on regular workshops and professional development in Digital Literacy (Training for Teachers)
- iii. Suggest aligning digital tools with curriculum objectives and ensuring infrastructure.

- iv. Recommend encouraging exploration, allowing trial and error learning, and reducing content bulk.

g) Support Needed

- i. Demand for affordable platforms, especially grammar and phonetic tools.
- ii. Need for current materials and ongoing ICT updates.
- iii. Desire for peer collaboration, expert workshops, and improved classroom infrastructure.

h) Final Reflections

Teachers largely support Digital Literacy as a growing necessity, albeit with uneven implementation. A few expressed inexperience but recognized the long-term value of Digital Literacy for enhancing English Language Learning and student independence.

2. Principals' Perspectives

a) Perceptions and Attitudes

- i. Principals see Digital Literacy as critical to bridging traditional learning with current demands, enabling better English Language acquisition.
- ii. Some highlighted Digital Literacy dual function in supporting both administrative efficiency and student learning.

b) Digital Literacy in Higher Secondary Context in Nagaland

- i. While some schools-initiated programs like Tata Edge or sensitization workshops, many still follow traditional methods due to poor infrastructure.
- ii. Principals cited government inaction, lack of funding, and poor management as barriers to effective Digital Literacy implementation.
- iii. Digital Literacy is seen as necessary for Nagaland to compete nationally and globally in education standards.

c) Challenges Encountered

- i. In many schools, devices are banned due to concerns over misuse (e.g., copying from the internet, AI abuse, and distraction).
- ii. Students from low-income backgrounds often lack exposure or foundational knowledge in Digital Literacy.
- iii. Some teachers and students remain more comfortable with traditional methods.
- iv. Ongoing school construction, lack of digital tools, and poor connectivity impede Digital Literacy integration.

d) Existing Initiatives

- i. Some schools conduct annual refresher courses like ICT Workshops.
- ii. Tools like the G. Rio App are used for teacher-parent communication.
- iii. Remote learning during the pandemic created Digital Literacy awareness among teachers (COVID-Era Adaptation).

Table 4.1.1
Summary Table of Key Themes of Digital Literacy by Teachers and Principals

Key Theme	Teachers	Principals
Importance of Digital Literacy	Essential for students' success. Critical thinking and global competitiveness. Teachers must also upgrade their Digital Literacy skills.	Bridges traditional teaching and Technological. Vital for student progress. Hindered by resource gaps.
Digital Literacy in Teaching Practice	Makes lessons engaging and effective. Uses various digital tools. Faces training challenges.	Supports administration and communication. Digital adoption accelerated by COVID-19.
Assessment of Students' Digital Literacy	Students generally advanced but unequal access. Assessed via online tasks and observation.	No dedicated Digital Literacy subject. some online assessments, progress limited by

		resources.
Challenges	Infrastructure, socioeconomic barriers, overcrowding, lack of training, Digital safety concerns.	Resource shortages. Administrative delays. Digital divide highlighted by COVID-19.
Suggestions	Upgrade infrastructure. Ongoing teacher training. Curriculum integration. Affordable access. Workshops.	Improve infrastructure Staff training bridge gaps Align with national policies.
Support Needs	Access to advanced software. Affordable platforms. Technical support better materials.	More government support. Digital tools for admin/learning, and Staff training.
Overall Reflections	1. Digital Literacy is vital but needs systemic changes. 2. COVID-19 exposed gaps.	1. Essential for progress. 2. Requires infrastructure and, 3. Ongoing integration efforts.

Discussion:

Findings reveal that Digital Literacy is widely acknowledged as a critical driver of English Language Learning, promoting independent learning, creativity, and global readiness. However, significant gaps remain in infrastructure, training, and equitable access particularly in government schools and rural settings. Teachers advocate for curriculum revision, better tools, and hands-on training, while principals emphasize the need for policy support, resource allocation, and controlled integration to minimize misuse. Similar results were also reported by Kasar (2025), Pawar and Patil (2024), Digital English Language Learning Market Report 2033 (2024) and Suar et al. (2025). The findings that Digital Literacy is a powerful catalyst for English Language

Learning, enhancing autonomy, creativity, and global engagement. However, the full benefits can only be realized through targeted interventions in infrastructure, teacher training, and equitable access-especially in under-resourced settings. Both teachers and school leaders advocate for systemic reforms, including curriculum updates, resource allocation, and policy support, to bridge the digital divide and ensure that all learners are prepared for the demands of a globalized world. However, it contradicted the findings of Sha'ar (2022), Mukhopadhyay (2021), Bradley et al. (2025) and Montes et al. (2022) who reported that Digital Literacy alone is not a guaranteed solution for improving English Language Learning. Factors such as lack of teaching support, poor internet access, and tools that don't fit students' needs can hinder its effectiveness. Even those who are proficient with basic digital use may struggle with online English learning. Therefore, the use and support surrounding Digital Literacy are crucial for effective English Language Learning.

4.1.2 Role of Technological Integration in the Improvement of English Language Learning

The following is a content analysis on the role of Technological Integration in the improvement of English Language Learning focusing on the specific key themes, namely perceptions and attitudes, practices, benefits, challenges, and suggestions on both the teachers and principals.

1. Teachers' Perspective

a) Perceptions and Attitudes

- i. Teachers recognize the limitations of traditional classroom methods and support the integration of Technological to make lessons more engaging and effective.
- ii. They observe that students are naturally curious and respond well to Technological-based learning, which caters to diverse learning styles and promotes independent thinking.

b) Classroom Practices and Experiences

- i. Teachers use multimedia tools such as projectors, audio-visual aids, and

PowerPoint presentations to supplement lessons, especially for complex or abstract topics.

- ii. Assignments often involve internet research or content creation, encouraging students to use digital resources for deeper learning.
- iii. Some teachers blend Technological with traditional methods, setting aside days for e-classrooms or video-based lessons.

c) Benefits Observed

- i. Notable improvements in student engagement, attention, and participation when Technological is used.
- ii. Enhanced listening, speaking, and pronunciation skills, as well as better retention and comprehension.
- iii. Technological fosters student autonomy and ownership of learning, with students often taking the initiative to explore and learn beyond the curriculum.

d) Challenges Faced

- i. Lack of digital infrastructure, insufficient devices, unreliable internet, and frequent electricity problems.
- ii. Many students, especially those from economically disadvantaged backgrounds, lack access to devices or internet at home.
- iii. Teachers often feel unprepared or lack confidence in using Technological due to limited training and exposure.
- iv. Overcrowded classrooms, rigid curricula, and time constraints further hinder effective integration.

e) Coping Strategies and Suggestions

- i. Teachers self-educate through webinars, online courses, and peer learning to improve their tech skills.
- ii. They recommend more practical tools and language apps, better infrastructure, and regular teacher training.
- iii. Emphasize the need for affordable and accessible digital platforms for all students.

- iv. Suggest curriculum adaptations to include more multimedia and project-based learning.

2. Principals' Perspective

a) Perceptions and Attitudes

- i. Principals see Technological as a bridge between traditional and modern teaching, essential for efficient school administration and academic progress.
- ii. They emphasize the importance of hands-on experience and skill development, often highlighting the use of smartboards, digital panels, and projectors.

b) Institutional Practices

- i. Many schools have invested in smart classrooms, computer labs, and high-end printers, though usage varies depending on the subject and necessity.
- ii. Technological is often used for administrative tasks and for teaching vocational and skill-based subjects.
- iii. During the COVID-19 pandemic, Technological was used extensively, but principals are cautious about device overuse and distractions, often restricting student access to personal devices during class.

c) Benefits Observed

- i. Technological streamlines administrative work and supports efficient management of school operations.
- ii. It enhances the teaching of subjects like computer science and arts, and supports visual, verbal, and hands-on learning.
- iii. Principals note that Technological can make lessons more interactive and accessible, especially through platforms like NCERT-Bright Tutee.

d) Challenges Faced

- i. Despite having some infrastructure, usage is often limited to certain

subjects or lower sections; traditional methods still dominate.

- ii. Concerns about student distractions, overuse of social media, and the digital divide among students.
- iii. Some schools face challenges in maintaining up-to-date equipment and providing equal access to all students.

e) Coping Strategies and Suggestions

- i. Principals advocate for regular updates to ICT resources and ongoing teacher training.
- ii. They suggest integrating Technological in a balanced way, ensuring both teachers and students are competent and confident in using digital tools.
- iii. Recommend outreach programs, seminars, and crash courses for teachers, as well as curriculum changes to better incorporate Technological.

Table 4.1.2
Summary Table of Key Themes of Technological Integration by Teachers and Principals

Key Theme	Teachers' Perspective	Principals' Perspective
Attitude	Supportive, See tech as necessary for engagement	See tech as essential for teaching and administration.
Practices	Use multimedia. Blended learning. Student projects	Invest in infrastructure. Use for admin and select classes.
Benefits	Better engagement Skills, and Autonomy.	Efficient admin. Supports skill-based learning.
Challenges	Lack of access. Training, and Infrastructure	Limited use. Digital divide, and Equipment maintenance.
Suggestions	More training. Practical tools, and Affordable platforms.	Regular updates. Balanced integration, and Teacher training.

Discussion:

Findings reveal that Technological Integration significantly enhances English Language Learning by increasing student engagement, access to resources, and communication skills. However, challenges such as inadequate infrastructure, limited access to devices, and insufficient teacher training hinder its full potential. Both teachers and principals recommend improving infrastructure, providing regular teacher training, updating curricula with multimedia content, and ensuring equitable access to Technological, emphasizing that these steps are essential for maximizing the benefits of Technological in English Language Learning. Pongen (2024), Rintaningrum (2023), Gajjarapu (2021), and Friedman (2025) have similar findings, which state that Technological integration enhances English Language Learning by increasing engagement, access, and communication skills. But common barriers-such as infrastructure, device access, and teacher training-limit its potential. Recommendations emphasize the need for better infrastructure, regular teacher training, curriculum updates, and equitable access to Technological. However, there was contradiction in the findings of Jamir and Sharma (2022), Sanyu (2023), and Chandra (2024). Which states that while Technological can enhance English Language Learning, it often reinforces inequities when implemented top-down without addressing contextual barriers. The digital divide is not just about access but also about pedagogical and cultural misalignment.

4.1.3 Role of Learners' Autonomy in the improvement of English Language Learning

The following is a content analysis on the role of Learners' Autonomy in the improvement of English Language Learning focusing on the specific key themes, namely fostering autonomy, digital impact, challenges, and overall perception on both the teachers and principals.

1. Teachers' Perspective

a) Fostering Learner Autonomy

- i. Teachers encourage students to select topics, resources, and learning methods, promoting ownership and engagement.

- ii. Modern tools (MS Office, smartboards, and online resources) are integrated to make learning interactive and relevant.
- iii. Students are guided to reflect on their learning, set goals, and evaluate progress.
- iv. Teachers act more as facilitators and guides rather than sole knowledge providers.
- v. Group work, discussions, and peer learning are common strategies.
- vi. A wide range of materials (books, articles, videos) is provided to cater to diverse learning preferences.
- vii. Emphasis on practical use-speaking, translating, sharing experiences in both English and local languages.

b) Impact of Digital Resources

- i. Audio-visual and online materials make learning more enjoyable and accessible.
- ii. Students can learn at their own speed, anytime and anywhere.
- iii. Students become more adept at using digital tools for learning.
- iv. Access to diverse resources fosters independent thinking and opinion formation.
- v. Notable improvements in assignments, projects, and exam performances.

c) Encouraging Ownership

- i. Students are encouraged to set and pursue their own learning goals.
- ii. Regular feedback and appreciation for growth are emphasized.
- iii. Presentations, group work, and inquiry-based learning foster active engagement.
- iv. Teachers stress the importance of using Technological responsibly.

2. Principals' Perspective

a) Current Level of Autonomy

- i. Students show moderate autonomy, excelling more in theory than in practical aspects.

- ii. Despite restrictions on devices in classrooms, digital platforms (WhatsApp, Google Classroom) are used for assignments and projects.
- iii. ICSE is perceived as offering more flexibility and exposure compared to other boards.

b) Strategies to Promote Autonomy

- i. Autonomy is encouraged in both academics and extracurricular activities.
- ii. Open communication and a supportive environment are prioritized.
- iii. Outreach programs and updated resources keep students informed about educational trends.
- iv. Students are encouraged to explore lessons independently beyond classroom teaching.

c) Effect of Digital Resources

- i. Students demonstrate greater elaboration and accuracy in assignments, indicating autonomous learning.
- ii. Increased Digital Literacy and smart use of Technological are observed.
- iii. While Technological enhances autonomy, over-reliance can hinder creativity and lead to misuse.

d) Overall Perception

- i. Digital Literacy and Technological Integration are seen as beneficial for learner autonomy and communication skills.
- ii. The school is still evolving, but policies (like CISCE's student-friendly approach) support autonomy and language development.

Table 4.1.3
Summary Table of Key Themes of Learners Autonomy by Teachers and Principals

Aspect	Teachers' Perspective	Principals' Perspective
Fostering Autonomy	Choice, Reflection, Digital tools, and Peer learning	Academic & extracurricular Open Communication
Digital Impact	Engagement, Self-paced, and Critical thinking.	Improved performance and Digital Literacy
Challenges	Responsible tech use Balancing guidance.	Over-reliance on tech and Evolving institutional setup.
Overall Perception	Positive, but needs Responsible use	Satisfactory, With room for growth

Discussion:

The interviews reveal a strong correlation between Learners' Autonomy and improvement in English Language Learning, especially when supported by digital tools. Both teachers and principals emphasize a transition from teacher-centered to learner-centered methods, strategic use of Technological to foster independence, and the role of feedback, reflection, and student choice in enhancing language skills. Teachers emphasize practical strategies and individualization, while principals focus on institutional support and the broader educational environment. Both groups agree that Digital Literacy and Technological play a crucial role in empowering students to take charge of their learning, though they caution against over-dependence on Technological. The overall outlook is positive, with ongoing efforts to further enhance learner autonomy and English proficiency. Findings of Chong and Reinders (2022), Liu (2023), and Minh and Ngoc (2023) support the result by revealing that Learner Autonomy especially when supported by digital tools, feedback, and institutional backing, significantly enhances English Language Learning. Both teachers' practical strategies and principals' systemic support are necessary, and while Digital Literacy is empowering, moderation is advised to avoid over-reliance on Technological.

However, Shehab (2022) contradicted the findings by reporting that excessive use of digital tools, such as video and audio, minimized opportunities for speaking and interaction, turning learners into passive recipients rather than active participants. The authors caution that mechanical sounds replace teachers' voices, reducing mutual communication and potentially harming language acquisition outcomes. Afkarina et al. (2024) reported that overreliance on AI causes information overload and reduces personalized learning. Jennings (2023b) found that teacher dependence hinders autonomy and critical thinking, autonomy is not easily cultivated and may not be sufficiently supported by digital tools or institutional policies alone.

Summary:

Digital Literacy is a crucial aspect of enhancing English Language Learning in Nagaland's higher secondary schools. It increases student engagement, fosters independent learning, and encourages critical thinking and creativity. DL uses digital resources like authentic videos, interactive applications, online articles, and educational platforms to develop practical language skills and navigate information responsibly. Teachers emphasize integrating DL into the curriculum to cultivate learner autonomy and address diverse learning needs. Common digital tools include Google, YouTube, online dictionaries, grammar applications, and e-resources like TataEd and BBC Languages. Assessments reveal advanced abilities in well-equipped schools but disparities in access and proficiency in less privileged contexts. Challenges to DL implementation include inadequate digital infrastructure, socioeconomic barriers, overcrowded classrooms, limited teacher training, and concerns over digital safety and privacy.

Technological Integration in English language classrooms is transforming teaching methods, making lessons more engaging and interactive. Teachers use multimedia tools, smartboards, and online platforms to supplement traditional teaching, particularly for complex topics. This approach encourages independent research and deeper learning, catering to diverse learning styles. It improves student engagement, participation, and language skills and fosters learner autonomy. However, challenges include insufficient infrastructure, unreliable internet connectivity, limited access to devices, inadequate teacher training, overcrowded classrooms, and rigid curricula. To overcome these, stakeholders recommend regular

teacher training, updates to ICT resources, affordable digital platforms, and curriculum adaptations that incorporate multimedia and project- based learning.

Learner autonomy is encouraged by allowing students to choose topics, resources, and learning methods, with teachers serving as facilitators. Integrating digital tools enables students to learn at their own pace, monitor progress, and set personal goals. Group work, peer learning, and inquiry-based activities foster engagement and ownership. Digital resources enhance accessibility and enjoyment, promoting independent thinking and personal opinion formation. Teachers provide regular feedback and motivate students to take responsibility for their learning, while principals support autonomy through open communication and updated resources. Although some schools restrict personal devices, digital platforms are used for assignments and projects. Students generally show moderate autonomy, excelling theoretically but needing more encouragement for practical application.

Interlink between Digital Literacy, Technological Integration, and Learner Autonomy

There is a strong interconnection between Digital Literacy, Technological Integration, and learner autonomy in the context of English Language Learning:

- i. Digital Literacy equips both teachers and students with the skills needed to effectively utilize Technological for language learning.
- ii. Technological Integration provides the tools and platforms that make learning more interactive and accessible, supporting differentiated instruction and independent exploration.
- iii. Learner autonomy is facilitated by the availability of digital resources and Technological, empowering students to take charge of their own learning journeys.

Collectively, these elements contribute to a more dynamic, student-centered, and effective English Language Learning environment. However, their full potential is contingent upon addressing systemic challenges such as infrastructure gaps, socioeconomic disparities, and the need for ongoing professional development. Strategic policy support, curriculum reform, and investment in digital infrastructure are essential to maximize the benefits of Digital Literacy, Technological, and learner

autonomy in English Language Learning. Findings from Bećirović et al. (2021), Gizem (2024), Imchen (2021), Ying (2024), Kara and Mede (2023) and Pratiwi and Waluyo (2023) has supported the findings by emphasizing the importance of Digital Literacy and Technological integration and Learners Autonomy in English Language Learning. They also highlight challenges such as infrastructure limitations and the need for teacher training though the context may vary. However, Babu and Kithan (2024) contradicts the assumption that Digital Literacy uniformly benefits English Language Learning, as disparities in access and training persist even among educators. While the original findings emphasize curriculum reform, Kuolie (2023) highlights conflicts between mother-tongue-based education (per NEP 2020) and the dominance of English/Hindi in schools. Tribal students often struggle with science due to language barriers, revealing that policy-driven curriculum changes may inadvertently hinder learning outcomes. Mudra (2020) note that digital tools can overwhelm learners, with complex content and expensive devices exacerbating inequities rather than mitigating them.

4.2 Status of Digital Literacy, Technological Integration, and Learners' Autonomy

The status of Digital Literacy, Technological Integration, and Learner Autonomy in English Language Learning in higher secondary schools in Nagaland was analyzed according to their dimensions that are presented in the following lines:

4.2.1 Status of Digital Literacy

Table 4.2.1
Mean, Median, Mode, S.D, Minimum and Maximum of Technical Skills, Information Literacy, Media Literacy and Communication Skills

N	Digital Literacy	Mean	Median	Mode	S.D	Min	Max
1500	Technical Skills	17.39	17	17	2.75	5	44
	Information Literacy	19.32	19	20	2.75	6	28
	Media Literacy	26.57	27	27	3.16	7	35
	Communication Skills	19.92	20	20	2.91	6	30

The table 4.1.1, presents the statistics for four different dimensions of Digital Literacy among 1,500 students: Technical Skills, Information Literacy, Media

Literacy, and Communication Skills. The mean for Technical Skills is 17.39, exhibiting an equal distribution around this value. A standard deviation of 2.75 indicates significant differences in the results. Information Literacy has a somewhat superior mean score (19.32) compared to Technical Skills, with a modest inclination towards high values. The range (6 to 28) is reduced, indicating a lower number of extreme outliers. Media Literacy scores have the highest values across all categories, with a mean of 26.57 and both median and mode at 27, indicating a strong central tendency. The mean of Communication Skills is 19.92, with both the median and mode at 20, indicating a very balanced distribution. The standard deviation (2.91) is similar to the other categories, indicating moderate differences. The range of 6 to 30 is very wide, although it is probable that the majority of scores are clustered around the mean.

Findings highlight that most students are fairly strong in media literacy, communication skills, and information literacy. This means they are generally good at using social media, finding useful information online, and communicating through digital tools. However, technical skills scored the lowest, with some people doing very well and others scoring quite low. This indicates that many students still struggle with using digital tools and software confidently. While overall Digital Literacy levels are balanced, there is a clear need for more training and support to improve technical skills. Familiar results were also shown in Sunny and Ramasamy (2024), Kanyika et al. (2024), and Li et al. (2025), where it reported that students are generally proficient in media literacy, communication, and information literacy, especially in using digital platforms for communication and information retrieval. However, the findings of Qurniasty et al. (2025), and Naparota and Rusiana (2021) revealed that technical skills, such as advanced use of digital tools and software-remain uneven, with some students excelling and others struggling. The consensus across studies is that to achieve balanced Digital Literacy, educational institutions must provide more targeted training and support, particularly in technical skills, and adapt teaching methods to address the diverse needs of students.

4.2.2 Status of Technological Integration

Table 4.2.2
Mean, Median, Mode, S.D, Minimum and Maximum of Digital Tools and Resources, Pedagogical Approaches, Assessment and Feedback and Professional Development

Technological Integration		Mean	Median	Mode	S.D	Min	Max
1500	Digital Tools and Resources	19.26	19	19	3.32	6	33
	Pedagogical Approaches	21.51	22	22	2.69	6	29
	Assessment and Feedback	24.63	25	25	3.85	10	37
	Professional Development	14.40	15	15	2.43	4	20

Table 4.1.2 reveals a consistent but varied adoption of digital tools and resources in educational settings, with an average score of 19.26. The pedagogical approaches leveraging Technological have a slightly higher mean (21.51) and a tightly clustered median and mode (22), with a lower standard deviation (2.69). Assessment and Feedback have the highest mean, median, and mode, indicating that Technological is most heavily integrated in this area. The standard deviation (3.85) is the highest, indicating greater diversity in how Technological is used for assessment. Even the lowest users still incorporate Technological to some extent in assessment. Professional development scores are the lowest across all metrics, with a mean of 14.40 and the smallest standard deviation (2.43), indicating limited but consistent engagement. This shows that professional development opportunities in Technological Integration may not be as widespread or robust as other areas, highlighting the need for ongoing teacher training and support to maximize Technological impact in education. These findings correspond with research highlighting that the advantages of Technological Integration are best utilized when adequate resources for professional development, consistent pedagogical strategies, and effective use of digital tools for assessment and feedback take place.

The findings show that Technological is most integrated in assessment and feedback, with the highest average scores and greatest variability among educators. Pedagogical approaches also demonstrate strong, consistent use of Technological, while digital tools and resources show moderate, but more varied, adoption. Professional development has the lowest and most consistent scores, indicating limited opportunities for teachers to enhance their Technological skills. Overall, while Technological is widely used in teaching and assessment, there is a clear need for more

robust professional development to support effective integration across all areas. Similar findings were revealed in Rawat and Nisa (2024), Admin and Admin (2024), Anis, (2024) and Joshi (2023) where it was found that that Technological is deeply ingrained in assessment, feedback, and pedagogical practices, with moderate adoption. But, the lack of ongoing professional development for teachers is a significant barrier to effective Technological Integration. Educational systems should invest in sustained, context-sensitive learning opportunities to enable confident and creative use of Technological to improve student learning outcomes. However, it contradicted the findings of Johnson et al. (2016), Maurya et al. (2024), Reddy et al. (2023), and The Role of Science and Technological in Enhancing Education in Nagaland (2025), where it reported that technical skill disparities reflect measurement biases rather than actual deficits. Localized, peer-driven professional development can outperform standardized programs. Generational assumptions about Digital Literacy require caution, as informal learning often fills gaps and cybersecurity literacy remains a critical blind spot even in digitally fluent populations.

4.2.3 Status of Learners' Autonomy

Table 4.2.3
Mean, median, mode, S.D, Minimum and Maximum of Goal Setting, Self-Directed Learning, Metacognition and Motivation

Learners' Autonomy		Mean	Median	Mode	S. D	Min	Max
1500	Goal Setting	25.74	26	26	3.30	11	35
	Self-Directed Learning	21.04	21	22	2.80	10	30
	Metacognition	28.60	29	29	3.71	8	54
	Motivation	32.62	32	32	4.33	9	45

Table 4.1.3 presents descriptive statistics for goal setting, self-directed learning, metacognition, and motivation among 1500 valid participants. The mean score was 25.74, indicating a high average level of goal-setting behavior. The median and mode scores were 26, indicating a strong central tendency and a likely normal distribution. The standard deviation was 3.30, indicating moderate variability in participants' responses. The scores ranged from 11 to 35, indicating a wide range in goal-setting tendencies. The mean score for self-directed learning was 21.04, indicating a moderate to high average level. The median was 21, and the mode was 22, indicating a distribution closely centered on the mean. The standard deviation was 2.80,

indicating moderate variability in how participants engage in self-directed learning. The mean score for metacognition was 28.60, indicating a high average level of awareness and regulation. The median and mode scores were 29, indicating a strong central tendency and a likely symmetric distribution. The standard deviation was 3.71, indicating moderate to slightly high variability in metacognitive abilities across the sample. The mean score for motivation was 32.62, indicating a high average level of motivation. The median and mode scores were 32, indicating a strong central tendency and a relatively normal distribution. The standard deviation was 4.33, indicating moderate variability in motivational levels.

The findings indicate generally high engagement in goal setting, self-directed learning, metacognition, and motivation, with metacognitive awareness and motivation particularly strong. However, considerable variability shows that while many students are well- equipped to regulate and drive their learning, others lag significantly behind. These disparities highlight the need for personalized interventions to support learners with lower autonomy. Targeted strategies in goal setting, self-direction, and motivation, along with enhanced metacognitive training, can help bridge these gaps and promote more consistent self-regulated learning in students. Similar findings were revealed in Kumar et al. (2024), EducationTimes (2025), Kumar (2024), and Lakha (2025), where it was shown that while many students excel in goal setting, self-directed learning, metacognition, and motivation, there is significant variability in these skills. Personalized interventions-such as adaptive learning systems, targeted metacognitive training, and motivational support are essential to help students with lower autonomy develop stronger self-regulation. These strategies are key to bridging gaps and ensuring more consistent and effective self-regulated learning for all students. However, Norman (2020), Domino and Shaffer (2025), Lan and Zhou (2025), and Greenquist-Marlett et al. (2025), contradict through their findings by revealing that self-regulated learning and metacognitive strategies are not universally beneficial and can sometimes impede performance or well-being. The effectiveness of self-regulated learning interventions is highly context-dependent, with challenges in both measurement and implementation. Over-reliance on AI tools and feedback may undermine learner autonomy, and gaps in teacher knowledge further complicate effective support. These findings shows that self-regulated learning should be promoted with careful consideration of individual needs, potential drawbacks, and the importance of balanced, context-sensitive instructional approaches.

4.3. Levels of Digital Literacy, Technological Integration, Learner Autonomy, and English Language Learning

Table 4.3.1
Percentage wise of Levels of Digital Literacy

		Frequency	Percent
Valid	Low	14	0.9
	Average	354	23.6
	High	1132	75.5
	Total	1500	100.0

The Table 4.3.1 and Figure 4.3.1 indicate that Digital Literacy levels among the students are overwhelmingly high, with 75.5% demonstrating strong Digital Literacy skills. Nearly a quarter (23.6%) possess moderate Digital Literacy, while only a negligible 0.9% exhibit low Digital Literacy. This shows that the majority of the sample is well-equipped to navigate and utilize digital technologies effectively, which reflects that there is a broadly positive trend in Digital Literacy within the students.

Figure 4.3.1
Percentage wise of Levels of Digital Literacy

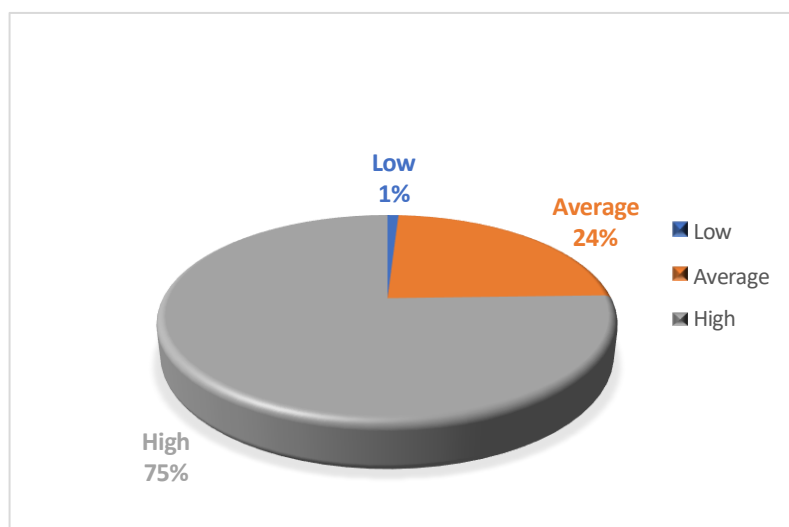


Table 4.3.2
Percentage wise of Levels of Technological Integration

		Frequency	Percent
Valid	Low	49	3.3
	Average	556	37.1
	High	895	59.7
	Total	1500	100.0

The Table 4.3.2 and Figure 4.3.2 reveals that Technological Integration is generally strong among the respondents, with 59.7% demonstrating high levels of integration in their practices. An additional 37.1% exhibit moderate levels, reflecting a significant portion of the group effectively incorporating Technological to some extent. Only 3.3% show low levels of Technological Integration, showing that very few individuals are lagging behind. Overall, these results highlight a positive trend in the adoption and use of Technological within the students.

Figure 4.3.2
Percentage wise of Levels of Technological Integration

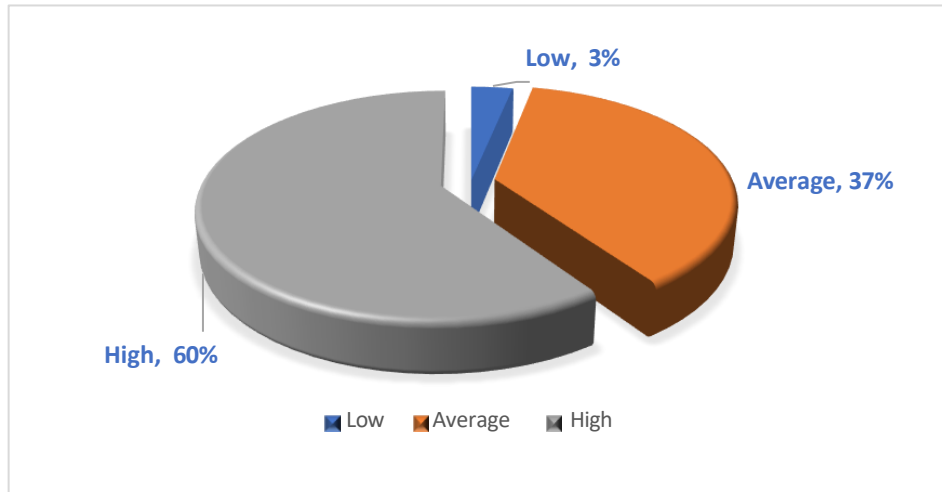


Table 4.3.3
Percentage wise of Levels of Learner Autonomy

		Frequency	Percent
Valid	Low	8	.5
	Average	267	17.8
	High	1225	81.7
	Total	1500	100.0

The Table 4.3.3 and Figure 4.3.3 result reveals that the vast majority of participants performed at a high level, with the high category accounting for more than 80% of the respondents. The very small percentage of participants in the low category (0.5%) indicates that only a lesser proportion of the sample exhibited lower levels of learner autonomy. Meanwhile, the average category, although more substantial than the low group, still represents a minority of the sample, reinforcing the trend toward higher achievement. Findings exhibits that most students showed a high level of learner autonomy, meaning they are good at managing their own learning. Only a very small number had low learner autonomy, and a few were in the middle. Overall, this indicates that most students are well- prepared to manage and direct their own learning.

Figure 4.3.3
Percentage wise of Levels of Learner Autonomy

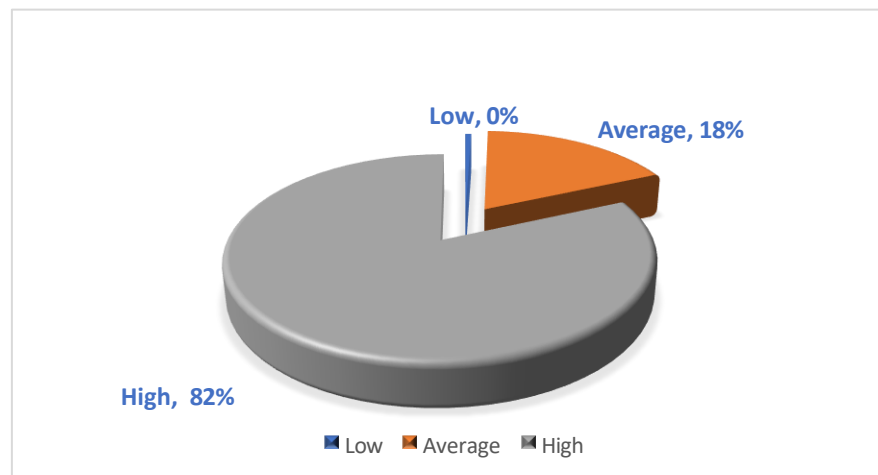


Table 4.3.4
Mean, S.D, Range, Minimum and Maximum of English Language Learning Scores

English Language Learning		Mean	S. D	Range	Minimum	Maximum
Valid	1500	53.99	8.67	75	21	96

The table 4.3.4, shows that the total number of participants in the study is 1500. A mean of 53.99 indicates that the average score of the participants is around 54 out of 100. This shows a moderate level of proficiency or achievement in their English language learning scores. A standard deviation of 8.67 means that the students' scores deviate, on average, by about

8.67 points from the mean score of 53.99. The result indicates a moderate level of variation, meaning that while some participants performed better or worse than the average, most participants' scores are reasonably close to the average. The range is 75, which is the difference between the maximum and minimum scores. A range of 75 shows that there is a significant difference between the highest and lowest scores in the dataset. The lowest score observed in the dataset is 21. This indicates that at least one participant scored very low in English language learning. The highest score observed in the dataset is 96, showing that some participants performed very well in English language learning. The difference between the minimum and maximum scores (75 points) supports the conclusion that there is a significant disparity in students' performance.

4.4 English Language Learning of Male and Female Students

Table 4.4.1
Frequency and Percentage in the English Language Learning Scores of Male and Female Students

Gender		Frequency	Percent	Cumulative Percent
English Language Learning Scores	Male	715	47.7	47.7
	Female	785	52.3	100.0
	Total	1500	100.0	

Figure 4.4.1
Frequency and Percentage in the English Language Learning Scores of
Male and Female Students

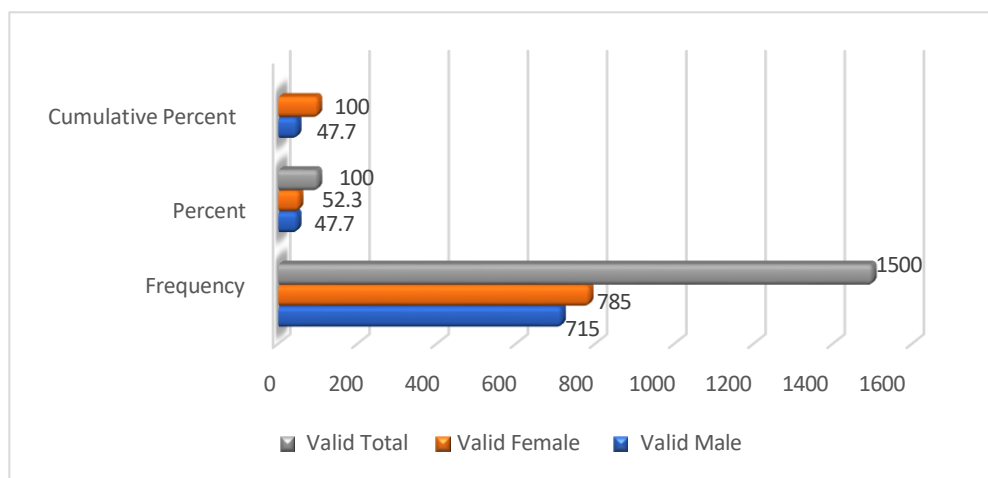


Table 4.4.2
English Language Learning Scores of Male and Female Students

	Gender	N	Mean	S. D	S. E. Mean	df	t-value
English Language Learning Scores	Male	715	54.30	8.55	.31984	1498	1.33
	Female	785	53.70	8.77	.31302		

The table value of t' (df = 1498) at the 0.05 level of confidence is 1.960

Table 4.4.2 shows the mean scores, standard deviation, standard error of difference, and t- value of male and female higher secondary school students in their English language learning scores. The table reveals that the mean scores of male and female school students in their English language learning scores are 54.30 and 53.70 respectively. The value of standard deviation in case of male is 8.55 and in case of female students it is 8.77. The t-value of male and female students in terms of their English language learning scores comes out to be 1.33 which is not significant at 0.05 level of confidence. It shows that male and female higher secondary students do not differ significantly in their English language learning.

Therefore, the stated hypothesis that male and female higher secondary school students do not differ significantly in their English language learning score is accepted at the 0.05 level of confidence. The null hypothesis is not rejected. Similar findings were reported by Khatoon (2020), Kumar and Negi (2021), Noor and Bepari (2023) and Martina and Afifi (2024b). However, the studies conducted by Mahmud and Nur

(2018), Aswad (2022) and Sudewi and Widhi (2025) revealed that male and female students differ significantly in their English language learning.

4.5 English Language Learning of Rural and Urban Area Students

Table 4.5.1
Frequency and Percentage in the English Language Learning Scores of
Students Residing in Rural and Urban Areas

Locality		Frequency	Percent	Cumulative Percent
Valid	Urban	755	50.3	50.3
	Rural	745	49.7	100.0
	Total	1500	100	

Figure 4.5.1
Frequency and Percentage in the English Language Learning Scores of
Students residing in Rural and Urban Areas

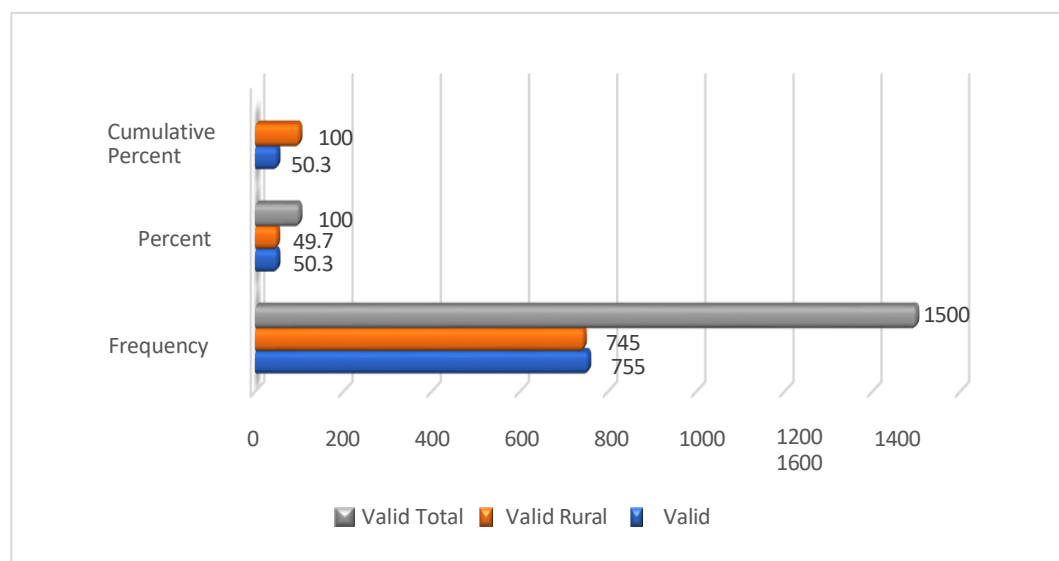


Table 4.5.2
English Language Learning of Students Residing in Rural and Urban Areas

	Gender	N	Mean	S. D	S. E. Mean	df	t-value
English Language Learning Scores	Urban	755	50.3	7.65	0.28	1498	.995
	Rural	745	49.7	9.59	0.35		

Table values of t' (df = 1498) at 0.05 level of confidence is 1.960

Table 4.5.2 shows the mean scores, standard deviation, standard error of difference, and t- value of urban and rural higher secondary school students in their English language learning scores. The table reveals that the mean scores of urban and rural higher secondary school students in their English language learning scores are 50.3 and 49.7 respectively. This indicates that urban students, on average, perform slightly better than rural students in their English language learning scores. The value of standard deviation in case of urban is 7.65 and in case of urban students it is 9.59. This shows that rural students' performance in English is more spread out compared to urban students. The t-value of urban and rural higher secondary school students in terms of their English language learning scores comes out to be .995 which is not significant at 0.05 level of confidence. It shows that urban and rural higher secondary school students do not differ significantly in their English language learning.

Therefore, the stated hypothesis that higher secondary school students residing in rural and urban areas do not differ significantly in their English language learning is accepted at the 0.05 level of confidence. The null hypothesis is not rejected. This finding was supported by Bachore (2022), Maurya and Swain (2025) and Shahi (2025). Yet, the study conducted by Sowmiya (2018), A and Mishra (2024), Ansari and Ali (2023) and Joshua and Sulaiman (2025) found that the students from rural and urban areas differ significantly in their English language learning.

4.6 English Language Learning of Students Studying in Science, Arts, and Commerce Streams

Table 4.6.1
Frequency and Percentage in the English Language Learning Scores of Students Studying in Science, Arts, and Commerce Streams

Stream of Education		Frequency	Percent	Cumulative Percent
Valid	Arts	525	35	35
	Science	525	35	35
	Commerce	450	30	100.0
	Total	1500	100.0	

Figure 4.6.1
Frequency and Percentage in the English Language Learning Scores of Students Studying in Science, Arts, and Commerce Streams

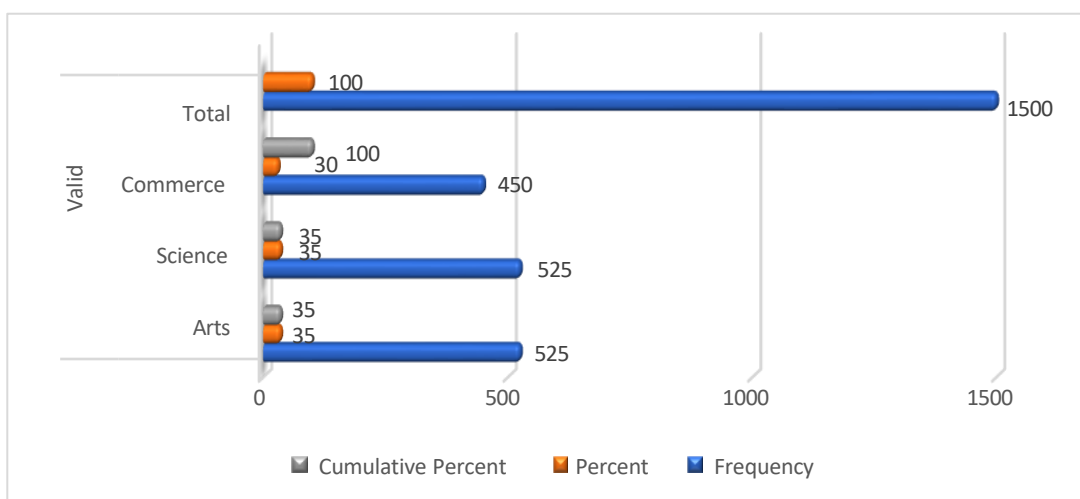


Table 4.6.2
Mean and SD of English Language Learning Scores of Students Studying in Science, Arts, and Commerce Streams

	N	Mean	S. D
Arts	525	53.44	7.11
Science	525	53.95	9.39
Commerce	450	54.67	9.39

As depicted in table 4.6.2, the mean of higher secondary school students in their English language learning scores of arts, science, and commerce stream are 53.44, 53.95, and 54.67 and their standard deviation are 7.11, 9.39 and 9.39 respectively. The

mean scores across the three streams are quite close, ranging from 53.44 (Arts) to 54.67 (Commerce), showing that students from all streams perform similarly in their English language learning scores. The slightly higher mean score of commerce students indicates a marginal advantage, but the difference is minimal. The standard deviation values show that arts students' scores are more clustered around the mean, while science and commerce students exhibit more variation in their performance. This indicates that English language learning scores among arts students is more consistent, whereas science and commerce streams have a broader range of abilities. The average English language learning scores of higher secondary students are very similar across arts, science, and commerce streams, with commerce students having a slightly higher mean score. Arts students show the most consistent performance, as indicated by a lower standard deviation, while science and commerce students have more varied results. Overall, students from all streams perform similarly in English, with only minor differences in average scores and consistency.

Table 4.6.3
Summary Table of ANOVA Showing Significance of Difference in English Language Learning Mean Scores for Students Studying in Science, Arts, and Commerce Streams

SOV	SS	df	MS	F	P-value
Between Groups	366.88	2	183.44	2.445	0.09
Within Groups	112293.9	1497	75.01264		
Total	112660.8				

Table values of the F-ratio for df (2 & 1497) at 0.05 level of confidence is 3.02

The F-value, as seen in table 4.6.3, is 2.445 which does not reach significance with a p- value of 0.09 and is not significant at 0.05 level of confidence. Therefore, the stated hypothesis that science, arts, and commerce students do not differ significantly in their English language learning is accepted. The null hypothesis is not rejected. Similar findings have been found in the studies of Borg et al. (2022), Debnath (2024) and P. A. Sharma and Dwivedi (2025). However, the studies of Ranjan et al. (2022) and Mohamed and Rafee (2025) contradicted the findings.

4.7 English Language Learning of Students studying in Government and Private Schools

Table 4.7.1
Frequency and Percentage in the English Language Learning Scores of Students Studying in Government and Private Schools

Type of School Management		Frequency	Percent	Cumulative Percent
Valid	Private School	967	64.5	64.5
	Government School	533	35.5	100.0

Figure 4.7.1
Frequency and Percentage in the English Language Learning Scores of Students Studying in Government and Private Schools

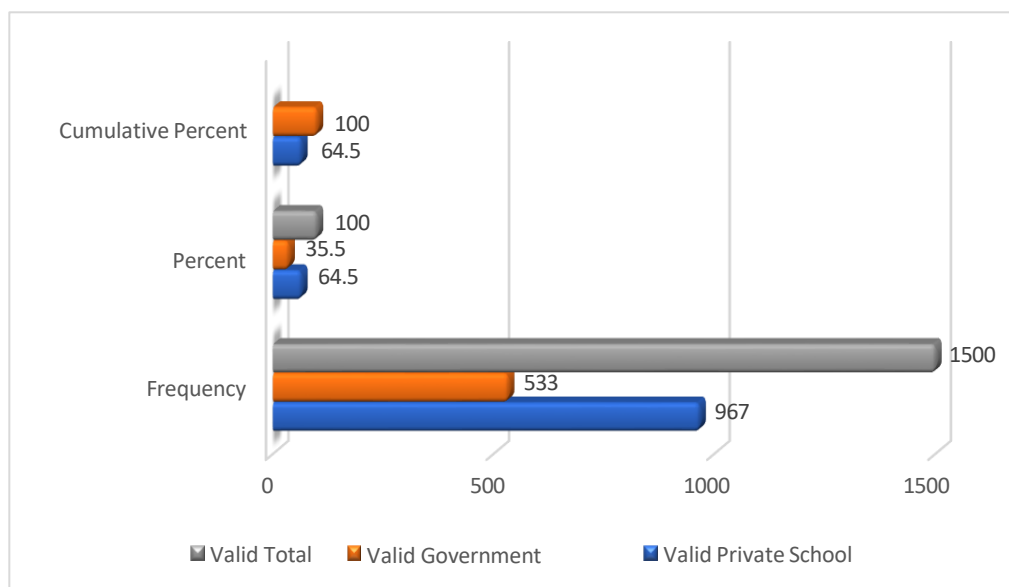


Table 4.7.2
Mean, SD and t-Value of English Language Learning Mean Scores of Students Studying in Government and Private Schools

	Management	N	Mean	S. D	S. E. Mean	df	t-value
English Language Learning Scores	Private	967	53.65	9.28	.44	1498	2.80
	Government	533	54.60	7.40	.32		

Table values of t' ($df=1498$) at 0.05 level of confidence is 1.960

Table 4.7.2 shows the mean scores, standard deviation, standard error of difference, and t- value of private and government higher secondary school students in

their English language learning scores. The table reveals that the mean scores of private and government higher secondary school students in their English language learning are 53.65 and 54.60 respectively. This indicates on average, government school students scored slightly higher than private school students. The value of standard deviation in case of private is 9.28 and in case of government students, it is 7.40. The t-value of private and government higher secondary school students in terms of their English language learning scores comes out to be 2.80 which is significant at 0.05 level of confidence. It shows that private and government higher secondary school students do differ significantly in their English language learning.

Therefore, the stated hypothesis that government and private school students do not differ significantly in their English language learning is rejected at the 0.05 level of confidence. The null hypothesis is rejected. This finding was supported by the studies of Nalom and Schochat (2020), Venkatalaksmi (2022) and Mehta (2025). Studies from Kumar and Choudhury (2021), Ansari and Ali (2023b), Ray and Soley (2024), and Robert and Meenakshi (2024) contradicted the findings by revealing that there is a significant difference between government and private school students in their English language learning scores.

4.8 English Language Learning of Students with Regards to the Level of Digital Literacy

Table 4.8.1
Mean and SD of the English Language Learning Scores of Students with
Regard to the Level of Digital Literacy

	N	Mean	Std. Deviation
Low	14	59.3571	10.88123
Average	354	54.5650	9.29818
High	1132	53.7420	8.41101
Total	1500	53.9887	8.66933

As depicted in the table 4.8.1, the low group has the highest mean score (59.36), which is noticeably higher than both the average (54.57) and high (53.74) groups. The average group has a mean score of 54.57, slightly higher than the high group's mean of 53.74. The High group has the lowest mean score among the three groups. The low group has a very small sample size (14), which means the estimate of its mean is less stable and more prone to variability. The average group (354) and high group (1132) have much larger sample sizes, providing more reliable estimates of their means. The

low group also has the highest standard deviation (10.88), indicating greater variability in scores within this group. The average group has a standard deviation of 9.30, and the high group has the lowest variability (8.41). The total standard deviation across all groups is 8.67, which is closer to the variability seen in the high group.

To explore the significance of differences between means of English language learning scores of students with regard to the levels of digital literacy among low, average, and high, one- way ANOVA was applied. The summary of one-way ANOVA is given in table.

Table 4.8.2-a
Summary Table of ANOVA Showing Significance of Difference in English Language Learning Mean Scores for Students with regard to Different Levels of Digital Literacy

	SS	df	MS	F	P-value
Between Groups	589.91	2	294.95	3.94*	.020
Within Groups	112070.90	1497	74.86		
Total	112660.81	1499			

Table values of F- ratio for df (2 & 1497) at 0.05 level of confidence is 3.02

The F- value as seen in table 4.8.2-a, is 3.94 which reach significance with a p-value of 0.02 significant at 0.05 level of confidence. Therefore, the stated hypothesis that there is no significant difference in the English language learning of higher secondary school students with respect to different levels of digital literacy is rejected. Hence, there is a significant difference in the English language learning of higher secondary students based on their different levels of digital literacy.

The results so far reveal a significant difference between the groups as a whole, not in particular. So, the Post Hoc test was computed to know which groups differed from each other. The Tukey Post Hoc t-test is used after a significant ANOVA to identify which group means differ while controlling the overall Type I error from multiple comparisons. It compares all possible pairs of means with adjusted significance, ensuring valid results and preventing false positives, making it a widely recommended method (Lee, 2018; Agbangba, 2024). The Tukey Post Hoc t-Test is generally a preferred test for conducting Post Hoc tests on one-way ANOVA.

Table 4.8.2-b
Result of Post-Hoc t-Test on English Language Learning of Students with
regard to the Levels of Digital Literacy

Pair of Comparison		Mean Difference (I- J)	Sig.
(I) Levels of Digital Literacy	(J) Levels of Digital Literacy		
Low	Average	4.80	.11
Average	High	0.82	.26
High	Low	5.62*	.04

The multiple comparisons in the table 4.8.2-b, reveal that the difference between low and average digital literacy students in English language learning is not significant. The difference between average and high digital literacy students is also not statistically significant. However, the difference between high and low digital literacy students is significant. Therefore, mean reveals that students with high digital literacy (5.62*) perform significantly better in English language learning compared to students with low digital literacy (4.80). Similar findings were found in the studies of Abbas et al. (2019), Arono et al. (2021), Nguyen and Habók (2021) and Syamsuyurnita and Hutasuhut (2025). Yet, the studies of Mavutha and Mabotja (2024) and Suar et al. (2025) contradicted from the present findings.

4.9 English Language Learning of Students with regards to the Level of Technological Integration

Table 4.9.1
Mean and SD in the English Language Learning Scores of Students with
regard to the Levels of Technological Integration

	N	Mean	Std. Deviation
Low	49	54.5918	11.33931
Average	556	53.8219	8.86834
High	895	54.0592	8.38142
Total	1500	53.9887	8.66933

As depicted in Table 4.9.1, the Low group (49) has a mean score of 54.59 with a standard deviation of 11.34, indicating a relatively higher variability in scores among this smaller group. The average group (556) has a mean score of 53.82 and a standard deviation of 8.87, showing slightly less variability compared to the low group. The

high group (895) has a mean score of 54.06 with the lowest standard deviation of 8.38, shows that the scores are more closely clustered around the mean. The overall mean for all participants is 53.99 with a standard deviation of 8.67. The mean scores across the three groups (low, average, and high) are very close, ranging between 53.82 and 54.59, indicating minimal difference between group performances. The low group shows the highest variability, while the high group exhibits more consistent performance (lowest standard deviation). The overall standard deviation shows moderate consistency across all 1,500 participants.

To explore the significance of differences between means of English language learning of students with regard to the levels of technological integration among low, average, and high, one-way ANOVA was applied. The summary of one-way ANOVA is given in table.

Table 4.9.2
Summary Table of ANOVA Showing Significance of Difference in English Language Learning Mean Scores for Students with regard to the Level of Technological Integration

	SS	df	MS	F	P-value
Between Groups	37.737	2	18.868	.251	.78
Within Groups	112623.070	1497	75.233		
Total	112660.807	1499			

Table values of F- ratio for df (2 & 1497) at 0.05 level of confidence is 3.02

The F-value, as seen in table 4.9.2, is .251 which does not reach significance with a p-value of 0.78 and is not significant at 0.05 level of confidence. Therefore, the stated hypothesis that there is no significant difference in the English Language Learning of higher secondary school students with respect to different levels of technological integration is accepted. The studies from Basaya and Bautista (2024), Pérez-Jorge et al. (2025) supported the findings that there is no significant difference in the English language learning of higher secondary school students with respect to different levels of technological integration. However, the studies from Sarangi et al. (2023) and Nafea (2024) contradicted the findings from the present study.

4.10 English Language Learning of Students with regard to the Level of Learners' Autonomy

Table 4.10.1
Comparison of Mean and SD in the English Language Learning Scores of Students with regard to the Levels of Learners' Autonomy

	N	Mean	Std. Deviation
Low	8	55.6250	10.32248
Average	267	53.9775	9.42957
High	1225	53.9804	8.49075
Total	1500	53.9887	8.66933

As depicted in table 4.10.1, low group (8) has a mean score of 55.63 with a relatively higher standard deviation of 10.32, indicating a slightly greater variability in scores within this small subgroup. average group (267) the average group recorded a mean score of

53.98 with a standard deviation of 9.43. This suggests moderate consistency among the participants' scores in this group. high group (1225) the largest group, high, also had a mean score of 53.98, very close to that of the average group. However, the standard deviation here was 8.49, indicating relatively less variation in scores compared to the average and low groups. Across all participants, the overall mean was 53.99 with a standard deviation of 8.67, shows a generally consistent pattern of scores across the full sample. The mean scores across the average and high groups are almost identical, indicating a very similar performance level between these two groups. The low group had a slightly higher mean score than both average and high groups, but given the very small sample size (8), this may not significantly influence the overall results. Standard deviation is highest in the low group, possibly due to the very small number of participants. Overall, the scores are quite consistent, as indicated by the relatively low standard deviations across all groups.

To explore the significance of differences between means of English language learning scores of students with regard to the levels of learners' autonomy among low, average, and high, one-way ANOVA was applied. The summary of one-way ANOVA is given in table.

Table 4.10.2
Summary Table of ANOVA Showing Significance of Difference in English Language Learning Mean Scores for Students with regard to the Level of Learners' Autonomy

	SS	df	MS	F	P-value
Between Groups	21.537	2	10.769	.143	.87
Within Groups	112639.270	1497	75.243		
Total	112660.807	1499			

Table values of F- ratio for df (2 & 1497) at 0.05 level of confidence is 3.02

The F-value, as seen in table 4.10.2, is .143 which does not reach significance with a p- value of 0.87 and is not significant at 0.05 level of confidence. Therefore, the stated hypothesis that there is no significant difference in the English language learning of higher secondary school students with respect to different levels of learners' autonomy is accepted. The studies from the Ghalebi et al. (2021), Minh and Ngoc (2023) and Soliman, C., & Gorospe, J. D. (2024) revealed the similar findings. Yet the findings from Almusharraf (2020), Chong and Reinders (2022) and Al-Khasawneh et al. (2024) revealed that there is a significant difference in the English language learning of higher secondary school students with respect to different levels of learners' autonomy.

4.11 Interaction Effect of Digital Literacy and Technological Integration on the English Language Learning

Table 4.11.1
Means of English Language Learning Scores with regard to the Levels of Digital Literacy and Technological Integration

	Level of Digital Literacy				
		Low	Average	High	Total
Levels of Technological Integration	Low	63.20	51.80	64.00	59.36
	Average	52.38	54.31	55.31	54.57
	High	54.74	53.57	53.79	53.74
	Total	56.77	53.23	57.70	

Table 4.11.1 presents that the highest mean score (64.00) is observed among participants who have low technological integration but high digital literacy. The mean scores for high technological integration "high" are relatively stable across all digital literacy levels (53.74 overall), and do not show a dramatic increase compared to other groups. The lowest column mean (53.23) is for the average technological integration

group, but the lowest individual mean (51.80) is for those with average technological integration and low digital literacy. The mean scores for the "high" technological integration group are quite close across all digital literacy levels (54.74, 53.57, 53.79), showing that increasing technological integration does not have a strong impact unless digital literacy is also high.

The findings indicate that digital literacy plays a more significant role than technological integration in achieving higher scores in the measured outcome. While technological integration alone does not consistently lead to higher performance, students with high digital literacy regardless of their level of technological integration tend to achieve better results. This shows that efforts to improve outcomes should prioritize enhancing digital literacy alongside, or even before, increasing technological integration. To explore the significance of differences between means of English language learning of students with regard to the levels of digital literacy and technological integration among low, average, and high, two-way ANOVA was applied. The summary of two-way ANOVA is given in table.

Table 4.11.2
Summary Table of ANOVA showing the Interaction Effect of Digital Literacy and Technological Integration on the English Language Learning

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Digital Literacy Levels	424.40	2	212.20	2.84	.06
Technological Integration Levels	439.77	2	219.89	2.94	.05
Digital Literacy Levels * Technological Integration Levels	595.79	4	148.95	1.99	.09
Error	111403.39	1491	74.72		
Total	112863.35	1499			

The two-way ANOVA analysis revealed that the main effect of digital literacy levels on English language learning is not significant since $F(2, 1491) = 2.84$, and $p = .06$, as the p-value exceeds the 0.05 level of significance.

Similarly, the main effect of technological integration levels is right at the level of the significance since $F(2, 1491) = 2.94$, and $p = .05$. This reveals a marginal effect of technological integration levels on English language learning, but it is not strong

enough to be considered clearly significant.

The interaction effect between digital literacy levels and technological integration levels is not significant since $F(4, 1491) = 1.99$, and $p = .09$. This shows that the combined influence of digital literacy and technological integration does not have a significant impact on English language learning.

Therefore, the results of the two-way ANOVA support the hypothesis that digital literacy and Technological integration do not have a significant interaction effect on the English language learning of higher secondary school students. Hence, the null hypothesis is accepted. While there is a marginal main effect of technological integration, neither digital literacy nor its interaction with technological integration significantly influences English language learning scores. Similar findings were reported in the studies of Khan and Ahmad (2024), Oyinloye et al. (2021) and Zakir et al. (2025). However, the findings from the studies of Pérez-Jorge et al. (2025b), Zheng et al. (2024) and Muawanah et al. (2024) contradicted from the present finding.

4.12 Interaction Effect of Technological Integration and Learners' Autonomy on the English Language Learning

Table 4.12.1
Means of English Language Learning Scores with regard to the Levels of Technological Integration and Learners' Autonomy

	Level of Technological Integration				Total
		Low	Average	High	
Levels of Learners' Autonomy	Low	54.33	54.33	59.50	55.63
	Average	54.69	53.45	54.50	53.98
	High	54.52	53.94	53.98	53.98
	Total	54.51	53.91	55.99	

Table 4.12.1 presents that the highest score (59.50) is observed in the group with low learners' autonomy and high technological integration. Lowest mean score (53.45) is found among learners with average autonomy and average technological integration. Low learners' autonomy scores increase as technological integration rises, peaking at 59.50 with high integration. The row average (55.63) is the highest among all autonomy levels. average learners' autonomy scores are lower and more consistent, ranging from 53.45 to 54.69. The row average (53.98) is the lowest among

all groups. high learners' autonomy scores are stable across all technological integration levels (53.94 to 54.52). The row average (53.98) is identical to that of average autonomy. Low technological integration scores are similar across autonomy levels (54.33 to 54.69), with a column average of 54.51. In average technological integration scores are the lowest overall, with a column average of 53.91. High technological integration is the highest individual score observed here (59.50 for low autonomy), and the column average is the highest (55.99). High technological integration appears to significantly benefit learners with low autonomy, as evidenced by the highest mean score in this category. Higher learners' autonomy does not correlate with higher mean scores. In fact, both average and high learners' autonomy groups consistently show lower mean scores across all levels of technological integration. To explore the significance of differences between means of English language learning of students with regard to the levels of technological integration and learners' autonomy among low, average, and high, two-way ANOVA was applied. The summary of two-way ANOVA is given in table.

Table 4.12.2
Summary Table of ANOVA showing Interaction Effect of Technological Integration and Learners' Autonomy on the English Language Learning

Source	Sum of Squares	df	Mean Square	F	Sig.
Learner Autonomy Levels	26.94	2	13.471	.179	.837
Technological Integration Levels	46.79	2	23.395	.310	.733
Learner Autonomy Levels * Technological Integration Levels	94.21	4	23.552	.312	.870
Error	112511.46	1491	75.460		
Total	112679.40	1499			

The two-way ANOVA analysis indicates that the main effect of learners' autonomy levels on English language learning is not significant as $F = 0.179$, and $p = .837$ which is greater than 0.05 level of significance.

Likewise, the main effect of technological integration levels on English language learning is also not significant since $F = 0.310$, and $p = .733$ which is greater

than the 0.05 level of significance.

The interaction effect between learners' autonomy and technological integration does not have a significant effect on English language learning as $F = 0.312$, and $p = .870$ is greater than the 0.05 level of significance.

Based on the results, there is no significant main effect of either learners' autonomy or technological integration, nor is there a significant interaction effect between the two on the English language learning outcomes of higher secondary school students. Therefore, these findings support the null hypothesis that technological integration and learners' autonomy do not have significant interaction effects on the English language learning of higher secondary school students. Hence the null hypothesis is accepted. The study from Khan and Ahmad (2024) and Nafea (2024) supported the present finding. Yet, the findings from the studies of Peng et al. (2023), AlTwijri and Alghizzi (2024), P, R. J., Priya, G. a. R., & KS, A. T. (2025) and P et al. (2025) contradicted the findings.

4.13 Interaction Effect of Digital Literacy and Learners' Autonomy on the English Language Learning

Table 4.13.1
Means of English Language Learning Scores with regard to the Levels of Digital Literacy and Learners' Autonomy

	Level of Digital Literacy				Total
		Low	Average	High	
Level of Learners' Autonomy	Low	54.00	56.33	62.71	59.35
	Average	59.33	54.00	54.81	54.56
	High	53.25	53.85	53.72	53.74
	Total	55.53	54.73	57.08	

Table 4.13.1, exhibits that the highest mean score (62.71) is observed among students with low autonomy and high digital literacy. Lowest mean score (53.25) is found in the group with high learners' autonomy and low digital literacy. Low learners' autonomy scores increase steadily as digital literacy increases (54.00, 56.33, and 62.71). Average learners' autonomy is the highest score in this group is found at low digital literacy (59.33), but scores drop at higher digital literacy levels. The average digital literacy (54.56) is lower than that of the low learners' autonomy group. High learners' autonomy scores are consistently low and show minimal variation across

digital literacy levels (53.25 to 53.85). Low digital literacy scores vary across learners' autonomy levels, with the highest in average learners' autonomy (59.33) and lowest in high learners' autonomy (53.25). Average digital literacy scores are relatively similar across learners' autonomy levels (53.85 to 56.33). In high digital literacy the highest individual score (62.71) is observed here for low autonomy, but other autonomy levels have lower scores. Generally, higher digital literacy is associated with higher mean scores, especially for students with low learners' autonomy. Surprisingly, students with low learners' autonomy and high digital literacy achieve the highest outcomes, while those with high learners' autonomy show little benefit from increased digital literacy. Students with high learners' autonomy consistently have the lowest mean scores, regardless of their digital literacy level. To explore the significance of differences between means of English language learning of students with regard to the levels of digital literacy and learners' autonomy among low, average, and high, two-way ANOVA was applied. The summary of two-way ANOVA is given in table.

Table 4.13.2
Summary Table of ANOVA showing the Interaction Effect of Digital Literacy and Learners' Autonomy on the English Language Learning

Source	Sum of Squares	df	Mean Square	F	Sig.
Digital Literacy Levels	145.09	2	72.54	.968	.38
Learners' Autonomy Levels	152.30	2	76.15	1.016	.36
Digital Literacy Levels * Learners' Autonomy Levels	255.84	4	63.96	.853	.49
Error	111784.70	1491	74.97		
Total	112337.93	1499			

The two-way ANOVA analysis indicates that the main effect of digital literacy levels on English language learning scores is not statistically significant as $F = 0.968$, and $p = .38$, is greater than 0.05 level of significance.

The main effect of learners' autonomy levels on English language learning scores is also not significant as $F = 1.016$, and $p = .36$ is greater than 0.05 level of

significance.

The interaction between digital literacy levels and learners' autonomy levels is not significant as $F = 0.853$, $p = .49$ is greater than 0.05 level of significance. This means that the combined effect of digital literacy and learners' autonomy on English language learning is not greater (or different) than the sum of their individual effects.

Based on these results, there is no significant main effect of digital literacy or learners' autonomy, nor a significant interaction effect between them, on English language learning scores. These findings support the null hypothesis that digital literacy and learners' autonomy do not have significant interaction effects on the English language learning of higher secondary school students. Therefore, the null hypothesis is accepted. The findings from the studies of Chong and Reinders (2022), Naseer et al. (2022) and E and Priyadharsini (2025) revealed an opposite result.

4.14 Relationship between English Language Learning and Digital Literacy

Table 4.14.1
Mean and S.D of English Language Learning and Digital Literacy

	N	Mean	Std. Deviation
Digital Literacy	1500	83.1933	8.30168
English Language Learning	1500	53.9887	8.66933

Table 4.14.2
Relationship between English Language Learning and Digital Literacy

	DLS	ELL	Sig	Pearson Correlation (r-value)
Digital Literacy	1	-.029	.255	-.03
English Language Learning	-.029	1		

The Pearson correlation coefficient (r) between digital literacy and English language learning is -0.03 , indicating a very weak negative linear relationship between the two variables. This value is very close to zero, showing almost no linear correlation. The significance value (Sig) is 0.255, which is greater than the common alpha level of 0.05. This means the correlation is not statistically significant, thus fails to reject the null hypothesis. The null hypothesis "there is no significant relationship

between English language learning and digital literacy."

Given the very low r-value and the non-significant p-value, the data supports the null hypothesis, indicating no significant relationship between English language learning and digital literacy. Similar findings were reported from the studies of Alakrash et al. (2021), Priya (2021) Ekaningsih and Kurnia (2022) and Prabakaran et al. (2025). However, the findings from the studies of Bansal (2021), Rahman et al. (2023) and Triana (2025) reported a contradictory result.

4.15 Relationship between English Language Learning and Technological Integration

Table 4.15.1
Mean and SD of English Language Learning and Technological Integration

	N	Mean	Std. Deviation
Technological Integration	1500	79.7973	9.00887
English Language Learning	1500	53.9887	8.66933

Table 4.15.2
Relationship between English Language Learning and Technological Integration

	TIS	ELL	Sig	Pearson Correlation (r-value)
Technological Integration	1	.024	.355	.024
English Language Learning	.024	1		

The Pearson correlation coefficient (r) between technological integration and English language learning is 0.024, which indicates a very weak positive linear relationship between the two variables. This value is very close to zero, showing almost no linear correlation. The significance value (Sig) is 0.355, which is greater than the conventional alpha level of 0.05.

This means the correlation is not statistically significant, thus fails to reject the null hypothesis. Therefore, there is no significant relationship between English Language Learning and Technological Integration. The findings from the studies of Justol and Potane (2024) and Lamichhane (2025) supported the present studies. However, the studies from the Rahmati et al. (2021) and Rintaningrum (2023)

contradicted from the present result.

4.16 Relationship between English Language Learning and Learners' Autonomy

Table 4.16.1
Mean and SD of English Language Learning and Learners' Autonomy

	N	Mean	Std. Deviation
Learners Autonomy	1500	107.9893	10.91253
English Language Learning	1500	53.9887	8.66933

Table 4.16.2
Relationship between English Language Learning and Learners' Autonomy

	LA	ELL	Sig	Pearson Correlation (r-value)
Learners Autonomy	1	.014	.595	.014
English Language Learning	.014	1		

The Pearson correlation coefficient (r) between learners' autonomy and English language learning is 0.014, which indicates a very weak positive linear relationship between the two variables. This value is extremely close to zero, showing virtually no linear correlation. The significance value (Sig) is 0.595, which is substantially greater than the common alpha level of 0.05. This indicates that the correlation is not significant, thus fails to reject the null hypothesis.

Given a null hypothesis stating, "there is no significant relationship between English language learning and learners' autonomy," the data supports this hypothesis. The correlation is almost non-existent, and the p-value is far above the significance of level. Similar findings were reported from the studies of Şakrak-Ekin and Balçıklanlı (2019), Chong and Reinders (2022) and Soliman and Gorospe (2024). However, the studies from Zappa-Hollman and Fox (2021), Namaziandost et al. (2024) and E and Priyadharsini (2025) revealed a contradictory result from the present finding.

4.17 Relationship of Digital Literacy, Technological Integration, and Learners' Autonomy with English Language Learning

Table 4.16.1
Multiple Correlation of Digital Literacy, Technological Integration, and Learners' Autonomy with English Language Learning

Variables Entered	R	R Square	Adjusted R Square	S.E of the estimate	Change Statistics			
					F change	df1	df2	Sig.
Digital Literacy, Technological Integration, Learners' Autonomy ^b	.059 ^a	0.004	.002	8.66	1.753	3	1496	.154

Dependent variable: English Language Learning^a

The results of the analysis, as presented in the table 4.16.2, indicate a multiple correlation coefficient (R) of 0.059, with an R² value of 0.004. This shows that the independent variables collectively account for approximately 0.4% of the variance in English language learning, which is a very weak relationship.

The analysis resulted an F value of 1.753, with degrees of freedom (df1 = 3, df2 = 1496), and a significance level (Sig.) of 0.154. Because the p-value (Sig. = 0.154) is greater than the standard alpha level of 0.05, the results are not significant. Therefore, the null hypothesis cannot be rejected.

Therefore, the finding reveals that there is no significant relationship between the combined influence of digital literacy, technological integration, and learners' autonomy with English language learning in this study. The findings from the studies of Alakrash and Bećirović et al. (2021), Guo et al. (2021), Razak (2021), Pratiwi and Waluyo (2023), Zhang (2023), Jegadeesan et. Al. (2025) reported a similar result. Yet the studies from Cao et al. (2023), Hong (2023), Zeng (2023), Akpan et al. (2024), and Han et al. (2024) reported an opposite result.

CHAPTER – V

FINDINGS, CONCLUSIONS, RECOMENDATIONS AND SUGGESTIONS

This chapter presents the final and most critical stage of the research process, offering a synthesis of the major findings derived from data analysis and their interpretation in light of the research objectives and questions. The purpose of this chapter is to provide a comprehensive understanding of the results, link them with existing literature, and explore their implications in educational contexts. This reflective phase of the research is essential for drawing conclusions, identifying limitations, and suggesting avenues for future investigation. According to Creswell and Creswell (2023), the concluding chapter of a research study plays a vital role in integrating findings with theoretical perspectives, drawing meaningful interpretations, and proposing practical implications. It allows the researcher to return to the initial aims of the study, evaluate whether and how those aims were achieved, and suggest how the outcomes can inform future educational practice and research. Hence, this chapter is organized into five key sections: a summary of major findings, discussion of results, educational implications, suggestions for future research, and the final conclusion.

5.1 Findings

a. Role of Digital Literacy, Technological Integration, and Learners' Autonomy in the improvement in English Language Learning

Content analysis on the role of digital literacy, technology integration, and learners' autonomy in the improvement of English language learning has been done from the semi-structured interview conducted on teachers and principals of higher secondary schools in seven districts of Nagaland. Specific key themes were identified and elaborated as per the need of the question.

- Findings reveals that digital literacy is widely acknowledged as a critical driver of English language learning, promoting independent learning, creativity, and global readiness. however, significant gaps remain in infrastructure, training, and equitable access particularly in government

schools and rural settings. Teachers advocate for curriculum revision, better tools, and hands-on training, while principals emphasize the need for policy support, resource allocation, and controlled integration to minimize misuse.

- Findings revealed that technological integration significantly enhances English language learning by increasing student engagement, access to resources, and communication skills. However, challenges such as inadequate infrastructure, limited access to devices, and insufficient teacher training hinder its full potential. Both teachers and principals recommend improving infrastructure, providing regular teacher training, updating curricula with multimedia content, and ensuring equitable access to technology, emphasizing that these steps are essential for maximizing the benefits of technology in English language learning.
- The interviews reveal a strong correlation between learners' autonomy and improvement in English language learning, especially when supported by digital tools. Both teachers and principals emphasize a transition from teacher-centered to learner-centered methods, strategic use of technology to foster independence, and the role of feedback, reflection, and student choice in enhancing language skills. Teachers emphasize practical strategies and individualization, while principals focus on institutional support and the broader educational environment. Both groups agree that digital literacy and technology play a crucial role in empowering students to take charge of their learning, though they caution against over-dependence on technology. The overall outlook is positive, with ongoing efforts to further enhance learner autonomy and English proficiency.

b. Status of Digital Literacy, Technological Integration, and Learners' Autonomy

- Findings highlighted that most students are fairly strong in media literacy, communication skills, and information literacy. This means they are generally good at using social media, finding useful information online, and communicating through digital tools. However, technical skills scored the lowest, with some people doing very well and others

scoring quite low. This indicates that many students still struggle with using digital tools and software confidently. While overall digital literacy levels are balanced, there is a clear need for more training and support to improve technical skills.

- The findings show that technology is most integrated in assessment and feedback, with the highest average scores and greatest variability among educators. Pedagogical approaches also demonstrate strong, consistent use of technology, while digital tools and resources show moderate, but more varied, adoption. Professional development has the lowest and most consistent scores, indicating limited opportunities for teachers to enhance their technology skills. Overall, while technology is widely used in teaching and assessment, there is a clear need for more robust professional development to support effective integration across all areas.
- The findings indicate generally high engagement in goal setting, self-directed learning, metacognition, and motivation, with metacognitive awareness and motivation particularly strong. However, considerable variability shows that while many students are well-equipped to regulate and drive their learning, others lag significantly behind. These disparities highlight the need for personalized interventions to support learners with lower autonomy. Targeted strategies in goal setting, self-direction, and motivation, along with enhanced metacognitive training, can help bridge these gaps and promote more consistent self-regulated learning in students.

c. Levels of Digital Literacy, Technological Integration, Learner Autonomy, and English Language Learning

- Findings shows that the majority of the sample is well-equipped to navigate and utilize digital technologies effectively, which reflects that there is a broadly positive trend in digital literacy within the students.
- Very few individuals were found to be lagging behind. Overall, these results highlight a positive trend in the adoption and use of technology within the students.
- Findings shows that most students showed a high level of learners'

autonomy, meaning they are good at managing their own learning. Only a very small number had low learners' autonomy, and a few were in the middle. Overall, this indicates that most students are well-prepared to manage and direct their own learning.

- Findings shows that while the overall proficiency is moderate, there exists a significant performance gap among students, likely influenced by variables such as access to resources, instructional quality, learners' autonomy, and digital literacy.

d. English Language Learning of Male and Female Students

The t-value of male and female students in terms of their English language learning comes out to be 1.33 which is not significant at 0.05 level of confidence. it shows that male and female higher secondary students do not differ significantly in their English language learning.

e. English Language Learning of Students Residing in Rural and Urban Areas

The t-value of urban and rural higher secondary school students in terms of their English language learning comes out to be .995 which is not significant at 0.05 level of confidence. It shows that urban and rural higher secondary school students do not differ significantly in their English language learning.

f. English Language Learning of students studying in Science, Arts, and Commerce Streams

The F-value is 2.445 which does not reach significance with a p-value of 0.09 and is not significant at 0.05 level of confidence. Therefore, the stated hypothesis that science, arts, and commerce students do not differ significantly in their English language learning is accepted.

g. English Language Learning of Students Studying in Government and Private Schools

The t-value of private and government higher secondary school students in terms of their English language learning comes out to be -2.80 which is significant at 0.05 level of confidence. It shows that private and government higher secondary school students do differ significantly in their English language learning.

h. English Language Learning of students with regard to the Level of Digital Literacy

The F- value is 3.94 which reach significance with a p-value of 0.02 significant at 0.05 level of confidence. Therefore, the stated hypothesis that there is no significant difference in the English language learning of higher secondary school students with respect to different levels of digital literacy skills is rejected. Post Hoc t-Test result, reveal that the difference between low and average digital literacy students in English language learning scores is not statistically significant. The difference between average and high digital literacy students is also not significant. However, the difference between high and low digital literacy students is statistically significant. Mean reveal that students with high digital literacy (5.62*) perform significantly better in English language learning compared to students with low digital literacy (4.80).

i. English Language Learning of Students with regards to the Level of Technological Integration

The F-value is .251 which does not reach significance with a p-value of 0.78 and is not significant at 0.05 level of confidence. Therefore, the stated hypothesis that there is no significant difference in the English language learning of higher secondary school students with respect to different levels of technological integration is accepted.

j. English Language Learning of Students with regards to the Level of Learners' Autonomy

The F-value is .143 which does not reach significance with a p-value of 0.87 and is not significant at 0.05 level of confidence. Therefore, the stated hypothesis that there is no significant difference in the English language learning of higher secondary school students with respect to different levels of learners' autonomy is accepted.

k. Interaction Effect of Digital Literacy and Technological Integration on the English Language Learning

To explore the significance of differences between means of English language learning of students with regard to the levels of digital literacy and technology integration among low, average, and high, two-way ANOVA was applied.

Findings reveal that that digital literacy and technological Integration do not have a significant interaction effect on the English language learning of higher secondary school students. The Null hypothesis is accepted.

l. Interaction Effect of Technological Integration and Learners' Autonomy on the English Language Learning

To explore the significance of differences between means of English language learning of students with regard to the levels of technological integration and learners' autonomy among low, average, and high, two-way ANOVA was applied.

Findings support the null hypothesis that technological integration and learners' autonomy do not have significant interaction effects on the English language learning of higher secondary school students.

m. Interaction Effect of Digital Literacy and Learners' Autonomy on the English Language Learning

To explore the significance of differences between means of English language learning of students with regard to the levels of digital literacy and learners' autonomy among low, average, and high, two-way ANOVA was

applied.

These findings support the null hypothesis that digital literacy and learners' autonomy do not have significant interaction effects on the English language learning of higher secondary school students.

n. Relationship between English Language Learning and Digital Literacy

The null hypothesis there is no significant relationship between English language learning and digital literacy. Given the very low r-value and the non-significant p-value, the data supports the null hypothesis, indicating no significant relationship between English language learning and digital literacy.

o. Relationship between English Language Learning and Technological Integration

Findings reveals that correlation is not statistically significant, and hence, the null hypothesis is rejected. Therefore, there is no significant relationship between English language learning and technological integration.

p. Relationship between English Language Learning and Learners' Autonomy

Result indicates that the correlation is not significant, and hence the null hypothesis is rejected. Therefore, there is no significant relationship between English Language Learning and learner autonomy, the data supports this hypothesis.

q. Relationship of Digital Literacy, Technological Integration, and Learners' Autonomy with English Language Learning

Result reveals that there is no significant relationship between the combined influence of digital literacy, technological integration, and learners' autonomy with English language learning.

5.2 Conclusions

The present study set out to examine the role of digital literacy, technology integration, and learners' autonomy in improving English language learning among higher secondary students in Nagaland. Through a detailed content analysis of semi-structured interviews with teachers and principals, complemented by statistical findings, the research aimed to capture both the opportunities and challenges associated with these three key dimensions of modern education. The results offer rich insights into the complex interplay between access to digital tools, pedagogical practices, and student agency, while also pointing to significant gaps that need careful attention.

One of the strongest findings concerns the importance of digital literacy in shaping students' ability to navigate and benefit from English language learning. Teachers and principals widely acknowledged that students who are digitally literate tend to learn English more independently, creatively, and with an awareness of global contexts. Such students demonstrate better media navigation, communication skills, and information literacy, particularly in accessing and utilizing online resources. However, technical competencies remain unevenly developed, with some students excelling while others struggle to handle digital tools effectively. This uneven distribution reflects differences in exposure, infrastructure, and training, particularly between private and government schools and between urban and rural areas. The data makes it clear that while digital literacy overall is improving, targeted training programs are necessary to bridge these gaps, especially for those at the lower end of the competence spectrum.

In relation to technological integration, the findings highlight its undeniable role in enhancing learner engagement and supporting the development of communication skills. Classrooms that effectively integrate digital resources into pedagogy and assessment practices not only motivate students but also enrich language input and exposure. That said, the study also underscores how the potential of technology is constrained by structural barriers namely, inadequate infrastructure, lack of devices, inconsistent internet access, and insufficient teacher training. Importantly, principals and teachers note that while digital tools are being widely used for assessment and teaching, the provision for continuous professional development in technology remains minimal and underutilized. For sustained improvement, systemic

investment is required in both infrastructure and teacher capacity, ensuring that technology becomes a pedagogically meaningful tool rather than a supplementary add-on.

The third-dimension learners' autonomy emerges as both an outcome and enabler of digital literacy and technology use. Interviews revealed a clear shift in educational practice from teacher-centered instruction towards more learner-driven approaches. Students who exhibit higher levels of autonomy tend to set their own goals, engage in self-directed learning, and monitor their progress with greater metacognitive awareness. This autonomy is often strengthened when students have access to digital platforms that encourage independent exploration and provide opportunities for reflection and feedback. At the same time, variability in learners' autonomy suggests that not all students are equally prepared for this transition. Some students thrive on self-regulated learning, while others require more structured support to develop the skills and motivation necessary for autonomous study. Thus, while learner autonomy is broadly strong in the study sample, there remains a need for targeted interventions to guide students who struggle with self-regulation.

One of the more striking results from the statistical analysis is the difference in English language learning outcomes between government and private school students. Unlike gender, stream of study, or rural-urban differences, where no significant disparities were observed, the government-private school divide proves to be significant. This shows that contextual factors such as access to quality teaching, resources, and technology play a decisive role in shaping students' language learning outcomes. Equally important is the finding that students with high levels of digital literacy perform significantly better in English compared to those with lower levels, even though average versus high differences were less stark. This underlines the idea that digital literacy, when developed to a meaningful extent, provides a tangible advantage in English learning outcomes.

On the other hand, when examining the interactions and correlations among digital literacy, technology integration, and learners' autonomy with English language learning, the results are more nuanced. The analyses show no significant interaction effects or direct correlations between these factors and language proficiency outcomes. Put simply, while each of these elements contributes independently to creating a conducive learning environment, their combined or overlapping influence does not statistically predict English language learning.

This may, however, point more to the multifaceted nature of language acquisition itself an area influenced not only by digital and pedagogical factors but also by socio-economic conditions, teacher quality, home support, and individual learner motivation.

Taken together, the findings signal three important insights. First, digital literacy is foundational. When students are confident in using and applying digital tools, they are better equipped to participate in modern learning environments and enhance their English language skills. Second, technology integration requires systemic support, particularly in infrastructure and teacher training, for its impact to be fully realized. Without these, technology risks becoming an unevenly distributed benefit that widens rather than narrows educational disparities. Third, learner autonomy is promising but inconsistent. While many students demonstrate strong motivation and self-regulation, those who lag behind need personalized strategies and scaffolding to reach comparable levels of effectiveness.

Overall, this study offers an encouraging yet cautious picture of English language learning in the context of digital literacy, technology integration, and learner autonomy in Nagaland's higher secondary schools. The positive trends suggest that students are increasingly ready to engage with digital resources and take responsibility for their learning. At the same time, the significant differences between sub-groups particularly government versus private schools and high versus low digital literacy students highlight the need for equitable resource allocation, ongoing teacher capacity building, and policy reforms that integrate digital skills training across the curriculum.

In conclusion, while digital literacy, technological integration and learners' autonomy may not directly guarantee improved English proficiency on their own, they form the necessary scaffolds that create a supportive environment for students to grow. The challenge ahead lies in ensuring equitable access, systematic teacher training, and the cultivation of learner autonomy across all levels of ability. Addressing these will not only strengthen English language outcomes but will also prepare students in Nagaland to thrive in an increasingly digital and interconnected world.

5.3 Recommendations

Here are targeted, actionable recommendations for teachers, principals, parents, stakeholders, and policy makers in the context of digital literacy, technological integration, and learners' autonomy for improving English language learning in higher secondary schools in Nagaland:

- i. Teachers are recommended to use language apps, online platforms, and interactive multimedia (such as YouTube, podcasts, and educational games) in the classroom to make English language learning engaging and relevant.
- ii. While teaching the students trustworthiness of online resources must be ensured for evaluation, avoid plagiarism, and use digital aids like dictionaries and grammar checkers responsibly.
- iii. Teachers should design activities that require students to set goals, self-monitor progress, and work collaboratively using cloud tools like Google Docs or virtual pen pals.
- iv. Teachers are recommended to regularly participate in workshops or peer-training sessions focused on both new digital teaching tools and effective strategies for cultivating learners' autonomy.
- v. Institutions should prioritize improving reliable electricity, internet access, and digital devices, especially in rural and government schools, through partnerships with government and organizations.
- vi. Launching initiatives for comprehensive digital literacy skill-building and safe technology use (such as cybersecurity workshops and digital citizenship programs) should be implemented.
- vii. Institutions are recommended to establish blended learning models and encourage sharing of best digital teaching practices among faculty.
- viii. Encourage and supervise children's use of educational apps, websites, and e-books, while discussing safe and ethical online behavior.
- ix. Motivate children to set personal learning goals and use digital tools for self-directed projects and language practice.
- x. Participate in school workshops or sessions on digital literacy and learners' autonomy to stay informed and actively support school initiatives.
- xi. Channel resources to ensure all schools, especially underserved and

government schools, have access to necessary infrastructure and up-to-date technology.

- xii. Embedding digital literacy and autonomous learning strategies holistically across subjects, and ensure professional development for teachers is mandatory and context-specific.
- xiii. Schools are recommended to collaborate with NGOs, edtech organizations, and community groups to supplement resources, mentor programs, and provide hands-on exposure to real-world digital and language skills.
- xiv. Monitor and share outcome data regularly to adapt policies and practices, ensuring ongoing alignment with student needs and technological advancements.

Eventually building digital literacy, technological integration, and nurturing learners' autonomy require ongoing shared investments in infrastructure, teacher and parent capacity, as well as supportive policy frameworks. When these efforts are equitable and coordinated, they help all students regardless of background, develop the confidence and skills needed for success in English language learning and beyond.

5.4 Suggestions for Further Research

- i. Qualitative studies on students' experiences with digital tools, and how socio-economic, linguistic, or cultural factors influence their confidence and usage.
- ii. Whether consistent exposure to digital tools enhances language performance and learners' autonomy in the long term.
- iii. Study different models of professional development (e.g., peer mentoring, online modules, blended learning) and their impact on teachers' ability to integrate technology effectively in language teaching.
- iv. Investigate how variations in infrastructure (e.g., internet speed, device availability) affect both digital literacy levels and English language learning across urban vs. rural or public vs. private schools.
- v. What specific technologies (e.g., learning apps or LMS platforms) support or hinder learner autonomy.
- vi. Comparative case studies between high-performing private and low-

performing government schools could shed light on systemic differences influencing language learning outcomes.

- vii. Examine how digital literacy and technological integration differ in impact across various academic streams (Arts, Science, Commerce), even though no statistical differences were found in this study.
- viii. Though no gender difference was found in language learning, further investigation could explore perceptions, access, and engagement with technology through a gender lens, especially in patriarchal or traditional communities.
- ix. Future research can examine whether teaching digital responsibility and online ethics contributes to more meaningful or critical use of English in digital environments (e.g., writing blogs, engaging in forums).
- x. Implement and test innovative teaching strategies like project-based learning or gamified language instruction through digital platforms to assess their effect on engagement and language acquisition.
- xi. Assess how national or state-level education technology policies (e.g., PM eVidya, Digital India) are influencing English language learning outcomes, especially in under- resourced regions like Nagaland.
- xii. Investigate the motivational factors behind students' use of digital tools for English learning, combining quantitative surveys with in-depth interviews.

SUMMARY

1. Introduction

The pervasive role of English as a global language is particularly evident in the educational experiences of higher secondary students in Nagaland, where both linguistic demands and societal expectations are continuously evolving. These learners not only engage with English as a tool for communication but also as a gateway to wider opportunities in education and the workforce. In the contemporary landscape, digital literacy emerges as more than simple computer proficiency, it is a nuanced blend of technical expertise, critical assessment, and ethical awareness. Research repeatedly emphasize that true digital literacy empowers students to thoughtfully interpret, create, and share information using a variety of digital platforms. The cultivation of these skills is inextricably linked to factors such as access to resources, supportive school environments, and purposefully designed curricula, all of which shape learners' abilities to thrive in an increasingly digital society.

In tandem with digital literacy, the meaningful integration of technology in the classroom is now considered foundational rather than optional. Rather than treating digital tools as occasional supplements, effective integration involves aligning technology with pedagogical goals, fostering engagement, and promoting collaborative problem-solving. Theoretical models like the Technology Acceptance Model, UTAUT, and TPACK demonstrate that individual attitudes, institutional support, and teacher readiness are central to technological adoption and equitable access. The seamless inclusion of technology supported by professional development and clear leadership enhances learning, fosters inclusion, and equips students with real-world skills.

The nurturing of learners' autonomy is very essential. Drawing upon constructivist, self-determination, and sociocultural theories, education today increasingly places students in the driver's seat of their own learning. Autonomy involves setting personal academic goals, regularly assessing progress, and adapting strategies in response to challenges, all within an environment of thoughtful instructor support and encouragement. Research indicates that learners empowered to take responsibility for their education tend to display heightened motivation, resilience, and an ability to self-regulate traits that not only benefit their immediate studies but also their lifelong growth.

When these three elements digital literacy, technological integration, and learners' autonomy intersect with the domain of English language learning, their impact becomes deeply transformative. Classic and contemporary approaches to language acquisition stress that authentic communicative competence is constructed through both exposure to meaningful language input and opportunities for purposeful output. Internal factors such as motivation and self-confidence, along with external influences like instructional quality and cultural context, play significant roles in shaping each student's journey. With robust digital support, learners gain not only language proficiency but also confidence, critical thinking abilities, and cultural awareness, opening doors to broader academic horizons and global engagement.

In essence, the integration of digital literacy, technological tools, and learners' autonomy constitutes a holistic framework for English language education in Nagaland and beyond. This model recognizes students as active architects of their own learning, capable of navigating and shaping their educational paths in a rapidly changing world, a perspective that positions them for success far beyond formal schooling.

2. Review of Literature

The researcher reviewed 37 works of literature related to Digital Literacy, 41 related to Technological Integration, 42 related to Learners' Autonomy, 37 related to English Language Learning, and 41 studies related to relationship between Digital Literacy, Technological Integration, Learners' Autonomy and English Language Learning. Thus, the researcher reviewed 198 related works of literature for the present study.

In the evolving landscape of contemporary education, the integration of digital literacy, technology, learner autonomy, and English language learning is seen as both a challenge and an opportunity for transformation. Sahu (2019) highlights that higher education must update its curriculum and provide hands-on training to cultivate digital skills, a sentiment echoed by Krishnamurthy and Shettappanavar (2019), who advocate for gender-responsive policies that empower women, particularly in STEM disciplines. Afzal (2022) underscores a deep connection between digital literacy and the quality of infrastructural support, observing that

while urban India is quickly approaching international standards in digital adoption, rural districts still lag due to connectivity issues and limited availability of digital tools. This contrast is confirmed by Maurya et., (2024), who notes that despite the widespread presence of mobile internet, genuinely effective digital skills remain rare among the rural and underprivileged, with only about one-fifth of users demonstrating true digital competence highlighting the necessity for ongoing, comprehensive training, rather than just distributing devices.

The barriers to digital literacy are multifaceted, with Rana (2022) detailing how age, region, gender, and socioeconomic status often impede progress, even as national initiatives like Digital India Mission strive to address these gaps. Rana emphasizes the importance of tailored strategies for the unique barriers faced by women and marginalized communities. Examining landmark programs such as DISHA and the National Digital Literacy Mission, Goel et al. (2021) find that while these initiatives have enhanced users' confidence and employability, they stress that lasting inclusivity requires a more personalized approach in program delivery. The Annual Status of Education Report (ASER) 2023 provides a snapshot of rural youth's digital reality: although smartphone ownership is widespread, significant gaps remain in real digital empowerment, often leading youth to overestimate their own skills and calling into question the overall effectiveness of prevailing educational models (ASER, 2023).

Policy-level reforms, including the National Education Policy (NEP) 2020, are gradually embedding digital literacy into formal curricula and fostering students' use of digital tools and critical thinking abilities (Kunal and Dhillon, 2023; Rana et al., 2023). However, disparities in teacher preparation and rural access continue to limit this progress, as identified by Adeppa (2025). Research by Nag and Meher (2025) reinforces that despite the expansion of basic training, infrastructural deficits and entrenched gender inequities still pose significant obstacles. Rani (2025) offers a reflective overview, noting meaningful progress in digital participation yet persistent disparities along geographical and gender lines, an issue echoed by Bansall (2024), who credits outreach initiatives for a rise in digital literacy to 37% by late 2024 but acknowledges unresolved social and economic hurdles.

Furthermore, Bhutada and Kumar (2025) report that even among rural adolescents with access to smartphones, only about 80% can manage basic phone functions, speaking to deeper systemic biases. National investments have advanced computational capabilities and digital inclusion (Kumar et al., 2025; Mehta, 2024), but Thekkumbad (2025) and others caution that device distribution and improved connectivity are prerequisites for achieving universal digital literacy. Within English language education, Godwin-Jones (2018) and Poonguzhali (2019) urge for curricula that prompt critical engagement with digital resources, with Zheng et al. (2019) highlighting the importance of culturally attuned teaching for English Language Learners. Multimedia's motivational benefits are detailed by Borooah and Sabharwal (2021), while Alakrash and Razak (2021) find that digital use often remains limited to vocabulary building, indicating a need to broaden digital training in these settings.

The effective integration of technology into learning environments is pivotal. Sharma (2021) and Das & Roy (2021) document how educators today use ICT tools not just for instruction, but to foster peer collaboration and creative engagement. Innovations such as the flipped classroom (Joshi & Mehta, 2021), YouTube-based pronunciation drills (Rao, 2021), and digital gamification (Menon & Thomas, 2022) are showing measurable improvements in student motivation and performance. Yet, researchers like Pritam and Shaikh (2024) warn of persistent divides, device access and teacher readiness are still far from universal, particularly in underserved regions.

The COVID-19 pandemic dramatically accelerated digital adoption, but it also revealed and sometimes deepened divides. National digital platforms such as DIKSHA and SWAYAM have improved access and democratized learning, though they have not always addressed on-the-ground disparities in infrastructure and faculty preparedness (Tyagi, 2023; Seth et al., 2024). The necessity of continuous professional development is voiced by Das (2024), Aggarwal (2023), and Abedi (2023), who argue that one-time workshops cannot substitute for sustained, context-specific teacher upskilling.

Learner autonomy emerges as a cornerstone of effective, long-term education. Studies from Saleem (2016) and Priyanka (2017) demonstrate that when teachers

foster autonomy, student engagement and self-regulation flourish especially in mixed-ability classrooms where reflection and self-designed tasks are encouraged. Autonomy-supportive classrooms, portfolio- based self-assessment (Rao, 2018), and digital resources (Awan, 2020; Singh, 2020) all contribute to increased adaptability and ownership over learning. Yet, as Gupta and Gupta (2023) and Mote and Kumar (2023) emphasize, systemic support ranging from curriculum flexibility to mentoring is crucial for nurturing creative and lifelong learners.

In English language learning specifically, Parab (2014) and George (2016) advocate learner- centered, communicative pedagogies, though they recognize that socioeconomic divides, resource gaps, and rigid academic traditions can impede progress (Baig & Singh, 2019; Kumari, 2020). Practical classroom research (Sravani & Babu, 2018; Singh & Halim, 2023) points to the superiority of communicative approaches, especially when strengthened by teacher digital literacy and accessible technology (Vincy & D'Souza, 2023; Sahoo & Padhi, 2023).

Ultimately, technology's transformative potential in education is clear from mobile devices and AR platforms fostering motivation and vocabulary (Kruk, 2017; Mohebbi, 2024), to AI- powered learning analytics enhancing feedback and support (Jasola, 2025). Yet, the enduring themes of equitable access, teacher empowerment, culturally sensitive curricula, and support for self-directed learning continue to shape the trajectory of educational innovation and inclusivity across India (Trivedi & Pandya, 2024; Suar et al., 2025; Nair & Yunus, 2021).

3. Significance of the Study

The need and significance of digital literacy, technology integration, and learner autonomy are crucial in English language learning among higher secondary school students in Nagaland. As the region's educational landscape adapts to the demands of the digital age, these factors hold immense value in shaping a comprehensive and practical learning experience. The study provides insights into bridging the digital divide among students. Students who develop autonomy in their education can take control of their learning and apply it to various subjects and situations. The study help educators encourage autonomy in their teaching practices.

Such studies are needed to enhance English language learning outcomes among

higher secondary school students in Nagaland. Improved English language skills significantly impact students' educational and career prospects, making them more competitive in a globalized job market. By addressing the specific needs and challenges of Nagaland's educational system, the study would be able to improve it by making it more aligned with the requirements of the digital age and globalized society.

In conclusion, the results of this study would enhance English language learning outcomes among higher secondary school students in Nagaland by addressing digital literacy, technological integration, and learners' autonomy. The benefits would certainly extend to students, educators, parents, policymakers, and the overall educational system, fostering a more technologically proficient, independent, and thriving generation of learners in Nagaland.

4. Statement of the Problem

The intention of the researcher through the present study was to focus on the English language learning of higher secondary school students. The study was able to identify the current status of digital literacy, technological integration, learners' autonomy as well as English language learning of higher secondary school students. The study compared the English language learning of higher secondary school students concerning their gender, locale, stream, and management and the different levels of digital literacy, technological integration, and learners' autonomy. The study further studies the relationship between English language learning and digital literacy, technological integration, and learners' autonomy. With this intention, the topic was entitled as “Digital Literacy, Technological Integration, and Learners’ Autonomy Impacting English Language Learning among Higher Secondary School Students of Nagaland.”

5. Operational Definitions

- a. *Digital Literacy Skills*: This refers to the skills, knowledge, and competencies related to using digital technologies effectively for learning and communication in the English language. In this study, it was assessed by administering the Digital Literacy Scale developed by the researcher.

- b. *Technological Integration*: It refers to the ways of incorporating technology into English language learning activities. In this study, it was assessed by using the Technological Integration Scale administered on learners, interview schedules for teachers, and heads of the institutions.
- c. *Learners' Autonomy*: This relates to the student's ability to take responsibility for learning, set goals, and make independent decisions regarding their English language learning using digital tools and resources. In the present study, it was assessed by using the Learners' Autonomy Scale.
- d. *English Language Learning*: It refers to acquiring the skills and knowledge necessary to effectively understand, communicate, read, write, and interact in the English language. In the present study, the annual marks obtained by the students in the English subject were taken as English language learning.
- e. *Higher Secondary School Students*: The students studying in 11th and 12th classes are known as higher secondary school students. In the present study, 12th-class students were taken as the subjects of study.

6. Objectives of the Study

This research study focused on the following objectives:

- i. To analyze the role of digital literacy, technological integration, and learners' autonomy in the English language learning of higher secondary school students concerning gender, locale, stream, and management.
- ii. To study the current status of digital literacy, technological integration, learners' autonomy and English language learning in higher secondary school of Nagaland.
- iii. To assess the levels of digital literacy, technological integration, learners' autonomy, and English language learning among higher secondary school students.
- iv. To analyse the main effect and interaction effects of digital literacy, technological integration, and learners' autonomy on English language learning of higher secondary school students.
- v. To study the relationship of digital literacy, technological integration,

vi. and learners' autonomy with English language learning.

7. Research Questions/Hypotheses

Research Questions

- Q1** How do digital literacy, technological integration, and learners' autonomy improve English language learning outcomes among higher secondary school students in Nagaland?
- Q2** What is the current status of digital literacy, technological integration, learners' autonomy, and English language learning in higher secondary schools of Nagaland?
- Q3** What is the level of digital literacy, technological integration, learners' autonomy, and English language learning among higher secondary school students?

Hypotheses

- H₀₁** Male and female students do not differ significantly in their English language learning.
- H₀₂** Rural and urban students do not differ significantly in their English language learning.
- H₀₃** Science, arts, and commerce students do not differ significantly in their English language learning.
- H₀₄** Government and private school students do not differ significantly in their English language learning.
- H₀₅** There is no significant difference in the English language learning of students with respect to different levels of digital literacy.
- H₀₆** There is no significant difference in the English language learning of students with respect to different levels of technological integration.
- H₀₇** There is no significant difference in the English language learning of students with respect to different levels of learners' autonomy.

H₀8 Digital literacy and technological integration do not have a significant interaction effect on the English language learning of students.

H₀9 Technological integration and learners' autonomy do not have significant interaction effect on the English language learning of students.

H₀10 Digital literacy and learners' autonomy do not have significant interaction effect on the English language learning of students.

H₀11 There is no significant relationship between English language learning and digital literacy.

H₀12 There is no significant relationship between English language learning and technological integration.

H₀13 There is no significant relationship between English language learning and learners' autonomy.

H₀14 Digital literacy, technological integration, and learners' autonomy have no significant conjoint relationship with English language learning.

8. Delimitation of the Study

- i. The study was delimited to students of class 12 only.
- ii. The study was delimited to English subject teachers teaching at higher secondary schools only.
- iii. The study was also delimited to the Heads of the institutions of higher secondary schools.

9. Variables

a. Independent Variables

- Digital literacy
- Technological integration
- Learners' autonomy

b. Dependent Variable

- English language learning
- c. Demographic Variables
 - Gender
 - Management
 - Streams
 - Locale.

10. Research Method

For the present study, the researcher adopted the descriptive research method.

11. Sample and Sampling Technique

The researcher used multistage sampling to select the sample for the study. In the first stage, six districts (Chumoukedima, Dimapur, Kohima, Mon, Mokokchung, and Tuensang) were selected randomly out of 17 districts of Nagaland.

In the second stage, 29 higher secondary schools were selected from 6 districts, proportionate to the population of the students in each district, focusing on their board, streams, management, locale and gender.

In the third and final stage, 1500 students were selected, where 967 students were from private higher secondary schools and 533 were from government higher secondary schools. Each head of the selected institution (government as well as private) and two teachers teaching English subject per school were included in the sample of the study i.e., 58 teachers. In total there were 1586 subjects in the sample of the study consisting of 1500 students, 58 English subject teachers and 29 Heads of the institutions.

12. Tools of Data Collection

The following tools were used for data collection in this study:

Digital Literacy Scale

This scale consists of 24 items, developed and standardized by the researcher ensuring validity, after incorporating the suggestions from the experts, determining the face validity, content validity, and accuracy of the scale. The split-half and test-retest reliability coefficients were found to be 0.76 indicating a good internal consistency and 0.72 demonstrating stability and consistency of the

instrument over time, respectively. Both reliability coefficients were significant at the 0.01 level.

Technology Integration Scale

This scale consists of 24 items, developed and standardized by the researcher ensuring validity, after incorporating the suggestions from the experts, determining the face validity, content validity, and accuracy of the scale. The split-half and test-retest reliability coefficients were found to be 0.78 indicating acceptable internal consistency and 0.88 demonstrating good stability of the scale over time. Both reliability coefficients were significant at the 0.01 level.

Learners Autonomy Scale

This scale consists of 30 items, developed and standardized by the researcher ensuring validity, after incorporating the suggestions from the experts, determining the face validity, content validity, and accuracy of the scale. The split-half and test-retest reliability coefficients were found to be 0.80 indicating strong internal consistency and 0.78, reflecting good stability of the scale over time. Both reliability coefficients were significant at the 0.01 level.

The English language learning of the students has been taken from the scores of the students in the English subject. The obtained scores of students in the English subject in the annual examination of 11th class have been considered as English language learning in the present stage.

The researcher administered a semi-structured interview schedule on the Heads of the institutions and the teachers to gather qualitative insights into their experiences, challenges, and suggestions related to digital literacy, technology integration, and English language learning according to the needs of the objectives of the study.

13. Techniques of Data Analysis

After the data collection, the response sheets from the selected sample were organised for coding, scoring, and tabulation. Statistical analysis was carried out using SPSS version 28 and MS Excel and the findings were interpreted accordingly.

The Researcher used descriptive statistics i.e. mean, median, standard deviation, and frequency distributions to understand the data related to digital literacy, technology integration, learner autonomy, and English language learning scores.

Inferential Statistics such as t-tests, ANOVA, and Two-way ANOVA, were used to compare English Language Learning among students on the basis of gender, locale, stream, management, Digital Literacy, Technological Integration, and Learners Autonomy. Additionally, the correlation coefficient was employed to examine relationships between variables.

The interview transcripts were analysed thematically to identify recurring themes and patterns to explore the perceptions of teachers and Principals of higher secondary schools concerning the role of digital literacy, technology integration, and learners' autonomy in the English language learning of students.

14. Findings

a. Status of Digital Literacy, Technology Integration and Learners' Autonomy in English Language Learning in Higher Secondary School of Nagaland

i. Status of Digital Literacy

Findings highlighted that most students are fairly strong in media literacy, communication skills, and information literacy. This means they were generally good at using social media, finding useful information online, and communicating through digital tools. However, technical skills scored the lowest, with some people doing very well and others scoring quite low. This indicates that many students still struggle with using digital tools and software confidently. While overall Digital Literacy levels are balanced, there is a clear need for more training and support to improve technical skills.

ii. Status of Technological Integration

The findings show that technology is most integrated in assessment and feedback, with the highest average scores and greatest variability among educators. Pedagogical approaches also demonstrate strong, consistent use of technology, while digital tools and resources show moderate, but more

varied, adoption. Professional development has the lowest and most consistent scores, indicating limited opportunities for teachers to enhance their technological skills. Overall, while technology is widely used in teaching and assessment, there is a clear need for more robust professional development to support effective integration across all areas.

iii. Status of Learners' Autonomy

The findings indicate generally high engagement in goal setting, self-directed learning, metacognition, and motivation, with metacognitive awareness and motivation particularly strong. However, considerable variability shows that while many students are well-equipped to regulate and drive their learning, others lag significantly behind. These disparities highlight the need for personalized interventions to support learners with lower autonomy. Targeted strategies in goal setting, self-direction, and motivation, along with enhanced metacognitive training, can help bridge these gaps and promote more consistent self-regulated learning in students.

b. Role of Digital Literacy, Technological Integration, and Learners' Autonomy in the Improvement of English Language Learning

Content analysis on the role of Digital Literacy, Technological Integration, and Learners' Autonomy in the improvement of English Language Learning has been done from the semi-structured interview conducted on teachers and principals of higher secondary schools in seven districts of Nagaland. Specific key themes were identified and elaborated as per the need of the question.

i. Role of Digital Literacy in the Improvement of English Language Learning

Findings reveals that digital literacy is widely acknowledged as a critical driver of English language learning, promoting independent learning, creativity, and global readiness. However, significant gaps remain in infrastructure, training, and equitable access particularly in government schools and rural settings. Teachers advocate for curriculum revision, better tools, and hands-on training, while principals emphasize the need for policy support, resource allocation, and controlled integration to minimize misuse.

ii. Role of Technological Integration in the Improvement of English Language Learning

Findings reveal that technological integration significantly enhances English language learning by increasing student engagement, access to resources, and communication skills. However, challenges such as inadequate infrastructure, limited access to devices, and insufficient teacher training hinder its full potential. Both teachers and principals recommend improving infrastructure, providing regular teacher training, updating curricula with multimedia content, and ensuring equitable access to technology, emphasizing that these steps are essential for maximizing the benefits of technology in English language learning.

iii. Role of Learners' Autonomy in the improvement of English Language Learning

The interviews reveal a strong correlation between learners' autonomy and improvement in English language learning, especially when supported by digital tools. Both teachers and principals emphasize a transition from teacher-centered to learner-centered methods, strategic use of technology to foster independence, and the role of feedback, reflection, and student choice in enhancing language skills. Teachers emphasize practical strategies and individualization, while principals focus on institutional support and the broader educational environment. Both groups agree that digital literacy and technology play a crucial role in empowering students to take charge of their learning, though they caution against over-dependence on technology. The overall outlook is positive, with ongoing efforts to further enhance learner autonomy and English proficiency.

c. Levels of Digital Literacy, Technological Integration, Learners' Autonomy, and English Language Learning

i. Levels of Digital Literacy

Findings showed that the majority of the students were well-equipped to navigate and utilize digital technologies effectively, which reflects that there was a broadly positive trend in Digital Literacy among the students.

ii. *Levels of Technology Integration*

The findings reported that very few individuals were lagging behind. Overall, results highlighted a positive trend in the adoption and use of technology among the students.

iii. *Levels of Learners' Autonomy*

Findings revealed that most students showed a high level of learners' autonomy, meaning they were good at managing their own learning. Only a very small number had low learners' autonomy, and a few were in the middle. Overall, this indicated that most students were well-prepared to manage and direct their own learning.

iv. *Levels of English Language Learning*

Findings displayed that while the overall proficiency was moderate, there was a significant performance gap among students, likely influenced by variables such as access to resources, instructional quality, learners' autonomy, and digital literacy.

d. English Language Learning of Male and Female Students

The t-value of male and female students in terms of their English language learning came out to be 1.33 which was not significant even at 0.05 level of confidence. It showed that male and female higher secondary students did not differ significantly in their English language learning.

e. English Language Learning of Rural and Urban Students

The t-value of urban and rural higher secondary school students in terms of their English language learning came out to be 0.995 which was not significant even at 0.05 level of confidence. It showed that urban and rural higher secondary school students did not differ significantly in their English language learning.

f. English Language Learning of students Studying in Science, Arts, and Commerce Streams

The F-value was 2.445 which did not reach significance with a p-value of 0.09 and was not significant even at 0.05 level of confidence. Therefore, the stated hypothesis that science, arts, and commerce students do not differ significantly in their English Language Learning was accepted.

g. English Language Learning of Students Studying in Government and Private Schools

The t-value of private and government higher secondary school students in terms of their English language learning came out to be 2.80 which was significant at 0.05 level of confidence. It showed that private and government higher secondary school students differ significantly in their English language learning.

h. English Language Learning of Students with regard to the Level of Digital Literacy

The F- value was 3.94 which reached significance with a p-value of 0.02 and was significant at 0.05 level of confidence. Therefore, the stated hypothesis that there is no significant difference in the English language learning of higher secondary school students with respect to different levels of digital literacy skills was rejected.

The post hoc t-test results revealed that the difference in the English language learning mean scores of students with low and average digital literacy, as well as those with average and high digital literacy, was not statistically significant. However, the difference in the mean English language learning scores of students with high and low digital literacy was statistically significant. Mean scores revealed that students with high digital literacy performed significantly better in English language learning compared to students with low digital literacy.

i. English Language Learning of Students with Regard to the Level of Technological Integration

The F-value was 0.251, which did not reach significance with a p-value of 0.78 and was not significant at the 0.05 level of confidence. Therefore, the stated hypothesis that there is no significant difference in the English language learning of higher secondary school students with respect to different levels of technological integration was accepted.

j. English Language Learning of Students with Regard to the Level of Learners' Autonomy

The F-value was 0.143, which did not reach significance with a p-value of 0.87 and was not significant at the 0.05 level of confidence. Therefore, the stated hypothesis that there is no significant difference in the English language learning of higher secondary school students with respect to different levels of learners' autonomy was accepted.

k. Interaction Effect of Digital Literacy and Technological Integration on the English Language Learning

To explore the significance of the difference between means of English language learning of students with regard to the levels of digital literacy and technological integration among low, average, and high, two-way ANOVA was applied. Findings revealed that digital literacy and technological integration did not have a significant interaction effect on the English language learning of higher secondary school students. The Null hypothesis was accepted.

l. Interaction Effect of Technological Integration and Learners' Autonomy on the English Language Learning

To explore the significance of the difference between means of English language learning of students with regard to the levels of technological integration and learners' autonomy among low, average, and high, two-way ANOVA was applied. Findings supported the null hypothesis that technological integration and learners' autonomy did not have significant interaction effect on the English language learning of higher secondary school

students.

m. Interaction Effect of Digital Literacy and Learners' Autonomy on the English Language Learning

To explore the significance of differences between means of English language learning of students with regard to the levels of digital literacy and learners' Autonomy among low, average, and high, two-way ANOVA was applied. The findings supported the null hypothesis that digital literacy and learners' autonomy did not have a significant interaction effect on the English language learning of higher secondary school students.

n. Relationship between English Language Learning and Digital Literacy

The null hypothesis was that there is no significant relationship between English language learning and digital literacy. Given the negative and very low 'r'- value and the non-significant p-value, at even 0.05 level of confidence. the data supported the null hypothesis, indicating no significant relationship between English language learning and digital literacy.

o. Relationship between English Language Learning and Technological Integration

Findings revealed that the correlation coefficient was not significant, thus the null hypothesis was accepted, reporting that there was no significant relationship between English language learning and technological integration.

p. Relationship between English Language Learning and Learners' Autonomy

The result indicated that the correlation coefficient was not significant, and failed to reject the null hypothesis. Therefore, it displayed no significant relationship between English language learning and learners' autonomy.

q. Relationship of Digital Literacy, Technological Integration, and Learners' Autonomy with English Language Learning

The finding exhibited that the correlation coefficient was not significant, and failed to reject the null hypothesis. Therefore, there was no significant conjoint relationship of digital literacy, technological integration, and learners' autonomy with English language learning of students.

15. Conclusion

The present study aimed to explore digital literacy, technology integration, and learners' autonomy and their impact on English language learning among higher secondary students in Nagaland. Combining detailed content analyses of interviews conducted with teachers and principals alongside statistical evidence, the research sought to uncover both the advantages and challenges linked to these three critical educational dimensions. The findings highlighted the intricate relationships between access to digital tools, the ways pedagogy would have enacted, and the agency students exhibited in their learning processes, while also revealing substantial gaps requiring focused attention.

A key insight emphasized the pivotal role digital literacy has played in shaping students' capacity to engage with and benefit from English language learning. Educators widely observed that digitally literate students tend to approach learning English independently and creatively, exhibiting greater awareness of global contexts. These learners demonstrated improved abilities to navigate media, communicate effectively, and critically assess information, especially when accessing online resources. Nonetheless, technical skills vary considerably across the student body, with some excelling and others struggling, reflecting disparities in exposure, infrastructure, and training differences particularly notable between private and government schools, as well as between urban and rural settings. Although digital literacy is broadly on the rise, these inequalities underscore the urgency for targeted training programs tailored to learners with lower proficiency.

Regarding technological integration, the data highlights its undeniable role in boosting student engagement and facilitating the development of communication skills. Classrooms that skilfully incorporate digital resources into teaching and

assessment not only stimulate students' motivation but also enrich their exposure to language input. Nonetheless, structural limitations such as insufficient infrastructure, lack of devices, inconsistent internet connectivity, and limited teacher training hinder the full realization of technology's potential. Teachers and principals alike pointed out that while digital tools are becoming commonplace in instructional and evaluative practices, systematic professional development for educators remains sporadic and underused. Addressing this requires concerted investment in infrastructure and continuous capacity-building for teachers, ensuring technology serves as an integrated, pedagogically meaningful resource rather than a peripheral add-on.

Learners' autonomy surfaced as both a consequence of and a condition for effective digital literacy and technology utilization. Interviews revealed a profound educational shift from traditional teacher-centered approaches toward learner-driven practices, with students exhibiting more autonomy by setting personal goals, engaging in self-directed study, and monitoring their own progress through enhanced metacognitive awareness. This autonomy thrives when digital platforms offer opportunities for independent exploration, reflection, and feedback. However, variability in learners' self-regulation shows not all students are equally prepared for such independence, with some requiring greater scaffolding and motivational support. While strong autonomy characterizes much of the studied cohort, targeted interventions remain essential for those less equipped to manage their learning proactively.

Statistical analyses revealed notable differences in English language achievement between students attending government versus private schools, a gap attributable to factors like access to quality instruction, educational resources, and technology. In contrast, no significant disparities were found concerning gender, academic stream, or urban-rural residence.

Furthermore, students with higher digital literacy outperformed their less digitally skilled peers in English proficiency, reinforcing the premise that well-developed digital competencies yield tangible academic advantages.

When examining interactions between digital literacy, technology integration, and learners' autonomy relative to English language learning, the study found no significant combined effect on language proficiency. Each dimension independently fosters a supportive educational environment, but their overlapping

influence does not directly predict English outcomes. This distinction reveals that language acquisition is complex and multifaceted, influenced by a constellation of factors beyond digital or pedagogical elements including socio-economic context, teacher quality, home support, and individual learner motivation.

Collectively, these findings offer three crucial takeaways. First, digital literacy forms the foundation for engaging effectively with contemporary learning environments and enhancing English skills. Second, technological integration's full benefits depend on systemic support in infrastructure and professional development, without which it may inadvertently exacerbate existing disparities. Third, while learners' autonomy holds great promise, inconsistencies in students' self-regulatory abilities call for personalized support to maximize its educational impact.

Overall, the study presents an encouraging yet cautiously optimistic portrait of English language learning within the framework of digital literacy, technology use, and learner autonomy in Nagaland's higher secondary schools. Positive trends indicate growing readiness among students to engage with digital tools and take ownership of their learning journeys. However, persistent disparities especially between private and government sectors and varying levels of digital competence highlight the critical need for equitable resource distribution, ongoing teacher training, and curriculum reforms that integrate digital skills comprehensively.

In conclusion, technology, digital literacy, and learner autonomy may not themselves guarantee improved English proficiency; rather, they construct the supportive scaffolding necessary for student growth. The principal challenge lies in ensuring fair access, continuous professional development for educators, and fostering learner autonomy across all ability levels. Addressing these priorities will not only bolster English learning outcomes but also equip Nagaland's students to succeed in a digitally interconnected world.

16. Recommendations

Here are targeted, actionable recommendations for teachers, principals, parents, stakeholders, and policy makers in the context of digital literacy, technology integration, and learner autonomy for improving English language learning in higher secondary schools in Nagaland:

- i. Teachers are recommended to use language apps, online platforms, and interactive multimedia (such as YouTube, podcasts, and educational games) in the classroom to make English language learning engaging and relevant.
- ii. While teaching the students trustworthiness of online resources must be ensured for evaluation, avoid plagiarism, and use digital aids like dictionaries and grammar checkers responsibly.
- iii. Teachers should design activities that require students to set goals, self-monitor progress, and work collaboratively using cloud tools like Google Docs or virtual pen pals.
- iv. Teachers are recommended to regularly participate in workshops or peer-training sessions focused on both new digital teaching tools and effective strategies for cultivating learners' autonomy.
- v. Institutions should prioritize improving reliable electricity, internet access, and digital devices, especially in rural and government schools, through partnerships with government and organizations.
- vi. Launching initiatives for comprehensive digital literacy skill-building and safe technology use (such as cybersecurity workshops and digital citizenship programs) should be implemented.
- vii. Institutions are recommended to establish blended learning models and encourage sharing of best digital teaching practices among faculty.
- viii. Encourage and supervise children's use of educational apps, websites, and e-books, while discussing safe and ethical online behavior.
- ix. Motivate children to set personal learning goals and use digital tools for

self- directed projects and language practice.

- x. Participate in school workshops or sessions on digital literacy and autonomy to stay informed and actively support school initiatives.
- xi. Channel resources to ensure all schools, especially underserved and government schools, have access to necessary infrastructure and up-to-date technology.
- xii. Embedding digital literacy and autonomous learning strategies holistically across subjects, and ensuring professional development for teachers is mandatory and context-specific.
- xiii. Schools are recommended to collaborate with NGOs, edtech organizations, and community groups to supplement resources, mentor programs, and provide hands-on exposure to real-world digital and language skills.
- xiv. Monitor and share outcome data regularly to adapt policies and practices, ensuring ongoing alignment with student needs and technological advancements.

Eventually, building digital literacy, integrating technology effectively, and nurturing learners' autonomy require ongoing shared investments in infrastructure, teacher and parent capacity, as well as supportive policy frameworks. When these efforts are equitable and coordinated, they help all students, regardless of background, develop the confidence and skills needed for success in English Language Learning and beyond.

17. Suggestions for Further Research

- i. Qualitative studies on students' experiences with digital tools, and how socio-economic, linguistic, or cultural factors influence their confidence and usage.
- ii. Whether consistent exposure to digital tools enhances language performance and learner autonomy in the long term.
- iii. Study different models of professional development (e.g., peer mentoring,

online modules, blended learning) and their impact on teachers' ability to integrate technology effectively in language teaching.

- iv. Investigate how variations in infrastructure (e.g., internet speed, device availability) affect both digital literacy levels and English language proficiency across urban vs. rural or public vs. private schools.
- v. Studies on specific technologies (e.g., learning apps or LMS platforms) to explore if it is a support or hindrance for learners' autonomy.
- vi. Comparative case studies between high-performing private and low-performing government schools could shed light on systemic differences influencing language learning outcomes.
- vii. Examine how digital literacy and technological integration differ in impact across various academic streams (Arts, Science, Commerce), even though no statistical differences were found in this study.
- viii. Though no gender difference was found in language learning, further investigation could explore perceptions, access, and engagement with technology through a gender lens, especially in patriarchal or traditional communities.
- ix. Future research can examine whether teaching digital responsibility and online ethics contributes to more meaningful or critical use of English in digital environments (e.g., writing blogs, engaging in forums).
- x. Implement and test innovative teaching strategies like project-based learning or gamified language instruction through digital platforms to assess their effect on engagement and language acquisition.
- xi. Assess how national or state-level education technology policies (e.g., PM eVidya, Digital India) are influencing English language learning outcomes, especially in under-resourced regions like Nagaland.
- xii. Investigate the motivational factors behind students' use of digital tools for English learning, combining quantitative surveys with in-depth interviews.

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Appendix-1: Data Collection Permission Letter



नागालैण्ड विश्वविद्यालय NAGALAND UNIVERSITY

(संसद द्वारा पारित अधिनियम 1989, क्रमांक 35 के अंतर्गत स्थापित केंद्रीय विश्वविद्यालय)
(A Central University established by an Act of Parliament No.35 of 1989)

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शिक्षक शिक्षा विभाग (कोहिमा परिसर)

DEPARTMENT OF TEACHER EDUCATION (KOHIMA CAMPUS)

NU/DTE/2024

10th May 2024

TO WHOM IT MAY CONCERN

This is to certify that Mr. Hiketo Wotsa is a Ph.D. scholar working on the topic of “*Digital literacy, technology integration, and learners’ autonomy impacting English language learning among higher secondary school students of Nagaland*” under the supervision of Dr. Sushil Kumar Singh, Department of Teacher Education, Nagaland University, Kohima Campus, Meriema. He may be allowed to use the library services of various institutions and collect the data for his research abiding by their rules and regulations.

He bears a good moral character. I wish him all success in life.

Head

Department of Teacher Education,
Nagaland University, Kohima Campus, Meriema.

Kohima-797004, Nagaland

Email: dept.teacher.education@nagalanduniversity.ac.in

आचार्य एवं अध्यक्ष / Professor & Head
शिक्षक शिक्षा विभाग (कोहिमा परिसर)
DEPARTMENT OF TEACHER EDUCATION
(KOHIMA CAMPUS, MERIEMA 797004)



Appendix-2: Data Collection Permission Letter



नागालैण्ड विश्वविद्यालय

NAGALAND UNIVERSITY

(संसद द्वारा पारित अधिनियम 1989, क्रमांक 35 के अंतर्गत स्थापित केंद्रीय विश्वविद्यालय)

(A Central University established by an Act of Parliament No.35 of 1989)

मुख्यालय : लुमामी, जिला : जुन्हेबोटो (नागालैण्ड), पिनकोड – 798627

Hqrs: Lumami, Dist. Zunheboto (Nagaland), Pin Code – 798627

वेबसाइट / Website : www.nagalanduniversity.ac.in

शिक्षक शिक्षा विभाग (कोहिमा परिसर)

DEPARTMENT OF TEACHER EDUCATION (KOHIMA CAMPUS)

NU/DTE/2024

9th September 2024

To,

.....
.....

Respected Sir/Madam,

I am Hiketo Wotsa, a research scholar under the supervision of Dr. Sushil Kumar Singh, associate professor of the Department of Teacher Education at Nagaland University, Kohima.

I want to administer 3 tools for data collection:

1. *Digital Literacy Scale*
2. *Technological Integration Scale, and*
3. *Learner Autonomy Scale for Higher secondary students (Class 12),*
4. *An interview schedule for the Head of the institutions (Principals) and a semi-structured questionnaire for Teachers*

Therefore, I request you to allow me to do the needful for my data collection and issue me a task completion certificate from your office.

Thank you.

Research Scholar

Hiketo Wotsa
PhD/TED/00675
Department of Teacher Education
Nagaland University, Kohima Campus

Supervisor

Dr Sushil Kumar Singh
Associate professor
Department of Teacher Education
Nagaland University, Kohima Campus

Contact details: 8730936305

Appendix-3:

DIGITAL LITERACY SCALE (DLS)

Personal data sheet (*Kindly fill in the following information*)

1. Name:

2. School:

3. District:

4. Stream: Arts () Science () Commerce ()

5. Management: Government () Private ()

6. Gender: Male () Female ()

7. Locale: Urban () Rural ().

INSTRUCTIONS

There are 24 statements about Digital Literacy Scale. Five options are given as answers to each statement - **Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D), and Strongly Disagree (SD)**. Read each statement carefully, decide the extent to which that statement is applicable to you, and put a tick mark (✓) in any one of the columns of the five options against each statement. The answers you provide will be kept confidential. These will be used only for research purposes. Hence indicate your responses to all the statements without any hesitation.

Scoring Table

	Raw Score			Z-Score	Grade	Level of Digital Literacy
page						
Score						
Total						

Sl. No.	Statements	Strongly agree SA	Agree A	Neutral N	Disagree D	Strongly Disagree SD	Score
1	I use Microsoft Office, such as Microsoft Word, Microsoft PowerPoint, and Microsoft Excel, for my academic purposes.	SA	A	N	D	SD	
2	I cannot protect my digital devices from viruses by installing appropriate antiviruses.	SA	A	N	D	SD	
3	I effectively utilize search engines (e.g., Google, Bing, Yahoo) to find information related to my school subjects.	SA	A	N	D	SD	
4	I understand the importance of data privacy and practice it online.	SA	A	N	D	SD	
5	I don't know how to manage my digital files and folders efficiently.	SA	A	N	D	SD	
6	I immediately go to my teacher to clarify the online resources.	SA	A	N	D	SD	
7	For my assignments I never copy from others work.	SA	A	N	D	SD	
8	I combine information from multiple sources to create new insights.	SA	A	N	D	SD	
9	I never actively seek out diverse viewpoints while researching a topic online.	SA	A	N	D	SD	
10	I know how to verify the authenticity of information before sharing it with others.	SA	A	N	D	SD	
11	In order to improve my homework, I don't hesitate to copy from my friend's work.	SA	A	N	D	SD	
12	I analyze the messages conveyed through digital advertisements before accepting them.	SA	A	N	D	SD	
13	I understand the impact of media on society.	SA	A	N	D	SD	
14	I identify different media formats (e.g., text, image, video) and their characteristics.	SA	A	N	D	SD	

15	I can distinguish between reliable and unreliable news sources on social media.	SA	A	N	D	SD	
16	I am not conscious of my online privacy.	SA	A	N	D	SD	
17	I take steps to protect my personal information.	SA	A	N	D	SD	
18	I cannot create media content using digital tools effectively.	SA	A	N	D	SD	
19	I communicate effectively using digital platforms (e.g., email and messaging apps).	SA	A	N	D	SD	
20	I engage in productive online discussions and debates.	SA	A	N	D	SD	
21	I never collaborate with others effectively on online projects.	SA	A	N	D	SD	
22	I respect cultural differences and norms when communicating with others online.	SA	A	N	D	SD	
23	I am not confident in participating in online meetings.	SA	A	N	D	SD	
24	I can handle disagreements and resolve conflicts effectively in digital communication.	SA	A	N	D	SD	

Appendix-4:

TECHNOLOGICAL INTEGRATION SCALE (TLS)

Personal data sheet (*Kindly fill in the following information*)

1. **Name:**
2. **School:**
3. **District:**
4. **Stream:** Arts () Science () Commerce ()
5. **Management:** Government () Private ()
6. **Gender:** Male () Female ()
7. **Locale:** Urban () Rural ().

INSTRUCTION

This scale contains some statements. Five options are given as answers to each statement - **Strongly Agree (SA)**, **Agree (A)**, **Neutral (N)**, **Disagree (D)**, and **Strongly Disagree (SD)**. Read each statement carefully, decide the extent to which that statement is applicable to you, and put a tick mark (✓) in any one of the columns of the five options against each statement. The answers you provide will be kept confidential. These will be used only for research purposes. Hence indicate your responses to all the statements without any hesitation.

Scoring Table

	Raw Score			Z-Score	Grade	Level of Digital Literacy
page						
Score						
Total						

Sl. No.	Statements	Strongly Agree SA	Agree A	Neutral N	Disagree D	Strongly Disagree SD	Score
1	In my classes, digital tools are used by the teachers.	SA	A	N	D	SD	
2	My school provides facility access to course materials and submit assignments.	SA	A	N	D	SD	
3	I never seek new digital tools and resources to support my learning outside the classroom.	SA	A	N	D	SD	
4	I can efficiently navigate and search for information on the internet to supplement classroom learning.	SA	A	N	D	SD	
5	I collaborate with classmates using digital platforms like Google Drive, Microsoft Teams, or similar tools.	SA	A	N	D	SD	
6	My teachers never support me in learning how to use digital tools effectively for academic purposes.	SA	A	N	D	SD	
7	Experts teaching is never shown in our classes through video conferences.	SA	A	N	D	SD	
8	Technology makes learning enjoyable by enhancing my ability to grasp complex concepts.	SA	A	N	D	SD	
9	I am encouraged to collaborate with classmates and participate actively in digital learning activities during class.	SA	A	N	D	SD	
10	I appreciate it when teachers incorporate educational games and quizzes into lessons.	SA	A	N	D	SD	
11	I believe that technology integration in the classroom fosters critical thinking, problem-solving, and creativity among students.	SA	A	N	D	SD	
12	I am not encouraged to ask questions, seek clarification, and provide feedback during digital learning activities.	SA	A	N	D	SD	

13	My teachers use a variety of digital tools and platforms to assess my understanding of course content, such as online quizzes, polls, or discussion forums.	SA	A	N	D	SD	
14	I receive timely and constructive feedback on my assignments and assessments through digital means (e.g., comments on documents, email, or online grading platforms).	SA	A	N	D	SD	
15	I do not prefer receiving teachers feedback through digital channels (e.g., email and online platforms).	SA	A	N	D	SD	
16	I feel that digital assessments provide a more accurate reflection of my knowledge and skills compared to traditional paper-based assessments.	SA	A	N	D	SD	
17	I am more engaged in learning when assessments are conducted using digital tools.	SA	A	N	D	SD	
18	I get opportunities to self-assess my learning process using digital tools provided by my teachers.	SA	A	N	D	SD	
19	I feel that digital feedback from teachers helps me better understand my strengths and areas for growth in the subject.	SA	A	N	D	SD	
20	Digital assessments should not be used more frequently to evaluate student learning.	SA	A	N	D	SD	
21	I am encouraged to explore new digital tools to enhance my learning experience.	SA	A	N	D	SD	
22	I receive guidance on how to use digital resources responsibly in academic settings.	SA	A	N	D	SD	
23	I feel more engaged in lessons when teachers demonstrate interest in using technology.	SA	A	N	D	SD	
24	Teachers should be recognized and rewarded for integrating technology into education.	SA	A	N	D	SD	

Appendix-5:

LEARNER AUTONOMY SCALE (LAS)

Personal data sheet (*Kindly fill in the following information*)

1. **Name:**
2. **School:**
3. **District:**
4. **Stream:** Arts () Science () Commerce ()
5. **Management:** Government () Private ()
6. **Gender:** Male () Female ()
7. **Locale:** Urban () Rural ().

INSTRUCTION

This scale contains some statements. Five options are given as answers to each statement - **Strongly Agree (SA)**, **Agree (A)**, **Neutral (N)**, **Disagree (D)**, and **Strongly Disagree (SD)**. Read each statement carefully, decide the extent to which that statement is applicable to you, and put a tick mark (✓) in any one of the columns of the five options against each statement. The answers you provide will be kept confidential. These will be used only for research purposes. Hence indicate your responses to all the statements without any hesitation.

Scoring Table

	Raw Score			Z-Score	Grade	Level of Digital Literacy
page						
Score						
Total						

Sl. No.	Item	Strongly Agree SA	Agree A	Neutral N	Disagree D	Strongly Disagree SD	Score
1	I set specific goals for my learning.	SA	A	N	D	SD	
2	I don't measure my progress regularly.	SA	A	N	D	SD	
3	I feel motivated by having specific goals to work in my studies.	SA	A	N	D	SD	
4	I don't seek guidance from teachers for setting my academic goals.	SA	A	N	D	SD	
5	I prioritize my goals based on my academic success.	SA	A	N	D	SD	
6	I celebrate my achievements when I reach my academic goals.	SA	A	N	D	SD	
7	I believe that having clear goals will enhance my overall academic performance.	SA	A	N	D	SD	
8	I seek additional resources (e.g., ebooks, websites, videos) to supplement my learning.	SA	A	N	D	SD	
9	I always enjoy in exploring new concepts and ideas outside of the classroom.	SA	A	N	D	SD	
10	I am comfortable learning independently without constant supervision from teachers.	SA	A	N	D	SD	
11	I never set dedicated time each day for self-study.	SA	A	N	D	SD	
12	I reflect on my learning experiences and identify areas for improvement.	SA	A	N	D	SD	
13	I am not confident in my ability to learn and master new skills independently.	SA	A	N	D	SD	
14	I am aware of my learning strengths.	SA	A	N	D	SD	
15	I don't feel good when teacher ask me questions.	SA	A	N	D	SD	

16	I recognize when I need clarification to overcome my learning obstacles.	SA	A	N	D	SD	
17	I am not aware of my learning weaknesses.	SA	A	N	D	SD	
18	I set specific learning objectives before engaging in a study session.	SA	A	N	D	SD	
19	I seek feedback from teachers to improve my learning.	SA	A	N	D	SD	
20	I recognize the importance of self-awareness in improving my academic performance.	SA	A	N	D	SD	
21	I collaborate with my peers to improve my learning.	SA	A	N	D	SD	
22	I am motivated to learn independently.	SA	A	N	D	SD	
23	I set high standards for myself to meet my goals.	SA	A	N	D	SD	
24	I never actively engage in classroom activities.	SA	A	N	D	SD	
25	I deal with challenges bravely.	SA	A	N	D	SD	
26	I find satisfaction in mastering new skills.	SA	A	N	D	SD	
27	I am committed to putting in the effort required to excel in my studies.	SA	A	N	D	SD	
28	I am never inspired by the achievements of others to push myself further in my academic pursuits.	SA	A	N	D	SD	
29	I know the importance of motivation.	SA	A	N	D	SD	
30	A positive attitude will not enhance my motivation to learn.	SA	A	N	D	SD	



INTERNATIONAL CONFERENCE 2024

SOCIO-ECONOMIC TRANSFORMATION & ITS IMPACT ON BUSINESS

Department of Management Studies, JIS University

Presents

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To

Prof./Dr./Mr./Ms. **HIKETO WOTSA**, Research Scholar, Department of Teacher Education,
Nagaland University

For presenting the paper titled

Empowering Educators: Exploring Employee Satisfaction and Productivity in the Digital
Paradigm of Nagaland's Colleges

during the conduct of **International Conference 2024** on "Socio-Economic Transformation & its Impact on Business"
held on 9th January 2024

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Conference Chairperson

Dr. Indranil Mutsuddi
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Conference Organizing Secretary

C E R T I F I C A T E



This certificate is presented to:

Hiketo Wotsa

has presented a paper entitled

Empowering Diversity: The Transformative Impact of
ICT on Inclusive Education in Nagaland

in the two days International Seminar on

"Equity and Inclusivity in School Education with Reference to NEP 2020"
organized by *Bosco College of Teacher Education*, in collaboration with *Salesian College of Higher Education*
Dimapur, Nagaland. Sponsored by Indian Council of Social Science Research (ICSSR, New Delhi)
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JAKHAMA, KOHIMA, NAGALAND

**CERTIFICATE
OF APPRECIATION**

AWARDED TO

Mr. Hiketo Wotsa

for presenting a paper titled

*"Technological Advancements and Innovation: Catalysts for Sustainable
Development of Indian Education"*

at the ICSSR, New Delhi, Sponsored National Seminar on the theme
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dated 10 - 11 November 2023,
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URBAN INDIA

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IN NAGALAND'S COLLEGES IN THE CONTEXT OF THE DIGITAL AGE**

AUTHORED BY

Mr. Hiketo Wotsa

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Editor in Chief
Urban India

A Journal of the National Institute of Urban Affairs

**UNDERSTANDING EMPLOYEE SATISFACTION AND
PRODUCTIVITY IN NAGALAND'S COLLEGES IN THE CONTEXT
OF THE DIGITAL AGE****Mr. Hiketo Wotsa, Dr. Sushil Kumar Singh**

Nagaland University, Kohima Campus Meriema

ABSTRACT

This review paper delves into the dynamic interplay between employee satisfaction and productivity within the distinct context of colleges in Nagaland as they embrace the transformative influence of the digital era. Understanding the nuanced relationship between educators' satisfaction and overall productivity is essential in optimizing the educational landscape. Drawing on an extensive literature review, this paper synthesizes critical insights on integrating digital technologies and their impact on employee satisfaction and productivity in Nagaland's college sector. The study aims to provide a comprehensive overview of this evolving educational paradigm's current state of affairs by examining scholarly discourse on teaching practices, technological adoption, and institutional dynamics. The synthesized literature in this paper serves as a valuable resource for educators, administrators, and researchers seeking a nuanced understanding of the implications of the digital era. Additionally, it offers a foundation for future research endeavors and strategic planning, providing insights into optimizing the integration of digital tools and strategies to enhance employee satisfaction and overall productivity. This paper contributes to the scholarly discourse surrounding higher education in the digital age, offering a consolidated perspective on the challenges and opportunities faced by educators in Nagaland's colleges. By examining existing research, the paper provides a basis for informed decision-making and strategic initiatives to foster excellence in higher education in the digital era and empower educators in Nagaland.

KEYWORDS: Dynamic Interplay, Employee Satisfaction, Productivity, Digital Paradigm, Transformative Influence, etc.

INTRODUCTION

Higher education is all about the process in a more advanced stage of human learning, when students are intellectually developed and able to analyze, synthesize, and understand concepts and ideas of all types at an abstract level. Equity, equality, and excellence with social justice are the goals of higher education, which generate knowledge via teaching, research, and extension activities.

The educational institutions of Nagaland are endowed with highly skilled and knowledgeable faculty members and state-of-the-art amenities, including internet access, computers, libraries, and labs, all of which support the state's excellent educational standards. Courses in arts, sciences, business, English, and other subjects are offered by colleges in Nagaland in various forms, including traditional, Open University, and on-campus instruction. The colleges in Nagaland are essential to the state's educational system. The several institutes in Nagaland provide courses in research, computers, hotel management, engineering, polytechnics, engineering, arts, medicine, science, and music, among other subjects.

Digital technology is a powerful tool that improves education in various ways, including making lesson planning easier for instructors and providing new teaching and learning methods. Technology is still an important part of children's education outside the classroom.

The Transformative Impact of Information and Communication Technology on Inclusive Education and the Empowerment of Diversity in Nagaland

^{*1}Hiketo Wotsa and ²Dr. Sushil Kumar Singh

¹Research Scholar, Department of Teacher Education, Nagaland University Kohima Campus

²Associate Professor, Department of Teacher Education, Nagaland University, Kohima Campus Meriema, Nagaland, India

Abstract

This review paper explores the transformative impact of Information and Communication Technology (ICT) on inclusive education within Nagaland, a region known for its diverse cultural and linguistic milieu. Inclusive education ensures equal opportunities for all learners, including those from marginalized communities and with disabilities. Nagaland's unique blend of cultural diversity and geographical challenges makes it an intriguing case study examining ICT's role in bolstering educational inclusivity. Beginning with explaining inclusive education's importance in promoting diversity and equity, the paper navigates through Nagaland's specific hurdles, such as limited infrastructure and socio-economic gaps. It underscores ICT's potential as a tool for surmounting these barriers, showcasing examples from Nagaland that demonstrate successful ICT integration into inclusive educational practices. These instances illustrate ICT's ability to personalize learning, cater to diverse learning styles, and foster collaboration. Additionally, the paper explores ICT's broader impacts, including social empowerment, economic opportunities, and community development, highlighting the necessity of policy backing, infrastructure enhancement, and capacity building for effective ICT implementation. Ultimately, it stresses ICT's transformative capacity in advancing inclusive education within Nagaland and beyond, advocating for its strategic use to create equitable and enriching educational environments.

Keywords: Inclusive Education, ICT, Equity, Empowerment and Diversity

Article Publication

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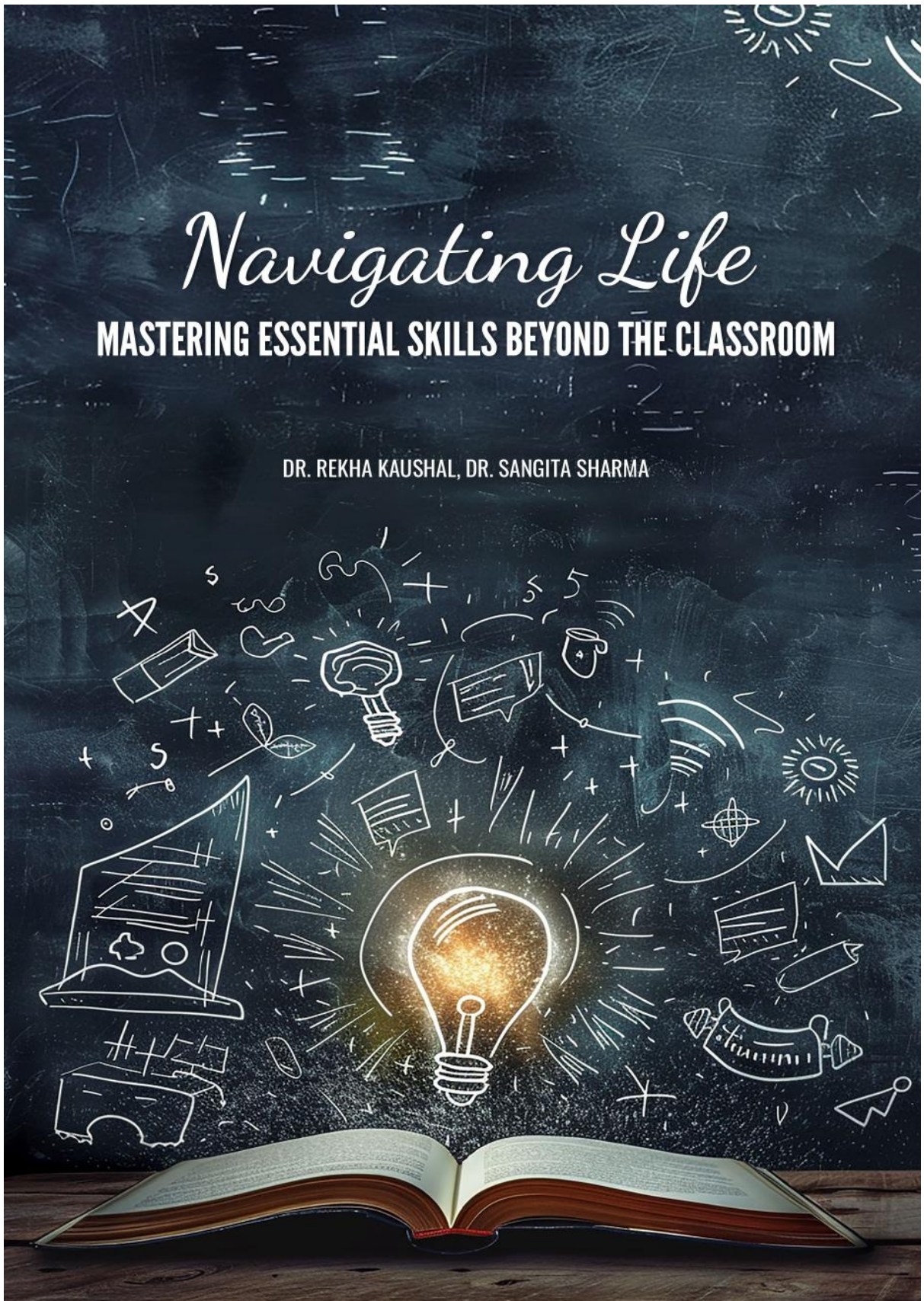
Introduction

Inclusive education is a comprehensive approach that considers the unique characteristics, interests, abilities, and learning needs of all children, youth, and adults, especially those vulnerable to marginalization and exclusion. It aims to provide access to standard preschool provisions, schools, and community educational settings with appropriate support services for all learners, regardless of disabilities. This approach creates an inclusive society, ensuring all students are included in learning (MHRD Draft Inclusive Education, 2003). NEP 2020 emphasizes instilling an inclusive educational structure and culture in our school education system through infrastructure support and curriculum changes that include materials on human values such as respect for all people, empathy, tolerance, human rights, gender equality, nonviolence, global citizenship, inclusion, and equity. It encourages stakeholders to overcome hurdles and eliminate prejudices and preconceptions through a sensitization campaign. The policy aims to promote inclusiveness, equity, and respect for diversity by fostering an understanding of diverse cultures, faiths, languages, and gender identities among students, teachers, and other teachers and administrators. The Nagaland Board of School Education (NBSE) has emphasized the importance of equity and inclusion in education, stating that all children, including those with special needs, deserve the right to education.

According to the 2011 national census, Nagaland has 29,631 people with disabilities in total. People in Nagaland need to be made aware of their rights and facilities, and there needs to be a significant gap between policy provisions and the actual application of laws. Only a few private and governmental institutions or non-profit organizations in urban areas provide special needs children with educational facilities. District-wise, the number of

MASTERING ESSENTIAL SKILLS BEYOND THE CLASSROOM

DR. REKHA KAUSHAL, DR. SANGITA SHARMA



SR.NO.	CHAPTER AND AUTHOR NAME	PAGE NO.
11	COPING WITH STRESS AND EMOTION: DEVELOPING REQUIRED SKILL SET <i>Dr. Adiba Ali, Ms Tasleem Khanam</i>	113
12	CLASSROOM DISCUSSIONS, BRAINSTORMING, ROLE PLAY AS METHODS OF ENHANCING LIFE SKILLS <i>Tlalane Mosae, Dr. Rekha Kaushal</i>	126
13	IMPLEMENTING EFFECTIVE CLASSROOM DISCUSSIONS FOR LIFE SKILLS EDUCATION <i>Hiketo Wotsa, Dr. Sushil Kumar Singh</i>	135
14	IMPORTANCE OF LIFE SKILLS FOR PERSONAL AND PROFESSIONAL SUCCESS <i>Dharna Malhotra, Dr. Rekha Kaushal</i>	147
15	INCULCATING LIFE SKILLS FOR GLOBAL CITIZENSHIP EDUCATION <i>Ms. Neha, Dr Pooja Chopra</i>	155
16	CONFLICT RESOLUTION THROUGH COMMUNICATION <i>Dr. Sheetal Yadav</i>	164
17	INCULCATING LIFE SKILLS THROUGH COMICS BOOKS: AN ANALYSIS OF 'BAL NARENDRA' <i>Dr Mohammad Kamran Ahsan</i>	174
18	EFFECTIVE CLASSROOM APPROACHES FOR CULTIVATING LIFE SKILLS <i>Dr. Ranu Varshney, Upasana Sharma</i>	181
19	EMPOWERING CRITICAL MINDS: REAL-WORLD APPLICATIONS OF CRITICAL THINKING SKILLS <i>Ms. Bhawna Sahu</i>	191
20	FOSTERING CREATIVITY AMONG STUDENTS <i>Dr. Lakhwinder Kaur</i>	203

CHAPTER 13

IMPLEMENTING EFFECTIVE CLASSROOM DISCUSSIONS FOR LIFE SKILLS EDUCATION

Hiketo Wotsa ¹, Dr. Sushil Kumar Singh ²

ABSTRACT

This abstract provides an overview of the significance of classroom discussions in life skills education, the importance of setting clear objectives for discussions, selecting appropriate discussion formats, and facilitating effective discussions. It emphasizes the critical role of classroom discussions in enhancing life skills education, such as problem-solving, critical thinking, communication, and decision-making. Clear objectives guide discussions, ensuring that students' learning outcomes are met. The choice of discussion format depends on the goals and context, whether it be Socratic, small group, or whole-class discussions. Facilitating effective discussions involves creating a safe and inclusive environment, encouraging active participation, and using effective questioning techniques. This abstract highlights the key elements educators need to consider when incorporating classroom discussions into life skills education, ultimately helping students develop essential skills for personal and professional success.

Keywords: *Effective Classroom Discussions, Life Skills and Education*

INTRODUCTION

In education, the development of life skills has gained increasing recognition as a critical component of a well-rounded education. Life skills encompass a wide range of competencies, including communication, critical thinking, problem-solving, decision-making, empathy, and adaptability. These skills are essential for

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² Associate Professor, Department of Teacher Education, Nagaland University Kohima Campus Meriema.



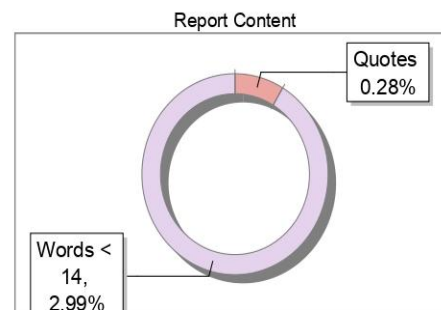
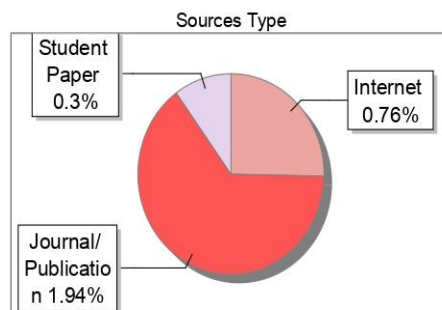
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Total Pages, Total Words	116, 36090
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