

**COMPUTER-GENERATED IMAGERY BASED
ANIMATION: A COGNITIVE PEDAGOGY FOR
ENHANCING THE CREATIVE WRITING SKILLS OF
SECONDARY SCHOOL STUDENTS**

Thesis Submitted for the Award of the Degree of
DOCTOR OF PHILOSOPHY

in
English

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September 2026

DECLARATION

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ABSTRACT

The present study entitled *Computer-Generated Imagery Based Animation: A Cognitive Pedagogy for Enhancing the Creative Writing Skills of Secondary School Students*, examines the effectiveness of Computer-Generated Imagery (CGI) based animation integrated into English classrooms over conventional methods of teaching in enhancing the creative writing skills of secondary school students. Modern pedagogical strategies include the integration of multimedia into the syllabus so that the content can be effectively transacted in the classroom. It helps to bring out better learning outcomes. Computer-Generated Imagery animation, as a vibrant and dynamic multimedia tool, can enhance the creative writing skills of students.

The theoretical foundation of this study draws upon Richard E. Mayer's Cognitive Theory of Multimedia Learning, which emphasizes the dual-channel nature of learning-visual and auditory-and the active processing of information for meaningful learning. Mayer posits that multimedia instruction facilitates the transformation of abstract ideas into concrete visual and verbal content, engaging learners more deeply. Teachers can thereby present content in flexible, personalized ways, improving the sequence and control of instruction and enhancing classroom interaction. This framework aligns closely with John Sweller's Cognitive Load Theory, which asserts that learning is impeded when the cognitive load exceeds the learner's working memory capacity. By distributing the cognitive load between visual and verbal channels, CGI animations help learners to manage complex information more effectively. Furthermore, Allan Paivio's Dual Coding Theory reinforces this perspective by proposing that verbal and non-verbal systems work together to enhance memory and comprehension. CGI-based instruction, which utilizes both image and text, stimulates dual processing pathways, thereby increasing the retention and creativity of learners.

This study adopts an experimental design, combining both theoretical and practical components to explore the impact of multimedia integration on creative writing instruction. A comprehensive review of existing literature forms the foundation of the research, offering insights into previous studies on multimedia learning and computer-generated imagery (CGI) in education. Building on this framework, the study implements a classroom-based experiment to evaluate the effectiveness of CGI-based animation as a pedagogical tool. Specifically, it investigates whether incorporating such dynamic visual content into English language instruction can significantly enhance the creative writing skills of secondary school students. By blending scholarly analysis with hands-on application, the research aims to provide evidence-based conclusions regarding the role of advanced multimedia in improving student engagement and learning outcomes in writing tasks.

For the present study, students were selected from Classes VIII, IX, and X from schools across Kerala. The experimental group was exposed to videos and films created through CGI, while the control group was exposed to conventional teaching methods. The experiment spanned four to five months in selected schools across the state and was supported by students, teachers, and parents. The intervention was conducted in both offline and online modes, with approximately 20 hours of contact sessions. CGI-based animation videos were systematically used to improve the creative writing skills of secondary school students. A pre-test – post-test research design was adopted. All students in both groups received a forty-five-minute orientation on how to write a creative composition in English. Following the orientation, students were instructed to rewrite the climax of the story. Their responses were evaluated and scored.

After the pre-test, the intervention phase commenced for the experimental group, lasting over twenty instructional hours. During this period, creative writing instruction was conducted using CGI-based animation videos and films. Special attention was given to task focus, cohesion and coherence, grammatical accuracy, and vocabulary development. Upon completion of the intervention, a post-test was administered to both the experimental and control groups. The resulting scores were

analysed and compared. The findings of the experiment revealed that the students who were taught using computer-generated imagery-based animation demonstrated significantly better performance in their writing, particularly in the areas of cohesion and coherence, grammatical precision, clarity of focus, and vocabulary usage.

The results demonstrated that the computer-generated imagery-based animation integrated instructional strategy offers substantial advantages over traditional teaching methods. The application of advanced multimedia tools in English language classrooms enabled students to achieve task-based learning goals more effectively. The study clearly indicates that the experimental group outperformed the control group. The integration of computer-generated imagery animations within the curriculum can create a stimulating and supportive learning environment, thereby enhancing the creative writing capabilities of secondary school students.

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List of Abbreviations	
AWE	Automated Writing Evaluation
AR	Augmented Reality
C++	C Plus Plus
CALL	Computer-Assisted Language Learning
CAI	Computer-Assisted Instruction
CGI	Computer-Generated Imagery
CMC	Computer Mediated Communication
CRT	Cathode Ray Tube
CUDA	Compute Unified Device Architecture
ELL	English Language Learner
ELLIS	English Language Learning and Instruction System
ESP	English for Specific Purposes
GIF	Graphics Interchange Format
GG1	Google Group 1
GPU	Graphics Processing Unit
GUI	Graphical User Interface
ICT	Information and Communication Technology
IELTS	International English Language Testing System
ILE	Imagine Learning English
ITS	Intelligent Tutoring System
IT	Information Technology
K-12	Kindergarten through Grade 12
L2	Second Language
LMS	Learning Management System
MIT	Massachusetts Institute of Technology
MOOC	Massive Open Online Course
N	Number
OOP	Object-Oriented Programming
OpenGL	Open Graphics Library

P	Probability Value
PhD	Doctor of Philosophy
Pr	Probability
PRNU	Photo Response Non-Uniformity Noise
Ps	Participants
RAM	Random Access Memory
SVM	Support Vector Machine
SHC	Spanish Heritage Language
SD	Standard Deviation
Std	Standard
TOEFL	Test of English as a Foreign Language
TU	Teaching Unit
US	United States
VFX	Visual Effects
WAM	Writing Assessment Measure
T	t-value

Glossary of Terms

Artificial Intelligence (AI): A field of computer science that develops systems capable of performing tasks that typically require human intelligence, such as problem-solving, decision-making, and language processing.

AI Prompt Engineering: The strategic design of input prompts to guide AI language models, like ChatGPT, to generate meaningful, relevant, and creative textual responses.

Blended Learning: An instructional approach that combines traditional face-to-face classroom methods with digital media and interactive technologies to enhance student engagement and learning outcomes.

CGI (Computer-Generated Imagery): Digitally generated visuals used to simulate scenes or effects, often employed in animation, films, or educational videos to enhance comprehension and stimulate imagination.

Constructivist Learning Theory: A pedagogical approach based on the idea that learners construct knowledge through experiences, reflection, and interaction with their environment and tools, including digital media.

Creative Writing: The artistic process of crafting original narratives, poems, or personal essays, often involving imagination, emotional depth, and linguistic creativity.

Curriculum Design: The structured planning and organization of learning experiences, content, and assessments to meet educational objectives and learner needs.

Digital Storytelling: A multimedia narrative technique that uses images, sound, video, and text to tell stories, often used to enhance literacy and creative expression in classrooms.

Experiential Learning: A hands-on approach where learners gain knowledge through direct experience, reflection, and practice, often used in technology-enhanced classrooms.

Multimedia Learning: An instructional approach that uses a combination of text, images, audio, video, animation, and interactive elements to enhance understanding and

retention. Based on cognitive theory, it aims to engage multiple sensory modalities to improve learning outcomes, especially in visually rich or technology-enhanced environments.

Multimodal Learning: An educational approach that integrates visual, auditory, textual, and kinaesthetic modes to support diverse learning preferences and increase comprehension.

Narrative Competence: The ability to construct, comprehend, and interpret stories, a key component of creative writing that involves structure, coherence, and expressive language.

Prompt: A stimulus, such as a word, image, or video, used to inspire or guide students' writing or creative thinking.

Scaffolding: Temporary instructional support provided by teachers or digital tools to help students bridge learning gaps and gain independence in complex tasks.

Secondary Curriculum: The structured set of educational content and learning outcomes aimed at students typically between the ages of 12 and 18, with a focus on core subjects like English.

Second Language (L2): A language learned in addition to one's native language, typically used for communication, education, or social interaction. In academic settings, English often functions as the second language for students in non-English-speaking regions, especially in multilingual classrooms.

Visual Literacy: The ability to interpret and create meaning from visual media, essential in understanding and producing multimedia text.

Introduction

Introduction

Over time, English language teaching has undergone significant transformation in response to the diverse and evolving needs of learners. Researchers and educators have explored new strategies to teach the universal language in a way that appeals to all types of learners. Since language learning is primarily skill-oriented, the transactional medium should be designed to foster students' language abilities. It is therefore important for authorities concerned to ensure that learners of different age groups develop a meaningful engagement with language learning. One of the persistent challenges faced by educators has been the effective integration of content with the development of language skills, including listening, speaking, reading, and writing. Since learners are expected to demonstrate their knowledge and language proficiency in measurable ways, the teaching of language skills requires considerable effort and appropriate approaches from teachers.

In a country like India, where the demographic dividend offers immense productive potential, teachers must be equipped with effective strategies for English language instruction. Equipping our youth with strong language proficiency alongside essential 21st century skills remain a central task for the English teaching community. Given that India possesses the world's largest youth demographic, with one third of the population under 14 years of age, the need for targeted language instruction is critical. Additionally, 50% of the country's population is under the age of 25, and 65% is under 35. Projections indicated that by 2020, India's average age would be 29-compared to 37 in China and the US, and 45 in Europe- positioning India to supply 28% of the global workforce. By 2030, over half of the national population will be less than 32 years old, bringing the working-age demographic to approximately 960 million. If effectively harnessed through robust educational strategies, this productive workforce comprising predominantly adolescents and youth presents a vital asset for national development. Conversely, a failure to channel this potential constructively risks severe socioeconomic challenges.

Finding an effective and comprehensive strategy to equip India's youth with appropriate language skills along with other essential life skills is one of the major challenges faced by policymakers and educators. As English serves as a primary gateway to various forms of knowledge in the world, providing the future leaders with adequate language skills remains a significant challenge. In this context, the responsibilities of India's educators are both broad and multifaceted, requiring strategies that not only build foundational literacy but also cultivate creative expression and critical thinking among secondary school students.

It is a well-documented fact that a vast majority of secondary school children in India, particularly those from rural areas, lack proficiency in writing in English compared to their counterparts in urban areas. A closer look into the causes of this issue may point to common causes such as poor parenting, socioeconomic background, lack of experienced teachers, and insufficient infrastructure. A significant number of students entering the eighth grade demonstrate an inability to construct a coherent and well-formed sentence about themselves. Despite receiving seven years of English language instruction at the primary school level, their lack of proficiency in creative writing remains a significant concern for researchers.

How can the creative writing skills of secondary school children aged 13 to 14 be effectively nurtured? Is there a panacea for this long-standing educational challenge? Could the integration of CGI (Computer-Generated Imagery) technology offer a practical solution? These questions underscore the significance of the problem addressed in this study.

Chapter 1

Cognitive Pedagogy through CGI Animation: Background and Research Rationale

Chapter 1

Cognitive Pedagogy through CGI Animation: Background and Research Rationale

The development of writing skills is a gradual process that demands consistent effort and focused attention from both learners and educators. The effectiveness of any instructional strategy employed in teaching writing significantly depends on how well the learner comprehends the content and how effectively the teacher presents and interprets the text (Graham and Perin 9). Since writing involves complex cognitive development, it is essential to incorporate engaging, diverse, and inclusive strategies to foster better outcomes among students and to support teachers in the teaching-learning process (MacArthur, Graham, and Fitzgerald 11)

1.1. Background of the Study

In the Indian context, development of language skills among secondary school students is of utmost importance. Research in the field suggests that a significant majority of students lack sufficient language proficiency, particularly in creative writing. Considerable attention is given to the development of speaking, reading, and listening skills; however, writing, an important skill that secondary school students must acquire, receives comparatively less consideration. The ability to express ideas and thoughts with clarity and coherence is a crucial competency for students. The prospect of becoming an ideal learner largely depends on one's ability to articulate thoughts clearly and lucidly. Therefore, proficiency in creative writing can be considered a key asset for a secondary school student.

In Indian, English is primarily taught and learned as an additional language, often functioning as a second or third language depending on the linguistic background of the learners. As a global medium of communication, English serves as a crucial bridge to accessing knowledge, information, and a wide range of professional

opportunities. Consequently, numerous research studies have been undertaken to assess the English language proficiency of Indian school students, with particular emphasis on their writing abilities (NCERT 4; Agnihotri 83). These studies reveal significant gaps and variations in writing competency, highlighting the need for improved pedagogical practices and resource materials. Students, particularly those from rural areas, often have limited exposure to English beyond the classrooms. In many schools, opportunities for using English in their day-to-day lives are limited. Overcrowded classrooms, the educational background of parents, a lack of experienced teachers, socioeconomic conditions, and the influence of the mother tongue are among the factors that may impede secondary school students in acquiring adequate second-language skills.

1.2. The Content Fallacy

In practice, English is often taught as a core subject rather than as a language to be acquired and used. Many teachers continue to believe that English should be taught through the mother tongue. Consequently, in many classrooms, English is taught in much the same way as other academic subjects, with greater emphasis on the transmission of content than on the development of language skills. English language teachers should focus on helping students develop the four language skills rather than merely rushing through the syllabus. Explaining content primarily through the students' mother tongue does not adequately support the acquisition of English language proficiency. Moreover, a conducive learning atmosphere that provides students with maximum exposure to listening, speaking, reading, and writing in English needs to be created both inside and outside the classroom. The practice of providing ready-made materials and answers to prepare students for examinations, coupled with an excessive focus on completing the syllabus, offers limited benefits for secondary school students particularly in the development of English writing skills. Such an approach primarily encourages the rote memorisation of information, thereby hindering the development of essential language skills.

Secondary school classrooms play a crucial role in shaping students' linguistic proficiency. Therefore, writing instruction needs to be delivered through a structured

approach that combines regular practice with innovative teaching methods and technologically enriched learning environments. Research indicates that the use of multimedia tools in writing instruction can address different sensory learning preferences, particularly visual and auditory, thereby enhancing student engagement and accommodating diverse educational needs (Mayer 223).

Ronald V. Frisby, in his research on English language teaching methodologies, emphasizes a contemporary approach grounded in linguistic theory. He encourages educators to view English not only as a practical means of communication but also as a source of cultural and literary enrichment. According to Frisby, although writing typically follows speaking and reading in the natural sequence of second language acquisition, this should not justify its neglect in the curriculum. Instead, he strongly advocates the early and consistent inclusion of writing activities in the classroom, challenging the widespread assumption among educators that writing can be delayed or given lesser importance in language instruction (Frisby 170–78).

One of the key challenges in second language writing development is the insufficient guidance provided to students in generating ideas, structuring their thoughts into coherent sentences, and selecting appropriate vocabulary. To develop a rich word store, students need to be exposed to engaging learning situations. Their exploration of new words should also extend beyond the boundaries of the school. Researchers in this area need to examine these concerns carefully. The formative years of school children are significantly influenced by their teachers. Therefore, teachers must be equipped with appropriate instructional strategies and should be able to help children acquire the desired language skills rather than limiting language learning to the stipulated classroom hours. If teachers are not updated on or aware of the latest developments in English language teaching pedagogy, prevailing challenges cannot be addressed effectively.

Writing is a productive skill, and remains a challenging area for many second language learners. It is also a challenging task for many L2 teachers. Writing instruction remains a complex task for language educators, particularly at the secondary level, where insufficient attention is often given to skill development (Hyland 5). Instead of

focusing more on sharpening students' practical writing skills, second language teachers may primarily concentrate on the teaching of writing as a classroom activity. In second language classrooms where writing practice is provided, instruction is often more content focused than oriented towards enhancing students' practical language skills. A teacher must understand what students think and feel and how they prefer to learn writing.

1.3. Creative Writing and Students

Creative writing transcends the conventions of traditional prose, embracing imagination as its driving force. It allows for the free flow of ideas, emotions, and perspectives, enabling writers to explore the depth of human experience and construct unique narratives that resonate with readers on both an emotional and intellectual level. Creative writing is the art of knitting together one's ideas and thoughts with originality. It allows for the fluent expression of feelings and emotions. The purpose of creative writing is to share human experience. In a second language classroom, developing creative writing skills in students is one of the primary responsibilities of a teacher. A teacher needs to take additional effort to develop the creative writing skills of students. As it is a skill that requires imagination and originality, the instructional strategies should be suitable to cater to learners' needs. A carefully selected video or animation can be more effective in stimulating students' thoughts and imagination in learners than traditional teaching materials such as blackboards and textbooks. The integration of multimedia into classroom practices will significantly enhance the development of creative writing skills of students. The teaching strategies used in the classroom will determine the level of improvement in students' writing. Writing an alternative ending to a story, developing a story from visual stimuli and creating character sketches based on a video or animation can help children develop their creative writing skills.

Creativity refers to the ability to produce original ideas, imaginative expressions, innovative practices, or unique artefacts. In the context of the present research, creativity specifically refers to the ability of learners to produce original discourses in English. Modern English language pedagogy emphasises process-oriented and experiential learning practices to enhance the creative abilities of students.

Scholars such as Joy Paul Guilford and Mihaly Csikszentmihalyi conceptualise creativity as a cognitive and socio-cultural process involving divergent thinking, imagination, problem-solving abilities, innovation, and flexibility in thought processes. Fluency, originality, adaptability, and the capacity to generate multiple perspectives are often identified as the essential components of creativity.

In educational contexts, creativity includes the ability to produce original ideas, construct critical arguments, and develop novel meanings. However, creativity itself does not constitute a pedagogical method. Rather, it functions as a psychological and cognitive foundation upon which meaningful creative learning experiences can be built. Creative pedagogy, on the other hand, refers to the theoretical frameworks and practical teaching approaches specifically designed to nurture creativity among learners.

In the context of the present study, creative pedagogy involves the incorporation of innovative technological tools and learner-centred instructional strategies within the teaching-learning process, particularly in the area of creative writing in English. Donald Murray and Peter Elbow view writing as a process-oriented activity involving drafting, revising, reflection, experimentation, and the expression of personal voice. Creative writing pedagogy therefore focuses on how teachers use various instructional strategies to facilitate imaginative writing in second-language classrooms. It promotes experiential learning methods and process-oriented teaching approaches where students remain at the centre of classroom engagement.

Creative writing pedagogy also involves the integration of AI-enabled lesson plans, multimedia resources, and CGI animation-assisted sessions to enhance student productivity and creative engagement (Murray 4; Elbow 15). While creativity represents the cognitive ability to think innovatively and imaginatively, creative writing pedagogy focuses on the educational mechanisms through which such creative abilities are systematically nurtured, refined, and expressed through literary and linguistic forms.

The National Education Policy 2020 (NEP 2020) and Kerala Curriculum Framework 2023 (KCF 2023) also direct educators and policy makers to adopt innovative teaching strategies that enhance creativity, critical thinking, communication

skills, and problem-solving abilities among students. The competency-based and learner-centred approaches proposed in NEP 2020 align closely with the principles of creative writing pedagogy advanced in the present research. In English language teaching, the policy recommends cognitively oriented teaching approaches that prioritise conceptual clarity, active participation, experiential learning, and higher-order thinking skills (NEP 2020 sec. 4.6). Furthermore, the policy strongly supports technology-enabled education and recognises the importance of digital tools in enhancing storytelling, creativity, and communication skills among learners. These recommendations provide a strong pedagogical rationale for integrating CGI animation as a multimodal instructional strategy in secondary English classrooms.

1.4. Creative Writing in Postmodern Education

In postmodernism, the prime aim of education is to develop the creativity of students. Postmodernism encourages the development of self-creation and critical thinking. Postmodern writers inspire teachers to guide their students to develop their thoughts and ideas and to express them in an original way. According to them, the purpose of education should be to encourage children to discover new things. Students should be given maximum opportunities to listen, speak and write new ideas and thoughts. Self-creation and independent learning receive considerable attention in the postmodern perspective on learning. It is very necessary that students think and write creatively. Classrooms must provide chances for children to develop their creativity in all ways. In a nutshell, postmodern education gives emphasis on creativity and originality of thoughts. In writing, students shall be given the freedom to express their own emotions and feelings in a unique way. Students must learn to tolerate and listen to others with acceptance. This will help them think critically. The construction of knowledge, development of critical thinking and creation of individual and social identity are the key components of postmodern education perspective. Developing creative writing skills in children is also emphasised in postmodern educational philosophies.

1.5. The Significance of Writing Skills in Language Development.

Students must meet a range of academic requirements to graduate from school, and they must complete several written assignments. These tasks involve producing project work, case studies, creating reports, and taking notes, among other things. Information organisation is another difficulty for students when it comes to writing. Academic writing may use a variety of writing styles, such as comparison and contrast or argument and discussion. The writing style is possibly the biggest obstacle faced by language learners from non-native speaking nations. Finding a writing style that authentically expresses the author's voice while adhering to traditional conventions can be challenging. There are certain confusing situations where students do not know what the writing requirements for one course are for another. Students can use the same procedure for each assignment, despite the varying task demands of different subjects.

Teachers can assist students in developing their writing proficiency and alleviating the burden of writing assignments by implementing consistent writing tactics across all subject areas. Writing entails several processes, including concept generation, idea development and organisation, and revision and editing. Students should be able to gather information about the subject and determine whether their writing is directed towards a certain goal. Students should be able to arrange the knowledge they have gained about the subject into a well-structured final product. An effective writer should be able to start their work with a powerful and targeted introduction that includes attention-grabbing details to pique the reader's curiosity, connect ideas in logical paragraphs that contain details supporting the main argument, and finish with a compelling conclusion. Students must evaluate their papers for content, clarity, and style either individually or through peer review after finishing a preliminary draft. This form of assessment can identify faults in grammar, spelling, and punctuation; also, it will help pupils take ownership of their work's accuracy.

Students need to be taught to write from a young age. Writing is the main test used to evaluate a person's intelligence and learning, and the ability to write well in English has become essential for success in both secondary and post-secondary education. Writing abilities are important since they are primarily used in the

assessment, evaluation, and grading of students' written work. Writing in the language classroom has become more mechanical and exam-focused than creative and inventive, even though writing is a crucial ability for both academic achievement and professional advancement.

Writing involves many different elements, such as vocabulary, spelling, grammar, sentence structure, sentence coherence, and punctuation. The three phases of writing are prewriting, writing, and publishing. Writing is regarded as a product of verbal expression. The process of completing a writing assignment includes generating ideas, organising the content, drafting, reviewing, editing, and finalizing the draft. The ability to write helps individuals think critically and communicate effectively. A lack of vocabulary, spelling, grammar, and handwriting skills may cause frustration and hesitation while engaging in writing activities. Time constraints, syllabus completion, classroom management, and ineffective teaching strategies are among the factors that affect teaching writing skills.

Writing proficiency in second language is a crucial ability that requires special attention. Errors in spelling or grammar can create poor first impression and often elicit unfavourable responses from readers. The use of vocabulary, connectives, sentence openers, and punctuation enhance students' writing proficiency. The development of writing skills is dependent on a few variables, including student motivation, a supportive and stimulating writing environment, and the teacher-student dynamic. Composing in a second language is considerably more challenging. It develops with practice over time. Skill acquisition can be significantly improved through the introduction of gaming techniques. Playing video games, for example, may lower the affective filter and promote linguistic creativity and spontaneity. Gamified activities enhance learning, strengthen classroom cohesion, encourage student participation, and improve communication skills.

Students who have strong writing abilities always succeed in communicating their thoughts and accomplishing their objectives. They ought to polish their writing abilities for both personal growth and career success. Writing is a process that teaches students how to write coherently, with proper grammar and spelling usage. Writing is

the process of putting ideas, facts, and thoughts into simple, understandable words. The ability to write well is an essential skill that students must develop to succeed both academically and in the workplace.

Writing in ESL can be challenging, just like learning any other foreign language. Writing is a higher-order skill that requires a blend of cognitive skills, linguistic understanding, and social and cultural awareness. The differences in grammar, vocabulary, syntax, discourse patterns, and writing standards between English and the learners' original language or languages further complicate writing in ESL. Notwithstanding these difficulties, ESL writers need to have strong writing abilities if they hope to excel academically, on the job, and in their personal lives.

Writing is an essential communication tool in a variety of contexts, including emails, social media posts, corporate reports, personal letters, and academic essays. Writing also fosters self-expression, creativity, and critical thinking, thereby helping students develop their cognitive and affective abilities. When writing is perceived as motivating and manageable, it can become a highly rewarding experience. Many parents, educators, and students wish it were as simple as it appears. While some young students struggle to write compelling stories, others find it easy and engaging to spend time typing or penning their thoughts in a coherent manner. Writing is a process that requires motivation, inspiration, ideas, organisation, and creativity. It is a fundamental component of literacy and people use it daily to express their thoughts and feelings.

Creative writing is as much a process as it is a product, and it requires the integration of multiple disciplines to help young minds focus and grow as writers. Every curriculum and educational system designed for school-going children has clearly emphasized the importance of writing. Therefore, it is critical to adopt an approach that is both thought-provoking and effective when teaching, guiding, and facilitating writing for young language learners. Proficiency in writing is essential for students for academic success, be it in report writing, research paper preparation, or essay-based assessments. Students soon realise that being a competent writer is vital for their academic survival. However, few people can claim to have mastered writing, as it remains one of the most challenging skills to develop.

The ability to articulate thoughts in writing in a second language with a respectable level of accuracy and coherence is demanding. Writing becomes even more challenging when there is a lack of coordination among hands, brain, and eyes. Since writing requires the writer to engage all their mental, physical, and emotional energies, it is expected that writers generate, organise and express ideas effectively. This implies that a range of cognitive, physical, and emotional issues may hinder writing efforts. Both native and non-native learners find writing a challenging skill as it requires the careful balance of multiple factors, including vocabulary, punctuation, spelling, organisation, audience awareness, and mechanics. Writing is specially challenging for second language learners because they are expected to produce written works that demonstrate various aspects of a new language. In recent years, the computer has become an indispensable part of modern life. It is no longer an expensive device used only by experts in the military, government, or large corporations.

Prewriting, drafting, revising, and editing are the primary stages of the writing process. This process is sometimes called recursive, meaning that writers may return to earlier stages while revising their work. These processes are very important while teaching creative writing for secondary school students. It can be made more interesting and engaging with the use of animations and information and technology integrated pedagogy. Revising may necessitate a return to the prewriting stage to further develop and expand upon the concepts. Before beginning the drafting process, prewriting entails several procedures. These tasks include making an outline, taking notes, performing research, and arranging data. Though idea generation is a continuous process that happens at every stage of writing, prewriting is typically regarded as the initial phase in the writing process. Converting prewriting concepts into cohesive phrases and paragraphs is the drafting stage. In this phase, the emphasis is on developing concepts, offering adequate justifications and proof, and making sure that the ideas flow logically and cohesively.

New connections and ideas may occur when one starts writing, requiring more editing, and polishing of the piece. During the drafting stage, spelling, grammar, and punctuation do not need to be the concern of students. Getting ideas down on paper is

the main goal. First drafts are frequently writer-centred documents in which the writer primarily writes for personal clarity on the subject. It might not be appropriate to share as it is the initial stage of writing. People could also need to add or remove matters during the revision process to improve the coherence of their writing or to make it more interesting. Reading the draft critically and impartially - putting oneself in the shoes of someone else reading it for the first time - is crucial. It can be helpful to get input from others to determine what needs to be improved.

Since revision is a cyclical process, anyone working on improving their product may need to go back to earlier phases like prewriting and drafting. Editing is more than just correcting mistakes; it is also about refining concepts and making them clear and easy to comprehend. Before moving on to editing, it is important to finish the earlier stages of the writing process, such as prewriting, drafting, and revising. During the editing stage, emphasis should be on proofreading for spelling, grammar, and mechanics during the editing stage. The writing process, which includes ideation, drafting, revision, and editing, is highlighted by the process approach to writing. This method places a strong emphasis on the value of giving students the freedom to explore their ideas, try out various modes of communication, and concentrate on improving their writing abilities. According to academics, this method can assist students in developing a deeper comprehension of the writing process as well as increase comfort levels when it comes to writing.

Since grammar-based assignments and teacher-centred instruction are predominant components of primary language learning classrooms in India, this research will be of considerable value for many language instructors and educators in our nation. The process-oriented and technology-integrated teaching-learning strategy in the second language classroom is likely to yield long-lasting improvements in students' language skills. ESL teachers will benefit from the pedagogical strategies and findings of the present research as a passionate and committed language teacher considerably seeks innovative approaches for effective classroom transaction of lessons and improving the language skills of their students. The primary consideration in selecting the population in the research was the researcher's extensive experience

working with children who face challenges in language development and social skills. Deliberate efforts were made to ensure that the instructional phases in the experiment were more student centred and process-oriented.

The emphasis of Indian teaching methods is primarily on grammar-based assignments. English language use and applications are currently undergoing significant change, necessitating a shift to comply with international norms. To promote social mobility for the younger generations of this developing country, it may appear suitable to select innovative teaching approaches and instruments for English language acquisition considering the current increase in technology and globalisation. A significant factor that may hinder the language development of primary English language learners is the lack of motivation and inadequate opportunities to articulate their thoughts and ideas in meaningful contexts. In this regard, the present research which focuses on the use of computer-generated imagery-based animation is the need of the hour.

Writing is one of the fundamental literacy skills that individuals use daily to express their thoughts and feelings. Writing opportunities and practices using digital technologies have multiplied together with the rapid evolution of new technologies. Students' writing skills can be improved by encouraging them to write more in academic and technical contexts with ever-evolving digital tools and applications. A revised approach to teaching writing with digital technology is even more important considering these increased opportunities. Because it enhances learning, research, and teaching, cutting edge and innovative technology is increasingly being adopted in academic writing across research and higher education institutions in the world.

A lack of ideas or information makes it difficult for preparatory-stage students to write in an orderly and coherent manner. Their written output is affected by inadequate cognitive and language skills, which they need to be strengthened. There is an urgent need to help students generate ideas, improve their capacity to communicate themselves in written form, organise their thoughts, and reflect them clearly. Difficulties may stem from mechanical teaching methods that result in failure and learner fatigue. Consequently, there is a growing emphasis on adopting alternative

approaches to teaching and learning English that can effectively equip students with real world skills needed such as collaboration, problem-solving, and teamwork.

Many studies have investigated the significance of helping students to become more fluent in their language. Fellowes and Oakley, for example, highlight the need of modelling, training, application, and practice to foster spontaneous writing development. They contend that students must see, understand, interact with, and participate in the processes employed by an active writer (215). As a result, the researcher's primary goal in this study is not just to evaluate the student's writing proficiency but also their writing fluency.

The rise in popularity and accessibility of digital tools has brought about a change in the way that classroom instruction is delivered. The newest developments in hardware and software technologies are driving an evolution in computer graphics technology. The ability of computers to produce visuals, the ability to access content from the internet, and the availability of video media, such as interactive educational games and animated content to support teaching. They have shown a great deal of promise for use in a variety of classroom settings and infinite course scenarios. Massive open online courses and other online and offline courseware have recently become more widely available, offering self-paced learning opportunities in an immersive computer-based environment. Several online courses give students access to helpful tools like practice tests, flashcards, progress reports, and reminders, all of which are integrated with university curricula.

The focus of the study is to determine how well computer-generated imagery (CGI) may improve young students' writing skills in an inclusive classroom. Furthermore, as a critical component of motivation and the generation of ideas, the research sought to examine the social interactions that occur between mentors and peers during the learning process.

The study anticipated that examining the learner-centred environment and inclusion would be important in introducing these concepts to a larger group of students in secondary school settings. The study sought to investigate how well young students

could concentrate on a topic that inspired a creative written narrative. Unlike adults, secondary school children tend to lose interest in learning, get easily distracted, and lack a realistic idea of how to acquire a language. Many learners find it annoying when teachers give them long instructions and notes. Children are active learners and thinkers. It is possible to foresee using a learner-centred approach to improve English language learning as being both successful and interesting for the students.

The research attempts to provide a teaching strategy that students may perceive as enjoyable and comfortable, particularly as younger learners engage actively in language acquisition without the explicit intention of mastering a particular skill. The child can simply concentrate on creatively developing an idea prompted by visual help, while the teacher can focus on the structure and form of a writing task as the instructional objective. Both the teacher and the student can, therefore, perceive the outcome as successful. Although Vygotsky's theory of child social development differed from Piaget's theory of cognitive development, the scaffolding approach is considered a very suitable instructional strategy for this study.

Computer-generated imagery (CGI) animation serves as a scaffold for setting the scene for a subsequent exploratory stage in the writing process. In this way, an inclusive classroom environment provides a social environment that encourages students to "think outside the box." Elements such as stories, characters, settings, emotions, and moral values can be explored through different writing styles. Rather than following the conventional approach in which students simply "listen to the teacher's instruction," this research employs computer-generated imagery animation as a pedagogical tool for guided instruction. Students are encouraged to engage with thought-provoking animations and videos, which stimulate their thoughts and facilitate the development of effective creative writing strategies.

1.6. What is Animation?

Animation is a method in which images are manipulated into moving characters. It is the process of drawing, designing, formulating a layout, and preparing photographic sequences. In animation, successive models, drawing, and other elements

are photographed to create an illusion of fine movements. Traditional computer animation techniques in which images were hand drawn have been given way to most modern technologies like augmented reality and artificial intelligence. Traditional animations are often referred to as cel animations. It is mostly done on a 2D platform. Today, 3D or computer animation is the most prevalent type. Unlike in 2D animation, a 3D animated character's full body is visible in 3D animation. The movement of each body part is possible in this type of animation and thus provides a very good sensory experience. The sensory experience provided by traditional animation to the audience was great in the initial stages of intelligent imagery. But now, as we have seen in films like Avatar, the total movie world has been taken to another realm of sensual involvement. The difference here is that, in traditional animations, the emotions of the characters were artificially incorporated, while in computer-generated imagery-based animations, the emotions and feelings of original human beings were merged with animated characters. Emile Cohl, a French cartoonist, and animator is commonly referred to as the father of animation.

Just like feature films, short films, television serials, GIFs etc., animation is also pervasive in sophisticated video games, graphics, ad movies and so on. Animation helps authors to tell stories in unique ways. The imagination of the author can be visualised in animation and thereby attract the attention of viewers of all types. Animation provides a powerful medium for bringing an author's creative vision to life, engaging viewers of all backgrounds.

1.7. Computer-Generated Imagery (CGI) Animation

The term 'CGI animation' encompasses motion pictures generated entirely or in part through computer-generated imagery. One of the primary features of computer-generated imagery-based animation is that it appears realistic and not cartoonish. The special effects rendered in such types of animation and movies will attract students easily and help them concentrate on the content with attention. Also, this dynamic platform will help teachers to perfectly blend the content with language skills. Many activities can be given individually and in groups for bringing out the talents in students. In the modern educational situation where information and communication technology

has a prime place in every walk of human life, planning a strategy that can attract children very easily is one of the major challenges an educator has to undertake. After 1980, educators have been using information and communication technology to enhance different language skills in children and to transact content very effectively. Cinemas, cartoons, language labs, television programmes etc., were extensively used for classroom transactions. This research attempts to discover the advantages of computer-generated imagery animation (CGI) to enhance the creative writing skills of secondary school students. Computer-generated imagery (CGI) is the application of computer graphics to generate or contribute to images in art, television programs, commercials, video games, printed media, films, videos, simulators, and shorts. The term "CGI" is most commonly used to refer to 3D computer graphics used for creating scenes or special effects in films and television.

Computer-generated graphics proliferated in the 2000s and are still prevalent today because of video games and movies that helped spread awareness of them. Since 2010, computer graphics have made it possible to create even videos, and photorealism has improved to the point where, on a high-end system, it is hard to tell the difference between genuine and computer-generated images. The process of creating animated or still visual information with imaging software is known as Computer-Generated Imagery, or CGI. Visual arts, advertising, anatomical modelling, architectural design, engineering, television series, video game art, cinema special effects, and augmented and virtual reality applications are just a few of the many uses for CGI.

Traditional animation methods, such as stop-motion or frame-by-frame animation and hand-drawn cartoons, are not included in Computer-Generated Imagery. But CGI frequently takes the role of conventional methods in both live-action and animated movies. The use of algorithms to create fractals, or intricate, never-ending visual patterns, as well as computer programs that produce two- and three-dimensional animations and special effects are all included in the phrase Computer-Generated Imagery, or CGI. Visual effects (VFX) departments supervise and produce Computer-Generated Imagery (CGI) employing many techniques in cinema and animation production. A 2D pixel-based picture editor used to construct shapes that become

images is a basic example of Computer-Generated Imagery. VFX teams may now build objects or characters that can be smoothly incorporated into pre-existing real-life video or even full CGI sequences by using sophisticated computer tools. Other techniques, such as compositing, which involves layering computer-generated images onto a video, can also be used to produce complex graphics. Actors are frequently positioned using this approach against a simulated background on a green screen.

In the 1990s, CGI software emerged as a crucial instrument and has continued to progress ever since. These software programs are currently useful not only for the entertainment industry but also for other businesses. With the advancement of computer graphics, it is now possible to add realistic components to backgrounds and environments, including weather, and alter a character's physical look. In the future, new technologies will become more prevalent across many businesses, and the entertainment sector is no exception. Emerging technologies like machine learning, a branch of artificial intelligence, have the potential to improve the efficiency of the CGI production process as it becomes more widely used and, consequently, less costly. AI and CGI have both developed quickly, faster than anybody could have predicted years ago. For this reason, it is too early to say how much AI will feature in CGI. For the time being at least, it seems doubtful that such technology will take the position of CGI artists. Furthermore, there is a chance that other similar technologies that have received a lot of attention will find their way into the CGI space. For instance, even though deepfake AI technology is well-known, deepfakes can also be employed for more lifelike visual effects. Additionally, as VR technology advances and becomes more immersive, it has the potential to completely change computer and video game design.

1.8. Benefits of CGI Animation in Classroom Learning.

Animation has become a prominent feature of technology-based learning environments. Animations are one of the important tools for presenting multimedia materials to students across all disciplines. Educational applications of animations have been widely accepted for all age groups worldwide. With the advent of high-end animations like computer generated imagery, the transmission of difficult concepts has become more comfortable for both teachers and students. Visual forms of presentations,

which followed the much-dominating verbal forms of teaching, have enhanced students' understanding.

Animated movies developed through CGI technology are a valuable instructional resource for educators and trainers. It is an advanced platform to inspire children to write in English. Animated movies can be effectively used to enhance the creativity of secondary school children as they lead them to a new realm of experience. Most secondary school children, especially in rural areas, are grammar and spelling conscious and they avoid writing in English. This clear and colourful springboard can be used as a fantastic tool for developing the creative writing skills of school children. The era of tedious classroom practices with limited exposure to writing is over, as CGI animation offers an effective platform that allows students to unleash their imagination and articulate their thoughts cohesively.

The traditional pen-and-paper method of teaching may not appeal to all students. Animation is a brilliant tool with which a teachers can effectively guide their students to the expected learning outcome. Animated movies help children to communicate stories, ideas, and concepts to a great extent. One of the main benefits of computer-generated imagery is that it can encourage the creativity of children and prepare them for divergent thinking.

The world of animation also gives great chances of collaboration with peer groups and students from all over the world. Also, language barriers can be overcome using computer-generated imagery technology. Another benefit of computer-generated imagery technology is that it helps children with self-expression. As we know, self-expression is a major challenge for many children. A conventional classroom atmosphere can contribute very little in this regard. However, in an integrated classroom where animation is used as the strategy, students have numerous opportunities to express themselves in English.

Animation is a better way to encourage children to put their best effort into their presentations, visual explanations of difficult concepts and to help preparing slide shows. A positive aspect of computer-generated imagery technology is that it can

enhance the presentation skills of students. Teachers can engage children in classroom presentations of simple concepts and projects they have completed. This kind of activity will increase the confidence level of students and will help them excel in their academic performance. This skill will help students to understand complex ideas easily. Through presentation skill practice, students can visually connect with the audience and can excel in their communication skills too.

1.9. Role of CGI Animation in the Education Field

In the education field, CGI has two major roles to play. The first one is that it accelerates the cognitive process of students. In return, this will help children to understand subjects very easily. An information and communication technology enabled classroom that effectively utilizes animated content can enhance the learning process to a remarkable extent.

The second major role of animated movies in the classroom is that of an affective learning tool. Animated stories enable children to create their own narratives with precision. As an effective learning tool, animated movies offer the following opportunities:

- a) Enhances students' critical thinking ability
- b) Enhances diverse skills in students
- c) Assists children in problem-solving
- d) Fosters divergent thinking in students
- e) Facilitates peer interaction
- f) Encourages self-learning
- g) Improves communication and presentation skills.
- h) Promotes creativity and develops problem solving skill
- i) Develops storytelling skills
- j) Helps to understand abstract ideas and concepts with clarity
- k) Encourages children to excel in academics and master various skills.

1.10. Role of Digital Pedagogy in Education

Recent scholarship on digital pedagogy identifies it not merely as the use of digital tools to transact complex concepts, but as a transformative educational approach capable of integrating technology meaningfully into the existing curriculum. Digital pedagogy is increasingly conceived as a dynamic instructional framework that facilitates knowledge construction, deeper conceptual understanding, learner engagement, and process-oriented methods of learning. Contemporary educational theorists emphasise that modern classrooms should move beyond conventional teacher-centred practices and embrace multimodal learning environments where learners actively participate in the construction of knowledge.

Gunther Kress argues that modern communication largely depends upon multimodal forms of meaning-making in which visual, auditory, and linguistic elements interact dynamically. This transformation has significantly influenced creative writing pedagogy by expanding traditional teaching-learning practices into digitally integrated environments that include digital storytelling, animation, multimedia composition, and interactive media platforms. Similarly, Henry Jenkins emphasises the importance of participatory learning environments in digital education where learners actively interact, collaborate, communicate, and create knowledge rather than remaining passive recipients within conventional classrooms. Such perspectives have contributed greatly to the emergence of multimedia-assisted pedagogy in language education (Kress 35; Jenkins et al. 8)

Within the secondary classroom context, CGI animation and AI-assisted creative writing activities function as effective pedagogical tools that foster imagination, creativity, collaboration, and critical thinking among learners. These multimedia-assisted learning environments enable students to visualise narratives, organise ideas more effectively, and engage with language in meaningful ways. Consequently, digital pedagogy has become a promising and evolving field in English language teaching because it combines technology, creativity, and experiential learning practices in a learner-centred framework

1.11. Animations and Cognitive Development of Students

Since 1980's, technology has played a vital role in our day-to-day lives. Unlike in the past, people have come to rely heavily on technology as an effective tool to interact with the world in almost every sphere of life. One of the major sectors where these booming technological practices have been incorporated is education. This transformation is evident from lower primary level to institutions of higher education, including the field of research. Many educational institutions have invested in technology to make the teaching-learning process more result-oriented and to keep pace with the evolving trends in the global education sector. The availability of powerful computers and smartphones with information technology integrated modules has influenced the education sector to a great extent. Games, cartoons, animations, and such multimedia platforms have been extensively used in classrooms with different degrees of educational success.

Multimedia resources can improve the attention span of children. Cartoons and animations can help develop the cognitive skills of students. They help children to get sustained attention as well as logic and reasoning abilities. The language of these media will help children develop their linguistic abilities. The vocabulary of each child is enriched when they interact with multimedia resources. It further helps them develop good pronunciation skills. The vivid and pictorial representation of settings, characters and the total ambience of cartoons and animations will help children to narrate the events in the visuals with maximum words. In the case of computer-generated imagery based animated movies, the child gets a real-time representation of the theme and characters. In this type of movie, the developers can integrate real human and animal emotions into the animated characters by which children feel that they are interacting with real animals and the environment. It will increase their level of imagination and thus result in their increased creativity. Children may be inspired to develop their own narratives after viewing animated movies.

Multimedia learning tools like CGI animation provide various opportunities for students to practice creative writing. CGI animations can enhance the attention span of students and will lead them to a world of imagination and creativity. The vocabulary

that students get from such animations will help to improve their language competencies. Various activities can be adopted in the classroom to improve the creative writing skills of students using animations. Teaching and learning process becomes more effective and fruitful when learners get a chance to apply their skills in real life situations. If appropriate stimuli, such as animation, are provided in classrooms with effective facilitation by the teacher, learners will have enough opportunity to develop their critical thinking, reasoning, and problem-solving skills.

The study aims to define and examine the key aspects of English as a Second Language (ESL) writing, with particular emphasis on its core concepts, instructional techniques and major forms of assessment used to evaluate ESL writing proficiency and how creative writing can be enhanced through the integration of CGI animation in ESL classrooms. It also offers strong recommendations for enhancing the writing abilities of ESL students using technology and modern teaching and learning strategies. Language teaching and learning approaches have changed significantly due to several technological breakthroughs over the years. The language learners of the present era are commonly known as “native speakers of the digital language of computers, videos, and the internet,” or “digital natives” (Prensky 3). Due to a variety of experiences that have resulted in radically different learning preferences, learning in traditional settings is no longer able to meet their expectations.

Innovative ways of thinking that provide students with opportunities to demonstrate and improve their language skills should be encouraged, in order to move away from teacher-centred techniques based on behaviourist models and the memorisation of vocabulary and grammar. One of the major goals of most language learners is to become proficient writers. Learners primarily aim to utilize their language skills effectively in real-world contexts. The possibilities of computers, as a relatively new educational tool, on achieving this goal is significant. The use of computers in the classroom is considered important because it requires moving beyond conventional wisdom and introducing cutting-edge pedagogical approaches. New approaches to computer-assisted language learning are widely valued, although not all classrooms have access to the newest technological advancements. Many teachers are unable to

incorporate technology into the teaching and learning process because they lack sufficient time and confidence, or because they fear being replaced by machines. This is why there are still situations in which technology is not used in the teaching and learning process.

This era is commonly referred to as the age of information and technology revolution. Our lives now revolve around technology, especially when it comes to education. Technology fosters engaging and stimulating environments and provides students with the opportunity for holistic personal growth, boosts their motivation and self-efficacy, and enhances their language learning abilities. People frequently invest time, money, and resources in learning it through various programs so they can converse, look for employment, travel, and recognise other cultures through engaging with English-language films, TV shows, and songs. Moreover, numerous scholarships demand a high level of proficiency in the language. Even if people understand how important it is to study English, there are still various obstacles on the way of students. There are many reasons why these difficulties arise, including the continued use of antiquated teaching techniques that do not meet modern demands or inspire students to learn. These techniques frequently concentrate only on teaching grammar and vocabulary in a vacuum, devoid of any real-world context. Students' limited opportunities for classroom-based English practice prevent them from using the language to its full potential. Their language fluency is affected by such obstacles. Rather, contemporary approaches view language as a tool through which students create meanings that support their active engagement and connection with peers and teachers. The most widely used language in the world now is English. It is regarded as the universal language of communication on a global scale and is the language of science, computers, and diplomacy. Learning the four language skills - listening, speaking, reading, and writing - is the first step toward achieving proficiency in English. These are all necessary abilities for ESL students.

These days, there is a switching from writing in physical form to digital form due to technological advancements. Learners can create more, write faster, and share tasks more effectively using technology. This technological advancement necessitates

a re-evaluation of traditional teaching and learning approaches. Technology has been integrated into writing programs at several colleges and institutions. Online education is now available to teachers, students, and nearly all educational institutions worldwide. Numerous studies have shown that educators have a favourable attitude towards the integration of technology into the classroom.

Information and Communication Technology (ICT) is one of the most useful instruments for teaching. In the past decades, countries around the world have widely adopted e-learning. Teachers use digital devices to access instructional materials beyond the traditional classroom. As a result, English language instruction could not have continued effectively without the support of technology. Computers and internet have become indispensable components of our daily lives and educational activities. Writing is a significant component of students' learning. When teaching students to write, teachers must incorporate technology. Students are drawn to using technologies such as computers, tablets, and mobile phones to learn writing. Digital writing enables students to express their ideas with peers, while simultaneously enhancing their writing skills.

Teachers now overwhelmingly favour electronic teaching systems because they may increase good student-teacher interaction and provide incentives for general English language acquisition. Writing is a vital tool for conveying ideas, feelings, and thoughts in a way that resonates with others. A young child does not inherently possess the ability to write because it is a difficult procedure that requires incredibly complex cognitive processes. Writing abilities are one of the most crucial ways to evaluate pupils, and academic writing is particularly difficult for most students from non-native English-speaking nations. A few teaching and learning techniques are designed to assist non-native students in developing the academic abilities necessary to succeed in tertiary education. Even in their mother tongue, some students struggle to write lengthy paragraphs and tasks. Foundational education heavily relies on paragraph writing, a process that involves researching multiple sources, synthesising information, and organising it into a coherent structure.

The walls of schools are no longer the only place that language teaching and learning techniques have gone to in this technological age. The quick advancement of technology and the information and communications revolution have affected educational approaches. Several developments that have integrated technology into education as a fresh approach to teaching methodologies have influenced the conventional approaches to language learning and teaching. Recent researches have proved that new technologies seem to have a significant role in promoting active learning, developing students' creativity, and improving their problem-solving skills. According to Sivin-Kachala and Bialo, technology has a good impact on students' achievement and helps them build a positive self-concept (7).

According to Watkins, new technologies help enhance the educational opportunities available to students. Educators shall make every effort to provide learning experiences that enable students to expand their knowledge. This helps learners to take ownership of their learning and increases their motivation. Essentially, the main objective of acquiring a foreign language is to facilitate communication and enable learners to express their thoughts and feelings through that language. Consequently, the primary aim of teaching students English, widely regarded as the world's most universal language, is to enhance their English communication abilities, enabling them to share their thoughts and exchange information with others in authentic settings. Because of this, educators are particularly interested in switching from using conventional ways to new technology approaches that are appropriate for this generation in the digital age (36)

New technologies are developed every moment, and educators may use these tools in the classroom for better learning experience. Teachers should provide their students with additional opportunities and ways to produce more thorough and grammatically perfect writing discourses by integrating technology into existing curriculum. In addition to producing written work, students should be able to collaborate as a team and participate actively during writing activities. They need to communicate with their peers and engage in one-to-one conferences with the teacher to develop into proficient technology-enabled writers.

Computer has become an integral part of daily life, often being used without a deep understanding of their functions. It plays an important role in numerous areas such as banking, word processing, traffic management, social security systems, accounting, record maintenance, design, office operations, gaming, education, and various recreational activities. Computers have the potential to facilitate a wide range of educational applications due to their flexible information processing capabilities. They can support education at all levels, from preschoolers learning their alphabet to physicians picking up new diagnostic skills. All subject areas - language, math, physics, history, business education, vocational training, music, and art - as well as reading and writing - can benefit from the use of computers.

Students' academic writing can benefit greatly from the integration of digital tools. Studies indicate that students are more likely to write when technological tools are used. Therefore, digital tools and applications should be incorporated in writing assignments to support learners. Instructors can give students more opportunities and ways to improve their academic and professional writing skills by incorporating digital technology. Providing students with appropriate tools when writing will help them realise that it is an engaging learning activity.

The nature of writing and the methods of teaching and learning it have been changed by new technologies. Writing has emerged as a key area of study at all levels of secondary and post-secondary education across disciplines, including computer technology programs, in tandem with rapid technological advancement. The requirement for individualised writing skill learning across the wide range of disciplines is, at least in part, driving the creation of new writing technologies. Discipline-specific differences, as well as the diverse goals, practices, and competencies required in various fields, have a substantial impact on writing. The purpose of this research is to demonstrate how students can effectively use these technologies to enhance their writing skills.

Computer-Generated Imagery (CGI) based animation integrated classrooms can improve students' writing abilities. It provides an inclusive language-learning setting. The present research was developed by examining the learning characteristics

and patterns of young learners worldwide with the observed lack of motivation among Indian students to engage in creative writing practices in the classroom.

The term ‘technology integration’ refers to the process of integrating technological tools and technology-based procedures into regular school practices. Computers with specific software, network-based communication systems, and additional hardware and infrastructure comprise technology resources. Collaborative work and communication, internet-based research, remote instrumentation access, network-based data transfer and retrieval, and other techniques are among the practices.

The use of technology in the classroom has become increasingly prevalent. Surprisingly, many teachers still require students to rely solely on hard-copy text books for their daily reading. Reading comprehension and writing abilities remain vital to a functional society. While most middle school language arts classes continue to incorporate handwriting practice, most of the schools have adopted to typewriting and basic computer skills as part of the teaching-learning process.

In Kerala, following the launch of the Little Kites Project, an IT based students wing in secondary schools, the integration of Information and Communication Technology (ICT) has become widespread. The syllabus of the Little Kites Project even includes design thinking strategies and robotics. However, in second language classrooms, conventional reading and writing techniques are still prioritised by most teachers over the use of contemporary technology. Many restrict computer use in the classroom, believing that students may grow weary of prolonged exposure to digital screens.

Teachers increasingly rely on technology for lesson planning, assignments, and grading. Many teachers have expressed concern regarding students’ spelling and grammatical accuracy, observing that frequent engagement with informal text messaging may contribute to erosion of these fundamental language skills. When teachers adopt digital tools, students also become dependent on technology, as they require computers and internet access to complete tests and submit assignments. This growing dependence is a direct consequence of the expanded use of technology in

educational settings. Teachers further note that while word processing tools have enabled students produce longer texts with ease, the overall quality of writing has shown sign of decline. By relying heavily on keyboarding, students often prioritise quantity over quality in their written work.

Teachers can significantly improve writing practice sessions by incorporating a wide range of computer tools, providing students with a customised and comprehensive learning environment to improve their writing abilities. A comprehensive analysis of various research studies reveals valuable insights into the diverse and effective applications of computer technology in enhancing both student performance and the overall quality of writing instruction. These studies collectively underscore the versatility and impact of digital tools in supporting the development of writing skills, illustrating how such technologies can accommodate different learning styles, individual needs, and pedagogical goals. In this context, the integration of Computer-Generated Imagery (CGI) animations emerges as a significant strategy for fostering creative writing skills among secondary school students. The growing popularity of Computer-Generated Imagery animations as an instructional aid is closely tied to its effectiveness in engaging young learners both visually and verbally, making abstract concepts more comprehensible and the writing process more dynamic and interactive.

Comprehensive review of literature showed that wide range of technology resources are available to support writing instruction, ranging from specialised tools like grammar-checking software to interactive platforms like digital storytelling programs. The research also revealed the effectiveness of pedagogical approaches and strategies that teachers can adopt to meaningfully integrate computer technology into writing instruction. Through a customised and innovative methodology, teachers can leverage the potential of technology to engage learners, stimulate imagination, and strengthen higher-order writing skills.

In the educational domain, particularly in writing instruction, digital technology plays an increasingly vital role. One of the most transformative aspects of this shift is the capacity of digital tools to provide immediate, personalized feedback.

Online platforms now offer detailed responses to student writing, highlighting areas such as grammatical accuracy, syntactic structure, stylistic coherence, and overall clarity. This feedback loop not only helps students refine their work in real time but also fosters metacognitive awareness about the writing process. The integration of such responsive technologies aligns well with learner-centered pedagogy, enabling students to develop more nuanced, effective written communication skills through iterative practice and constructive revision.

Furthermore, these resources often offer suggestions for enhancement, which can help students improve their writing skills and build confidence. Another advantage of technology in writing training is its ability to provide students with targeted practice. Students can access individualised writing assignments according to their interests and ability levels through these platforms. These resources allow students to track their progress and receive prompt feedback. This instant, tailored feedback can be used in future writing projects. They can also be used to practice certain writing abilities including constructing sentences, organising paragraphs, and using transitional words and phrases. Additionally, the use of technology helps raise students' enthusiasm for writing instruction.

Digital tools and platforms offer opportunities for collaboration, which is an essential component of effective writing instruction. They allow students to work together in real-time on writing assignments and help them to provide and receive peer feedback. In a similar vein, blogging sites motivate students to produce high-caliber work by enabling them to share their writing with a wider audience. Digital tools and platforms should be utilised in conjunction with existing teaching methods, despite their clear benefits. Traditional methods such as peer evaluation, teacher feedback, and direct instruction are still necessary for effective writing instruction. Educators must carefully consider the benefits and drawbacks of different teaching strategies to determine which one best meet the requirements and goals of their students. Future research should investigate the effectiveness of various technology interventions and how they could affect students' writing outcomes.

As technology advances, new platforms and tools will undoubtedly emerge, offering new opportunities for writing instruction. The development of writing skills can benefit from technological improvements. Beginning in the 1970s, computer graphics began to shift from practical to realistic. In addition, as personal computers became more and more common, there was a growing need for computer graphics professionals. This led to the discipline - which had previously only been academic - gaining enormous popularity and a far wider audience.

1.12. Scope of the Study

The English language plays an important role in the academic and personal development of every child. As English language functions as a gateway to diverse forms of knowledge, it has become essential for learners to attain proficiency in the four language skills-listening, speaking, reading, and writing. English also serves as a link language, library language and the primary language of the web. So, students cannot subsist without language skills, especially writing. Writing is a higher-order cognitive skill, and educators consistently seek engaging and innovative strategies to teach the skill effectively. A student needs to get a proper classroom atmosphere and an effective learning strategy to develop the skill without difficulty. CGI animation can arouse the curiosity of children and can help them to learn the skill effectively. Animated movies can stimulate multiple senses at a time and facilitate proper skill acquisition from an early stage.

The Following scopes of the investigation were presumed:

1. The investigation will help teachers to find an effective platform to enhance the creative writing skills of secondary school students.
2. CGI animation will help children to acquire writing skills with ease and interest.
3. Children will actively participate in the teaching-learning process as the strategy is greatly appealing and dynamic
4. This strategy will help teachers and educators to use CGI platform for teaching other language skills too.

5. The strategy will help students to comprehend text easily and will help teachers to transact lessons effectively.
6. The present study will help educators to use the platform under investigation in other fields of research.

1.13. Objectives of the study

The following objectives were formulated for the present study.

1. To compare the advantages of computer-generated imagery-based animation videos (CGI) over conventional methods to enhance creative writing skills in English for secondary school students.
2. To identify the difference in the response of rural and urban secondary school students who were trained in creative writing in English through CGI animation videos and conventional methods
3. To examine the difference in the response of boys and girls who were trained in creative writing in English through CGI animation videos and conventional methods
4. To demonstrate the difference in the response of students in government and private schools who were trained in creative writing in English through CGI animation videos and conventional methods
5. To analyse the difference in the response of students hailing from different social backgrounds who were trained in creative writing in English through CGI animation videos and conventional methods
6. To propose CGI animation videos as an effective tool to enhance creative writing in English of secondary school students.

1.14. Hypotheses of the Study.

1. There is no significant difference between the pre-test and post-test scores of the experimental group in creative writing skills after receiving CGI animation-based

instruction.

2. There is no significant difference between the pre-test and post-test scores of the control group in creative writing skills after receiving traditional instruction.

3. There is no significant difference in the main criterion test scores of the experimental group before and after CGI animation-based pedagogy.

4. There is no significant difference in the main criterion test scores of the control group before and after traditional instruction.

1.15. Research Questions

This experimental study seeks to answer the following questions:

1. To what extent does the use of CGI animation in teaching creative writing influence the achievement levels of learners compared to those taught through conventional methods?

2. What measurable improvements, if any, are observed in task focus, lexical resource, cohesion and coherence, and grammatical accuracy among learners in the experimental group following the CGI-based intervention?

1.16. Research Methodology

The present study employed an experimental research design involving two groups: an experimental group and a control group. The control group consisted of participants who were comparable in characteristics to those in the experimental group; however, they were not subjected to the instructional intervention. This group served as a source of reliable baseline data, enabling a valid comparison with the performance outcomes of the experimental group, which received the intervention.

The design adopted for this study is a pre-test–post-test format, allowing for the assessment of change in the dependent variables before and after the treatment. During

the pre-test phase, both the experimental and control groups were evaluated to determine their existing creative writing proficiency. Following this, the instructional phase began: the experimental group was exposed to creative writing instruction through CGI (Computer-Generated Imagery) animated content, while the control group was taught using conventional tools such as textbooks, visual aids, and blackboard instruction.

After the completion of the instructional phase, a post-test was administered to both groups. This helped in assessing the impact of the CGI-based instructional method on the creative writing abilities of secondary school students. The collected pre-test and post-test scores from both groups were then statistically analysed to determine the effectiveness of the intervention in terms of measurable learning gains.

1.17. Sampling Procedure

The present study adopted a random sampling technique to select the participants. The participants in the research comprised secondary school students from Classes VIII, IX and X, aged between 13 and 15 years, drawn from schools across the state of Kerala. From each participating school, approximately 100 students were selected for the research. Two divisions from each school were randomly chosen, with one division assigned to the control group and the other to the experimental group. The experimental intervention was implemented over a period of four to five months. During this period, both the control and experimental groups received a total of twenty instructional hours, with the experimental group being exposed to the treatment while the control group followed the conventional instructional approach. The overall sample size for the study was approximately 800 students, providing a sufficiently large and representative sample for meaningful statistical analysis and interpretation of results.

Samples for the study were collected based on the following criteria.

1. **Locale** (Rural and Urban Schools). Students both from rural and urban schools will be selected for the present study. A close inspection of the social milieu where the students study will have a special impact on the result of the study.

Infrastructure, availability of resources and expert teachers etc., will be different in rural and urban school. Education of the parent, their occupation, family background, etc will affect the study of a student.

2. Gender (Boys and Girls). To ensure gender-neutrality, both boys and girls will be selected and their performance will be analysed separately to get a clear-cut idea about the effectiveness of the strategy.

3. Types of Schools (Govt. Schools and Private Schools, English Medium, and Malayalam Medium). Schools from the government and private sectors will be selected for collecting the data.

4. Socio Economic Conditions The socio-economic conditions of the students will also be considered to assess the effectiveness of the strategy on students hailing from different backgrounds.

1.18. Particulars of the Experiment

In the first phase, both the control group and the experimental group were given forty-five-minute orientation on how to prepare a written composition.

In the second phase, each group was allotted thirty minutes to prepare a write-up based on a visual stimulus. This pre-test was designed to assess the students' baseline writing proficiency and to establish the homogeneity of the two groups.

During the intervention phase, the control group was instructed in preparing a written composition through activity-oriented methods using conventional teaching aids like blackboard, textbook and static visuals. In contrast, the experimental group was taught the same discourse using CGI animation. For this purpose, smart classroom equipped with a projector, laptop and multimedia speakers was arranged for the experimental group. A total of twenty instructional hours were provided to each group to examine the effect of CGI animation over conventional instructional strategies and to measure the level of improvement in the experimental group.

In the final phase, a post-test was administered to both the control and experimental groups, followed by a thorough analysis of the results. A comparative

analysis was conducted to evaluate the changes in the scores between the pre-test and post-test, focusing on the improvement levels among the members of the experimental group who received creative writing instruction through CGI animation.

1.19. Analysis of the Result

To validate the findings of the study, a paired sample t-test was conducted using SPSS software. The data were analysed in accordance with the IELTS Writing Band Descriptors, which evaluate four key aspects of writing proficiency: task focus, lexical resource, grammatical accuracy, and coherence and cohesion. A comparative analysis of the t-test values between the control and experimental groups was conducted to determine the effectiveness of CGI animation as an instructional strategy in teaching creative writing and to assess the improvement in the writing skills of students in the experimental group.

1.20. Structure of the Thesis

The thesis consists of five chapters. They are as follows:

Chapter1: Cognitive Pedagogy through CGI Animation: Background and Research Rationale.

This chapter presents a comprehensive overview of the study, outlining its foundational context, core objectives, proposed hypotheses, guiding research questions, and the methodology employed. It provides a detailed background on the teaching of English in India, exploring the common challenges encountered by Indian students in acquiring writing proficiency in English. Furthermore, it examines the potential of integrating animation as a pedagogical tool in English language classrooms. Specific attention is given to how animation technologies can support creative expression and improve students' engagement in writing activities. The introduction aims to establish a clear rationale for the study by linking the educational challenges with the innovative possibilities offered by visual technologies such as CGI animation.

Chapter 2: Visual Imagery in ELT: A Critical Review of Pedagogical Effectiveness.

This chapter offers an in-depth analysis of existing scholarly work related to the application of information and communication technology (ICT) in second language acquisition, with particular focus on computer-generated imagery (CGI)-based animation as a means of enhancing language learning. The review prioritizes literature that addresses the integration of animation in second language classrooms, especially studies that examine its impact on improving the writing skills of secondary school learners. Relevant books, peer-reviewed journal articles, academic research papers, and conference proceedings will be examined to build a solid theoretical framework for the current study. The chapter also highlights research gaps that justify the present investigation and contextualizes the use of CGI within broader trends in technology-enhanced language instruction.

Chapter3: Technology Enhanced Learning: Research Design and Methodology for Exploring the Impact of CGI Animation.

This chapter is dedicated to explaining the research approach and design used in conducting the study. It provides a detailed description of the methodology, including the selection of participants, tools for data collection, and procedures followed during implementation. The statistical methods and techniques used for data analysis will be clearly articulated, along with measures taken to ensure the reliability and validity of the results. Special emphasis is placed on how the research design aligns with the study's objectives and how it facilitates accurate evaluation of the effectiveness of CGI animation in improving students' writing skills in English.

Chapter 4: Cognitive and Creative Impact of CGI Animation: Analysis and Interpretation of Student Engagement.

This chapter is devoted to the detailed analysis of the data gathered during the research. It not only presents the statistical findings but also provides a thorough interpretation of the results in relation to the objectives and hypotheses of the study. The analysis includes an examination of numerical data using appropriate statistical

tools, and each value is interpreted to understand its significance in the context of the present research. All four writing proficiency indicators like lexical resource, coherence and cohesion, grammatical accuracy and task focus are separately analysed. The goal is to establish clear connections between the data and the impact of CGI-based animation on the creative writing abilities of secondary school students. Tables, charts, and graphs may be used to enhance clarity and support evidence-based interpretation.

Chapter 5: Advancing ELT through CGI Animation: Key Findings, Pedagogical Recommendations and Future Directions.

This final chapter focuses on a comprehensive discussion of the study's findings, synthesizing the results derived from data analysis and drawing meaningful conclusions. It summarizes the entire research process and presents the key outcomes in alignment with the study's objectives. The implications of the findings are thoroughly discussed, particularly in terms of their relevance and practical application for English language teachers and learners. Moreover, this chapter outlines several pedagogical recommendations for integrating CGI animation into English writing instruction. The limitations encountered during the study are candidly addressed, and thoughtful suggestions are provided for overcoming such constraints in future research. Finally, this chapter highlights potential directions for further investigation in the field of technology-enhanced language learning, especially in developing writing skills through animated instructional tools.

The concluding part of this thesis brings together the key findings and insights derived from the research. It offers a reflective summary of the study, reaffirming how the integration of computer-generated imagery (CGI) animation can effectively support the development of creative writing skills among secondary school students. This section synthesizes the outcomes of the research considering the original objectives and questions, highlighting the pedagogical relevance of using visual and technological tools in language classrooms. It also acknowledges the limitations encountered during the study and proposes possible avenues for further exploration. By drawing meaningful connections between theory, practice, and empirical evidence, the

conclusion reinforces the significance of adopting innovative teaching strategies to enhance student engagement and writing proficiency in English.

Chapter 2

Visual Imagery in ELT: A Critical Review of Pedagogical Effectiveness

Chapter 2

Visual Imagery in ELT: A Critical Review of Pedagogical Effectiveness

2.1. Theoretical Framework

Research begins with questions that guide the investigation toward meaningful interpretations and conclusions. Accordingly, the present research examines relevant pedagogical fields, theories, and teaching techniques to establish an appropriate theoretical basis for the selected research and instructional approaches. To this end, this chapter establishes the academic foundation, justifies the research design and proves the necessity of a study in the field of English language teaching and learning.

For the study, the researcher examined relevant scholarly journals, previous research reports, various books, and synthesised their research findings to establish their significance to the present investigation. The review of related literature has contributed to clarifying the significance of the research problem, establishing an appropriate research framework, relating the findings of the present study to existing research and knowledge, and identifying areas for further investigation. This chapter precisely explains the significance of the research questions, identifies a suitable research paradigm, and establishes the research gap upon which the study is undertaken

A primary objective of this study was to examine books related to writing. Effective writing among young learners also involves the expression and exchange of ideas and interaction with peers and others within the social contexts. Writing represents a creative process through which learners communicate ideas, experience, and originality. The study also considered whether motivation is a contributing factor in this process.

Structure, grammar, and vocabulary are the primary focus of language classrooms in Indian schools, given the country's educational system. Teachers typically expect students to complete the textbook, regardless of their level of motivation or self-awareness. When learning a language, most young students communicate less confidently both orally and in writing. As a result, it became clear that eliminating creativity, encouraging voluntary articulation, and emphasising action-based learning were important issues.

The inclusive character of education is another significant issue of concern. Today's world is witnessing an increasing number of learning disorders among children, with young children being disproportionately affected by "labels and clinical diagnoses." Social acceptability and equitable access to schooling are often impeded by the stigma associated with such labels. Along with many other challenges in the field of education, these students may develop a sense of apprehension toward writing. Creating an environment in which all children feel accepted is therefore crucial for supporting younger learners.

To provide learning strategies that are more appropriate for students an inclusive learning environment was selected for the research. This was done with the intention of recognising the diversity of young learners and their cognitive state. Therefore, this research considers the significance of inclusion in learning. Rapid implementation of the study's goal will be achieved if all students can effectively explore their ideas creatively through narrative written prose.

Thorough reading was done to determine the significance of visual aids in enhancing the creative writing skills of secondary school students. Young children can benefit a great deal from visual training regardless of their learning problems or level of motivation in creative writing practices. Many studies suggest that visual aids can motivate young children to be enthusiastic learners. In addition, it makes student-centred learning easier, as opposed to the more common teacher-centred approach. For secondary school students, visual cards with questions and concepts, the use of semiotic forms like symbols, signs, and

codes are all excellent resources for learning a language. Effective use of multimedia and information and communication technology in the secondary English classrooms will help teachers to develop different language skills of students.

In today's ever-changing world, exposure to visual stimuli can be achieved not only through signs, boards, and items but also through moving images. Computer-Generated Imagery is one such contemporary tool (CGI). Historically, films have represented a writer's journey into visual imagery through personification; however, these cinematic narratives are now created on computers and are easily accessible to youthful audiences. There is a useful function for these visual creations in addition to monitoring the risks that unattended viewing could pose. Many educational institutions worldwide have worked together to produce visual aids like videos, which have a positive impact on language competency in areas like writing.

This review set out to investigate the positive results that different forms of technology integration in second language classroom have on secondary students' writing and academic performance. Due to the rapid changes in both education and teaching-learning strategies, this evaluation of the literature is crucial. As more educational institutions and instructors integrate technology into the classroom, it is imperative that they have the resources and know-how to keep up with students' changing needs. Since technology permeates most industries and communication skill is a most desired ability in contemporary settings, students must learn how to use it to communicate effectively. They must be prepared to communicate in a professional context because they will soon be in those roles.

Global pedagogical platforms are more widely available in the field of study that was selected. In Europe and other western regions, inclusive classroom arrangements are rather helpful for language acquisition. Even the tiniest county schools, state institutions, or privately owned language centres in certain parts of the world accept students with a range of talents from average to higher

achievers. A primary school teacher or private tutor regularly provides differentiated activities, and diversity is ensured in different classroom practices. Although they are rarely used in schools and language centres, curriculum implementation and inclusive settings are discussed in everyday Indian contexts. Consequently, India experienced a dearth of expertise in this area of study, underscoring the critical importance of valuing research in this field within the language teaching profession.

This comprehensive literature review investigates the integration of computer-based technology in writing instructions and its subsequent impact on writing performance. Effective writing training that incorporates technology necessitates a nuanced understanding of the various strategies, benefits and potential challenges associated with this pedagogical approach. The benefits of using computers in writing lessons include improved vocabulary growth, motivation, social engagement, critical thinking, and overall writing performance.

Technology and ICT applications have presented our students with abundant opportunities. Technology has touched every field in some way or another, the most spectacular field being education. A significant amount of research has been done by academicians, scholars, and technology experts to assess the effectiveness of integrating technology in education. The studies also focused on the efficiency of technology in shaping the future of students and adding quality to their thinking and values.

This study reviews the literature that is available from offline and online sources in the form of books, scholarly articles, and research writing from peer reviewed journals. The purpose of the literature review is to understand the scholarly works on the topic of integrating technology in education with special reference to the use of computer-generated imagery animations in second language classrooms and their impact on the students. The research identifies the gaps in the existing literature and highlights the areas that future research should focus on to bridge the existing gaps in the literature available on the topic.

Educators can take advantage of the vast range of resources offered by information and communication technology, selecting those that align with their distinctive instructional approaches and curriculum objectives. A significant advantage of these teaching and learning tools is their ability to foster a cooperative and student-focused environment that accommodates the unique needs of each learner.

The opening section of this chapter offers definitions of the concepts of ‘creative writing’ and ‘computer-generated imagery-based animation’. Following that, the second section elaborates on the theoretical framework underpinning the research. This part examines into various theories related to both creative writing and multimedia learning. The final section of the chapter provides a comprehensive review of prior studies relevant to the subject of this investigation. It also explains the possibilities of artificial intelligence and prompt engineering in the field of teaching English in secondary school classrooms.

The theoretical basis for this study is the principles put forward by Mayer in his Cognitive Theory of Multimedia Learning. Mayer deals with various dimensions of multimedia learning. He opines that multimedia has broken through the conventional means of teaching. It has helped to change abstract ideas into visual, audible, and vibrant. Multimedia can stimulate students’ interest in learning. According to Mayer’s Cognitive Theory, a computer is a system for imparting information to learners. The information thus given can be expanded by using animation. The young learners who are interested in visual presentations will benefit from such kind of processes. Teachers can use computer animation to present content as they like and can control the process as and when needed. It also helps teachers and students to communicate through a network to discuss the details of the lesson taught. Students can create a deeper understanding of the content as multimedia presents it colourfully and dynamically. (7-15).

Sweller’s Cognitive Load Theory posits that learning is most effective when it aligns with the inherent structure of human cognitive architecture. This theory draws from the findings of extensive experimental research that reveal how the human mind

is organized to process information. Sweller emphasizes that long-term memory does not merely store disconnected facts, but rather contains complex and interrelated structures known as schemas. These schemas are formed through continuous learning over a person's lifetime and serve as the foundation for advanced cognitive activities such as perception, reasoning, and problem-solving. Unlike memorizing isolated pieces of information, schemas enable individuals to integrate and apply knowledge more efficiently and effectively. Sweller's work has significant implications for instructional design, especially when it comes to teaching complex content. His theory asserts that educational materials should be developed in a manner that consciously reduces the cognitive load imposed on learners. By managing and minimizing extraneous cognitive demands, instructional designers can create learning environments that foster deeper understanding and long-term knowledge retention (19–30).

The Dual Coding Theory of Paivio is related to the cognitive theory of multimedia. The dual coding theory assumes that mental representations occur from perceptions in our sensory modalities. These can be verbal or non-verbal, including images that we see, hear, smell, taste or feel. Recognition is heightened by presenting information in both visual and verbal form. Many experiments conducted by Paivio and others support the importance of imagery in cognitive operations. Lin and Chen (83–106) argue that multimedia has a fundamental role in teaching English. Shuell and Menter (13–15) investigated the effect of multimedia on students' writing. There was a remarkable increase in students' scores in writing essays. Bikowski and Vithanage (79–99) claim that “technology enhanced collaborative tools have taken L2 writing instruction into new and exciting spheres”. (79). According to Truong and Zanzucchi (263–288), multimedia significantly contributes to the development of students' writing abilities. In a related study, Charles and Nathalia (4–20) explored how multimedia-based teaching influences the enhancement of English writing proficiency.

Several scholars define Jean Piaget's cognitive pedagogy as an instructional approach rooted in perception, attention, memory, reasoning, and problem-solving processes. However, scholars differ considerably in their interpretation of how cognition develops and how pedagogy should be structured to support meaningful learning. Early cognitive theorists such as Jean Piaget conceptualized learning as an

internal and developmental process in which children construct knowledge through the gradual formation and modification of cognitive schemas across various developmental stages. Piaget believed that learners actively organize experiences and adapt their mental structures through processes such as assimilation and accommodation. In contrast, Lev Vygotsky argued that cognitive growth is fundamentally shaped through social interaction, language, and cultural mediation. Vygotsky emphasized that learning is not merely an individual psychological activity but a collaborative and socially mediated process in which interaction with teachers, peers, and cultural tools plays a central role. He therefore positioned collaborative learning environments and guided participation as indispensable components of effective pedagogy.

The contrasting perspectives of Piaget and Vygotsky closely align with the conceptual foundations of CGI-integrated pedagogical interventions. CGI-based instructional practices simultaneously promote individual cognitive stimulation and socially mediated learning experiences. On the one hand, learners independently process visual narratives, decode symbolic representations, and engage in imaginative interpretation while interacting with CGI animations. On the other hand, these animations often encourage collaborative discussions, peer interaction, and collective meaning-making within classroom environments. Consequently, CGI animation should not be viewed merely as a technological addition to the classroom or as a decorative audiovisual aid. Its pedagogical significance largely depends upon whether it is designed to support deeper cognitive engagement, collaborative knowledge construction, or an effective integration of both dimensions. In this context, CGI-integrated pedagogy reflects the synthesis of cognitive constructivism and social constructivism by creating immersive learning environments that stimulate both internal reflection and social participation (Piaget 23; Vygotsky 86)

Likewise, theoretical perspectives related to multimedia learning proposed by Allan Paivio and Richard E. Mayer reveal important conceptual distinctions regarding the relationship between visual and verbal learning processes. Paivio's Dual Coding Theory argues that verbal and visual information are processed through two interconnected yet distinct cognitive systems. According to Paivio, learning becomes

significantly more effective when textual and visual stimuli reinforce one another because learners are able to create multiple representational pathways for memory and comprehension. His theory strongly supports the educational relevance of visual storytelling, imagery, and animation-based instruction (Paivio 53). However, Mayer extends this conceptual framework by emphasizing not only the existence of dual processing channels but also the limited capacity of working memory and the active role of learners in selecting, organizing, and integrating information meaningfully. Mayer's Cognitive Theory of Multimedia Learning therefore provides a more structured and operational explanation of how multimedia environments influence cognition and comprehension. His framework is particularly relevant in digitally enhanced classrooms because it highlights principles such as coherence, signaling, redundancy, and segmentation that determine the effectiveness of multimedia instructional design. (Mayer 71)

A similar theoretical divergence can also be identified between behaviourist and cognitive interpretations of technology-assisted teaching-learning practices. Behaviourist theorists influenced by B. F. Skinner primarily perceive digital learning tools as mechanisms for reinforcement, repetition, and stimulus-response conditioning. From a behaviourist perspective, CGI animations function mainly as attention-grabbing instructional devices capable of increasing learner engagement, sustaining concentration, and reinforcing desired behavioural responses. The emphasis therefore remains on observable performance outcomes and measurable behavioural change. In contrast, cognitive pedagogues argue that meaningful learning occurs through mental organization, conceptual restructuring, and schema integration rather than through mere behavioural reinforcement. According to cognitive theorists, CGI animations possess the potential to transform abstract concepts into visually comprehensible experiences, thereby enabling learners to engage in experiential learning, analytical reasoning, and higher-order cognitive processing. CGI-based pedagogy thus moves beyond entertainment-oriented instruction and contributes to conceptual understanding, critical thinking, creativity, and reflective learning practices. Consequently, while behaviourism values CGI primarily for its motivational and reinforcement functions,

cognitive pedagogy recognizes CGI animation as a sophisticated educational medium capable of facilitating deep and meaningful learning experiences.

2.2. Empirical Studies

Kerala is the first state in India to equip its public schools with 100% high-tech classrooms, thereby bridging the digital divide and empowering students from the primary level to higher secondary education. The visionary educational leadership of the state has ensured that even schools located in remote and rural regions remain connected to the mainstream educational ecosystem through digital platforms. As a result, teaching-learning practices in Kerala have gradually transformed into more productive, interactive, and enjoyable experiences for learners. The Digi-Keralam project, which aimed at making the public digitally literate, further accelerated this educational transformation by creating awareness among people regarding the importance of digital infrastructure in ensuring better learning experiences and equitable educational opportunities.

The Kerala Infrastructure and Technology for Education (KITE), the governmental agency that spearheads the digital revolution in Kerala schools, has established a strong and vibrant digital ecosystem across public educational institutions. KITE has also launched its own educational television channel named KITE VICTERS and several digital platforms to support technology-enabled learning practices in schools. More importantly, the organisation has played a significant role in digitally empowering teachers by offering advanced training programmes that incorporate Artificial Intelligence tools and digital platforms, making teaching more productive, learner-centred, and process-oriented. Through its flagship programme “Little Kites,” KITE has successfully nurtured a digitally skilled student community and developed a new generation of technologically empowered learners in Kerala.

The integration of Artificial Intelligence, robotics, and coding into the existing curriculum demonstrates how KITE has pioneered innovative educational practices within the Indian school education system (“KITE’s AI Platform”). Public schools in Kerala are now equipped with more than four lakh digital devices including laptops, projectors, desktops, interactive smart boards, and several robotics kits distributed

across schools. The experimental phase of the present research is therefore anchored in Kerala because of these favourable educational and technological conditions. Although the study is geographically carried out in Kerala, the findings and recommendations can be generalised to a broader Indian context as many states in India have significantly invested in the digital transformation of school education.

An EdexLive report points out that states such as Madhya Pradesh, Gujarat, Punjab, Haryana, Delhi, Odisha, Andhra Pradesh, Himachal Pradesh, Karnataka, Tamil Nadu, Maharashtra, Telangana, and Arunachal Pradesh have also implemented digitally integrated literacy curricula and technology-assisted educational initiatives (“Empowering Students”). According to an ICRIER report, more than 90% of classrooms in public schools in Madhya Pradesh have already been upgraded with digital learning facilities. Likewise, the Samagra Shiksha Kerala initiative under the Government of India has undertaken major steps toward the digitalisation of Indian classrooms through programmes such as DIKSHA and PM e-Vidya, creating approximately 1.46 lakh smart classrooms that covered nearly 82% of institutions during 2024–25. The Skilling for AI Readiness (SOAR) programme further aims to bring students from Grades 6 to 12 into AI-driven classrooms with the objective of transforming Indian education into a sophisticated hybrid model of academic excellence.

The State Council of Educational Research and Training Kerala (SCERT), through the Kerala Curriculum Framework 2023 (KCF 2023), strongly advocates a gradual transition from rote-based learning practices to digitally mediated classroom pedagogy that emphasises learner-centred and process-oriented educational approaches. The framework aims to ensure competency-based instructional strategies capable of preparing students for contemporary educational and technological realities (Government of Kerala 45).

KCF 2023 strongly supports experiential learning, multimedia-assisted instruction, and technology-supported classroom practices within school education. The framework promotes the integration of Information and Communication Technology (ICT), digital content, and multimedia resources to make the teaching-

learning process more participatory, collaborative, and engaging. Moreover, KCF 2023 envisions classrooms as spaces of exploration, innovation, and experiential engagement through multimodal learning strategies.

Educational studies conducted in states such as Tamil Nadu and Karnataka reveal that digitally mediated classroom pedagogy enhances learner engagement, creativity, and critical thinking abilities more effectively than traditional text-centred instructional methods. Indian educational research further demonstrates that multimedia learning environments provide substantial support for learners who experience difficulties in writing because visual stimuli stimulate imagination, contextual understanding, and conceptual clarity among students (Mishra and Koehler 1032).

Brian points out the need for a teacher generated and child-centred instructional strategy for greater learner involvement and effective transactions. Apart from the textbook, a learner shall be introduced to a wide variety of real-life experiences so that they can cope with the changes in society. Developing operative materials for second language acquisition must be a prime concern for any teacher. The value of a material is assessed by its effectiveness in encouraging learners to make discoveries for themselves through self-investment supported by opportunities for genuine interaction (1-14). Choudhury exemplifies the importance of adopting innovative materials that are learner-centred. The book highlights the importance of computer assisted language teaching methods that will help learners to understand concepts very easily (3-5). Lowe and Rolf attempt to highlight the possibilities of animation in language classrooms. Animations largely entertain children and it is learner-centred. The dynamic visualisation effect that computer generated images provide language teachers with a plethora of chances to inculcate the concepts very fast and effectively. Animations can be used for teaching all four language skills with child centred strategies (2-7). In his book, French explores the experience of teaching English in different countries like India, Japan, Africa, Malaya, Burma and China. The author claims that written composition is a dark shadow for many teachers around the world. In most classrooms, the learners are discouraged from producing the written text for many reasons such as too many markings on the part of the teacher, lack of interest of learners in writing etc.

In senior classes, pupils are writing to no audience and they are exposed to the same strategies again and again. Without the opportunity to engage with a more dynamic environment, students may struggle to find the motivation to express themselves through writing. Providing them with innovative tools and a supportive community can significantly enhance their creativity and confidence in their abilities. So, giving real audiences and exposure to new transactional tactics are the ways to encourage students to write English properly (118-137). Frisby attempts to describe modern methods of teaching English and their linguistic bases. The writer also tries to lead the teacher to a consideration of English both as a medium of communication and a way of enjoyment. The author says that though writing follows speaking and reading, it does not mean that it can be neglected. A teacher must bring writing practice as early as possible. In no case can the writing part be neglected, as many second language teachers think (170-179). An educator must be aware of the pros and cons of using technology in the classroom. Technology has been considered a saviour of the public education system. However, educators must understand that technology is not a solution to all problems. If not monitored properly, a technology integrated classroom may be ineffective, costly, and a waste of time. The writer points out that technology must be integrated with other traditional learning materials and should be monitored at proper intervals so that the stakeholders will have a positive result in the teaching learning process. According to the writer, the truth is that technology is not a panacea for all types of illness in education. It is simply a tool that successful teachers can use to reinforce the lessons (Kelly 121-140).

The vivacious effects of animated videos in classrooms and the wonderful changes they bring about will be a great boon as far as a second language learner is concerned. Animated teaching materials perfectly integrated with textbooks and animated movies alone can be used as authentic teaching learning materials in second language classrooms. Complicated language skills like writing can be made possible using animation through controlled classroom practices (Sanderson 4). The researcher also referred to a book in which the writers argue that writing skills has not been given much attention in second language classroom until recently. Through the advent of the audio-lingual method, the writing part has been given less attention by educators.

Second language writing shall be given same importance as oral practices in second language classrooms. Considering writing only as a subskill will leave children behind in their professional careers. More sophisticated modes of teaching shall be adopted for transacting writing skills as it is a much more difficult task for teachers. In no case, can writing be neglected in an English classroom (Barbara, et al. 287-310). Baglama and Yikmis argue that the use of animation has gained much attention from both teachers and learners. The study focuses primarily on the use of animation for teaching children with special needs. The essay puts forward the idea of animated movies as a powerful platform for teaching individuals with special needs. The study also examines the possible benefits of animation for enhancing the learning output of the focussed group of learners (660-667). In another article, the writers highlight the importance of integrating technology with traditional classroom practices for better transaction of lessons. Teachers must try to adapt students with interactive learning strategies so that the involvement of the learner can be ensured. The study presents visual learning as a means of great learning possibilities when compared with traditional practices.

Developing visual learning materials for students to create a proper learning atmosphere and qualitative instructional style shall be given prime importance in the modern era. The study also evaluates the ability of children to acquire new knowledge and skills through visual learning. Integration of visual learning materials like animations with verbal instructions is a blended approach learning. This blended approach enhances students' ability to acquire knowledge and skills, the study concludes (Islam et al. 43-51). Kumar et al. point out the importance of 3D animation in teaching learning process. So many multimedia tools have been developed and applied in classrooms. 3D animation clips with proper interaction with the part of teachers can be used more effectively. Interactive videos, mobile phones, social media etc. can also be used as powerful means of communication. One of the main characteristics of animation is that the materials can be easily downloaded from the web and used appropriately. Though many multimedia learning materials are available for students to teach difficult subjects and concepts, educators need good 3D animation videos to attract the learners to easily understand the content, as the study sums up (397-399). The study of Ajith shows the need for animation in the teaching and learning

process. The study looks at teaching English poetry using animated videos. It explores the effectiveness of animation in teaching English poetry very efficiently in Indian classrooms. Animation has proven to be a great success in teaching complicated poems very easily without losing their main ideas. An educator is expected to devise meaningful instructional strategies to transmit the content that will arrest the attention of the learner and help the teacher to delineate the ideas comfortably. For this purpose, animated movies are more effective and dynamic than verbal communication (65). Cartoons can be used at any time during the teaching and learning process if they are relevant to the topic. Cartoons keep the learners occupied and alert during the discussion of a particular topic. She observes that the impact of cartoons is immediate and learners can respond immediately to a particular point under discussion. Cartoons mostly attract the learners and help them understand the topics with ease and interest. Integration of technology along with verbal communication is essential in a modern classroom, she observes (Sajana 1-6). In another article, the investigator read the discussion about the possible ways of teaching English grammar through animated movies. To a great number of English learners, many language elements are very difficult to understand. But the writer proves that such difficult concepts can be easily taught by the integration of animation with verbal communication (Mushthaq78). The research conducted by Ibrahim and Hameed incorporates neurological evidence by utilizing animated videos, supporting the notion that an enjoyable learning atmosphere is significantly more effective than one that is unpleasant. Their study emphasizes that younger learners should be given ample opportunities to interact with animation-based content to enrich their educational experiences (1415–1423).

Writing skills develop over the course of time and it requires much attention from the part of learners and teachers. The level of understanding of the learner and the way the text is explained decide the effectiveness of the strategy used for transacting a particular topic. As writing is a cognitive developmental process, more interesting and inclusive materials need to be used for getting a better result from the learners and educators (Ronald 1-12). According to Westrup and Baker, using a variety of resources in a classroom makes the learning process more effective. Seeing a picture or an object will be a more impressive and long-lasting experience than reading a text. In areas

where the classes are large, resources are limited, and expert teachers are not available, the use of computer assisted teaching learning materials will have a great impact on classroom interaction. We know that learners are very different from place to place and a teacher is required to cater to the need of all learners in the classroom (1). In an English Classroom, using English while teaching English shall be given prime importance. The medium of instruction is very important in enhancing the language skills of students. An adequate learning environment where the students get a chance to use the language is highly required to improve the language competencies of students (Jane 1-8). Beck et al. assert that the instructional strategies prioritized by educators play a crucial role in the development of students' writing skills. The careful choice of the mode of instruction directly affects the quality of written output generated by learners. It is essential for teachers to recognize and implement suitable classroom strategies that support the advancement of writing abilities beyond the prescribed textual content (68–71). Additionally, the function of working memory is considered vital in strengthening the writing competencies of young learners acquiring a second language. The study further investigated the possibility of those instructional strategies that can be devised to supplement the interest of children. In this research, the investigators identified that students were more comfortable with email writing and integrated listening-writing tasks, which proves that computer assisted language learning will be a plus point for a second language learner. (Marije, et al. 31-45). The effect of Automated Writing Evaluation (AWE) on writing is also a matter of fact for any researcher. It is a popular form of educational technology to assist writing instruction and feedback. The study proved to be positive and assessed that automated writing evaluation strategy can influence the quality of writing of a second language learner (Stevenson, et al.51-65). Naishtat, et al. studied that personal writing empowers learners and improves their critical reflectivity. They argue that personal writing encourages students to undertake the challenges posed by social evils and helps trainers to develop their own (2). A study carried out by Derya, et al. about the importance of learners' ability in writing found that their academic achievement decided the texts they produced in English. The study also highlighted the factors affecting students' ability to write (88-103). Another study about the possibility of using attractive videos to promote the autonomous learning of students proved that videos including animations

can influence students of all ages, and they will positively affect the skill acquisition of children. Difficult language skills like writing can be enhanced with the help of videos and animated movies. Acquisition of language skills can be achieved easily if the strategy of transaction is able to develop the autonomous learning of students. English teaching is normally a great challenge especially in a big classroom. As individual attention cannot be given in such cases, videos can be used to transact the lessons effectively. The study investigated how to integrate videos in EFL classrooms to promote autonomous learning and thereby improve language skills, including cohesive writing. (Khotimah 73-78). Syarif studied the importance of cohesion in the writing skills of students. Study proved that cohesion in writing is not an easy task for students. The investigator discusses different task-based strategies to improve the cohesive writing skills of children (3). Javadi studied the key issues faced by second language learners in writing. The study states the difficulties confronted by both teachers and students in teaching writing skills and the possible solutions that can be followed by teachers and students. The study investigates the importance of writing skills and states that writing skills are a must for students for their academic success. Students who are weak in writing and academic performance are at risk. The study further investigates different approaches to writing like the behaviourist approach, contrastive rhetoric approach, etc (15-25). Another study analysed the issues faced by foreign students in English writing. The investigator points out the importance of a continuous assessment criteria to check the improvement of learners in writing skills (Askita 371). Aryadoust investigated the importance of writing subskills in testing English as a foreign language. The study put forward the idea that while testing the effectiveness of teaching English as a foreign language, the level of the learner in acquiring writing skills shall be given an important place. A student's mastery over the language is mainly assessed based on his ability to use cohesive devices accordingly (174-183). Johari studied the approach to teaching academic writing skills among second language tertiary learners. The investigator studied the effectiveness of task-based process in enhancing the writing skills of students. As writing skills is a tedious activity for many of the second language learners, a teacher shall resort to task-based activities to motivate the children to write in English (1-20). Sandra investigated the effectiveness of the Writing Assessment Measure (WAM) for assessing the narrative writing of children. WAM was developed

to replicate the skills that children of different abilities are anticipated to realize in written expression (2). A book on the influence of animation on children reveals a model of how young pupils consider animation and machinima as learning platforms and how creativity is encouraged in a class where these strategies are used. The book considers animation both as a popular medium and as an art. The author argues that 3D virtual worlds are an attractive springboard using which the creativity, imagination, and fantasy of young learners can be developed (Britta 2-19). Ran analyses the history of English language teaching in India. The importance of English as a link language or as a world language encourages Indians to learn the language with enthusiasm. This book suggests different approaches and techniques to be applied in second language classrooms to get better result (12). According to Soni, the benefits of using multimedia in the language classroom are manifold. While lessons are transacted through multimedia that includes visual and auditory information, learners get authentic language. Another benefit of multimedia is that it helps learners to construct knowledge enthusiastically. The long-lasting influence of visual lessons will help learners to retain the content and concepts for a long time. It also maximises the multiple intelligences of young learners (2-8). Bram stated that writing means trying to produce or reproduce the written message (Bram 7). John M. Swales and Christine (34) describe writing as a multifaceted socio-cognitive activity that entails creating documented messages on physical surfaces such as paper or, in modern contexts, on digital platforms like computer screens.

McCrimmon (1984:6) says that writing is hard work. But writing is also an opportunity to convey something about yourself, to communicate ideas to people. Harris (10) defines writing as a process that occurs over a period, particularly if we consider the sometimes, extended periods of thinking that precede creating an initial draft. Freedman, Pringle and Yalden (2) as cited in Corbet (2), define writing:

.... that writing was not studied in the schools; for in the meantime, as suggested above, there had arisen that very limited tradition of composition teaching which is so familiar to all of us in first and second language situation, with its emphasis on correct usage, correct grammar, correct spelling, and its focus on the topic sentence, the various methods

of developing the paragraph.....and the holy trinity of unity, coherence, and emphasis. (626)

From the above observations, we can conclude that writing is a process of writing one's thoughts and ideas into a well organised text. It is a process of arranging thoughts, ideas, and feelings into letters, words and sentences that invokes a set of grammar rules, spelling, vocabulary, punctuation, and cohesion.

A teacher must be creative and innovative to produce the best results in students' writing skills. Still, many second language students find it difficult to comprehend the text, and it causes many problems in the teaching and learning process. Traditional classroom teaching and students' understanding level of a text and their ability to write with proper grammar, spelling, vocabulary, cohesion, and punctuation are to be addressed with a much developed and innovative way of integrating multimedia into classroom practices. The study of Hendri Setiyawan et al. proved that multimedia can increase the interest and attention of students and thereby help improve the quality of the teaching process. When a teacher properly integrates animated videos and other visual texts into regular classroom practices, it will help to save time and will help teachers to drive home difficult and complex language tasks easily.

Many students take a long time to start writing. Still, many children need the help of their peers to familiarise themselves with the text and get a proper start. These problems are usually caused by students' difficulties in using appropriate words. In other words, a lack of adequate vocabulary is a major hurdle for many students in writing. One solution to solve such a problem is to implement animated videos in second language classrooms. Studies prove that animated videos can improve students' writing skills.

According to Nunan (1993) videos can bring a directness and proximity to the relative artificiality of the classroom. It can help English language teachers to provide genuine interaction in the classroom and to absorb aspects clearly when animated videos are used as instructional tools. A study by Hendri Setiyawan et al. also proved that a second language learner face many difficulties while writing in English in the

initial days. The main obstacles are that they are shy, nervous, and afraid and in most situations, they are unconfident. The main reason behind these problems is identified as a lack of adequate vocabulary, grammar, punctuation, and spelling. Students opined that they did not have enough vocabulary to form sentences and paragraphs. Also, many students dislike English writing classes as teachers follow the same procedure in every class. The normal English classroom where tedious and routine activities are carried out continuously, makes the students feel they are practicing a Himalayan task. Also, students expressed their willingness to attend classes where the teachers successfully used animated videos as teaching aid and instructional strategy. As a result, their ability to express themselves improved significantly, allowing them to participate more actively in discussions. This confidence not only enhanced their communication skills but also fostered a collaborative learning environment where everyone felt encouraged to share their thought.

Many researches proved that animation can increase students' motivation levels. They can make the class livelier and more interactive. One of the major benefits of animated videos is that they allow the viewer to see non-verbal communication such as facial expressions, emotions, gestures, and different postures. Another major benefit of computer-generated imagery animations is that they are rich sources of communication. Audio and video recording are types of ethnographic observation that are like and different from written ethnographies. This enhancement occurs as students engage with visual storytelling, which helps them better understand narrative structures and vocabulary usage. Consequently, their ability to express ideas coherently and creatively in writing also increases. It is proved that in second language classrooms, where the instructional strategy is animated videos, can improve the writing skills of students. Students can explore their ideas easily by watching animated videos. Also, they can organise their ideas coherently using proper structure. Moreover, proper intervention in English classrooms through theme-based animations can enhance the grammar aspects, and students will be able to write grammatically correct sentences. It will also help them to punctuate in proper places. They can also use correct spelling in written texts.

Multimedia or digital learning resources help learners to get on well with mental representations of different topics that will otherwise feel complex and difficult for students. A software tool can be used to expand teaching and learning processes in various fields, especially in the teaching of English as a second language. Studies prove that in second language classrooms where digital or multimedia tools are effectively used as a transactional strategy, the result of students learning output is ostensibly positive and progressive. One of the main characteristics of multimedia is that it ensures a better understanding of the content. It also helps students to simplify abstract content. Learners can select suitable platforms to pace with one's own speed and convenience.

Many studies have demonstrated that there are positive results observed in students who are exposed to both words and visuals than those who are taught only through words (Mayer 45: Chen and Liu 670). The visual impact of computer-generated imagery-based animations in this regard is far ahead of mere textbooks. The visual appeal is more emphatic and helps children analyse the complex contents with ease. Further, it helps them to interact with imaginary characters and widen their imagination. Teachers who make use of the strategy will be able to introduce different topics to children by demonstrating them. Animated videos can stimulate group discussions and pair work. It also helps teachers to make English classrooms livelier and more interactive. Teachers who even handle other difficult subjects like mathematics can also utilise the possibilities of animated videos in their respective classrooms.

Following are the benefits of using CGI animated videos in second language classrooms.

1. Animated videos can stimulate students' interest in learning the English language with interest
2. Teachers can turn abstract content into concrete concepts using animated videos.
3. They will help teachers to assess learners' levels and identify their progress in the study
4. Multimedia enabled classrooms can present large volumes of information within the stipulated time frame without much effort.

5. Appropriate use of information and communication technology in English classrooms will transform the learning environment from teacher-centred to learner-centred

Technology is evolving day by day and researchers in the fields of education and information and communication technology constantly study how ICT can be integrated in education for the enhancement of different skills of students.

Research conducted by Guan et al. highlights that a significant advantage of information and communication technology lies in its ability to establish a multimedia learning setting within EFL/ESL classrooms. A multimedia learning environment refers to the use of multiple forms of media—such as visuals, written text, graphics, illustrations, audio, video, and animations—typically supported by technological tools, to enhance students’ conceptual understanding (102). This type of environment is effective in boosting learners’ engagement with the target language, enabling them to absorb more content-related information and deepening their comprehension of spoken input, while simultaneously fostering their creative writing skills. Numerous extensive studies in this field have demonstrated that integrating ICT-based multimedia tools, particularly those featuring animated videos, positively influences student academic performance.

Abdulrahman et al. (5) stated that “the use of the computer-based techniques as an interface between students and what they are learning with suitable fonts and design can be very valuable”.

Strassman et al. (78) emphasized that acquiring essential 21st-century competencies such as reading and writing can be most effectively supported through the integration of digital technologies, including television, the Internet, and platforms like YouTube. They concluded that multimedia resources offered by ICT tools can significantly enrich both formal and informal English writing experiences, making the learning process more dynamic, engaging, and inclusive. The possibility of animated videos as sophisticated multimedia tool can be effectively utilized to create a suitable digital learning atmosphere for second language learners with precision. This can be

achieved through interactive tools and platforms that encourage collaboration and engagement among students. Additionally, incorporating diverse literary resources can inspire students to express themselves more freely and enhance their overall language proficiency.

We know that English is the most important foreign language. It is the gateway to many subjects and people from all walks of life, whether they are students or professionals trying to get mastery over English. Teachers and students approach learning the language for better career opportunities and self-development. Though the four language skills need to be focused on in the target language, difficulty in writing skills in most situations demotivate students which in turn adversely affects the learning outcomes of second language learners. Alobaid studied that there is a positive association between the development of students' writing fluency and their engagement with multimedia learning environments using information and communication technology tools, including images, videos, animations, etc (60). The rapid advancements in the field of information and technology have forced the teaching community to shift their focus from traditional classrooms to multimedia integrated gateways to keep the interest and motivation level of students high and the learning outcomes picture-perfect. Learning outcomes are affected by many factors such as curriculum, teacher competence, suitable learning environment and instructional strategies and methods. Low student motivation will affect learning outcomes in many ways. When we speak in terms of creative writing of students, the prime concern of a teacher must be to devise techniques to develop the ability and willingness of the students to learn. Students will be encouraged to study when they have good motivation to learn. The learning medium is a very influential factor in this regard the best strategy being the implementation of information and technology-based classroom transactions. Computer generated imagery animation based cognitive pedagogy can be effectively used to increase the motivation level and interest of students in second language classrooms thereby improving their creative writing skills in English.

Researches carried out to check the effectiveness of animated videos as learning media has proved many facts. First, in traditional classrooms where students are exposed to textbook information and paper and pen methods, the interest level of

the learners is very low. This is because of the recurring classroom atmosphere where students witness the same strategies. However, in this setting, the pressure to keep up with the pace can lead to frustration and disengagement. Consequently, educators must adapt their teaching strategies to ensure that all students can participate meaningfully and develop their reading skills at their own pace. But the case of writing is a bit difficult for many. This requires proper remedial measures, and the teaching community must seek the possibility of computer-generated imagery-based animations as a powerful medium to motivate children to write creatively. As indicated earlier based on several studies, animated videos can motivate learners to interact with peers and face language challenges effectively.

With the introduction of new electronic devices, technology is always evolving and has assimilated into society worldwide. “Technology has been an integral part of the educational environment” for the last 200 years (Stewart et.al., 5). With the increasing availability of this technology, the classroom has adapted to them. Radio and cinema were the first electronic media to be used in classrooms in the 1930s. The use of television and video in the classroom did not begin until the 1970s. It took forty years to transition between the two distinct media, which is a lot slower than the current rate of technological advancement. Just ten years after television and video mediums were introduced, computers emerged as the dominating new medium in education during the 1980s. Mobile technologies have become more and more ingrained in society over the past thirty years, which has resulted in a greater integration of these technologies into education. Technology integration in the classroom has also been impacted by the Common Core Standards’ introduction in 2010.

During the early development of computer graphics in the 1970s, key issues that needed resolution involved visibility algorithms and methods for geometric modelling. At the time, a computer capable of executing one million floating-point calculations per second was extremely expensive, often costing several hundred thousand dollars. This limited the complexity of computer graphics, making it impossible to accurately simulate real-world physical behaviours. Additionally,

possessing even one megabyte of RAM was rare and regarded as an expensive asset. Physically based approaches have become feasible because of the increasing capability and decreasing cost of computers, which allowed for the consideration of more computationally demanding rendering techniques. Blinn's law, which states that "as technology advances, rendering time remains constant," succinctly explains this evolution. Jim Blinn's concise remark encapsulates a crucial limitation: a finite amount of processing time may be allocated to each image out of a predetermined number that needs to be produced. The greatest computation per image is inevitably constrained because one has a finite quantity of computation available and a certain amount of time before rendering must be completed. Blinn's law highlights the ongoing disparity between the visuals that users can produce and the ones they aspire to create. Instead of using enhanced computational power to speed up the rendering of existing scenes, content developers have consistently leveraged it to produce more intricate visuals by employing advanced rendering techniques as hardware performance has improved. Rendering continues to fully utilize all available processing resources. It is common knowledge in science, engineering, and architecture that computer graphics facilitates visualisation; it makes complex shapes like enzymes, spacecraft trajectories, architectural designs, and paintings easier to understand. The idea underlying this argument is that "spatial thinking," "visualisation," and associated abilities are innate - the computer word for this is "hard wired" - and unrelated to past developments or specific technological advancements. The assertion that computer graphics must provide replicas of reality for their validity hinges on two intertwined factors; Western art history renders an inherent connection to the principles underlying computer graphics. Even when they go unacknowledged, the expressive meanings, creative techniques, and customs of that genre continue to support advancements in computer graphics.

Although the phrase 'computer graphics' is ambiguous, it primarily refers to the process of creating images using computers. Because computers are so widely used now and because having a good graphical user interface has become standard, computer graphics are important and should be thoroughly researched (215). These days, they are an essential component of many specialised applications that use their visuals to meet

specific needs, as well as image- or vision-based systems of any kind. This abrupt expansion of the field into a large domain has been made possible by the numerous specialised hardware and software developments that have been made with computer graphics in mind over the last two or three decades. In addition to its connection to computer science, it has permeated artistic forms profoundly. User interface design, rendering, ray tracing, geometry processing, animation, vector graphics, 3-D modelling, shaders, and many more topics are all included in this broad discipline. William Fetter, a Boeing graphics designer, first used the word “computer graphics” in 1960. Since the release of Ivan Sutherland’s PhD thesis on the MIT Sketchpad program, this word has become widely used. The creation and manipulation of digital images using computers is known as computer graphics. The first completely functional interactive Graphical User Interface (GUI) was Sutherland’s Sketchpad, which allowed users to draw primitives like circles, lines, and polygons and execute actions like zooming and clipping them using a light pen. Ivan Sutherland gained notoriety as the “Father of Computer Graphics” when he created Sketchpad. Despite using antiquated hardware, such as a monochrome Cathode Ray Tube (CRT) monitor and a 64KB Lincoln TX-2 computer, Sketchpad attracted many researchers who were interested in investigating the potential of graphical user interfaces. Although Sketchpad was only available in two dimensions in its initial version, Timothy Johnson added support for three dimensions to it in Sketchpad 3.0, which was released a few years later. The four well-known viewpoints that comprised the CRT display were orthographic front, top, side, and perspective. Sutherland created the first head-mounted display, which replaced the original camera equipment with computer-generated graphics that enabled remote viewing after Sketchpad was created. These days, most people refer to this gadget as a virtual reality device. Eventually, Sutherland’s work on hidden-surface removal algorithms became well-known due to its ability to resolve important rendering and display technology issues. The implementation of parametric surfaces, hidden surface removal methods, and the use of homogeneous coordinates for point-to-vector differentiation were made possible by later developments in raster algorithms. These developments significantly facilitated the development of projective geometry within the realm of 3D graphics. A wide range of sectors have been using computer graphics

more frequently during the last ten years due to advancements in modelling techniques, computer hardware, and software.

Computer graphics can be said as the primary apparatuses used to present data or art to the viewer in a meaningful way. They are also used to process real-world data, such as images or videos, with image processing. All visual media have undergone a revolution thanks to the field's unexpected advances, with video games, movies, animations, and ads being the most widely recognised examples. Visual aids, such as graphs, are always simpler to understand and comprehend of than complex statistics or the facts they are intended to represent. They are a commonly utilised format for information delivery since they are simple to understand. This may all now be computer created with the aid of computer graphics, making the clearly understood form more widely available and accessible. The evolution of computer graphics has its roots in the advancements made in electrical and electronic engineering, as well as in the increasing capacity of visual display technologies to render artistic content. These early developments, which began in the early twentieth century, laid the foundation for the sophisticated graphics systems we see today. Nevertheless, computer graphics emerged as a distinct and transformative field only during and after the Second World War, when military applications accelerated technological innovation. During the 1950s, key breakthroughs such as the invention of the light pen as an input device and the practical application of the cathode ray tube as a display interface significantly advanced interactive computing. A landmark moment occurred in 1968 with the introduction of the original ray tracing algorithm-a method that has since become fundamental to the pursuit of photorealistic rendering. This technique simulates the physical behaviour of light as it travels from a source, interacts with objects, and reaches the viewer's perspective, thus producing lifelike images that enhance visual storytelling.

Technology is changing how literacy is defined, how instruction is done, and how new strategies to engage readers are always being invented. New literacy practices that mirror social behaviours have been prompted by technologies (Race 93). Mobile technology has transformed social connections for teenagers and young adults by altering how people engage and communicate with one another. Social media and internet access give people additional

means of isolating themselves from viewpoints or concepts that unnerve them and of avoiding social situations (Clough et al. 64). Increased social isolation brought about by the social shift has made it simpler for people to avoid those who have opposing opinions and to maintain ties with those who share them.

Technology empowers students with greater options for active participation in language learning activities, fostering a more equitable learning environment. Teachers must therefore be able to use it in the classroom. Students' preferences for the kind of classrooms they feel most comfortable in are influenced by their learning styles and motivating ideas. When the online learning environment is deficient, teachers try to ascertain the students' motivational beliefs and learning strategy preferences. Therefore, learning techniques are linked to self-regulated learning, which includes both cognitive and metacognitive strategies. When they were unable to participate fully in an online course, they discovered that students tended to choose for traditional learning since it accommodated different learning styles and offered a greater variety of instructional tactics. It follows that the availability of technology would have an impact on how the student employed techniques.

The affordances and competencies of the technology in their environment have an impact on how students use it (Egbert 61). Conversely, despite having the same gadgets or other technology available to them, students do not possess the same proficiency with technology. Furthermore, students may choose not to use a particular piece of technology even when they are aware of its potential to enhance their education (Bikowski and Casal 47). Though it can improve learning, technology also has drawbacks that need to be considered. It must be used wisely by both teachers and students. Before they can incorporate technology into the teaching and learning process, they must first understand how to use it. It has been noted that students ought to have had the chance to practise and expand their ICT skills by using the technology to enhance their education and find a variety of educational resources (Adams and Brindley 50).

The concept of writing fluency is interpreted differently based on the perspectives of various scholars. According to the research conducted by Atasoy and Temizkan, writing fluency involves the capability to present a topic in a coherent and structured way that preserves the writer's original intent without causing misinterpretation for the reader. They assert that fluency is the defining element of a coherent, purposeful, and easily understood piece of writing (45).

Writing serves as a vehicle for expressing one's thoughts, viewpoints, and ideas. Nevertheless, as highlighted by Gayed et al., English language learners across the globe face significant challenges in achieving a high level of proficiency in writing, particularly in areas such as structural organisation and introspective content. Their study also points out that educational practices often emphasise basic writing skills like vocabulary memorisation and direct translation over more advanced ones (101906). Given the rapid evolution of the modern world and the continuous emergence of new technologies that are reshaping conventional reading and writing methods, it is crucial to develop innovative strategies that motivate learners to engage with and adapt to these dynamic forms of communication and information exchange.

Proficiency in writing is a fundamental communication need for all academic fields. It is essential for language learners because it enables them to write about their thoughts and experiences and express their opinions. However, several researchers, like Rahimi and Zhang, have found that many students struggle to express their ideas in writing because of their weak writing fluency (1052). The lack of writing fluency has a negative impact on students' academic performance.

Around the world, learning English is an essential task. People frequently invest time, money, and resources in learning it through various programs so they can converse, look for employment, travel, and recognise other cultures through viewing English-language films, TV shows, and songs. Moreover, there are numerous scholarships that demand a high level of proficiency in the language.

Even if nations and people recognise the importance of studying English, students still face numerous obstacles to overcome. According to William et al. there are a variety of reasons why these difficulties may arise, including the continued use of antiquated teaching techniques that do not meet modern demands or inspire students to learn; these techniques also frequently concentrate only on teaching grammar and vocabulary in a vacuum, devoid of any real-world context (188).

Students' limited opportunities for classroom-based English practice prevent them from using the language to its full potential. Their language fluency is affected by such obstacles. Rather, contemporary approaches view language as a tool through which students create meanings that support their active engagement and connection with peers and teachers. Students observe how using technology affects their writing in a variety of ways.

According to Lenhart et al. 73% of teenagers who use social media, text, email, instant messaging (IM), and other online communication tools believe that technology has little to no effect on their ability to write in school. According to the research that involved eight focus groups, 15% of teenagers believe technology has helped them write better, whereas just 11% believe the opposite. According to Lenhart et al. 59% of teenagers believe that using a computer improves their writing since it makes editing and revision easier. It is interesting to note that teenagers who saw using technology to communicate with friends as "writing" were more likely to employ informal writing styles in their academic writing (16).

More than half of the 80 college students studied by Drouin and Davis opined that technology was making it harder for them to remember normal English (49). Many consequences of technology use on student writing were discovered by researchers. Some students do acknowledge that technology has an impact on their writing; they disagreed with some of the purported consequences of research findings and agreed with others. Their word choice is

one of those impacts. Adams found that students who were used to interacting with peers online tended to avoid using terminology that was higher level since they were not used to it (80). It is starting to have an impact on their scholarly writing. Individuals are unfamiliar with using the word in academic settings since they do not utilise it in their daily lives.

According to a poll done by Adams in 2007, students also acknowledged that they do not give their writing much thought. Because they are so accustomed to multitasking on the internet, they find it difficult to focus on the task at hand. Their capacity to finish extensive and well-considered writing assignments is being impacted by this.

There are students who consider technology to be an effective learning aid. In a study, for instance, two sections of forty college students evaluated Google Docs' collaborative capabilities as high (a 4) and very high (a 5), and they did not score it any lower (Suwantarathip and Wichadee 150). Two student groups participated in the study; one worked on Google Docs in person with classmates during class, and the next team used Google Docs outside of the classroom. According to their responses, students enjoyed that they could exchange ideas, that using Google Docs encouraged collaborative learning, and that using it enhanced interaction. Results, however, showed that the students' knowledge growth was only minimal. The researchers found that there was no significant difference in the writing performance between the two test groups.

Sixty-eight teachers were polled by Carver regarding their opinions of technology use in K–12 classrooms. Teachers enrolling in graduate education programmes were given the survey. The survey inquired about several aspects, such as obstacles to adopt technology in the school curriculum, advantages of technology integration, and elements influencing the occurrence of use by educators and students. Of the 68 educators who took part in the research, 19% taught high school, and 74% were involved in teaching English or language arts. Carver discovered that the largest obstacles were the availability of technology (61% of respondents cited this as a barrier), its location (6%), the

length of the school day (6%), and the knowledge or abilities of the teachers (24%). The study's conclusions showed that teachers' opinions on technology varied (112).

In addition to the challenges, educators mentioned the advantages of utilising technology in the classroom. Technology, according to 59% of instructors, improved student engagement; 23% thought it improved students' comprehension of the subject, and 95% thought it improved differentiation. Teachers, parents, and students all have very different perspectives about writing and how important it is to leading a successful life. For instance, according to Lenhart et al. 86% of students think that writing well is vital for success in life, although just 56% would agree that it is necessary (14).

The percentage is significantly higher among individuals who write for fun, with 65% of them concurring that creative writing composition is necessary. A vast majority of parents agree that writing successfully is important, and they said that today's requirement for strong writing skills is higher than it was twenty years ago. Additionally, parents believe that their students write more now than they did in school.

Purcell et al. report that 92% of the 2462 teachers polled believed that "writing effectively" was a prerequisite for success in life and that writing was crucial for formal learning. Teachers, parents, and students all have differing opinions about the use of technology in writing (6).

As previously mentioned, most teachers would likely disagree; however, a considerable number of students do not perceive technology as having a negative effect on their writing. While some students are aware of these influences and can point out specific examples in their own writing, many remain unconcerned. In a study conducted by Lenhart et al., it was revealed that 64% of students acknowledged using informal writing styles in their academic assignments, 50% reported occasionally employing incorrect mechanics such as improper capitalisation, syntax, and punctuation, 38%

admitted to incorporating text-message shortcuts, and 25% confessed to including emoticons in their academic work (14).

Many people just use spellcheck instead of double-checking their work, according to Jackowski-Bartol. In general, students believed that their computer-generated writing was accurate and did not require editing. It seems that while students can identify characteristics that are inappropriate for academic writing - such as structural issues, a lack of vocabulary, and an overall informal writing style - they either do not consider these characteristics to be “negative” or do not care enough to alter their writing for academic reasons (245). Though some would disagree, most parents see technology as a good influence in their children’s lives. According to Lenhart et al. 27% of parents believe that their child’s usage of technology has made them a worse writer, whereas 40% do not notice any effect on their child’s writing (12).

According to Purcell et al. teachers’ opinions on using technology for writing in the classroom varied. They discovered that 94% of educators polled continued to support students in doing at least some handwriting. The responses to this question were very different. While some teachers chose to teach and assess writing using online resources, others continued to require students to do most of their writing by hand to avoid plagiarism or prepare for standardised testing (5). Interactive videos are major contributing factors that help students in the analysis of various subjects and evolve a deeper understanding of the study material (Dongsong Zhang et al. 125).

Williamson et al. investigated secondary students’ views towards research and plagiarism as well as how they used information at four different schools. Even when the material was new to them, the students they studied did not believe they needed to cite sources if they expressed it in their own terms (they were aware that they needed to cite the source when quoting directly from a source, though). Essentially, the students believed that a bibliography sufficed for internal citations when paraphrasing (265).

Regarding the necessity of citing sources, one of the study's participants said, "It was all elementary knowledge. For example, if it was detailed, but when I found it and added to it using a dot point, it was essentially written in my own words." Their research also revealed that among students who plagiarised, the majority did so more often from websites than from printed works. Students' work was greatly impacted by the internet's accessibility, as they perceived Google as a "one-stop solution for all of their information needs."

Teaching a foreign language involves a lot of important factors. These could include the students' aptitude for writing and reading as well as their comprehension of grammatical structures. Nonetheless, some linguistic features provide a language an air of fluidity or seem almost effortless. One could think of this chapter as fluency.

Fluency in the English language is one of the main goals of language study. Most people on the planet rely on English for interpersonal communication, employment searching, and sharing of ideas and opinions. Furthermore, Jones claims that fluency can be able to put words together into coherent phrases, much like pearls on a chain. To put it another way, the way the words flow is significant (42). According to Tavakoli et al. language fluency has been the subject of an increasing amount of research in recent decades because it is crucial for the development of communication skills and for the evaluation of learners' competency (381).

To examine the impact of the English Language Learners Instructional System (ELLIS) on students' oral, written, and reading performance, Beaird conducted a research study titled "*The effects of computer-assisted language learning on English language learners with and without disabilities in an elementary school setting.*" The study also assessed teacher satisfaction with the use of ELLIS and other computer-assisted language learning (CALL) tools. The sample included 78 students from third, fourth, and fifth grades at a public elementary school, comprising both students with disabilities and those without. These participants were randomly divided into three

groups. Data were collected to address eight research questions focusing on the effectiveness of the ELLIS program. The analysis involved both qualitative and quantitative methods, using ANCOVA as the primary statistical tool (107).

Findings indicated that students with disabilities who received instruction through the ELLIS program performed at similar levels in oral, written, and reading skills as those with disabilities who did not receive instruction through ELLIS. Furthermore, the performance outcomes of students receiving paired instruction and those receiving individual instruction through ELLIS were comparable. Teacher feedback gathered through open-ended interviews demonstrated a high level of satisfaction with the ELLIS software.

Martin emphasizes that literacy remains a fundamental aspect of education, and that technology significantly influences students' cognitive and behavioural patterns outside the classroom. By equipping educators with diverse teaching strategies, we empower them to help students grasp pedagogical practices that more effectively integrate emerging literacies (160). Considering rapid technological advancements, it is vital that teachers are offered ongoing professional development to better motivate students and strengthen their ability to use technology as a tool for improving writing proficiency.

Since we already know that these technologies will affect our children's success in life, as Leu contends, perhaps more time and effort should be spent studying teachers' aspirations and capacities to see novel applications for emerging technologies in literacy instruction (215). To successfully create a school literacy culture, Sternberg concurs with Halsey that professional development should be a continuous process in the classroom and that it is vital for all teachers.

According to Davis, individuals utilise technology only to the degree that they think it will improve their performance at work or that it will benefit them. In other words, people would only utilise computer technology if they thought it would have advantages (320). Through three categorisation levels—job effectiveness, productivity and time savings, and the significance of the

technology to people's jobs—Davis went on to explain the perceived usefulness of a technology. According to Davis, perceived utility and perceived value are similar. Therefore, the perceived benefit of utilising new technology is known as perceived usefulness. People assess a new technology's use in terms of its perceived usefulness and decide whether to embrace it depending on how desirable they find it to be.

According to Larbi et al. attitude refers to a person's level of interest in a certain technology, and it directly influences both the intention and the actual use of that technology (138). The intention to accept a technology influence how much acceptance it receives over time. Given that attitude towards a behaviour can predict intention, it seems sensible to assume that students who have good attitudes towards using tools and apps to improve their academic and technical writing skills will eventually embrace using them. Given that attitudes seem to play a significant role in determining whether people accept a technology, it is critical to comprehend how people feel about it.

People's attitudes might often be more influential in the process of absorbing new technologies than their skill set. A student's mindset can be more important than their technological knowledge when it comes to taking action to increase writing proficiency utilising technology. Typically, computer technology majors with strong IT backgrounds have had a negative attitude towards academic writing. Thus, a key indicator of students' behaviour in this area should be their attitude towards using technology to improve their writing abilities. Any study on how computer technology students use technology to better their writing should consider how they feel about writing in general and about utilising technology specifically for writing.

Chien-Yu conducted a study to evaluate the effectiveness of implementing computer-assisted language learning (CALL) technology within an English for Specific Purposes (ESP) training program. The use of CALL technology is becoming increasingly prevalent across both public and private sectors, as well as in educational institutions, whether through online ESP training programs or in traditional classroom

environments. It is essential that all stakeholders involved in ESP instruction examine the effectiveness of incorporating online CALL platforms into both conventional classroom settings and remote learning contexts, as part of their responsibility to enhance students' learning experiences.

The study employed a methodology that included evaluating participants through pretest and post-test assessments specifically aligned with the ESP training objectives, to determine the impact of a corporate ESP instructional initiative (67). The participants were a cohort of eighteen adult Chinese male trainees engaged in an Aviation English training course at a flight academy located in central Florida. The research utilized a one-group, pretest-post-test design, and the training combined online CALL technology with instructor-led sessions. Additionally, a comprehensive survey was administered to collect data regarding the trainees' demographic profiles, attitudes toward the use of CALL technology for English acquisition, motivations for language learning, and perceptions of CALL as a means of enhancing student interaction. According to the study, participants' test scores significantly improved two months after blended learning was included in the Aviation English training program.

Pre- and post-two-month Aviation English training program participants typically expressed good opinions towards studying English via CALL. Prior to and following the training program, they also held favourable opinions about the role that CALL technology played in fostering classroom interactions. Additionally, the study discovered that participants who thought well of CALL as a tool for fostering classroom interactions also tended to think well of CALL as a tool for learning English.

Dellario (23) explored the impact of Computer-Assisted Instruction (CAI) on foundational skills among at-risk ninth-grade students, particularly in mathematics and English. The purpose of this research, designed using an ex post facto approach, was to determine whether integrating CAI in basic skills courses led to measurable improvements in students' academic achievement. In addition to academic outcomes, the study investigated three behavioural and engagement-related variables commonly linked to high-risk students: dropout rates, behavioural issues, and school attendance.

The study included 384 ninth graders from four high schools located in two urban districts, with data collected by school staff. Standardized assessments used in the research included the Metropolitan Achievement Test, the Nelson Reading Test, the Stanford Diagnostic Mathematics Test, and the California Achievement Test. The findings provided valuable insights for educators and future research, emphasizing that CAI has shown promise not only in enhancing academic achievement in certain areas but also in contributing positively to student behaviour and school engagement. These results are instrumental for shaping future decisions regarding the integration of computer-assisted learning strategies in education.

In another study focusing on linguistic pragmatics, Dewberry presented a compelling framework for implementing computer-assisted instruction within English as a Second Language (ESL) learning, emphasizing the integration of pragmatics into the instructional content. This research examined the theoretical underpinnings of linguistic pragmatics to build a coherent structure and clarify relevant terminology. It subsequently detailed the design and preliminary evaluation of a Computer Assisted Language Learning (CALL) module specifically aimed at teaching pragmatics to ESL learners. The study selected the passive voice as its primary instructional topic. As a result, it offered a pragmatic theory that was not only made accessible to learners but also operationalized through a CAI model that embedded pragmatics into ESL instruction. Ultimately, the study concluded that effective development and implementation of CAI should involve an adapted systems approach that accounts for the nuances of pragmatic theory (17).

A study titled *“Computer-Assisted Instruction (CAI) as a Teaching Tool for Occupational Therapy Education: A Guide to Understand CAI Design and Effectiveness”* sought to compare the efficacy of CAI with traditional instructional methods in the context of occupational therapy education. The research comprised three consecutive studies to analyse this comparison in depth. The findings provide valuable guidance for educators in the fields of occupational therapy and other allied health sciences by clarifying the potential benefits of CAI tools. Analysis indicated that CAI was more effective than traditional classroom lectures in delivering both theoretical knowledge and practical competencies. Moreover, it was observed that under a learner-

centered approach, CAI was able to present instructional content more efficiently and quickly (Galvis 45).

Longberg's research titled *"Evaluation of Imagine Learning English, A Computer-Assisted Instruction of Language and Literacy for Kindergarten Students"* used a 2 x 2 crossover design to assess the effectiveness of the Imagine Learning English (ILE) program. This CAI-based program was evaluated for its impact on receptive vocabulary and early literacy development among 284 kindergarten students, including English Language Learners (ELLs). The results from within-subject t-tests revealed no significant differences in learning outcomes between students participating in the ILE program and those engaged in regular classroom activities, regardless of the time devoted to the CAI intervention (52). These findings were consistent for both general kindergarten students and the subgroup of ELLs. Nevertheless, the study identified a notable period effect, demonstrating that students showed greater gains in language and literacy when instruction—whether CAI-based or traditional—occurred during a structured instructional period compared to time spent outside of such periods.

Merkel carried out a study to examine the role of CAI in teaching English to speakers of other languages. Employing an analysis of variance, the research evaluated how incorporating CAI into a traditional ESL curriculum influenced reading proficiency. Conducted at an intensive private English language school, the study compared test results from a control group receiving standard instruction and an experimental group receiving additional CAI support. The primary assessment tool used was the Test of English as a Foreign Language (TOEFL). Results showed that students in the experimental group, who had access to CAI resources for reinforcing reading skills, achieved higher reading proficiency scores relative to their total test scores than those in the control group. These findings underscore the effectiveness of CAI in enhancing reading outcomes for ESL learners (17–20).

A 2005 study titled *"Is Computer-Assisted Instruction an Effective Tool in the Reading-Writing Classroom?"* investigated the value of CAI across various software applications, with one newly developed software being tested and analysed (Nuno 12). The study involved 60 students and focused on the application of CAI within the realms of reading and writing instruction. One of the featured programs, Zoo Phonics,

addressed the 42 phonemes in the English language and encouraged students to use phonetic spelling to express spoken words. The experimental design included two kindergarten classrooms, each consisting of 30 students. The study's outcomes strongly supported the conclusion that CAI holds significant value and effectiveness in modern educational environments, particularly for enhancing early literacy development (Nuno 35).

Ibnian investigated how brainstorming helped first-semester secondary school students improve their EFL essay writing abilities. It examined the abilities required to write essays as well as the impact of brainstorming. A pre-post mode essay writing test, a score scheme, and a checklist for determining the necessary essay writing skills were the instruments used in the study. The results indicated that it had a favourable influence on students' essay writing abilities, especially regarding writing mechanics, language use, content organisation, and skills derived from creative rational (originality, eloquence, flexibility, and explanation). It was discovered that it was very beneficial in allowing students to generate ideas, share viewpoints, and cement fresh ideas on the necessary subjects. In addition, it helped to increase students' motivation because they were informed that they would not be judged during the brainstorming process and could participate in the learning process by openly sharing their thoughts (264-266).

Research by Sullivan and Pratt compared the effects of a computer-assisted classroom versus a regular classroom on learners' ESL writing. Three factors were examined: writing quality, writing anxieties, and attitude towards using a computer for writing. The results showed that attitudes towards computer use and writing anxieties were unaffected by the writing environment. Nonetheless, in a classroom with computer assistance, writing quality increased. According to the study, instruction using computers also reduced the importance of teachers in conversations involving large groups of people and students found it easy to focus during peer group sessions by allowing for more remarks (493).

The significance of “Computer Mediated Communication (CMC)” in the instruction of English writing abilities was expounded in research. The conversation provided insight into the variety of writing-related tools available. The paper included a variety of synchronous and real-time communication methods. The technologies that are highlighted in the article for writing include web-based bulletin boards, synchronous instant messaging, internet-based chat, asynchronous email, and hypermedia (multimedia, hypertextual) authorship (Warschauer 910).

Research on the influence of interactive whiteboards on ESL essay writing was carried out in 2010. After determining the students’ areas of weakness in writing, the study created a module. A two-group experimental design was adopted. A sample of sixty students was employed in the research, and they were randomly assigned to two groups: one was conventional (using the traditional approach), and the other was experimental (using a whiteboard). The study employed a writing attitude survey, an accomplishment exam, and a rubric to evaluate the micro skills of writing. The study’s conclusions indicated that 29 students need writing skills, and the experiment had no beneficial effect on the students’ writing proficiency. On the other hand, the experiment improved the way that students used the interactive whiteboard and their attitude (Albaaly 48).

The perception of students about the significance and purpose of finishing a learning task to enhance their academic and technical writing utilising technology are reflected in their motivation. Intrinsic and extrinsic motivation are the two fundamental dimensions that Berestova et al. described. The focus of intrinsic motivation is on the enjoyment, delight, and enthusiasm for the learning process; it can be directed towards acquiring knowledge or accomplishing a particular goal (46). According to Firat et al. the degree of autonomy, enjoyment, and satisfaction can also be used to gauge intrinsic motivation (15).

Extrinsic motivation in people describes learning as an objective that must be met to fulfill commitments and fulfill the role of responsibility for achieving that goal (Faridah et al. 91). Students in computer technology degrees will not be willing to work out of their assigned hours to develop their academic and technical writing skills if they believe that writing is not important in their technical professional sector.

Fillali claims that a wide range of viewpoints and definitions have been developed because of extensive research on writing (12). Writing, according to Widdowson, is the process of creating grammatically sound sentences that can be typed on paper. It is the process of converting spoken language into written symbols, necessitating an understanding of and proficiency with writing's linguistic components. This perspective, however, ignores the complexity of writing, which entails more than merely knowing syntax and being able to put words on paper (62). Conversely, writing is a complex cognitive task requiring the writer to manage multiple variables at once (Nunan 34).

Additionally, Levy and Randsell agree that creative writing is a complex task that requires authors to translate concepts into printed language, modify structure and mechanics, evaluate their work, and ultimately aim to produce a coherent message (86). This description emphasises how complex writing is, requiring the navigation of multiple cognitive processes to generate a written piece that is both cohesive and meaningful. For EFL students, writing is frequently seen as the most thought-provoking of the four language skills; listening, speaking, reading, and writing. It is a useful ability that calls for abilities to turn ideas and thoughts into coherent, well-spoken words.

According to Flower and Hayes, writing tasks can be understood as a unique intellectual process that authors use to construct their works. Writing well requires an understanding of language conventions related to syntax, vocals, punctuation, spelling, coherence, and cohesion (368). Writing is frequently seen as a creative instrument that helps students develop their critical thinking abilities by pushing them to use language in a way that invites

introspection. Furthermore, because writing is a social practice that involves audience concern, it can promote social development.

Revision of ideas and information is made possible by writing because, as Harris points out, writing makes concepts visible and palpable. Byrne asserts that writing is the most difficult language skill for learners to master, as it requires deliberate mental effort and allows for revision and refinement, since thoughts are externalized on paper and can be modified (57). He classifies the challenges that authors encounter into three categories. The first is a psychological issue brought on by the absence of communication and exchange of ideas between the author and reader. The second is a language issue since authors must utilise proper grammar while expressing their ideas. The third challenge is cognitive in nature since formal education is required to teach writing and help writers organise their thoughts for written communication. Writing proficiency is directly linked to other language proficiency, especially speaking, and reading (5-8).

Writing is different from speaking since it is a controlled form of communication and a necessary instrument for academic learning. Furthermore, unlike spoken language, which is transient, written themes can be remembered for a longer period because they are permanent. Comparably, reading is a great way for students to develop their style, thoughts, and correctness before writing. According to Krashen's reading hypothesis (1993), reading widely promotes the growth of a large vocabulary, enhanced writing abilities, better spelling, and a higher level of control over intricate grammatical constructs (River and Temerly 102).

Four phases are suggested by Steele for the product approach to writing instruction (19). Students examine model texts in the first step and pinpoint elements unique to each genre. For example, Students can learn about paragraphing and the vocabulary used in formal requests when studying a formal letter. Similarly, while reading a story, they focus on the techniques employed to make the narrative engaging and apply these elements in their own writing. For instance, students can

practise utilising the “I would be grateful if you would...” format when learning how to write a formal letter. Students organise their thoughts in stage three. Advocates of this technique contend that structure is just as crucial as concept generation and language control. In the last phase, students select a writing assignment and, utilising the vocabulary, grammar, and structure they have acquired in the earlier phases, create the work on their own, demonstrating their proficiency and fluency in the language. All things considered, the product approach has proven to be a successful strategy for enhancing EFL learners’ writing abilities, especially regarding precision and correctness.

Considering the interaction patterns that are developing in cyberculture draws our attention to online social networks, which are attracting a growing number of users - a trend that is unquestionably mirrored in offline reality (Alshammari 85). According to Almarwaey and Lim, a social network is a collection of personal connections made by people who have similar interests. Social networks are dynamically transforming their structure because of the flow of various interactional forms inside them (123).

According to Khatun and Al-Dhlan, networks offer sociability, support, information, and a sense of integration (1285). Aloraini’s study states that having access to reading materials is a social right and is crucial to exercising one’s civic duties. As a result, its relevance deepens and broadens knowledge, expanding one’s language, facilitating communication, training the mind, and raising consciousness (234). The readily available content on social media offers endless possibilities for the language development of adolescents (Pujati and Tamea 21) There have been significant alterations to the student profile, particularly regarding the textual content. The literature on social media use and how it helps students develop their academic English skills is presented in this section.

Part of the project involves leveraging the language and cultural exchange via social networks to support English academic learning that is primarily interactive and appealing to Arab students. Professors at universities

have recommended this approach since they now think social media can help students' language skills (Ahmed and Hassan 56). Researchers have long supported the collaborative building of knowledge through the pedagogical use of social networks to increase students' interest in learning, as evidenced by several efforts, including foreign language teaching (Salih and Elsaid 725). Literature on social media encourages academic continuity, horizontalizes, and positively narrows the relationship between educators and students (Alasmari and Zhang 2158).

The computer is the main piece of technology used in classrooms nowadays. The use of computers as a writing tool by young children is one potentially useful application. Young writers can produce visually appealing final versions and concentrate on spelling and content rather than handwriting thanks to computers (Green and Hannan 4). Immediate printing of extremely readable drafts by the computer has been credited with other advantages. When their work is nicely printed instead of illegibly handwritten, students may find it much more enjoyable to see it on paper and may be more inclined to share it with others. Writing may be seen by students as a meaningful form of communication with genuine personal value and as something in which they can take pride if they are able to produce polished reports, newsletters, and book for a real audience (Bruce et al.143).

Producing a clean, printed copy can boost inspiration and motivate writing for a larger readership. With the ability to edit, revision may be accomplished without time-consuming duplication, allowing educators and students to treat writing as a process that requires multiple drafts. It is also possible to get around certain spelling and handwriting issues (MacArthur and Shneiderman 248). Using a word processor to streamline the editing process can encourage students to work more freely and experiment with different ways of expressing themselves, even if they are aware that any writing can be altered at any time (Collier 149). According to him, there are certain benefits to using a word processor for revision as opposed to the more conventional approach of

copying material from one handwritten paper to another. Additionally, there does not seem to be any negative impact on revision techniques.

Another prevalent finding among students who use the computer is an increase in interest and interaction. The open format of the screen could encourage students to read each other's writing, which would increase peer editing and evaluation (Dickenson 357). Students in a sixth-grade classroom at a lower-class urban school in the northeastern United States participated in a study by Bruce et al. After seeing a show, the students were told to write a critique of the show using a computer for both the rough and final versions. Once they finished writing the rough text, the students returned to the computer to edit it. It was discovered that the students were more likely to read and discuss each other's papers when they had to wait around to use the computer (143).

Student writing was impacted by these exchanges in terms of both form and substance. Peer interactions during computer-based writing sessions and students' access to archived work by other students can also impact students' comprehension of the goal of writing as well as their feeling of audience.

One hundred eleven eighth-grade students were instructed to write a tale on the computer and another story off the computer in a study done by Owston et al. Two writing assignments were created. Students from a different grade eight class at the school who were not involved in the study pretested the assignments. The task administration protocols were improved because of this pretesting. They also had enough data from the student papers to determine that the tasks were similar enough to be regarded as equal. Two of these four factors - competence and mechanics - showed a substantial difference in favour of utilising the computer when competence, focus, support, and mechanics were assessed. WordPerfect, a word processing application, was used to calculate word counts. When lengths were compared using the Wilcoxon matched pairs signed-ranks test, it was discovered that articles written on computers were

much longer in their draft and final versions than in their non-final versions (270).

Studies also show that students who utilise computers are motivated by powerful factors. The effectiveness of word processing for motivation has been proven by student observations and attitude questionnaires (Bean et al. 412). The learning-disabled child's attention level and skill development have also shown improvements because of computer use. Students with learning disabilities who had struggled greatly to learn how to write responded favourably to word processing.

Within a few weeks of starting to write with, the youngsters in a study at MIT's computer centre moved from being completely rejected from writing to being intensely involved and seeing a rapid rise in quality. A room full of word processing computers fosters a sense of accomplishment among its users as well as a sense of community among authors, creating an almost perfect environment for collaborative learning. When word processors are used by students, good outcomes are routinely reported by educators and researchers (Suhol 33). According to Kleiman and Humphrey, when given access to word processors, learning impaired youngsters between the ages of seven and sixteen - many of whom had previously refused to write at all—began to write with zeal. Children “wrote more, edited more, and produced better compositions” after word processors were introduced in Canada's East York School (97).

According to Vygotsky's theory, knowledge is dynamic rather than fixed (Fageeh 31), and it is crucial for students to participate in a social setting to build their knowledge (Brown 118). This allows them to practise what they have learnt in the actual world. According to Vygotsky, several communities are essential to the growth of the learning process. He thinks that when students interact with social groups, they can learn new things. Because language and culture play a significant role in communication, this theory is seen as a collaborative learning theory (Brodahl, Hadjerrouit and Hansen 90).

After doing a meta-analysis study, Hillocks concluded that traditional grammar teaching was ineffective at improving writing skills. Consequently, it has been established that the traditional approach, which is still employed by most teachers today, is ineffective and does not assist all students. According to Grejda and Hannafin, using computers to teach writing reduces errors made by students, improving the quality of their writing, and making it easier for them to learn from the works of their peers (41). By effectively using computers for study, students can engage with one another anytime they wish, this is seen as a source of the learners' autonomy and self-confidence (Yang, Ko and Chung 285).

In their meta-analysis of writing research including students in grades 4 through 12, Graham and Perin found that using word processors resulted in participants producing writing of a higher caliber than writing by hand (446). Teachers must thus acknowledge the need to incorporate fresh, engaging approaches that draw students' attention to the need for excellent writing. Among these strategies is using social networks for educational purposes, especially those that cater to learners' requirements and are socially engaging (Blattner and Fiori 17).

Online writing instruction is crucial since the setting can be fully textual (Warnock 6). Students can be guided in this setting to learn how to communicate in their own terms, and this technology platform for communication gives them the chance to work together and engage with other students as well as their teachers. Additionally, this virtual setting offers writing instructors a special opportunity whereby these writing-focused online classes allow instructors and students to communicate outside of the classroom and assist them in forming a welcoming learning community by utilising technology. However, not every student will benefit from this, as some students would rather have in-person conversations. However, shy students may benefit from using these tools as they become more driven to interact with people on a social and professional level, which illustrates the true worth of education.

Many educational technology tools are available for use in the classroom to help students' language proficiency (Kasapoğlu-Akyol 112). For example, they utilise the internet and email to read technological texts to pique their interest in improving their reading skills, publish their work, and seek information. According to the study's findings, integrating ICT into language learning can help students transition from a behavioural to a constructivist learning style, which in turn embraces communicative pedagogy in the classroom.

In their study, LeLoup and Ponterio describe instructional technology techniques that can be utilised in English language classrooms to enhance language proficiency. which include, among other things, chat, audio and video conferencing, texting, streaming audio and video, electronic journals, the World Wide Web, search engines, and remote access to libraries and databases. The study clearly illustrates how these resources will improve instructors' technical proficiency (3).

Xiaoqiong and Xianxing (2008) employed a movie in addition to LeLoup and Ponterio's study to instruct students in English language proficiency. They found that learners become more motivated to actively learn the language when they are exposed to engaging videos and audio. Additionally, that this approach enhances students' pronunciation and listening abilities. However, integrating ICT into language instruction motivates and engages students in their education (58).

According to the findings of Kung and Chuo's study, "Students' perceptions of English learning through ESL/EFL websites," most students demanded recommendations regarding educational technology tools to be used and how to use them from their teachers to improve their language skills. It also reveals that students felt it was a waste of time to attempt to complete assignments on a certain ability by spending an excessive amount of time on the internet. They believe that for students to spend less time on computers completing the required schoolwork, teachers should be the ones to teach them

what to do when they are exposed to computers (27). It will not be appropriate to spoon-feed the students with such technology tools and such basic facts. Students must possess creativity and originality. As a result, allowing students ample time to spend on their computers will educate them on how to operate with computers in the fastest possible methods by identifying the websites and applications that function the best for the tasks at hand.

Using digital tools in the classroom for the teaching-learning process includes using a computer, laptop, smartphone, and other electronic devices. This is known as digital literacy. According to the study of American Library Association (ALA), the assessment of an individual's digital literacy is based on their proficiency in grammar, composition, typing, and the use of technology to create text, images, audio, and designs. 'Digital literacy' is a relatively new field. An initial definition of 'visual literacy' was provided by John Debes in 1969. According to him, visual literacy is a set of vision competencies that an individual can acquire through seeing while simultaneously experiencing and incorporating other sensory inputs.

Paul Gilster first introduced the idea of digital literacy in the 1990s; however, it was first known as technological literacy until 1970. At first, he defined it as the capacity to comprehend and apply knowledge from a variety of digital sources in lieu of using technology to obtain facts. It is comparable to literacy in the modern period. Information, computer, and visual literacy gave rise to digital literacy. Examining and understanding communications, determining the veracity of information, and evaluating the caliber of digital output are all components of digital and media literacy.

Digitally literate people raise awareness and assist others in finding digital solutions at home, at work, or on a national platform, which helps them become socially responsible members of their community. According to Brown's theory, writing is a thought process that can be planned and revised indefinitely until publication (112). Furthermore, according to Harmer, writing helps students concentrate on using language correctly. The reason for this is

that when students write, they consider how language is employed. Students will answer challenges that come up in their writing, which will encourage language growth (56).

According to Troyka, writing is done for a variety of reasons, including self-expression, informational writing, persuasion, and literary creation (201). These goals have a significant impact on the human mind and culture. Writing is a tool used to convey ideas or opinions to others. Brereton supports Troyka's viewpoints by stating that there are three crucial components in writing: the writer (the audience to be addressed), the text or message (the subject to be covered), and the writer (44).

Teaching writing is more difficult stated than done, though, as it appears that producing students with exceptional writing abilities is a daunting endeavour for educators. Because writing involves the application of appropriate cognitive techniques, linguistic knowledge, language rules, and appropriate motivation, it is therefore regarded as a complex cognitive talent (Tierney et al.168). Teachers must adopt a variety of teaching strategies to guarantee that students thrive in writing. Cooperative learning is one of the approaches that is currently in use extensively. Kagan and High provide evidence for this argument by stating that students' writing skills have improved because of using cooperative learning (47).

Since English is taught as a second language (ESL) in India, teaching it is not as straightforward as it may seem. Students are expected to develop proficiency in all four language skills—reading, speaking, listening, and writing. Among these, writing is often considered the most challenging skill to teach and learn. A writer must be able to apply both their communicative and linguistic skills to generate writing that serves as written communication (Mukminatin 34). It implies that the students must conceptualise the information they have gathered on paper and write a document utilising specific language norms and conventions (Byrne 24).

Writing requires general problem-solving mental activity (cognitive) in addition to language proficiency. Because of the peculiar characteristics of each of our unique cognitive systems, the challenges we face and the methods by which we resolve them differ (Byrne 12). When writing, authors must manage multiple subprocesses at once, including content development, coherence, reader awareness, and language selection.

According to Starkey, there are standards for acceptable writing in academic contexts that apply to several areas of writing, such as organisation, vocabulary, language use, punctuation, proper capitalisation, and paragraphing. He went on to say that well-structured, cohesive writing with precise language and well-chosen words is what makes it effective (25).

In their study “Secondary Students’ Perceptions of Information, Communication and Technology (ICT) Use in Promoting Self-directed Learning in Malaysia,” Asfar and Zamzami aim to ascertain secondary students’ perspectives regarding the utilisation of ICT in fostering self learning among students in Malaysia. Using questionnaires, survey design was employed to collect measurable data. The results demonstrated that students in Malaysia were accustomed to using ICT, and that it had fostered a high degree of preparedness for self-directed learning and formed relationships between students, teachers, and peers (67-70).

The goal of Dang Hoang Tri’s study, “An Explanatory Study of ICT Use in English Language Learning among EFL University Students,” was to investigate how frequently, why, and what EFL students thought and expected from their use of ICT. A convenience sample of 149 English students was used in the study. The results showed that the participants used ICT more frequently for personal use than for language acquisition. The majority had favourable opinions about using ICT to study English and expressed the belief that more frequent use of ICT in the classroom will optimise language instruction and learning.

Reid investigated the efficacy of the process approach while instructing EFL students in writing. According to the study, the process method assisted students in developing their writing abilities, especially in terms of coming up with ideas and editing and revising their work. The study also discovered that because the students felt more at ease with the writing process, the process approach helped to boost their motivation and self-confidence (92).

In a related study, Zare-ee and Riazi examined the impact of the process approach on Iranian EFL learners' writing abilities. Their findings indicated that the process approach significantly supported students in generating ideas, as well as in revising and editing their work. The study also highlighted that enhancing learners' ability to communicate concepts effectively contributed to the success of the process approach (40). Overall, the process approach has proven to be an effective method for teaching writing to EFL learners, as it encourages the development of writing skills and provides opportunities for experimenting with various forms of expression.

According to Haas, the tools we use to write with might influence the writing process itself. She acknowledges the material nature of writing technologies and investigates the ways in which the actual tools of the trade - pen and paper, for example, or a computer's keyboard and screen - affect people's ideas and writing processes (110). In-depth discussion of how computer technology might support writing instruction and improve students' writing abilities can be found in Handa. She contends that digital tools can promote more inclusive and egalitarian learning settings in the classroom and present new possibilities for more participatory and collaborative writing experiences (45).

Yancey investigates how students can be involved in the writing process and have better learning outcomes through the usage of digital portfolios. Digital portfolios, according to Yancey, can facilitate introspection, self-evaluation, and the provision of several sources of feedback, all of which can contribute to better learning outcomes (325). Selfe and Hawisher highlight how technology can change literacy habits and have an impact on writing. They

explore how technology has broadened the definition of literacy and contend that digital technologies have given rise to new forms of lettering that are interactive and rich in multimedia (145).

In contrast to writing by hand, Barrera, Rule, and Diemart looked at how computers affected writing proficiency. In this study, repeated measures analyses of variance were used to examine over 750 writing samples that were split between handwriting and computer conditions. According to their research, students who practiced writing on computers outperformed students who did not use one (78). This shows that, in comparison to the group that did not use computers for writing assignments, the usage of computers increased writing competence.

Egbe endorsed using computers to help students write better in English. In contrast to traditional teaching methods, the expert claimed that ICT-based platforms offer an engaging learning process that students find interesting (112).

In their study, Aremu and Sulymon emphasised how important it is for Nigerian students to use computers and other ICT-based devices to improve their English writing skills. The researchers argue that this is justified by the fact that the introduction of computers has improved teaching and learning in almost every industry (56). Using this approach could therefore accelerate students' understanding as they are exposed to a variety of visuals and captivating displays.

The usage of computers and other ICT-based media offers students improved learning opportunities, according to a 2011 study by Aremu. This is because the introduction of mobile devices has made a variety of computing platforms more accessible while most students discover how easy and enjoyable learning can be while using computer technology on their mobile devices, they will find it impressive (23).

A constructivist writing method utilising a computer and a multimedia environment was studied by Fan et al. The research conducted two experiments. Twenty students were chosen at random to be in the first group. Following a pretest, students had six weeks to complete a multimedia writing assignment. They composed their post-test essay following the completion of the project. The experiment's findings demonstrated that after taking part in the multimedia writing project, students' writing skills significantly improved (93). There were forty-seven students in the second group. The participants were further divided into two groups: an experimental group and a control group. The experimental research group spent six weeks working on their multimedia projects. The control group completed two writing assessments by the conclusion of the grading period as part of a writing workshop.

Essays for the pre- and post-test experiment were written by every student. The experiment's findings demonstrated that there was no discernible difference between the experimental group's and the control group's writing. The researchers observed that most of the work created by the children who were given the multimedia assignment was in the form of audio and images rather than text. Fan et al. argue that using technology in the classroom on its own is not the solution to all the issues that students face by presenting their research findings. The usage of technology requires careful consideration. One should think about the value-addition of using technology and use it properly, rather than merely using technical tools to teach languages.

Van Waes and Leijten emphasize that, despite the overall importance of English fluency, research focusing specifically on writing fluency remains insufficient (281). Writing serves as a vital tool for expressing and clarifying ideas through written communication (Rouhani et al. 134). The ability to write effectively is often considered essential for achieving success across various areas of life. English language learners must develop strong writing skills to perform well both academically and professionally. Moreover, writing proficiency is not only key to academic achievement but also plays a pivotal role in broader language acquisition and personal development across diverse contexts.

According to Martin, literacy is essential to education, and technology has a major role in how our students think and behave in the outside world (47). We enable our teachers to provide students with the opportunity to comprehend pedagogical techniques that more effectively integrate new literacies by providing them with a variety of learning modes. Given how quickly technology is evolving, it is critical that teachers have access to professional development opportunities to help students stay more motivated and proficient in using technology to enhance their writing.

Since we already know that these technologies will affect our children's success in life, as Leu contends, perhaps more time and effort should be spent studying teachers' aspirations and capacities to see novel applications for emerging technologies in literacy instruction (115). To successfully create a school literacy culture, Sternberg concurs with Halsey that professional development should be a continuous process in the classroom and that it is vital for all teachers (89).

On the other hand, Hansen discussed various barriers that early childhood educators may face. He merely stated that there are several issues with literacy instruction: teachers' limited conceptions of literacy, a lack of time and experience exploring and comprehending software, and a lack of knowledge about the possibilities of emerging technologies and the confidence to apply them successfully (62).

According to Van Leeuwen and Gabriel, when concerns about technology arise in the classroom, educators should take the following into account: set reasonable expectations when introducing a word processing component to the process writing program; plan to modify current instructional strategies; arrange for student feedback periods; be ready for students to spend the computer lab concentrating on the machine rather than the lesson; and teach students how to work cooperatively (211).

Teachers need to motivate and pay attention to their resistant learners when they are delivering new material (Lee and O'Rourke 57). After completing this task, educators can promote self-reliance and accountability. According to their research, when teachers first started using technology in the classroom, they usually started by teaching students how to use the mouse and printer and how to use the keypad. As soon as they began the class, they saw that the students were becoming more self-assured because of being allowed to experiment on the computer. According to Van Leeuwen and Gabriel, the teacher's duties during computer-based writing assignments include motivating students to keep up their work, assisting them in concentrating on crucial aspects, and assisting them in developing problem-solving techniques (216).

The concept of writing fluency is defined differently depending on the perspectives of various scholars. According to Atasoy and Temizkan, writing fluency involves the capacity to present a subject in a coherent and structured manner without distorting the writer's intended message for the reader (87). Fluency stands out as a defining trait of a well-structured, meaningful, and clearly understood piece of writing. Writing serves as a vehicle for expressing thoughts, beliefs, and ideas. Nevertheless, numerous studies have shown that English language learners across the globe face significant challenges in achieving high-level writing skills such as effective organization and thoughtful reflection. Additionally, the instructional process often emphasizes more basic writing tasks like vocabulary memorization and direct translation rather than fostering advanced writing abilities (Gayed et al. 104).

Finding innovative approaches to inspire students to study and adapt to the new technological advancements in education is necessary because the world is changing daily, and innovations are replacing traditional reading and writing techniques. Proficiency in writing is a fundamental communication need for all academic fields. It is essential for language learners because it enables them to write about their thoughts and experiences and express their opinions. However, several researchers, like Rahimi and Zhang have found that many students struggle to express their ideas in writing because of their weak

writing fluency (45). The lack of writing fluency will have an undesirable impression on the academic performance of children.

Bratitsis and Alexander showed how innovative ideas can improve children's learning outcomes and increase their motivation to attend school by describing dual approaches and the implementation of a narrative creation project. The overall number of activities was 13, and their lengths varied from one day to two and a half months. The findings showed that combining creative writing with digital storytelling offers students a safe, secure, and cost-free environment in which to improve their skills (132).

The use of web apps to employ digital storytelling in foreign language instruction was examined by Tsigani and Nikolakopoulou. Digital storytelling and narration encourage students to work more on their narrative writing. In the classroom, web technologies were utilised to stimulate and engage students as they produced their narrative eBooks (70).

Istiq'Faroh and Mustadi conducted a study to explore the impact of digital comic creation on the creativity and writing proficiency of elementary school students. Employing an experimental research design, the study utilized both preliminary and post-test assessments to measure changes in student performance. The research sample consisted of 56 fifth-grade students, divided into an experimental group of 27 and a control group of 29. The results indicated that engaging students in the production of digital comics had a positive effect on their creative thinking and writing abilities. Furthermore, the study demonstrated that the experimental group, which utilized digital comics, exhibited significantly greater improvement in these areas compared to the control group (312).

López-Belmonte et al. assessed the level of digital aptitude among teachers in their instructional role and concluded on big data prediction. A study using the descriptive quantitative method was carried out. 832 Spanish-speaking instructors participated in the study's structured question data gathering. The results showed that the instructor's proficiency with digital

media is mediocre during the teaching phase. The research indicated that the degree of big data understanding is contingent upon the digital proficiency of the educational component (77).

Big data, according to Jin and Yang, is what inspires creative writing. Writing styles, visuals, and text combination formats can be combined across media to produce new intellectual functions for a range of media. The outcome showed that big data fosters innovation and creates new platforms for creative writing (22). In a Spanish heritage language (SHL) classroom, Parra broadened the notion of literacy and writing through the examination of poems, digital art, and the corresponding analytical essays of four students. The investigation shows how teaching creative writing and Spanish language literacy to heritage language learners is enhanced by the digital art-making tool. Tools from digital technology are essential to the creative process (144).

Yalcin and Ozturk investigated the influence of digital storytelling on students' creative writing skills, with a particular focus on gender differences. Their analysis revealed that students experienced heightened motivation and increased engagement during the process of creating their own digital stories. Additionally, the findings highlighted notable enhancements in students' creativity and problem-solving capabilities, suggesting that digital storytelling effectively fostered these skills through its engaging and interactive nature (207).

In English as a Foreign Language (EFL) schools, Lee looked at a media transfer project that used a digital game to encourage student creativity and creative writing. A creative writing assignment and the digital game Her Story were used to give students a realistic learning experience. Students' writing creativity was proved by Torrance's model of creativity, originality, adaptability, and elaboration. Participants also stated that a creative writing assignment increases students' motivation for learning engagement (188-190).

Chassignol et al. assert that digital technologies have unquestionably become a fundamental aspect of our everyday lives, serving not only as essential tools for

retrieving information but also as powerful means for enhancing interpersonal communication and fostering stronger personal relationships (78). These technological advancements have brought about significant transformations in the educational landscape, making the learning experience more dynamic, productive, and engaging for both educators and learners.

In the realm of education, there has been a noticeable surge in the adoption of a wide range of interactive teaching tools. Educators have become increasingly conscious of the benefits of incorporating alternative digital learning environments into their instructional practices. Platforms such as Moodle, Edmodo, Google Classroom, and PowerSchool are now commonly used to create flexible and interactive learning spaces. Furthermore, many educational institutions have embraced Learning Management Systems (LMS) like Moodle to organize and deliver content efficiently. At the same time, the emergence of Massive Open Online Courses (MOOCs), including widely used platforms such as coursera.com, has opened new avenues for accessible, large-scale online learning.

In addition to these technologies, the integration of artificial intelligence (AI) into the educational process has emerged as a transformative force. AI applications are increasingly being employed to personalize learning experiences, support instructional design, and improve overall learning outcomes, making education more effective and tailored to individual student needs.

The central aim of modern educational strategies, particularly in the field of teaching English as a foreign language, is to optimize the learning process by making it more straightforward, efficient, and learner-centered (Morony et al. 118; Platsidou and Kantaridou 122). As part of this goal, educators and institutions are placing greater emphasis on fostering motivational outcomes—such as task value and academic self-efficacy—which are considered critical for student success. These motivational elements not only enhance student engagement but also encourage sustained participation in both formal educational programs and informal learning activities. Consequently, educational institutions continuously seek innovative approaches to equip learners with the motivation and resources needed to thrive in diverse learning environments.

Borna and Fouladchang (45), G.H.R (62), and Rosas and Esquivel (96) emphasized that educational strategies play a crucial role in shaping students' motivational outcomes. These scholars identified pedagogical approaches as one of the primary determinants influencing learners' motivation in educational contexts. Building on this, Prince argued that fostering positive motivational attributes in learners, such as recognizing the value of academic tasks and cultivating a sense of academic self-efficacy, is among the most vital achievement of quality education. He further highlighted that artificial intelligence stands out as a prominent technological innovation that contributes significantly to realizing these motivational goals (104).

In a related technological development, Peng et al. proposed a sophisticated method for differentiating between natural photographs and Computer-Generated Imagery (CGI), utilizing a combination of hybrid features. Their approach begins with the extraction of statistical parameters, such as mean, variance, skewness, kurtosis, and median, from greyscale image histograms in both the spatial and wavelet domains. These statistical indicators help in characterizing image patterns (18). Additionally, wavelet sub-bands and the fractal dimensions of the greyscale images are identified and extracted as visual features. Following this, the images are subjected to a pre-processing stage using a Gaussian filter to refine their quality. Once pre-processed, the images undergo the calculation of photo response non-uniformity noise (PRNU), which is enhanced through the application of a wavelet-based denoising filter. This refined PRNU data is then used to extract physical features from the images. The final stage of the method involves classifying the images using a Support Vector Machine (SVM) classifier, which achieves a high level of accuracy, 91.28% for identifying authentic photographs and 97.3% for detecting computer-generated images.

Recently, attention has shifted to investigating the advantages of incorporating several technology gadgets to improve students' writing abilities. The significance of e-learning in fostering academic writing proficiency is emphasised by Iwasaki et al. E-learning helps students to access and teachers to transact the content effectively (109). According to Ellison and Drew, computer games can help authors develop their critical thinking and organisational skills (74). Numerous writers emphasise how important

technology is to establishing the best possible learning environment, encouraging students to write, and improving the caliber and volume of student outputs. Furthermore, it is recognised that technology can reduce errors through better editing capabilities and save time for both teachers and students (Baker and Lastrapes 58; Gharehblagh and Nasri, 92). This growing corpus of research highlights the numerous benefits of various technology instruments in forming a more successful and efficient approach to writing instruction.

It has been demonstrated that incorporating computers into the writing process improves students' work (Williams and Beam 142). These results suggest that students who use computers typically write longer and better works of writing. In addition, it has been established that using smartphones and applications in writing classes can help students become more motivated, creative, and capable of coming up with original ideas while correcting grammar and sentence structure mistakes (Estarki and Bazyar 58).

Tam goes on to highlight the benefits of mobile phones by pointing out that they give students the chance to practise writing outside of the traditional classroom, enabling ongoing skill development even outside of colleges and universities (115). In conclusion, integrating technology into writing instruction - including computers and mobile devices - offers a variety of advantages, from better writing quality to greater student motivation and accessibility.

Studies conducted by Williams and Beam's have demonstrated the beneficial effects of integrating computers into the writing process on students' work (142). These results suggest that students who use computers typically write longer and better works of writing. Furthermore, it has been established that using smartphones and applications in writing classes is a useful strategy for raising students' motivation, encouraging creativity, and strengthening their capacity to come up with original ideas while correcting grammar and sentence structure errors (Estarki and Bazyar 60; Fattah 41; Kanala et al.76). The research highlighted the benefits of mobile phones by pointing out that they give students the chance to practise writing outside of the traditional classroom,

enabling ongoing skill development even outside of colleges and universities. In conclusion, integrating technology into writing instruction - including computers and mobile devices - offers a variety of advantages, from better writing quality to greater student motivation and accessibility.

Comprehensive examination of all the many technologies and research approaches used in the field of computer graphics creation. Inadequate in terms of current generation techniques but still relevant today (McConnell et al 15). A process for creating computer graphics presentations with half-tones in three dimensions. An explanation of the algorithm used to create a polygonal surface in three dimensions. Compared to the Utah Warnock algorithm, the algorithm is substantially faster. Understanding the extent of computer graphics at the time and how graphics algorithms evolved was greatly aided by this work. The paper's main drawback is that, having been published more than 40 years ago, its relevance has completely faded.

The article, "Realism in Computer Graphics: A Survey," by Amanatides, provides information on the advancements and patterns of realism in computer-generated images (7). This publication provides a detailed explanation of surface determination algorithms and numerous rendering procedures. According to E. Bazarov et al., the creation and application of information and communication technologies is a necessary component of modern life, both in the public domain and in educational settings. Every activity has seen significant changes, and education is no exception (24). These technologies are launched in response to a need for them, improving knowledge and laying the groundwork for higher education reform. Prior to the use of cutting-edge technologies in the classroom, direct instruction between teachers and students was primarily accomplished through attendance. However, the virtual reality approach is currently valid and has shown to be successful. However, educational establishments are eager to implement more effective techniques to enhance student-teacher interaction and raise the degree of knowledge that students comprehend and absorb.

According to Rashidi et al. the increasing number of smartphone devices has drawn attention to Augmented Reality (AR) technology in recent years. The functionality of smartphones is strong enough to accommodate augmented reality technology (3). An augmented reality (AR) app on a smartphone can offer functions that make tourism more convenient and enhance visitors' experiences. Such an application needs to be developed after a careful analysis of the software requirements. Therefore, the goal of this study is to assess the criteria required for creating a mobile application for augmented reality tourism and to suggest such requirements for further research and development.

Rokita's "Fast generation of the depth of field effects in computer graphics" suggests a novel and interchangeable method to create depth in computer-generated scenes (654). This paper's technique is appropriate for real-time applications like visual simulators.

The article by Rubinstein et al., "Generating comics from 3D interactive computer graphics," offers a novel perspective on computer graphics with an alternative use. It concerns a system that can translate key elements of a storyboard and 3D visual interactions into a 2D comic book art style (980). The article "Computer graphics and architecture: state of the art and outlook for the future" by Dorsey and Leonard McMillan discusses the topic's long-term prospects as well as the state-of-the-art technology available today (28). Since it dates from 1998, we can use it to examine both the potential for the future and the state of computer graphics in the past few decades.

The article by Lombardi, "Teaching Computer Graphics Through a Digital Humanities Project," is an intriguing digression into the field of computer graphics education. It discusses the main difficulties and approaches in teaching computer graphics through 3D modelling of a city, which causes us to consider the subject from a new angle (490). The work by Paucar et al., "Software development with computer graphics, distributed database, and Object-oriented programming (OOP) for deregulated power systems analysis,"

focuses primarily on software development rather than computer graphics, though it does cover a fair amount of the subject and aids in our understanding of how computer graphics are applied (22).

The paper “Automatic 3D scene generation based on Maya,” by Canlin Li et al. discusses the use of Autodesk Maya for automatic 3D scene generation. It describes the drawbacks of creating 3D scenes by hand and attempts to address them by automating the procedure (4). The precise issue description of this study pertains to automation and has to do with computer graphics.

In R. Pickles’ “White Paper - Next Generation Graphics GPU Shader and Compute Libraries,” the Vulkan libraries - the next generation of computer graphics libraries or embedded graphics libraries following OpenGL and CUDA - are surveyed and detailed (6). The study establishes the possibility of next generation graphics in the field of education. Liu, Bowen et al. discuss the use of fractals used in terrain modelling in Dong’s “An improved algorithm for generating real sense terrain and parameter analysis based on a fractal”. This approach, which is an OpenGL and Visual C++ implementation of the traditional Diamond-Square algorithm, allows for the creation of virtual realistic landscape modelling.

The article, “Bubbloid Algorithm: A Simple Method for Generating Bubble-like Line Drawings,” by M. Oku, offers a straightforward approach for creating 2D drawings that resemble bubbles (3). It is also helpful for warping images, graphs, and geographical data visualisation. Although it is a straightforward and current algorithm, its use may be restricted due to its two-dimensional foundation.

The growing significance of incorporating artificial intelligence (AI) into educational practices has been emphasized in numerous recent scholarly investigations. Luckin et al. explored the rise of AI as a transformative force within the realm of information and communication technologies, underlining its expanding role in modern education (115). Similarly, Woolf et al. suggest that artificial intelligence is poised to

revolutionize every aspect of human life, with education being one of the primary domains of transformation (9). According to Salas-Pilco et al., AI has become an indispensable component of both teaching and learning processes, marking a shift toward more technologically integrated educational systems (5).

The integration of AI into English language learning has the potential to make the experience more engaging, enjoyable, and accessible. Karkera considers the rise of AI in education as a natural development stemming from earlier forms of digital media. Prior to the widespread implementation of artificial intelligence, learners made use of various digital platforms—such as podcasts, YouTube channels, and radio applications—to improve their language acquisition skills (17). Yoestara and Putri observe that AI has significantly enhanced the educational value of these tools by introducing advanced features, including self-correction mechanisms and interactive communication capabilities that simulate conversations with native speakers through humanoid technology. As a result, artificial intelligence in education has evolved into a form of “edutainment,” combining educational content with entertaining experiences to foster more effective learning outcomes (27).

Without the need for a single teacher, Intelligent Tutoring Systems (ITS) use AI applications to imitate person-to-person human coaching by providing learning experiences that are most suitable to the cognitive needs of the learners and by providing targeted and pertinent feedback. With ITS, students can give the system detailed information about their issue in the same method they would if they were working with paper. After that, the system displays a response depending on every student’s response. Hence, rather than only providing feedback once a task is finished, ITS can engage with students on a step-by-step basis.

According to Suh and Prophet, there has recently been a notable rush in interest in virtual reality education research. It is a useful teaching tool that replicates some aspects of reality (34). Users of this simulation tool can interact with various environments, including hazardous ones and places that have historically or geographically been inaccessible. Virtual reality, on the other

hand, would not allow students to access these kinds of surroundings or give them the impression that they are taking part in actual activities.

Immersion in intelligent virtual reality has been demonstrated in numerous studies to solidify their understanding of complex concepts which will contribute significantly to deeper learning experiences. By engaging with realistic scenarios, learners can enhance their critical thinking skills and apply theoretical knowledge in practical situations, thereby considerably enhancing students' academic performance. For example, Khare et al. found that artificial intelligence apps positively impact students' academic performance (95). Tuomi's study also stressed the value of artificial intelligence in creating stimulating learning environments and the potential for applying AI to address common educational issues (212).

Furthermore, Fryer claimed that robots greatly encourage students to study foreign languages (48). Ma and Siau demonstrated in a related study the benefits of artificial intelligence in advancing higher education and displacing conventional teaching techniques (368). AI is also being used in machine learning environments to evaluate the attention, emotions, and interaction dynamics of students, for example, in subject development and monitoring, to form the best possible groups for cooperative learning activities and identify patterns that indicate student dropout (Rosé et al. 143).

Additionally, this research demonstrated how learners can develop their perspectives and understanding of the world and their own surroundings by immersing themselves in various circumstances and environments. Artificial intelligence (AI) learning tools like Chatbots and Duolingo are fantastic tools that let students interact with a program online through text or voice. They also give students a genuine learning experience by integrating dialogue into the classroom. They are supposed to offer the kind of engaging, tailored conversation, and engagement that language learning calls for.

In a related study, Kim explored the potential of AI chatbots, specifically clever bots, to enhance English writing skills among Korean college students. The study involved 70 participants engaged in 16 weeks of chatbot interactions. Findings revealed a significant improvement in the participants' English grammar proficiency, suggesting that chatbot interactions can effectively support English language learning (60).

2.3. CGI Animation and AI Prompt Engineering in Creative Writing Classrooms: A Paradigm Shift in Future Research

The integration of CGI animation into the secondary curriculum has significantly enriched creative writing instruction by offering learners a visual framework to construct and develop narrative ideas. Through animated sequences, students are encouraged to explore setting, plot, and character with greater clarity and enthusiasm. This visual storytelling model has not only fostered imaginative thinking but also provided a concrete foundation upon which students can structure their written narratives. The literature consistently highlights how CGI enhances engagement, narrative coherence, and expressive depth in students' creative compositions (Anderson & Bracken, 2020; Kumar, 2022).

Building on this foundation, AI prompt engineering emerges as a natural and advanced evolution of the same pedagogical vision. While CGI aids students in externalizing their imagination through visuals, prompt engineering facilitates internal cognitive expansion by guiding students in real-time textual ideation and elaboration. Essentially, AI prompt engineering can be seen as an intelligent, adaptive extension of CGI, wherein the static visual cues are supplemented by dynamic, language-based interactions that stimulate reflective thinking, conceptual development, and linguistic creativity.

Both CGI and AI prompt engineering share the core objective of scaffolding student creativity, yet AI goes further by offering interactive, context-sensitive prompts that adjust to students' inputs, styles, and narrative intentions. Where CGI animates imagination through imagery, prompt engineering animates thought through language.

Thus, rather than existing in separate domains, AI prompt engineering represents a continuum of the CGI-based creative writing paradigm—deepening personalization, enhancing interactivity, and fostering a co-creative space between learner and machine. In doing so, it preserves and amplifies the educational goals already achieved by CGI, situating itself as an evolved form of digital storytelling assistance.

The use of AI tools in educational settings, especially in creative writing classrooms, has transformed how learners engage with storytelling. The increasing sophistication of AI models has led to more accessible and dynamic applications in the classroom. Through prompt engineering students and teachers can now engage in a collaborative creative process that blends textual imagination with AI-generated responses. This transformative approach has turned AI into a creative partner, helping learners shape narratives, refine language, and experiment with story structure (Kim 43; Zhao and Wong 72). For students in the secondary curriculum, where the foundations of creative expression are laid, prompt engineering can act as both a cognitive scaffold and a creative catalyst. It enhances the ability to generate ideas, construct plots, and visualize complex narrative structures.

Moreover, prompt engineering facilitates the integration of generative AI tools with CGI animation platforms, allowing students to visualize their creative writing through animated sequences, thereby deepening narrative understanding and multimodal expression (Chung and Patel 88). The collaborative use of AI in creative writing classrooms has also opened new possibilities for inclusive education. Students from diverse linguistic and cultural backgrounds can receive tailored support, breaking language barriers and fostering equitable access to creative learning (Miller and Reeves 117). AI-generated feedback can guide learners in refining their drafts, offering suggestions for tone, style, character development, and dialogue. Through iterative prompt refinement, students learn to control the direction and quality of AI outputs, promoting critical thinking and agency in the writing process (Zhou and Li 104; Banerjee and Singh 93). Additionally, prompt engineering helps students become more aware of the structure and components of storytelling, making them conscious of narrative choices and the impact of stylistic decisions. This not only enhances their

technical writing skills but also nurtures their creative confidence. The integration of CGI animation further strengthens this process.

The use of animation in conjunction with creative writing supports differentiated instruction, catering to diverse learning styles and promoting engagement through visual storytelling. Moreover, the accessibility of AI-CGI tools democratizes creative production, offering students without formal training in design or animation the opportunity to bring their stories to life. This empowerment fosters a sense of authorship and ownership over creative work, motivating students to explore complex themes and experiment with genre and form (Kim 55; Das and Thompson 79). The classroom thus becomes a space for collaborative inquiry and creative exploration, where AI serves as a partner in the artistic process.

Prompt engineering also supports teachers in curriculum design. Educators can craft targeted prompts to align with learning objectives, scaffold writing assignments, and provide models of good writing. AI-generated story starters, character sketches, and thematic outlines can inspire students and help overcome writer's block. Teachers can also use AI to model the revision process, demonstrating how changes in prompts lead to improved narrative outcomes (Zhou and Li 110; Banerjee and Singh 94). This metacognitive engagement with writing—thinking about how and why choices are made—deepens students' understanding of the writing process. When used thoughtfully, AI prompt engineering can enrich classroom discourse, spark peer collaboration, and nurture a reflective writing culture.

The integration of AI and CGI technologies in creative writing education is not without challenges. Issues of authorship, originality, and ethical use must be addressed through clear guidelines and critical discussions (Chung and Patel 90). Teachers play a crucial role in framing AI as a tool for augmentation rather than substitution, emphasizing the importance of human creativity, empathy, and voice. With proper scaffolding, prompt engineering and CGI animation can serve as powerful tools to enhance creative writing instruction in secondary classrooms. These technologies offer new ways to visualize, revise, and share stories, fostering a multimodal literacy that prepares students for the narrative demands of the digital age. The convergence of text

and technology invites learners to become not only writers but also designers, animators, and storytellers who can navigate and shape the evolving landscape of creative expression.

In this regard, it is essential to review the available literature to explore the future implications and possibilities of AI prompt engineering, which may be considered a pedagogical evolution beyond CGI animation in creative writing instruction as AI prompt engineering introduces students to the mechanics of narrative generation by empowering them to formulate contextually rich, targeted prompts that guide AI output. Moreover, prompt engineering enables differentiated instruction by allowing students to engage with AI at various levels of complexity. Beginners can explore simple descriptive writing through direct prompts, while advanced learners can design layered queries that involve genre conventions, tone modulation, or thematic subtexts.

The current literature suggests that prompt engineering cultivates critical thinking, metacognitive reflection, and editorial skill, making it a valuable companion to traditional creative writing practices. As AI tools become more integrated into educational ecosystems, understanding how to use them responsibly and creatively becomes an essential component of digital literacy. Thus, the pedagogical trajectory from CGI-based creative writing to AI-assisted prompt engineering suggests a continuum where visual and textual literacy intersect to form a new paradigm of expressive learning.

This framework opens new avenues for empirical research in English language teaching. For instance, future studies could examine how AI prompt engineering affects students' narrative structure, lexical variety, or revision strategies. Similarly, researchers might investigate how the collaborative use of CGI stimuli and AI tools impacts learner autonomy, motivation, and engagement.

In recent years, the integration of Artificial Intelligence (AI) into educational settings has evolved from a novel experiment into a transformative force. As classrooms become increasingly digital, educators are leveraging AI tools to enhance instruction, provide personalized feedback, and support student learning across disciplines. One

area undergoing profound transformation is creative writing—traditionally a space defined by human imagination, subjective interpretation, and linguistic experimentation. AI-driven tools, particularly those powered by large language models, are now incorporated into writing instruction through a process known as prompt engineering (Smith 45).

Prompt engineering involves crafting specific, structured inputs that elicit targeted and meaningful outputs from AI systems. For students, this means learning how to interact with AI to generate story ideas, build narrative structures, and explore stylistic techniques. Rather than replacing human creativity, AI serves as a writing partner, brainstorming assistant, and language mentor. This evolving dynamic is reshaping how creative writing is taught and how students engage with the writing process (Johnson 28).

Creative writing instruction seeks to cultivate originality, voice, and narrative coherence. However, students often face challenges such as writer's block, limited vocabulary, and lack of structural awareness. AI prompt engineering provides an effective strategy to overcome these barriers. According to Lee, When students input a simple phrase or idea into an AI model, they can receive narrative suggestions, character outlines, or thematic expansions that guide their creative process (132).

For example, a student may begin with “a city beneath the ocean,” and the AI offers several plot possibilities involving this setting. This iterative exchange helps students explore different genres and themes. Teachers can scaffold this interaction by instructing students on prompt refinement, critical evaluation of AI outputs, and the creation of personal interpretations from AI-generated ideas (Martinez 67).

This practice aligns with constructivist theories of learning, which emphasize active engagement and the construction of knowledge through experience. In this context, prompt engineering becomes a form of metacognitive training-encouraging students to reflect on how ideas are formed, revised, and articulated (Anderson 90).

Implementing AI tools in writing classrooms demands thoughtful curriculum design. Educators must balance fostering human creativity with leveraging AI's

generative capacities. Strategies may include activities where students compare human and AI drafts, collaborative writing with AI-generated prompts, and critical reflections on the writing process (Taylor 154). Preliminary classroom studies reveal that students using AI report greater writing confidence, increased experimentation with genre and form, and deeper awareness of language structures. Prompt engineering also promotes computational thinking—a key literacy in the digital age (Nguyen 73).

While AI offers significant pedagogical potential, its use in creative writing raises questions about authorship, authenticity, and ethics. Overreliance on AI could lead to formulaic writing, while heavy AI involvement might obscure the true author's voice. Institutions must define clear guidelines to ensure AI is used for enhancement rather than substitution. Assignments might include reflective components requiring students to articulate the role AI played in their work (Bennett 116). Bias in AI outputs is another concern. Models trained on large internet datasets may inadvertently replicate stereotypes. Educators should teach students to evaluate AI-generated content critically, fostering ethical reasoning and digital literacy alongside technical skills (Rahman 99).

CGI animation has already proven effective in enhancing creative writing by enabling students to visualize characters, settings, and plot sequences. It supports narrative development by grounding abstract ideas in immersive visual experiences (Patel 83). Building on this visual foundation, AI prompt engineering extends these benefits through dynamic, interactive language generation.

Where CGI provides the external structure for imaginative expression, AI prompt engineering offers internal cognitive scaffolding. It supports ideation, elaboration, and narrative experimentation, presenting a fluid dialogue between learner and machine. Both technologies share a commitment to fostering creativity, but AI offers a more personalized, adaptive experience that aligns closely with each student's evolving needs and abilities (Kumar 107).

In this way, AI prompt engineering represents not a departure from CGI-enhanced instruction, but its logical progression. Together, they form a multimodal

approach to creative writing—one that amplifies imagination and narrative skill in tandem (Singh 91).

The benefits of AI prompt engineering in creative writing can be grouped into five areas: idea generation, personalized learning, enhanced creativity, improved mechanics, and iterative development.

A key benefit of prompt engineering is its capacity to help students overcome writer's block. Faced with a blank page, students often struggle to begin. AI-generated prompts act as a catalyst, offering narrative possibilities such as, “a lonely astronaut discovers an ancient alien library on a distant moon.” These seeds of inspiration can evolve into detailed stories through student interpretation and development (Morgan 45).

Unlike traditional instruction, AI systems can adapt to individual students' interests, needs, and skill levels. A student interested in fantasy may receive prompts about enchanted realms, while another may explore social realism. This level of personalization fosters engagement and supports differentiated instruction (Clark 135). AI also adjusts prompt complexity, supporting beginners with structured input and challenging advanced learners with abstract or experimental tasks. This adaptability enables inclusive, scaffolded growth for all students (Garcia 88).

AI prompt engineering also enriches creativity by encouraging students to explore unfamiliar genres, styles, and voices. A student accustomed to realistic fiction may be prompted to write dystopian or magical realist narratives, expanding their literary repertoire (Roberts 59). Additionally, AI can simulate stylistic elements of iconic authors, inviting students to mimic and internalize diverse literary forms. This not only strengthens their expressive range but also deepens their appreciation of narrative craft (Yoon 121).

According to Hammond et al., AI prompt engineering plays a crucial role in refining writing mechanics. Contemporary AI tools offer real-time suggestions on grammar, vocabulary, syntax, and sentence structure, enabling students to enhance their work at a technical level. These features are especially beneficial when paired with

prompts that encourage revision and recursive writing, fostering an iterative development process in which learners refine their drafts multiple times (42).

For instance, a student prompted to write a dialogue-centred narrative can use AI to assess the pacing, tone, and coherence of the conversation. After drafting an initial version, the student might prompt the AI to offer three alternative opening lines, thereby gaining insight into narrative hooks and strategies for engaging readers (Wang and Yu 103). This cycle of writing and revision reinforces essential habits such as improving clarity, eliminating redundancy, and diversifying sentence structures. Moreover, the immediate feedback enabled by AI tools proves especially valuable in overcrowded classrooms, where personalized attention from educators may be limited (Holmes et al. 66).

As AI technology becomes more entrenched in educational ecosystems, the primary focus has shifted from debating its inclusion to determining how best to integrate it into pedagogical frameworks. The successful adoption of AI prompt engineering in creative writing classrooms requires educators to identify clear instructional goals, understand AI's limitations, and adopt intentional strategies that maximize its benefits (Luckin et al. 27). When effectively implemented, AI can stimulate creativity, support skill development, and increase student engagement, especially when it complements rather than replaces traditional teaching methods.

One of the most organic ways to integrate AI into the writing classroom is through established writing workshop models. Within these spaces, students typically brainstorm, draft, revise, and receive peer and instructor feedback. AI can function as a creative partner at various stages of the workshop, serving both as a spark for initial ideation and a tool for mid-process revision (Holmes et al. 71). Educators may introduce AI-generated prompts like “Describe a moment when a single letter changes a character’s life,” and encourage students to personalize the exercise based on tone or perspective.

Beyond the drafting phase, students can prompt AI to suggest alternate settings, reactions, or endings, using these variations as springboards for further development.

When revising, students might ask the AI for rewritten versions of awkward sentences and critically evaluate the outputs. By positioning AI as a collaborative guide rather than an authoritative source, teachers can preserve student agency while facilitating iterative learning (Wang and Yu 105). Classroom discussions around the strengths and weaknesses of AI responses can further strengthen critical thinking.

AI prompt engineering also excels at promoting literary risk-taking. Many young writers tend to settle into familiar genres and styles early in their creative journeys. While comfort can nurture fluency, broader exposure leads to deeper growth. AI-generated prompts allow students to step outside their stylistic comfort zones, encouraging exploration across genres, tones, and narrative voices (Hammond et al. 50). Educators can further facilitate experimentation by introducing prompts that simulate historical writing styles or mimic famous authors' voices. A student might be asked to write from the viewpoint of an antique object or compose a story in the form of an 18th-century journal. These exercises, coupled with open-ended rubrics emphasizing originality and creativity, promote both play and rigor (Holmes et al. 74).

While AI tools offer instant feedback, teacher guidance remains indispensable. Educators should scaffold the writing process by helping students reflect on their interactions with AI. Journals or revision notes can prompt students to consider which prompts they used, how AI outputs influenced their writing, and what they accepted or rejected—and why (Luckin et al. 45). These reflective practices deepen metacognition and ensure that students remain at the centre of the creative process.

Instructors can also encourage students to share AI-generated prompts alongside their drafts during peer review. This opens opportunities to compare how different individuals responded to the same input and to critique both human and AI contributions. By focusing feedback on the process—such as students' creative adaptations or prompt modifications—teachers can highlight thoughtful engagement rather than mere output quality (Wang and Yu 110).

As we peer into the horizon of creative writing education, one of the most

compelling trends is the rapid evolution of AI-powered writing tools. Large language models (LLMs) have already demonstrated their capacity to produce coherent, context-aware writing prompts. Moving forward, these systems are expected to integrate deeper levels of user understanding, assessing individual student interests, writing history, emotional cues, and cognitive preferences to provide highly personalized writing support (Zou and Xie 118).

The role of AI in creative writing education signals a paradigm shift in how expression and storytelling are taught. AI prompt engineering offers promising avenues for personalized learning, ideation, and increased confidence. White opines that when used mindfully, AI can deepen student engagement and broaden pedagogical horizons (193). Nonetheless, this technology must be adopted with foresight and balance. Challenges ranging from overuse to ethical risks require proactive, principled responses. Best practices rooted in student agency, reflection, and educator preparedness are crucial. In a nutshell, it is evident that AI has the potential to support students by personalizing learning, providing feedback and academic support.

AI prompt engineering is already reshaping how students approach the act of writing, but we are only at the beginning of this transformation. As classrooms become increasingly digital, and AI tools more nuanced, we are presented with a unique opportunity to cultivate a writing culture where human creativity and technological assistance thrive symbiotically (Smith and Watson 201).

To realize this future, it is essential to ensure that students stay central in writing education and it must continue to prioritize the student's voice, agency, and imaginative input. AI Tools should be framed as creative partners, not substitutes for thinking. Professional development, resource access, and collaborative networks will empower educators to lead this transition. Responsible AI integration must reflect values of fairness, accessibility, and academic transparency.

With these principles as guiding stars, we can shape a learning environment where AI enriches the human spirit of storytelling. In this vision, students will not

merely improve their writing skills; they will become bold architects of a new era.

As artificial intelligence becomes embedded in the writing process, it is crucial to reimagine how we evaluate student work. Traditional assessment models that focus largely on the final product are insufficient for understanding the nuanced interaction between students and AI writing tools. Instead, a revised approach should recognize how students engage with AI to inform, refine, or inspire their creative output (Seldon and Abidoye 63). Digital portfolios offer a rich repository for showcasing student growth. By compiling multiple writing samples, reflective notes, and AI interactions, students can document their evolving skills, voice, and engagement with AI. Similarly, reflection journals provide qualitative data on student experiences—frustrations, breakthroughs, and strategies—that humanize the learning process (Burke and Wood 39).

AI tools can be particularly helpful for students with learning differences, such as dyslexia or ADHD, by offering scaffolded support. Assessment strategies should accommodate these dynamics. Rubrics can be differentiated, allowing students to set personal goals. For example, a student working on overcoming writer's block may be evaluated based on idea generation and engagement rather than sentence structure.

From a pedagogical standpoint, it is crucial that educators refrain from dismissing AI outputs as inherently flawed, deceptive, or pedagogically inferior. Instead, such tools should be leveraged similarly to how calculators revolutionized mathematics instruction—used not to replace conceptual understanding but to extend it (Holmes et al. 5). With deliberate scaffolding, AI can be a powerful aid that stimulates student creativity, encourages experimentation, and promotes agency. When integrated thoughtfully, these tools shift focus from rote memorization to higher-order thinking and reflective practice (Mollick and Mollick 45; Trust and Whalen 84).

The growing prevalence of AI-enhanced writing calls for a reimagining of professional development for educators. Teachers must acquire the necessary

competencies to evaluate AI-supported compositions with nuance and fairness. Training modules should include strategies for designing rubrics that reflect AI usage, interpreting student annotations and prompt-engineering logs, and assessing originality when AI collaboration is involved (Kukulska-Hulme 124; Luckin et al. 212). Workshops and collaborative learning forums can facilitate peer-to-peer knowledge exchange, helping teachers stay updated on AI advancements and pedagogical implications.

Administrators also play a vital role in fostering a culture of ethical innovation. Institutional support should involve reallocating resources to support teacher development, revising academic honesty policies to reflect technological realities, and providing students with access to AI tools in a manner that is equitable and inclusive. When executed with intentionality, such systemic changes can empower both educators and learners to embrace AI as a productive component of the writing process.

To bridge traditional pedagogy with technological innovation, educators must design assignments that reflect the collaborative nature of AI-human interaction. Effective prompts might include tasks such as: crafting a short story from an AI-generated prompt followed by a reflective commentary; juxtaposing a student's own version of a narrative with an AI-produced draft to identify stylistic divergences; or constructing a character using AI suggestions and then diverging significantly in plot development. These assignments compel students to think critically about authorship, structure, and voice while minimizing the risk of passive dependence on AI outputs (Stommel 25; Trust and Whalen 85).

Incorporating reflective writing alongside generative tasks ensures that students remain the central agents of the writing process. It reinforces the idea that AI is a cognitive partner-not a creative replacement-and that authentic expression stems from intentional and judicious decision-making skills and human interpretation. Assessing AI-enhanced writing demands a shift from traditional models focused solely on product to frameworks that emphasize process, iteration, and reflection. Writing in this context evolves into a hybrid endeavour-part human composition, part algorithmic suggestion-necessitating assessment methods that honour this complexity. Rather than

penalize students for using AI tools, instructors should reward critical engagement, evidence of revision, and ethical usage (Montgomery et al. 2023).

The broader aim is to cultivate a generation of writers who can skilfully navigate the symbiosis between human cognition and machine intelligence. By celebrating student creativity, encouraging metacognitive practices, and maintaining ethical guardrails, educators can ensure that AI becomes a meaningful ally in the pursuit of expressive and original writing.

Artificial Intelligence-generated content, though beneficial in numerous educational settings, often relies on structured and foreseeable linguistic patterns. When learners become overly dependent on these AI-driven prompts or auto-suggestions, they may begin to mirror a uniform style of expression, thereby risking the dilution of their distinct narrative voice and imaginative insight. This trend threatens a foundational aspect of creative education: the cultivation of individuality in writing (Smith 142).

AI tools operate through extensive datasets derived from pre-existing online materials. Consequently, their outputs frequently replicate familiar storytelling formulas, cultural stereotypes, or well-worn tropes. When students incorporate these suggestions without critical engagement, their compositions may lack emotional resonance, depth, or novel perspectives. The outcome is often a technically sound yet uninspired narrative, devoid of personal significance or originality (Jones 88).

Moreover, learners may become reluctant to explore unconventional themes or experimental literary forms, especially if they internalize the assumption that AI output represents an authoritative creative benchmark. This mindset inadvertently promotes uniformity and discourages the risk-taking essential to artistic growth (Taylor 215).

To combat these tendencies, educators must underscore the importance of personal engagement and creative reinterpretation. Students should be guided to critique AI-generated ideas, reshape them dramatically, or even use them as counterexamples to amplify their own voices. Assignments can reward bold expression and individuality, emphasizing creativity and authenticity (Brown 164).

Another pressing concern is the ethical landscape surrounding AI tools and the readiness of educators to handle them responsibly. Many AI systems collect user data to optimize performance, raising concerns about how student-generated input is stored, analyzed, and potentially shared. This issue is particularly sensitive in contexts involving minors (Davis 97).

Professional development programs should incorporate modules on prompt engineering, critical evaluation of AI content, ethical application, and integration into pedagogical models. Teachers must first become competent and confident users of AI if they are to mentor students effectively (Anderson 119).

One foundational principle in AI-enhanced writing instruction is presenting the tool as a creative companion, not a substitute for original work. Educators must consistently stress that AI serves as an idea stimulator, not a ghostwriter. This distinction preserves the student's role as the central creative agent (Parker 52). This concept can be put into practice by reserving AI use for initial brainstorming. Students might generate multiple prompts with AI tools and choose one to expand using only their ideas. AI thereby becomes a prewriting facilitator, while content development remains human-centered (Johnson 145). Another useful exercise involves comparing AI-generated prompts with those written by peers or teachers. Through critical evaluation, students learn to differentiate between thought-provoking and generic suggestions. Such comparisons foster analytical thinking and highlight the merits and limitations of automated creativity (Reed 201).

Effective implementation also requires ongoing observation and introspection. Given the often-self-directed nature of AI use, educators must maintain insight into how students engage with the tool, ensuring alignment with instructional goals (Campbell 91). One strategy involves requiring students to document their interactions with AI via screenshots, iterative drafts, or journal entries. This encourages transparency and supports formative assessment. It also facilitates reflective dialogue on how the AI shaped their thinking (Walker 128).

The integration of AI-generated prompts into creative writing instruction, while beneficial in stimulating ideas, can inadvertently stifle originality when overused or applied uncritically. AI outputs are typically derived from massive corpora of online content, and thus reflect prevalent linguistic patterns, narrative conventions, and thematic tropes. This can result in homogenized and formulaic outputs that, though grammatically sound and contextually relevant, may lack the nuance, depth, or emotional authenticity essential to literary writing (McAllister 103). When students excessively rely on AI-generated prompts or text completions, they risk adopting a standardized voice at the expense of their own individual expression—a cornerstone of creative education.

Originality in student writing depends on the cultivation of a unique voice—an identifiable pattern of diction, syntax, and thematic interest. However, when students use AI tools without critical engagement, their work may echo generalized patterns, leading to a dilution of their narrative identity. According to Selwyn and Jandrić, the repetitive structure and content of AI outputs risk reinforcing dominant norms and discouraging experimental or subversive narratives (89). This poses a pedagogical challenge: AI tools, by their very design, are programmed to optimize coherence and fluency based on past human data, which may discourage risk-taking and innovation in student compositions.

Further complicating this issue is the perception of AI as an authoritative co-author. Students may assume that the AI's suggestions are inherently superior due to their perceived objectivity or efficiency, thus sidelining their creative instincts. The phenomenon can subtly promote conformity and discourage boundary-pushing writing practices. McNeal and Van der Veen argue that students in AI-mediated classrooms sometimes suppress unconventional ideas if they do not align with AI-generated themes, believing that such deviations may be “less correct” (152). In effect, AI becomes less a tool for exploration and more a mould into which student creativity is shaped.

To counter these effects, educators must intentionally foreground student voice and agency. Teachers can structure assignments in ways that reward deviation from AI-

generated content, such as by asking students to write counter-narratives or alternative endings that deliberately depart from AI suggestions. Rubrics should privilege originality, creative risk, and personal engagement over technical polish. Revision-based pedagogy becomes especially critical here. By encouraging students to refine AI-generated outputs through recursive drafting and self-reflection, educators can redirect focus back to personal voice and interpretative depth (Murray 57).

Another strategy is to reframe AI as a “creative foil” rather than a ghostwriter. Assignments can require students to critique AI outputs, highlighting clichés or emotional flatness, and then rewrite the content to add depth, irony, or stylistic flair. This not only reinforces critical thinking but empowers students to challenge the authority of the algorithm. When students reassert control over their writing process in this way, they reaffirm their own authorial identity.

Ultimately, creative writing education must remain rooted in the cultivation of human expression. While AI can inspire and scaffold creativity, it must never be allowed to dominate or flatten it. As educators navigate the shifting landscape of AI-enhanced instruction, preserving student voice must remain paramount.

In conclusion, the rise of AI in education presents both a challenge and an opportunity. When ethically managed and pedagogically integrated, AI tools can support diverse learners, enhance creativity, and foster reflective practice. The future of writing pedagogy lies not in resisting technological change but in embracing a more nuanced, process-driven, and student-centered approach. A comprehensive framework that includes transparent guidelines, revised assessment strategies, ongoing teacher training, and reflective writing practices will ensure that AI strengthens-rather than weakens-the educational mission of fostering empowered, ethical, and imaginative writers.

When integrated with care and pedagogy, AI prompt engineering emerges as a dynamic ally in creative writing education. From enhancing technical skills to fostering innovation and self-reflection, AI transforms classrooms into interactive spaces that support diverse learning paths. The thoughtful use of AI-alongside ethical guidance and reflective practice-ensures that this technology amplifies human creativity without

diminishing individual voice. Far from being a passing trend, AI prompt engineering is redefining how writing is taught, practiced, and experienced in modern classrooms (Holmes et al. 82).

Recent global empirical studies strongly demonstrate that digital multimodal pedagogies enhance creative expression among secondary school students. Research conducted in countries such as Finland, Singapore, Australia, the United Kingdom, and South Korea highlights the effectiveness of multimedia-assisted pedagogy in school education, particularly within second-language classrooms. These studies collectively establish that creative writing pedagogy supported by digital multimodal learning environments significantly improves learner engagement, narrative construction, collaboration, and linguistic performance.

A classroom-based study conducted by Lim Fei Victor and Yeo Lay See in Singapore proved that animation-assisted instructional sessions improved students' ability to organise plot structure, characterisation, cohesion, and coherence in English writing tasks. Similarly, mixed-method research conducted in Finland demonstrated that multimedia-integrated classroom practices strengthened the cognitive abilities of students and enhanced higher-order thinking skills among adolescent learners when visual resources were incorporated into linguistic production activities. Another study revealed that learners with varying levels of linguistic proficiency benefitted substantially from multimedia-based instruction (Kumpulainen and Sefton-Green 214).

Research conducted in South Korea and Australia also supports the pedagogical relevance of multimedia-integrated creative writing frameworks. Studies in South Korea investigating AI-assisted visual storytelling techniques observed measurable improvements in descriptive writing skills, vocabulary development, cohesion, and coherence among students. The findings validated the effectiveness of experiential and process-oriented learning methods within secondary school curricula and strongly aligned with the principles of contemporary constructivist pedagogy.

Likewise, Australian studies examining imaginative writing and digital storytelling established a strong connection between emotional experience and creative expression. These studies validated that CGI-integrated pedagogy is not merely a

technological tool, but a cognitively enriching instructional strategy that fosters learner autonomy, imaginative thinking, creativity, and deeper language engagement in second-language classrooms (Kim and Lee 214; Mills and Levido 112).

Research conducted in the United Kingdom on digital literacy and media-integrated instruction also suggests that visual and interactive pedagogies significantly improve learner perception, participation, and engagement compared to conventional text-centred classrooms (Burn and Durran 67).

Collectively, these recent empirical studies highlight the enormous pedagogical potential of CGI animation-integrated second-language classrooms in enhancing the creative writing abilities of students in English.

Chapter 3

Technology Enhanced Learning: Research Design and Methodology for Exploring the Impact of CGI Animation

Chapter 3

Technology Enhanced Learning: Research Design and Methodology for Exploring the Impact of CGI Animation

3.1. Overview

The current study explores the use of Computer-Generated Imagery based animation as a cognitive pedagogical approach to improve the creative writing skills of secondary school students. This chapter outlines the research methodology, including the variables involved, ethical considerations, assessment instruments, procedures for data collection, and techniques for statistical analysis. Additionally, it addresses the operational definitions of the research concepts and variables utilized in the study.

3.2. Objectives

1. To compare the advantages of Computer-Generated Imagery-based animation (CGI) videos over conventional methods to enhance creative writing skills in English of secondary school students.
2. To identify the difference in the response of rural and urban secondary school students who were trained in creative writing in English through CGI animation videos and conventional methods.
3. To examine the difference in the response of boys and girls who were trained in creative writing in English through CGI animation videos and conventional methods.
4. To demonstrate the difference in the response of students in government and private schools who were trained in creative writing in English through CGI animation videos and conventional methods.
5. To analyse the difference in the response of students hailing from different social backgrounds who were trained in creative writing in English through CGI animation videos and conventional methods.
6. To propose CGI animation videos as an effective tool to enhance creative writing in English for secondary school students.

3.3. Operational Definition

In the words of Goddard and Melville (2001), research is much more than merely gathering information. It is a systematic process of finding suitable answers to unanswered questions thus creating new knowledge. A researcher must prove the validity of the findings for the generated knowledge to be recognized. According to Kothari, research can be defined as a scientific and systematic search for relevant information on a specific topic. Research is the art of scientific investigation. (1)

Quantitative research is data-oriented. It is defined as a systematic study of a phenomenon by collecting and analysing quantifiable data and performing statistical techniques. In quantitative research, researchers collect data from existing customers using sampling methods. The results of such studies are depicted in the form of numerical inferences. Quantitative research is carried out in social sciences mostly to collect quantitative data from the research study. Data is collected using organized methods and conducted on huge samples that represent the total population.

The template of quantitative research is objective and investigational. Thus, the result will be logical and unbiased.

3.4. Method of Research

The first step of the study was to conduct an achievement test for the students to identify their current level of writing competence after conventional teaching of writing an alternative ending to a story. Generally, there are three methods to evaluate the students' writing skills:

- Open Analysis Method
- Interview or Oral Method
- Questionnaire or Written Test Method

3.4.1. Open Analysis Method

This is a method of analysing the writing skills of students by checking their notebooks, assignments, etc. Test papers and other such approaches can be used in this method. These materials are collected, scrutinised, and analysed to assess writing. This is a very common practice in classrooms. The teacher can give direct guidance in this method. Teachers can assign different works after the instruction, and students will submit the assignment at proper intervals. The completed works are scrutinised for errors in grammatical elements, coherence, vocabulary, etc.

3.4.2. Limitations of Open Analysis Method

Though the open analysis method is a very common practice in second language classrooms. It has some limitations

- Organization and generalisation are difficult
- It is a time-consuming process if the number in the classroom is large
- It is difficult to standardise this method
- In most cases, it is not possible to give the researcher a common framework
- The data is very limited in scope

3.4.3. Interview or Oral Method

This method of assessing writing is a direct method of analysing the writing skills of students. In this approach, the writing skills of a child are assessed orally. It is an oral type of questionnaire whereby data are collected directly. It is the process of oral communication or interaction between the teacher and student. It is carried out with the definite purpose of obtaining certain information utilizing spoken word.

3.4.4. Limitations of Interview or Oral Method

- The same questionnaire cannot be used for all students.
- The researcher cannot arrive at a generalisation.
- It can be administered individually, and as such, it may be time-consuming.

3.4.5. Questionnaire or Written Test Method

A questionnaire is a generally used instrument for gathering information from the contributors in research. It consists of a set of structured and unstructured questions developed by researchers to collect data from the participants. A valid and reliable questionnaire will help the researcher to validate the data in an accurate way. “It basically seeks the opinions of individuals in a sample or population on issues directly related to the objectives of the research study” (Aina 348).

A questionnaire has many advantages. First, the identity of the respondent can be kept secret as information is collected without personal details. It helps to collect large amount of data within a short period. Questionnaires have some demerits too. If there are confusing questions, the respondents may be misled. Also, in the absence of the person who conducts the research, doubts cannot be clarified. If the respondent is illiterate, the questionnaire will not be practical.

The following are the characteristics of a good questionnaire.

- Questions in the questionnaire must not be vague. It must be self-explanatory.
- Questions must be easily understood.
- Questions must not have any ambiguous words or phrases.
- Questions shall help the respondent to mark answers unbiasedly.
- Questions shall not require tough calculations.
- Questions must be short and precise.
- Questions must help the respondent convey the exact answer.

3.5. Research Design

The study employed a true experimental research design involving two comparable groups: an experimental group and a control group. The control group comprised students who shared similar characteristics with those in the experimental group but were not exposed to the instructional intervention. This group functioned as

a benchmark, enabling the collection of baseline data against which the outcomes of the experimental group could be systematically compared. The experimental group, in contrast, received the designated instructional treatment as part of the study. To ensure objectivity and comparability, both groups were subjected to randomly administered pre-tests and post-tests, facilitating an accurate assessment of the impact of the intervention.

A pre-test–post-test design was employed in this study. During the pre-test stage, both groups were assessed on the independent variable. This phase was followed by an instructional period, during which the experimental group was taught creative writing skills using CGI animated videos, while the control group received instruction through traditional methods such as blackboard teaching, textbooks, and visual aids. After the instructional phase was completed for the experimental group, a post-test was administered to evaluate the impact of computer-generated imagery-based animation films on enhancing the creative writing skills of secondary school students in English. The effectiveness of the intervention was determined by comparing the pre-test and post-test scores of both groups.

3.6. Variables (Independent and Demographic)

Samples were collected based on the following criteria.

- 1. Locale** (Rural and Urban Schools). Students both from rural and urban schools were selected for the current study. A close inspection of the social milieu where the students study will have a special impact on the result of the study. Infrastructure, availability of resources, expert teachers etc., will be different in rural and urban school. Education of the parent, their occupation, family background, etc will affect the study of a student.
- 2. Gender** (Boys and Girls). To ensure gender neutrality, both boys and girls were selected as samples, and their performance was analysed to get a clear-cut idea about the effectiveness of the strategy.
- 3. Types of Schools** (Govt. Schools and Private Schools, English Medium, and Malayalam Medium). Schools from the government and private sectors were selected for collecting the data.

4. Socio Economic Conditions The socio-economic conditions of the students were also considered to assess the effectiveness of the strategy on students hailing from different backgrounds.

3.7. Sample and Technique

The study drew its participants through a random sampling method. The participants in the research were secondary school students from classes VIII, IX and X, within the age range of 13 to 15, from schools across Kerala. Approximately one hundred students were chosen from each participating school. Two divisions from each school were selected; one as a control group and the other as the experimental group. The intervention was implemented over four to five months during which each group received twenty instructional hours. The total sample size for the study was approximately 800 students, ensuring adequate representation and reliability of the findings.

The sample size for the present study was determined by considering the accessibility of students, availability of classrooms, and feasibility of conducting extensive classroom interventions within the selected educational setting. Since the study focused on integrating CGI animation into the existing curriculum to assess its impact on the creative writing skills of secondary school students, a manageable sample size was considered appropriate for ensuring systematic implementation of instructional strategies, close observation of learner participation, and accurate assessment of outcomes.

Educational researchers argue that experimental and quasi-experimental studies require controlled and context-specific samples to facilitate detailed pedagogical analysis and minimise instructional variability. The selection of samples was also influenced by factors such as timetable flexibility, technological infrastructure, availability of teachers trained in Information and Communication Technology, and continuity of intervention sessions. In addition, learners were selected by considering academic background and curricular exposure to ensure homogeneity within the experimental setting.

Therefore, the selected sample was adequate for generating meaningful pedagogical insights regarding the integration of CGI animation into secondary English language classrooms. The present study prioritises depth of pedagogical engagement and detailed classroom interaction within the selected educational environment rather than broad quantitative generalisation.

3.8. Research Ethics

Research ethics is the process of applying fundamental ethical principles in the process of collecting data for the research. Empirical research in social sciences is built on the foundation of trust. The society trusts that the result of the research reflects an honest attempt by the researcher to create new knowledge by experimenting on the human participants. In research, the researcher has the responsibility to secure the actual permission of the participants and their parents in case they are children. No information collected through the experiment shall be misused or transmitted for purposes other than that specified for the research.

The first and broadest objective of research ethics is to protect the participants. A researcher shall ensure that research is carried out in a way that guarantee, the privacy and interest of individuals, groups, and society who take part in the research process. The protection of confidentiality of the study is also very important in research. In the present study, the researcher has taken maximum care to protect the rights of people who became part of the study as well as their privacy. The privacy and confidentiality of each participant are given maximum guarantee, and all measures have been taken to ensure that only valid information required for the study is collected from the participants.

3.9. Measuring Tools

The collection of data is a crucial component of any research endeavour, and in the present study, it played a central role in evaluating the effectiveness of Computer-Generated Imagery (CGI)-based animation as a pedagogical tool to enhance creative writing skills among secondary school students. In line with the pre-test–post-test experimental design, data collection was systematically carried out at two key stages:

before the instructional intervention (pre-test) and after the intervention has been administered (post-test). These two phases enabled the researcher to measure changes in students' performance attributable to the CGI-based instruction.

To ensure that the data collected were both reliable and relevant, a variety of measuring instruments had been employed. These included standardized creative writing assessment rubrics aligned with curriculum objectives. Each of these tools was carefully selected to objectively capture students' abilities in areas such as originality, coherence, vocabulary usage, grammatical accuracy, and organization of ideas.

The pre-test provided baseline data on the creative writing competencies of both the experimental and control groups, offering a foundation against which post-instructional gains could be measured. The post-test, administered after the instructional phase, reflected the outcomes of the pedagogical treatment. This comparative approach allowed the researcher to empirically test research assumptions and hypotheses regarding the impact of CGI-based animation on writing skill development.

It is essential that all measurement instruments are chosen and implemented to yield data that is both accurate and valid. To this end, content validity, scoring reliability, and consistency in administration were given due consideration. Furthermore, the research process upheld the principles of confidentiality and ethical integrity, ensuring that the responses and performances of all participants were treated with respect and anonymity. By adhering to these methodological standards, the study ensured the credibility of its findings and contributed meaningfully to the field of educational research.

3.9.1. Quantitative Research Approach

In quantitative research, the researcher first identifies a research problem and then explains the relationship among different variables. The problem can be answered by a study in which the researcher tries to identify the overall tendency of responses from individuals and to study how this tendency differs among people. The result of such research can inform how a majority respond to different situations and can lead to generalisation of the issue discussed.

3.10. Method of Data Collection

The data for the present study were collected through a structured, multi-phase procedure. In the initial phase, students in both the control and experimental groups participated in a forty-five-minute orientation session aimed at familiarising them with the basic components and expectations of preparing a written composition. Following this orientation, a pre-test was administered. During the pre-test, participants were given thirty minutes to produce a written response based on a common visual stimulus. The responses collected at this stage served as baseline data to determine the students' initial writing proficiency and to ensure the comparability of the two groups prior to the intervention.

The next phase involved the instructional treatment. Data were generated through students' written outputs produced during and after instruction. The control group was taught using activity-based conventional methods supported by the blackboard, textbooks, and static visual materials. In contrast, the experimental group received instruction using CGI animation in a smart classroom environment equipped with a projector, laptop, and multimedia speakers. Both groups were provided with an equal number of instructional hours to maintain uniformity in exposure. Upon completion of the intervention, a post-test was administered to both groups under conditions like those of the pre-test. The written responses collected in the post-test constituted the primary data for analysis. A comparative evaluation of pre-test and post-test scores was subsequently carried out to measure changes in writing performance, with particular focus on the extent of improvement demonstrated by students in the experimental group following CGI-based creative writing instruction.

3.11. Statistical Analysis

To validate the findings of the study, a paired-sample t-test was employed using SPSS software. The data were analysed with reference to the IELTS Writing Band Descriptors, which assess four essential dimensions of writing performance: task focus, lexical resource, grammatical accuracy, and coherence and cohesion. The t-test results obtained for the control group and the experimental group were systematically

compared to determine the relative effectiveness of CGI animation in relation to conventional instructional methods in enhancing the creative writing skills of secondary school students. This comparative analysis also enabled an assessment of the magnitude of improvement achieved by learners in the experimental group following the instructional intervention.

3.12. Limitations of the Methodology

As with any academic research, certain methodological limitations may influence the scope and findings of the study. The present research was conducted in institutions located within a limited geographical area that may not represent the diverse educational realities of other parts or institutions. Variations in ICT infrastructure in schools, teacher competency, learners' exposure to digital media, socio-economic conditions of participants, and the locality of schools may affect the broader applicability of the research findings. Another limitation was the duration of the intervention as creative writing development and digital pedagogical integration require long-term reflection to harvest more inclusive outcomes. The swiftly evolving world of Artificial Intelligence and animation technology also present a methodological limitation as technological advancements may change the applicability of certain tools in the experimental phase. However, the researcher attempted to overcome these limitations through structured data collection process and continuous observation to guarantee the reliability and validity of the research findings.

To ensure academic rigour, several measures were undertaken to establish the reliability and validity of the research instruments and procedures. Expert opinions were sought to validate the content, pedagogical relevance, and technological appropriateness of the research tools. The instruments were carefully verified to ensure clarity, contextual relevance, and alignment with the objectives of the study.

Necessary modifications were introduced into the instructional tools before the commencement of the actual experimental sessions. Reliability was further strengthened through pilot testing conducted among members of the experimental group. This preliminary phase helped assess the clarity, consistency, practicality, and

effectiveness of the research tools and intervention strategies. Collectively, these measures strengthened the methodological framework of the study and ensured greater accuracy, reliability, and academic credibility.

3.13. Conclusion

The methodology employed in this experimental research was strategically developed to investigate the impact of Computer-Generated Imagery (CGI)-based animation on the writing skills of secondary school students. Grounded in insights drawn from an extensive review of relevant literature, the study was anchored in well-established theoretical and empirical frameworks that support the integration of multimedia tools in language learning. The methodological design, including the careful selection of control and experimental groups, the development of valid assessment instruments, and the implementation of pre- and post-intervention procedures, ensured that the research maintained both academic integrity and practical relevance.

The experimental nature of the study allowed for the examination of cause-effect relationships in a real-world educational setting, without the constraints of random assignment. This approach provided a feasible yet rigorous means to assess the pedagogical value of CGI-based animation. Moreover, the use of both quantitative data (test scores) and qualitative feedback (student responses, observations) offered a holistic understanding of the learners' progress. The methodological choices were made with attention to ethical considerations, contextual realities, and the specific learning needs of the target population.

Chapter 4

Cognitive and Creative Impact of CGI Animation: Analysis and Interpretation of Student Engagement

Chapter 4

Cognitive and Creative Impact of CGI Animation: Analysis and Interpretation of Student Engagement

4.1. Overview of the Data Analysis

The focus of the study is to find out the effectiveness of Computer-Generated Imagery (CGI) based animation videos to enhance the creative writing skills in English of secondary school students. CGI animation enables students to bring their imaginative ideas to life visually. It helps students visualize scenes, characters, and settings in a more detailed manner. This chapter presents an analysis of the study's results to determine whether the proposed objectives were achieved and the hypothesis validated.

The following objectives were formulated for the present study.

1. To compare the advantages of computer-generated imagery-based animation videos (CGI) over conventional methods to enhance creative writing skills in English for secondary school students.
2. To identify the difference in the response of rural and urban secondary school students who were trained in creative writing in English through CGI animation videos and conventional methods.
3. To examine the difference in the response of boys and girls who were trained in creative writing in English through CGI animation videos and conventional methods.
4. To demonstrate the difference in the response of students in government and private schools who were trained in creative writing in English through CGI animation videos and conventional methods.
5. To analyse the difference in the response of students hailing from different social backgrounds who were trained in creative writing in English through CGI animation videos and conventional methods.
6. To propose CGI animation videos as an effective tool to enhance creative writing in English of secondary school students.

4.2. Detailed Analysis and Interpretation of Data

Analysis of achievement scores of experimental and the control groups in the pre-test and post-test

- Preliminary analysis of the achievement test scores.
- Comparison of the mean pre-test and post-test scores of the experimental and the control groups for the total sample.

Preliminary analysis of the achievement test scores

The achievement scores of pre-tests and post-test were subjected to preliminary statistical analysis to decide the further statistical procedure to be done. The major statistical measures, namely mean, median, mode, standard deviation, skewness, and kurtosis were calculated. The distributions were examined for normality.

Before Experiment

Prior to initiating the experimental phase, a pre-test in English was conducted for both the experimental and control groups to assess the existing creative writing skills of secondary school students. The results obtained from the pre-test were initially analysed using basic statistical techniques to determine the appropriate subsequent statistical methods. Key statistical measures, including the mean, median, mode, standard deviation, skewness, and kurtosis of the pre-test scores, were computed. Additionally, the score distributions for each group were individually evaluated to assess their normality.

Statistical measures of the pre-test scores of both the experimental and the control groups were computed and given in table 4.1.

*Table 4.1: Statistical measures for creative writing skills scores
for pre-test of the experimental and the control group*

Statistical Measures Calculated	Experimental	Control
Mean	10.03	9.33
Median	10.00	9.00
Mode	11.00	9.00
Std. Deviation	2.14	2.13
Skewness	-.006	.060
Std. Error of Skewness	.110	.115
Kurtosis	-.336	-.179
Std. Error of Kurtosis	.220	.229
Range	12.00	12.00
Minimum	4.00	4.00
Maximum	16.00	16.00

Table 4.1 shows that the mean and median pre-test scores of both the experimental and control groups are almost the same. The experimental group has a mean score of 10.03, while the control group has a mean score of 9.34. The standard deviations are 2.14 for the experimental group and 2.13 for the control group. These relatively low standard deviation values suggest that the scores in both groups are close to the average, with little variation among students.

Indices of skewness suggest that the distribution of pre-test scores of the experimental group is slightly negatively skewed, and for the control group it is positive. The skewness value is -0.006 for the experimental group and 0.06 for the control group.

The frequency curves drawn for the distribution of scores of pre-tests for the control groups are presented in figure 4.1.

Figure 4.1: Frequency distribution of pre-test scores of the control group

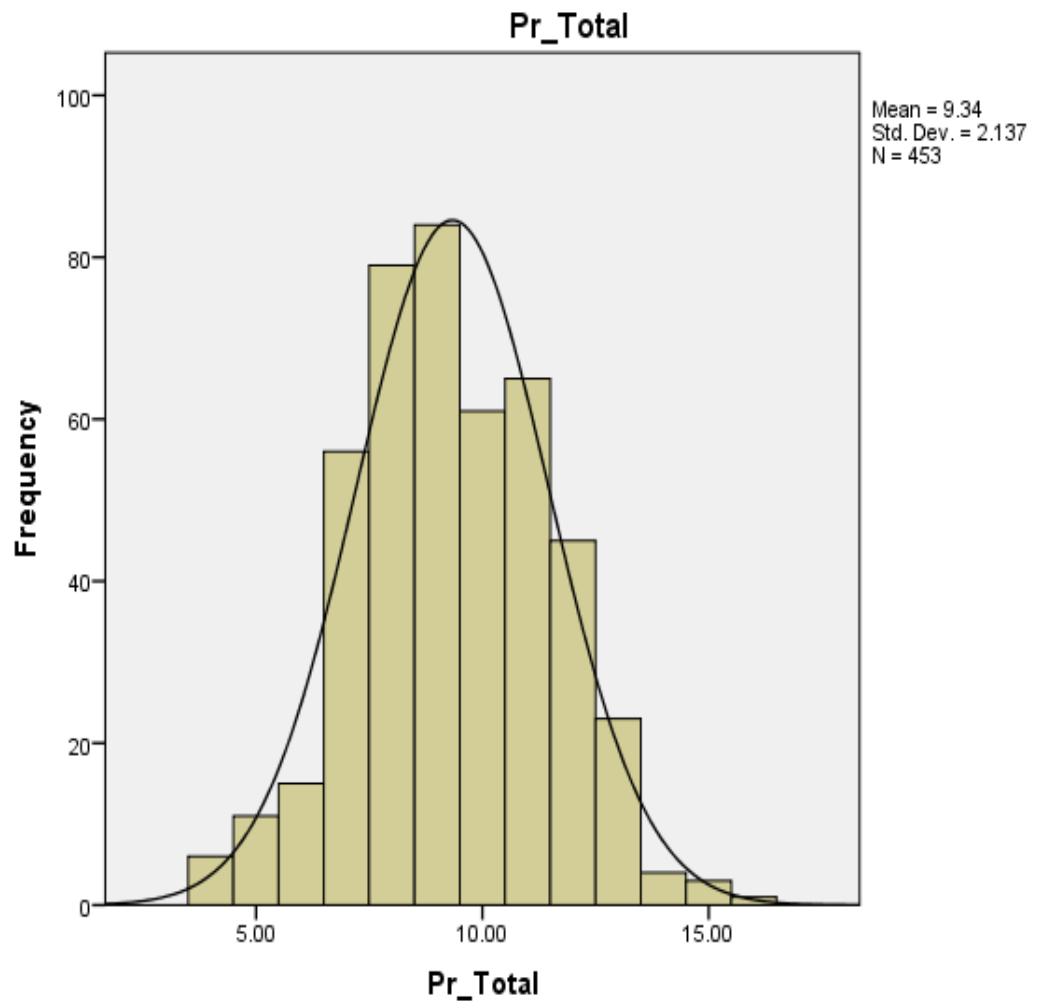
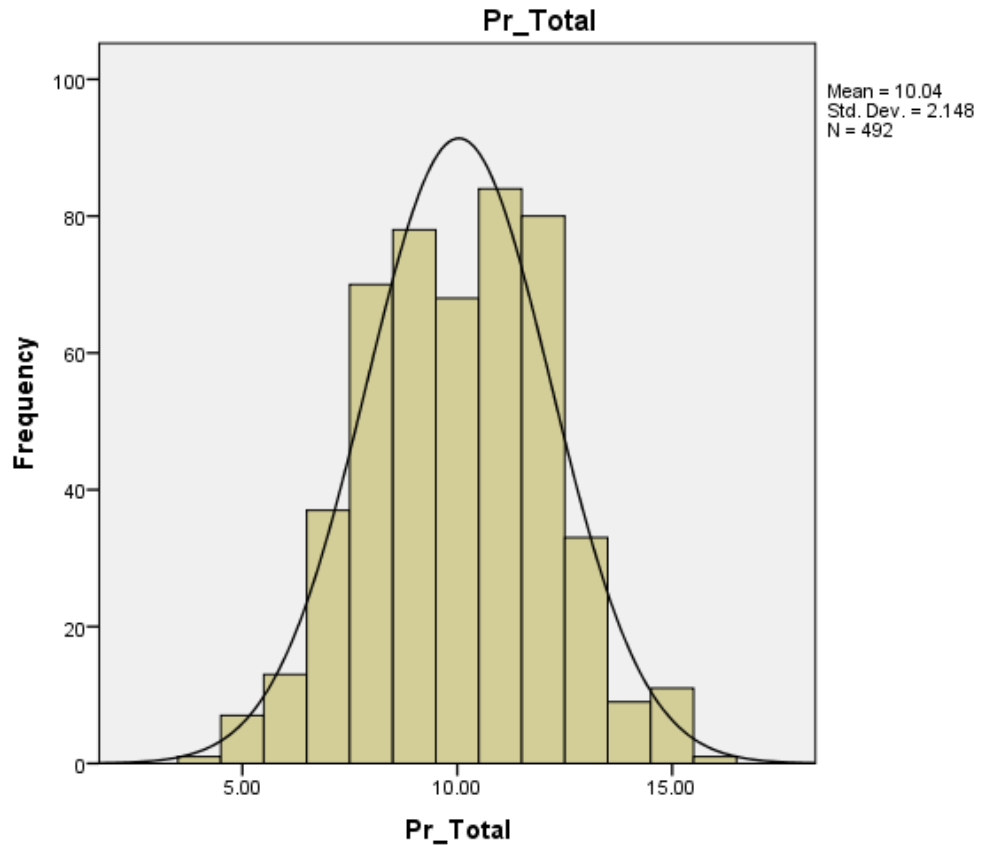


Figure 4.1 illustrates the frequency distribution of the pre-test scores of the control group. It shows that most participants scored within the lower and middle score ranges. Only a small number of students achieved higher scores. The mean score of the group is 9.34, with a standard deviation of 2.137, indicating a moderate level of performance.

The frequency curves drawn for the distribution of scores of pre-test for the experimental groups is presented in figure 4.2.

Figure 4.2: Frequency distribution of pre-test scores of the experimental group



As illustrated in figure 4.2, the pre-test scores of the experimental group are centred around a mean of 10.04 with a standard deviation of 2.148. It indicates homogeneity in the initial proficiency of students. The figures show that the data of the control and the experimental group follow normality and are hence reliable for further analysis.

After Experiment

After the experiment was completed, a post-test was given to both the experimental and control groups to assess their improvement in creative writing skills in English. The scores collected from the students were first examined through basic statistical analysis. This included calculating the mean, median, mode, standard deviation, skewness, and kurtosis to understand the overall performance and distribution of the results.

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The statistical measures of the post-test scores of both the experimental and the control groups were computed and shown in table 4.2.

Table 4.2: Statistical Measures for creative writing skills scores in post-test of experimental and the control group

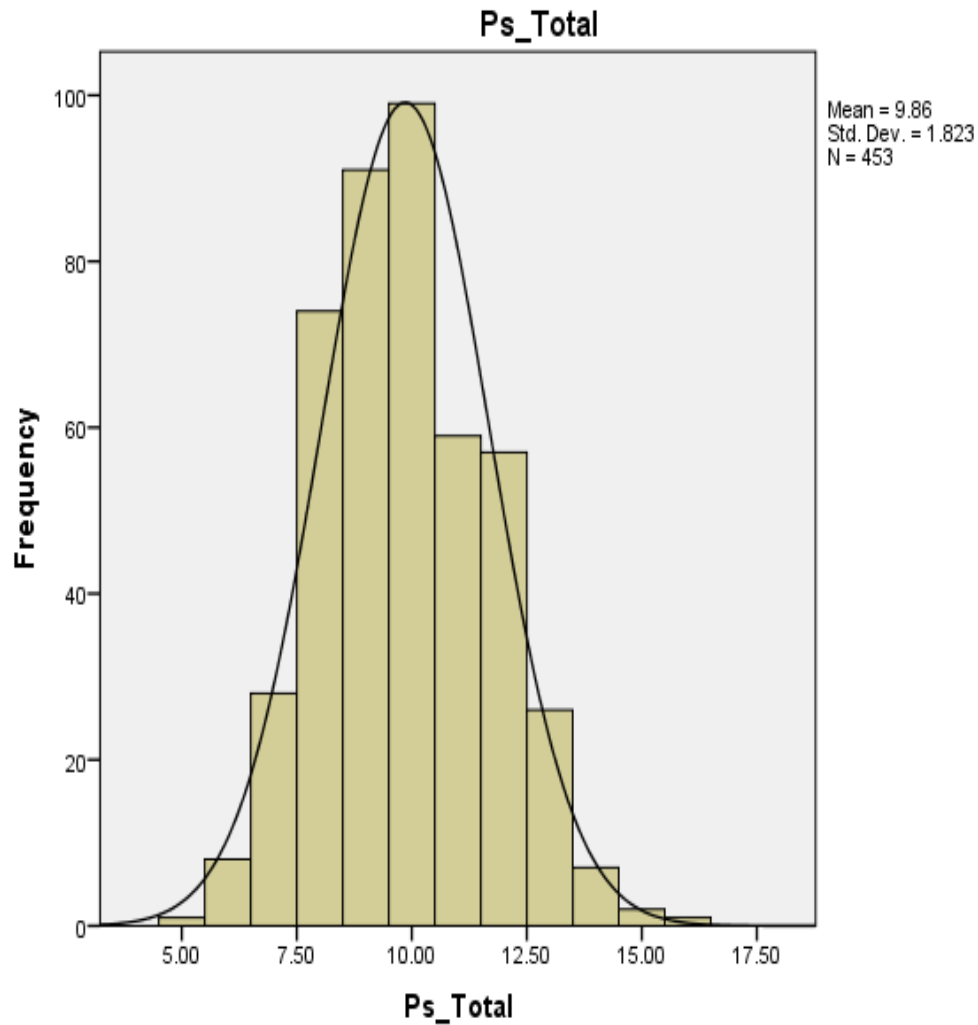
Statistical measures Calculated	Experimental	Control
Mean	15.45	9.85
Median	16.00	10.00
Mode	16.00	10.00
Std. Deviation	1.81	1.82
Skewness	-.223	.258
Std. Error of Skewness	.110	.115
Kurtosis	-.449	-.207
Std. Error of Kurtosis	.220	.229
Range	9.00	11.00
Minimum	10.00	5.00
Maximum	19.00	16.00

Table 4.2 shows that the mean, median, and mode of the post-test scores for both the experimental and control groups are nearly the same. The average post-test score for the experimental group is 15.45, while the control group's average score is 9.85. The standard deviations are 1.81 for the experimental group and 1.82 for the control group, which indicates that the scores in both groups are close to their respective averages and do not vary much.

The skewness values suggest that the score distribution for the experimental group is slightly skewed to the left (negative skewness), while the control group's distribution is slightly skewed to the right (positive skewness). The skewness for the

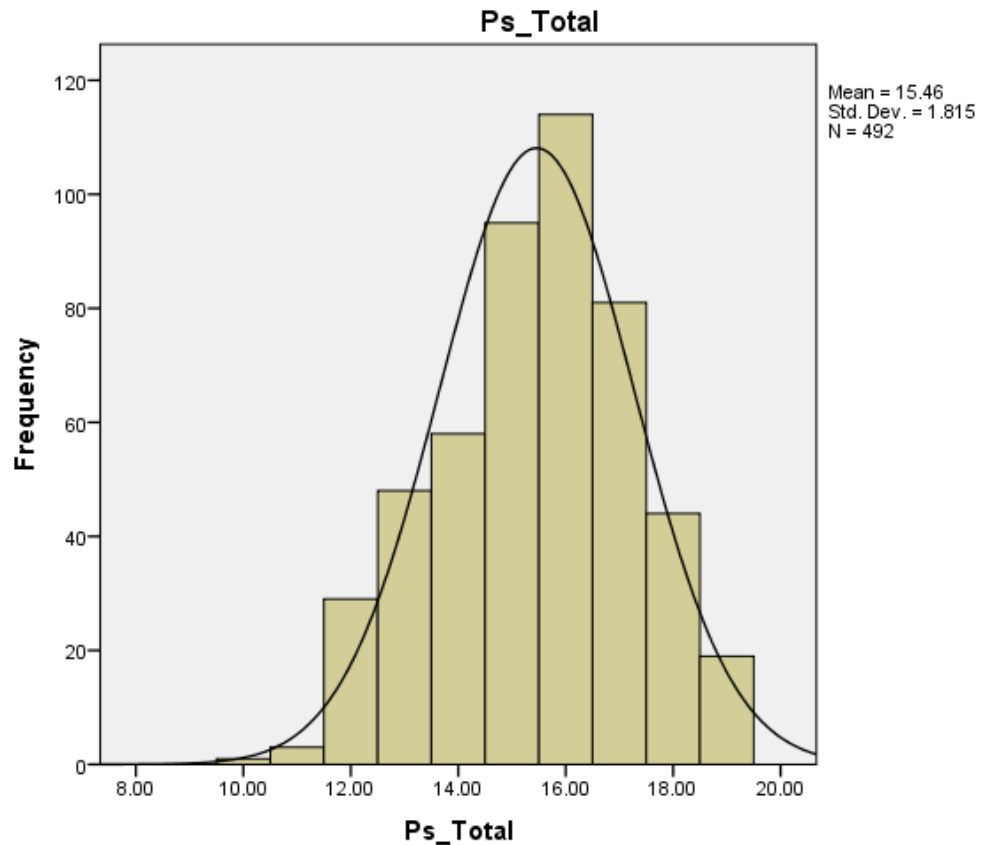
experimental group is -0.223 and for the control group is 0.258. The frequency curve showing the distribution of post-test scores for the control group is illustrated in figure 4.3.

Figure 4.3: Frequency distribution of post-test scores of the control group.



The frequency curves for the distribution of scores of post-tests for the experimental group are presented in figure 4.4.

Figure 4.4: Frequency distribution of post-test scores of the experimental group



The figures show that the data of the control and experimental group follow normality and hence reliable for further analysis.

Four dimensions of writing-namely task focus, lexical resource, grammatical resource, and coherence and cohesion-were considered for the analysis. The evaluation of students' written responses was carried out using the IELTS Writing Task 1 Rubric, which assesses performance across these four domains: relevance and completion of the task, effective use of vocabulary, accuracy and range of grammatical structures, and the clarity and logical organisation of ideas.

1. Task Focus

A task given to students to learn writing enhances their creativity. It helps them to learn from real-life situations and provides them a chance to get involved in the

activity with great enthusiasm. Through a task, a child is given a chance to apply his/her skills spontaneously even outside the classroom. It also helps them to think and write based on the given stimulus. In task focus, the attention of the student is channelised to getting the focus towards achieving the goal.

The task given to students to enhance creative writing skills shall be contextualised so that the student can think his/her way and write with focus. In task focus, the teacher checks whether the learner generally addresses the task, and whether he/she presented an overview of the task given by adequately presenting key features of it like vocabulary, punctuation, and correct use of language. It also helps teachers to identify if the student illustrates the key features of the task and clearly illustrates a fully developed response or not. The key features of the task can be visible in writing the task.

2. Lexical Resource

In simple words, lexical resource means vocabulary. Using words that find a close association with the topic is a skill. It also means to use relevant words for the topic under discussion. It is very important to observe that the child finds the right words and phrases to convey the idea flexibly and fluently.

In the study, attention had been given to evaluate whether the students were able to use vocabulary in a very natural and sophisticated way accepting minor errors usually. It is very important to use precise vocabulary in writing to convey the exact meaning. Children's use of both common and uncommon lexical resource will confidently decide their ability to delineate their thoughts in concrete form. It is a fact that children will produce occasional errors in choosing the vocabulary i.e., word choice, spelling, and word formation. Attention has also been given to checking whether the students could collect suitable vocabulary from the video in appropriate places. Visual images and videos will help children to collect a wide range of words to complete a piece of writing.

3. Grammatical Resource

Proper grammar is essential for clarity, readability, and credibility. Proper knowledge of grammar would make a piece of writing clearer and more readable. Grammar does play an important role in creative writing. An investment in grammar resources will be a great investment in one's life as a learner and communicator. Grammatically correct sentences and compositions make them clear, concise, and consistent. Proper punctuation, use of determiners and connectors, proper word order, etc., are the fundamentals of grammar.

In the study, it had been evaluated if the students could use a variety of structures in a piece of writing. Different sentence patterns, use of correct word order, punctuation, etc., have been considered to assess the grammatical resource. Students' ability to write error free sentences was also examined. An attempt was made to ensure that students produced error-free sentences with a good control of grammar and punctuation.

4. Coherence and Cohesion

Coherence and cohesion are slightly different terms. Coherence means the connection of ideas, and cohesion is the connection of sentences in a piece of writing. Cohesion is related to the grammatical aspects of writing. In creative writing, both coherence and cohesion are important. Effective writing hinges on the skilful integration of grammatical accuracy and the logical flow of ideas. A well-structured piece of writing demonstrates a clear connection between individual sentences and the overarching topic, while the writers' success lies in their ability to link each idea to the central task or objective.

Coherence and cohesion in a piece of writing are very important. The smooth flow of ideas from one sentence to another is equally important, like the flow of one sentence to the topic sentence. The connection of ideas must be logical and sensible. In other words, we can define coherence as clarity of expression. Clarity of expression is achieved through the appropriate use of vocabulary and grammar. A text without

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coherence will be difficult to understand. The unity of a paragraph greatly depends on coherence and cohesion.

In this study, the aspects of coherence and cohesion were examined to evaluate whether the students were able to complete the writing task in a clear, logical, and well-connected manner. The responses of the learners were evaluated to assess if they were able to sequence ideas and information skilfully and whether there was a clear progression of ideas throughout the composition. It was also examined whether the students could use cohesive devices like conjunctions, pronouns, and connectives to link parts of the sentences. Proper use of cohesive devices of addition like and, also, too, cohesive devices of sequencing like first, second, etc, cohesive devices of contrast like instead, cohesive devices of result like so, therefore, because, cohesive devices of qualifying like but, however, unless etc were considered for assessment.

This section examines the changes in task focus scores among participants in the control group, comparing their performance in the pre-test and post-test.

Table 4.3: Task focus scores in the pre-test and post-test of the control group

Score	Pre-test		Post test	
	Frequency	Percent	Frequency	Percent
1	11	2.4	-	-
2	155	34.2	140	30.9
3	221	48.8	243	53.6
4	66	14.6	70	15.5
5	-	-	-	-
Total	453	100.0	453	100.0

The table presents the task focus scores of the control group in the pre-test and post-test. The pre-test results indicate a high concentration of students at the lower end

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of the scale, suggesting that most learners in the control group initially demonstrated limited ability to maintain task focus. In the post-test, a marginal upward shift in scores is observed. The number of students scoring at levels 3 and 4 shows a slight increase, while those scoring at levels 1 and 2 decrease correspondingly. This pattern indicates a modest natural improvement in task focus of students in control group.

Task focus scores in the pre-test and post-test of the experimental group.

This section examines the changes in task focus scores among participants in the experimental group, comparing their performance before (pre-test) and after (post-test) the intervention.

Table 4.4: Task focus scores in the pre-test and post-test of the experimental group

Score	Pre-test		Post test	
	Frequency	Percent	Frequency	Percent
1	2	.4	-	-
2	151	30.7	-	-
3	242	49.2	39	7.9
4	97	19.7	283	57.5
5	0	0.0	170	34.6
Total	492	100.0	492	100.0

The table shows the task focus scores of the experimental group in the pre-test and post-test. In the pre-test, many students are concentrated at the lower score levels, indicating weak task focus prior to the intervention. In the post-test, a clear shift towards higher score levels are evident. The number of students with low scores decreases markedly, while as many as 170 students attain the maximum score. It proved that the

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intervention had a significant positive impact on improving the task focus of students in the experimental group.

Lexical resource scores in the pre-test and post-test of the control group

In the assessment of creative writing, lexical resource refers to the writer's ability to use a wide range of vocabulary, phrases, and linguistic devices to convey meaning, create tone and engage reader. It involves range of vocabulary, phrasal variety, word choice, tone, linguistic devices etc., Through the assessment of lexical resource, teachers can determine whether the student has demonstrated a strong command of language, can use phrases and vocabulary effectively, and can create engaging writing.

This section examines the changes in lexical resource scores among participants in the control group, comparing their performance in pre-test and post-test.

Table 4.5: Lexical resource scores in the pre-test and post-test of the control group

Score	Pre-test		Post test	
	Frequency	Percent	Frequency	Percent
1	40	8.8	10	2.2
2	229	50.6	207	45.7
3	163	36.0	216	47.7
4	21	4.6	20	4.4
5			-	-
Total	453	100.0	453	100.0

The above table shows the frequency of scores for the control group's lexical resource, comparing pre-test and post-test results. The control group's lexical resource

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scores show a moderate improvement from pre-test to post-test. The number of students at the lowest level decreased while those scoring at the mid-level increased notably. But scores at the higher level remained almost the same and no student reached the maximum score in either test. Overall, the group showed natural progress in lexical resource.

Lexical resource scores in the pre-test and post-test of the experimental group

This section examines the changes in lexical resource scores among participants in the experimental group, comparing their performance before (pre-test) and after (post-test) the intervention.

Table 4.6: Lexical resource scores in the pre-test and post-test of the experimental group.

Score	Pre-test		Post test	
	Frequency	Percent	Frequency	Percent
1	27	5.5	-	-
2	216	43.9	2	.4
3	224	45.5	145	29.5
4	25	5.1	280	56.9
5	0	0.0	65	13.2
Total	492	100.0	492	100.0

The table shows a substantial improvement in the lexical resource scores of the experimental group. Though most students were clustered in the low level and mid-level bands in the pre-test, their number substantially improved in the post-test. The shift is evident in the achievement of scores 4 and 5. Overall, the data indicate a strong upward progression in the experimental group's lexical resource.

Grammatical resource scores in the pre-test and post of the control group

In creative writing assessment, the grammatical resource refers to the ability of the student to use grammar, syntax, and sentence structure effectively to convey the message. By assessing grammatical resource, teachers can evaluate the ability of the students to use language effectively and provide targeted feedback to support their development.

This section examines the changes in grammatical resource scores among participants in the control group, comparing their performance in pre-test and post-test.

Table 4.7: Grammatical resource scores in the pre-test and post-test of the control group.

Score	Pre-test		Post test	
	Frequency	Percent	Frequency	Percent
1	134	29.6	67	14.8
2	265	58.5	319	70.4
3	53	11.7	66	14.6
4	1	.2	1	.2
5			-	-
Total	453	100.0	453	100.0

The table shows only a minor improvement in the grammatical resource score of the control group. The number of students with low scores dropped from 134 to 67 but most of them shifted only to score 2. No students reached the highest level in either test. Overall, the group shows a limited natural progress.

Grammatical resource scores in the pre-test and post-test of the experimental group

This section examines the changes in grammatical resource scores among participants in the experimental group, comparing their performance before (pre-test) and after (post-test) the intervention.

Table 4.8: Grammatical resource scores in the pre-test and post-test of the experimental group

Score	Pre-test		Post test	
	Frequency	Percent	Frequency	Percent
1	80	16.3	-	-
2	285	57.9	15	3.0
3	125	25.4	231	47.0
4	2	.4	245	49.8
5	0	0.0	1	0.2
Total	492	100.0	492	100.0

A clear and substantial improvement in the grammatical resource scores of the experimental group after the intervention is shown in the table. The students who were in the lower and mid-level bands in the pre-test shifted to higher proficiency with clear increase in score 3 and 4. Overall, the results show a significant upward movement in the achievement of grammatical resource by the experimental group after the intervention.

Coherence and cohesion scores in the pre-test and post of the control group

Coherence and cohesion refer to the learner's ability to create clear, logical, and connected text that engages the reader. Cohesion is the way a writer uses language to link ideas, sentences, and paragraphs together. It is achieved using various linguistic devices. On the other hand, coherence refers to the overall meaning and clarity of the text.

This section examines the changes in coherence and cohesion scores among participants in the control group, comparing their performance in pre-test and post-test.

Table 4.9: Coherence and cohesion scores in the pre-test and post-test of the control group

Score	Pre-test		Post test	
	Frequency	Percent	Frequency	Percent
1	25	5.5	7	1.5
2	238	52.5	242	53.4
3	177	39.1	190	41.9
4	13	2.9	14	3.1
5			-	-
Total	453	100.0	453	100.0

The table shows only minimal, natural improvement in coherence and cohesion of the control group. Though the number of students at the lowest level declined from 25 to 7, most of these students shifted only to score 2. No students reached the highest score in either test, Overall, the group shows limited progress in achieving coherence and cohesion.

Coherence and cohesion scores in the pre-test and post-test of the experimental group.

The coherence and cohesion scores of the experimental group are analysed, highlighting any improvements or declines from the pre-test to the post-test, providing insights into the effectiveness of the intervention.

This section examines the changes in coherence and cohesion scores among participants in the experimental group, comparing their performance before (pre-test) and after (post-test) the intervention.

Table 4.10: Coherence and cohesion scores in the pre-test and post-test of the experimental group

Score	Pre-test		Post test	
	Frequency	Percent	Frequency	Percent
1	17	3.5	-	-
2	220	44.7	2	.4
3	221	44.9	114	23.2
4	34	6.9	311	63.2
5	0	0.0	65	13.2
Total	492	100.0	492	100.0

The experimental group's coherence and cohesion scores indicate a significant improvement from pre-test to post-test. Students distributed across lower and mid-level bands in the pre-test were shifted to higher scores after the intervention with significant increase in scores 4 and 5. Overall, the results reflect substantial progress, with most of the students advancing to higher levels of coherence and cohesion after the intervention.

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Creative writing scores in the pre-test and post-test of the control group.

Creative writing score indicates the learners' ability to produce an engaging, effective, and well-crafted piece of writing that showcases their creative skills. It includes originality and creativity, relevance and coherence, depth, and complexity etc.,

This section examines the changes in creative writing score among participants in the control group, comparing their performance in pre-test and post-test.

Table 4.11: Creative writing scores in the pre-test and post-test of the control group

Score	Pre-test		Post test	
	Frequency	Percent	Frequency	Percent
4.00	6	1.3		
5.00	11	2.4	1	.2
6.00	15	3.3	8	1.8
7.00	56	12.4	28	6.2
8.00	79	17.4	74	16.3
9.00	84	18.5	91	20.1
10.00	61	13.5	99	21.9
11.00	65	14.3	59	13.0
12.00	45	9.9	57	12.6
13.00	23	5.1	26	5.7
14.00	4	.9	7	1.5
15.00	3	.7	2	.4
16.00	1	.2	1	.2
Total	453	100.0	453	100.0

The table shows the creative writing scores in the pre-test and post-test of control group. It shows only modest, natural improvement from pre-test to post-test.

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The number of students with lower score bands decreased, indicating that some of the weaker performers moved upward. The middle range scores (8 to 11) remained almost stable but with minor shifts overall. There is a small increase in the higher-level performance particularly at score 13, 14 and 15. But the gains are limited. Overall, the control group demonstrates gradual progress across levels but no major improvement typically associated with an intervention.

Creative writing scores in the pre-test and post-test of the experimental group.

This analysis compares the creative writing scores of the experimental group at two time points: pre-test (before the intervention) and post-test (after the intervention), aiming to identify any significant changes.

Table 4.12: Creative scores in the pre-test and post-test of the experimental group

Score	Pre-test		Post test	
	Frequency	Percent	Frequency	Percent
4	1	.2	-	-
5	7	1.4		
6	13	2.6		
7	37	7.5		
8	70	14.2		
9	78	15.9		
10	68	13.8	1	.2
11	84	17.1	3	.6
12	80	16.3	29	5.9
13	33	6.7	48	9.8
14	9	1.8	58	11.8
15	11	2.2	95	19.3
16	1	.2	114	23.2
17			81	16.5
18			44	8.9

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19			19	3.9
Total	492	100.0	492	100.0

The table shows great improvement in creating writing skills of the experimental group from pre-test to post-test. In the pre-test, students were spread across the lower and middle-range bands, with the highest score reached being 16 and no students scoring 17 to 19. In the post-test, all lower-level scores disappeared, showing that every student moved beyond the weak and average performance level. The table also shows a substantial increase at scores 15,16,17,18 and 19 indicating advanced creative writing proficiency. Overall, the results demonstrate a significant upward shift with the intervention leading to strong gains across the entire group.

Conclusion

Writing is a convenient mode for judging a child's performance. A student's performance can be assessed through his or her writing skills. Writing skills have become an urgent and immediate requirement for aspiring youngsters in the field of higher studies and career opportunities. In today's interconnected world, effective communication is essential and writing proficiency is paramount. Of the four core language skills, writing is arguably the most complex and demanding, yet it is crucial for success in our increasingly globalised society. To thrive in this world, individuals must develop strong writing skills to effectively communicate both locally and globally.

Analysis of Task Focus

Comparison of Pre-test Scores

To confirm that both the experimental and control groups had a similar level of academic performance in task focus before the experiment, the pre-test scores for task focus were compared across the total sample. The comparison results are shown in Table 4.13.

Table 4.13

***Comparison of mean pre-test achievement scores in task focus between
the control group and experimental group***

Group	N	Mean	S. D	't'-value	P value
Control	453	2.75	.72	2.717	.007
Experimental	492	2.88	.71		

The average pre-test scores in task focus for the control and experimental groups are 2.75 and 2.88, respectively, with standard deviations of 0.72 and 0.71. The difference between the means is 0.127. The calculated t-value is 2.717, which is greater than the critical value of 1.96 at the 0.05 level of significance. This result indicates a meaningful difference between the two groups in terms of their pre-test scores in task focus. In other words, the students in the control and experimental groups showed a significant difference in their initial performance in task focus before the intervention.

Therefore, it can be concluded that while the experimental and control groups are similar in terms of their class level, they differ in their pre-test achievement in task focus. This means the students in both groups are from the same academic level, but they are not uniform in their task focus scores before the start of the experiment.

Comparison of Post-test Scores

The post-test scores of the achievement in task focus for the total sample were compared to know the difference between the experimental and the control groups

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concerning the academic achievement after the experiment in task focus and it is presented in table 4.14.

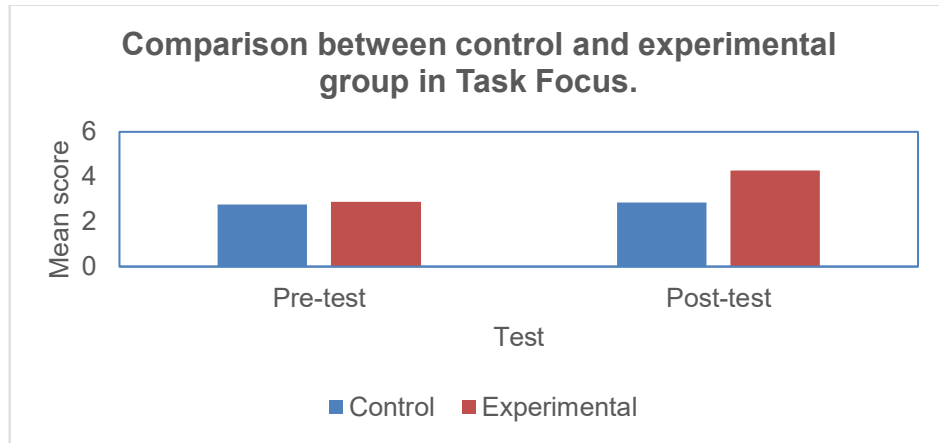
Table 4.14: Comparison of mean post-test achievement scores in task focus between the control and experimental groups

Group	N	Mean	S. D	t'-value	P value
Control	453	2.84	.66	34.679	.000
Experimental	492	4.26	.59		

The comparison of task focus achievement scores between the experimental and control groups based on the post-test results is shown in the table. The control group has an average score of 2.84, while the experimental group has a higher average score of 4.26. The difference between these two means is 1.42. The standard deviation is 0.66 for the control group and 0.59 for the experimental group. The calculated t-value for the post-test scores in task focus achievement between the experimental and control groups is 34.678, which is significantly higher than the critical value of 2.58 at the 0.01 level of significance. This clearly shows a significant difference in post-test achievement scores in task focus between the two groups.

A visual comparison of the average pre-test and post-test scores in task focus achievement between the control and experimental groups is shown in Figure 4.5.

Figure 4.5: Comparison of mean pre-test and post-test achievement scores in task focus between the experimental and control groups



Comparison of Gain Scores

The gain scores of the achievement in task focus for the total sample were compared to know the difference between the experimental and the control groups; to gain in academic achievement after the experiment in task focus and it is presented in table 4.15.

Table 4.15: Comparison of mean gain achievement scores in task focus between the control and experimental groups

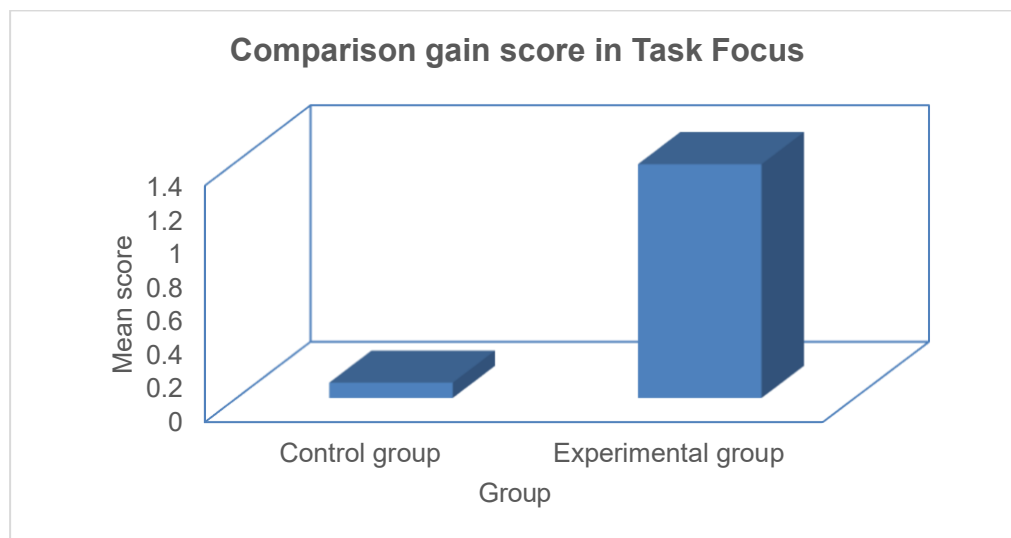
Group	N	Mean	S. D	t'-value	P value
Control	453	.09	.39	35.479	.000
Experimental	492	1.38	.67		

The comparison of gain scores in task focus achievement between the experimental and control groups for the entire sample is presented. The control group, which consists of 453 students, has an average gain score of 0.09, while the experimental group, which includes 492 students, has a much higher average gain score

of 1.38. The difference in the average gain scores between the two groups is 1.29. The standard deviation for the control group is 0.39, and for the experimental group, it is 0.67. The t-value calculated for this comparison is 35.479, which is much higher than the critical value of 1.96 at the 0.05 level of significance. This indicates that there is a statistically significant difference in the gain scores of task focus achievement between the control and experimental groups across the total sample.

A graphical illustration showing the comparison of mean gain scores in task focus achievement between the control and experimental groups is provided in Figure 4.6.

***Figure 4.6: Comparison of mean gain achievement scores in task focus
between the experimental and control groups***



Comparison of mean pre-test and post-test Scores of task focus in the control group

The mean scores of the achievement in task focus for the total sample were compared to know the significance of the difference between the pre-test and post-test scores of the control group after the experiment and it is presented in table 4.16.

Table 4.16: Comparison of pre-test and post-test achievement scores in task focus of the control group

Test	N	Mean	S. D	t'-value	P value
Pre test	453	2.75	.72	4.920	.000
Post test	453	2.84	.66		

The average scores of the control group in task focus for the pre-test and post-test are 2.755 and 2.845, respectively. This shows a small mean difference of 0.09 between the two tests. The standard deviation of the control group in the pre-test is 0.725, while in the post-test, it is slightly lower at 0.663. When comparing the pre-test and post-test scores of the control group, the calculated t-value is 4.920. Since this t-value is greater than the critical value of 1.96, it indicates that there is a statistically significant difference between the pre-test and post-test scores of the control group in task focus, at the 0.01 level of significance.

Comparison of mean pre-test and post-test scores in task focus in the experimental group

The mean scores of the achievement in task focus for the total sample were compared to know the significance of difference between pre-test and post-test scores of the experimental group after the experiment and it is presented in table 4.17.

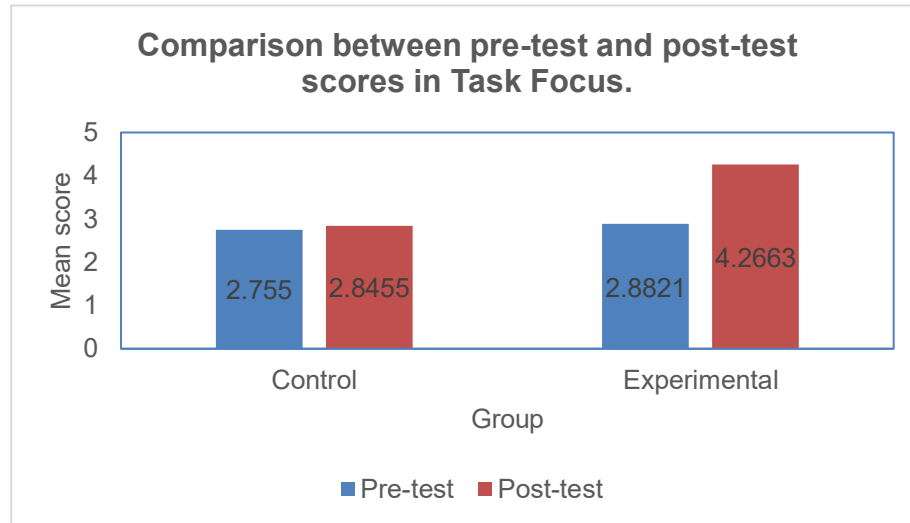
Table 4.17: Comparison of pre-test and post-test achievement scores in task focus of the experimental group

Test	N	Mean	S. D	't'-value	P value
Pre test	492	2.88	.71	45.214	.000
Post test	492	4.26	.59		

The average pre-test and post-test scores in task focus for the experimental group are 2.882 and 4.266, respectively. This indicates a mean difference of 1.386 between the pre-test and post-test results. The standard deviation for the experimental group in the pre-test is 0.712, and in the post-test, it is slightly lower at 0.595. When the pre-test and post-test scores of the experimental group were compared, the calculated t-value was 45.214. Since this value is greater than 1.96, it confirms that there is a statistically significant difference between the pre-test and post-test scores of the experimental group in task focus at the 0.01 level of significance.

A visual comparison of the mean pre-test and post-test scores achievement in task focus for both the control and the experimental groups is shown in Figure 4.7.

Figure 4.7: Comparison of mean pre-test and post-test achievement scores in task focus of the experimental and the control groups



4.3. Conclusion

In summary, before the experiment began, the average achievement score for task focus in the control group was 2.755, while the experimental group had a slightly higher average score of 2.882. Following the experiment, the control group's mean score in task focus rose modestly to 2.845, whereas the experimental group's mean score increased substantially to 4.266. The mean gain score, which reflects the improvement from pre-test to post-test, was 0.09 for the control group and much higher at 1.38 for the experimental group. An independent sample t-test analysis revealed a significant difference in the gain scores of task focus achievement between the two groups across the entire sample. Therefore, it can be concluded that the experimental treatment had a significant positive impact on enhancing task focus skills among secondary school students.

Analysis of achievement in coherence and cohesion

Comparison of Pre-test Scores

The pre-test scores of the achievement in coherence and cohesion for the total sample were compared to ensure the homogeneity of the experimental and the control

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groups with respect to the initial academic achievement in coherence and cohesion and it is presented in table 4.18.

Table 4.18: Comparison of mean pre-test achievement scores in coherence and cohesion between the control and experimental groups

Group	N	Mean	S. D	t'-value	P value
Control	453	2.39	.63	3.735	.000
Experimental	492	2.55	.67		

The average pre-test scores for achievement in coherence and cohesion were 2.39 for the control group and 2.55 for the experimental group, with standard deviations of 0.63 and 0.67, respectively. The difference between the means is 0.15. The calculated t-value is 3.735, which exceeds the critical value of 1.96 at the 0.05 level of significance. This indicates that there is a significant difference between the pre-test scores of the students regarding their achievement in cohesion and coherence. In other words, the two groups differ significantly in their initial academic performance in cohesion and coherence.

Therefore, it can be concluded that although the experimental and control groups are similar in terms of their class level, they show a significant difference in their achievement in coherence and cohesion before the experiment. Both groups are homogeneous with respect to class level but heterogeneous in their pre-test achievement scores for cohesion and coherence.

Comparison of Post-test Scores

The post-test scores of the achievement in coherence and cohesion for the total sample were compared to know the difference of the experimental and the control group with respect to the academic achievement after the experiment in coherence and cohesion and it is presented in table 4.19.

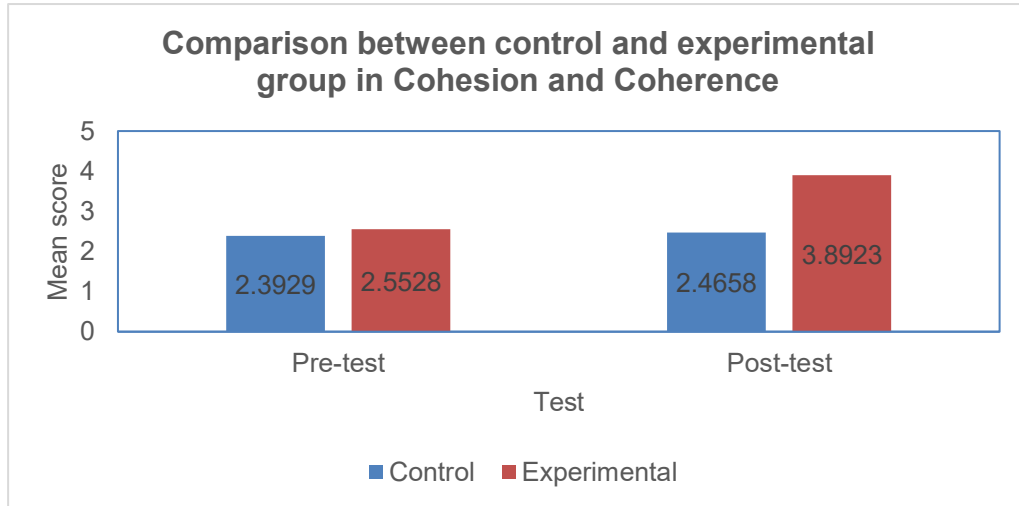
Table 4.19: Comparison of mean post-test achievement scores in coherence and cohesion between the control and the experimental groups

Group	N	Mean	S. D	t'-value	P value
Control	453	2.46	.58	36.700	.000
Experimental	492	3.89	.60		

Comparison of achievement scores in coherence and cohesion between experimental and the control groups as per the post-test is depicted in the table. Here, the mean score achieved by the control group is 2.46 and that of the experimental group is 3.89. Here the mean difference is 1.42. The standard deviation value is calculated as 0.58 for the control group and 0.60 for the experimental group. The final t-value of the post-test scores in achievement in coherence and cohesion between experimental and the control groups are 36.700 which is greater than 2.58 at 0.01 significance level. Hence, there is a significant difference in the post-test achievement scores in coherence and cohesion between the control group and experimental group.

A graphical representation of the comparison of mean pre-test and post-test achievement scores in coherence and cohesion between the control and experimental groups is presented in Figure 4.8.

Figure 4.8: Comparison of mean pre-test and post-test achievement scores in coherence and cohesion between the experimental and the control groups



Comparison of Gain Scores

The gain scores of the achievement in coherence and cohesion for the total sample were compared to know the difference between the experimental and the control groups with respect to the gain in academic achievement after the experiment in coherence and cohesion and it is presented in table 4.20.

Table 4.20: Comparison of mean gain achievement scores in coherence and cohesion between the control and the experimental groups

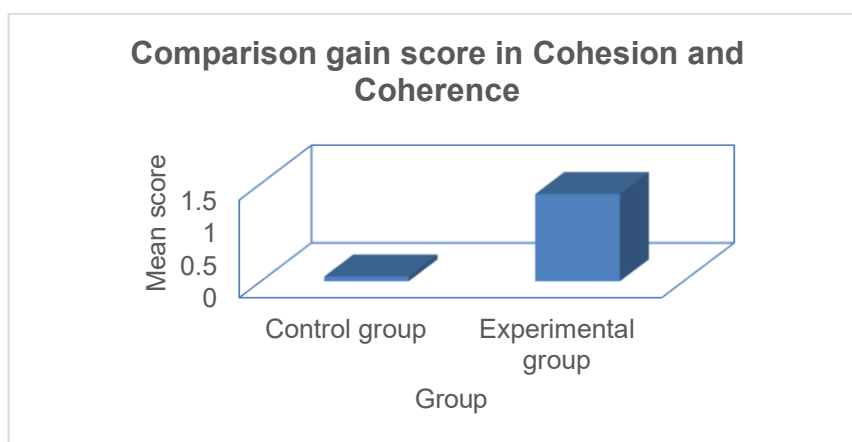
Group	N	Mean	S. D	't'-value	P value
Control	453	.072	.37	35.264	.000
Experimental	492	1.33	.67		

The comparison of gain achievement scores in coherence and cohesion between the experimental and control groups for the entire sample is presented. The control

group, consisting of 453 participants, achieved a mean gain score of 0.0728, whereas the experimental group, with 492 participants, obtained a mean gain score of 1.3394. The difference between the mean gain scores for coherence and cohesion achievement is 1.266. The standard deviation values for the control and experimental groups are 0.37 and 0.67, respectively. The calculated t-value is 35.264, which exceeds the critical value of 1.96 at the 0.05 significance level. This indicates a statistically significant difference in the gain achievement scores in coherence and cohesion between the experimental and control groups for the total sample.

A graphical illustration comparing the mean gain scores for coherence and cohesion achievement between the control and experimental groups is shown in Figure 4.9.

Figure 4.9: Comparison of mean gain achievement scores in coherence and cohesion between the experimental and the control groups



Comparison of mean pre-test and post-test scores of cohesions and coherence of the control group

The mean achievement scores in coherence and cohesion for the total sample were compared to know the significance of the difference between Pre-test and Post-test Scores of the control group after the experiment and it is presented in table 4.21.

Table 4.21: Comparison of mean pre-test and post-test scores of cohesions and coherence of the control group.

Test	N	Mean	S. D	t'-value	P value
Pre-test	453	2.39	.63	4.166	.000
Post-test	453	2.46	.58		

The control group's mean scores for coherence and cohesion were 2.392 in the pre-test and 2.465 in the post-test. The difference between these mean scores is 0.073. The standard deviation for the control group was 0.638 in the pre-test and 0.585 in the post-test. After comparing the pre-test and post-test scores of the control group, the calculated t-value was 4.166. Since this t-value is greater than 1.96, it indicates a significant difference between the pre-test and post-test scores of the control group in terms of coherence and cohesion at the 0.01 level of significance.

Comparison of mean pre-test and post-test scores of cohesions and coherence of the experimental group

The mean scores of the achievement in coherence and cohesion for the total sample were compared to know the significance of difference between Pre-test and Post-test Scores of the experimental group after the experiment and it is presented in table 4.22.

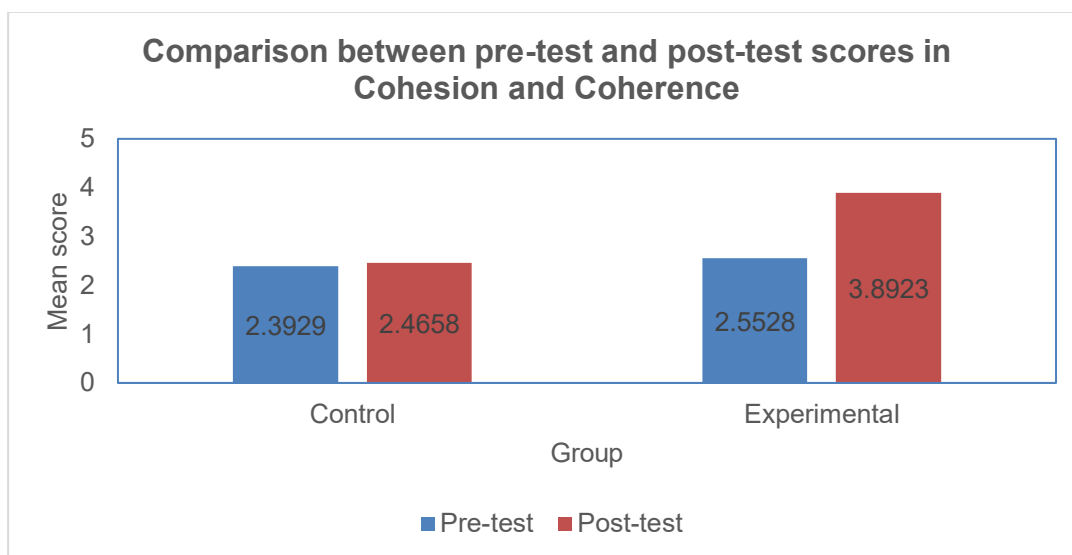
*Table 4.22: Comparison of mean pre-test and post-test scores of cohesions
and coherence of the experimental group*

Test	N	Mean	S. D	t'-value	P value
Pre-test	492	2.55	.67	43.956	.000
Post-test	492	3.89	.60		

The experimental group's average scores for coherence and cohesion were 2.552 in the pre-test and 3.892 in the post-test. The difference between these average scores is 1.34. The standard deviation for the experimental group was 0.674 in the pre-test and 0.607 in the post-test. When comparing the pre-test and post-test scores of the experimental group, the calculated t-value was 43.956. Since this t-value is greater than 1.96, it indicates a significant difference between the pre-test and post-test scores of the experimental group regarding coherence and cohesion at the 0.01 level of significance.

A graphical illustration showing the comparison of mean pre-test and post-test scores for coherence and cohesion between the control and experimental groups is displayed in Figure 4.10.

Figure 4.10: Comparison of mean pre-test and post-test achievement scores in coherence and cohesion of experimental and the control groups



Conclusion

The results show that before the experiment, the average achievement score for coherence and cohesion was 2.3929 for the control group and 2.5528 for the experimental group. After the experiment, the mean score for the control group increased slightly to 2.4658, while the experimental group's mean score rose substantially to 3.8923. The average gain score for the control group was 0.0728, compared to a much higher gain score of 1.3394 for the experimental group. An independent sample t-test revealed a significant difference in the gain scores of coherences and cohesion achievement between the experimental and control groups for the entire sample. Therefore, it can be concluded that the experimental intervention was highly effective in improving coherence and cohesion skills among secondary school students.

Analysis of the scores of lexical resources

Comparison of Pre-test Scores

The pre-test scores of the achievement in lexical resource for the total sample were compared for ensuring the homogeneity of the experimental and the control group

with respect to the initial academic achievement in lexical resource and it is presented in table 4.23.

***Table 4.23: Comparison of mean pre-test achievement scores in lexical
resource between the control and the experimental groups***

Group	N	Mean	S. D	t'-value	P value
Control	453	2.36	.70	3.050	.002
Experimental	492	2.50	.67		

The average pre-test scores for achievement in lexical resource among the control and the experimental groups are 2.36 and 2.50, respectively, with standard deviations of 0.70 and 0.67. The mean difference between the two groups is 0.137. The calculated t-value is 3.050, which exceeds the critical value of 1.96 at the 0.05 level of significance. This indicates a statistically significant difference between the pre-test scores of the students in terms of lexical resource achievement. In other words, the two groups show a significant difference in their initial academic performance in lexical resource.

Therefore, it is concluded that while the control and the experimental groups are comparable in terms of class level, they differ in their initial achievement in lexical resource before the experiment. Thus, the students from both groups are homogeneous with respect to class level but heterogeneous in terms of their pre-test achievement scores in lexical resource.

Comparison of Post-test Scores

The post-test scores of the achievement in lexical resource for the total sample were compared to know the difference between the experimental and the control group with respect to the academic achievement after the experiment in lexical resource and it is presented in table 4.24.

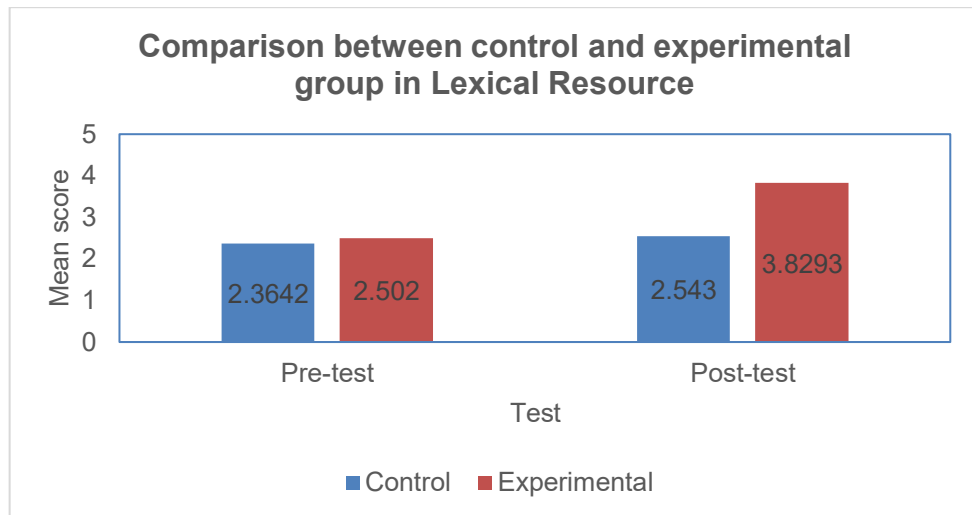
Table 4.24: Comparison of mean post-test achievement scores in lexical resource between the control and the experimental groups.

Group	N	Mean	S. D	t'-value	P value
Control	453	2.54	.61	31.279	0.000
Experimental	492	3.82	.64		

A comparison of the post-test achievement scores in lexical resource between the experimental and control groups is presented in the corresponding table. The mean score attained by the control group is 2.54, whereas the experimental group achieved a higher mean score of 3.82. This yields a mean difference of 1.28. The standard deviation values are 0.61 for the control group and 0.64 for the experimental group. The calculated *t*-value for the post-test scores is 31.279, which is significantly greater than the critical value of 2.58 at the 0.01 level of significance. This indicates that there is a statistically significant difference in the post-test scores of lexical resource achievement between the control and experimental groups.

A graphical representation comparing the mean pre-test and post-test scores in lexical resource achievement for both the control and experimental groups is provided in Figure 4.11.

***Figure 4.11: Comparison of mean pre-test and post-test achievement scores
in lexical resource between the experimental and the control groups***



Comparison of Gain Scores

The gain scores of the achievement in lexical resource for the total sample were compared to know the difference between the experimental and the control group with respect to the gain in academic achievement after the experiment in lexical resource, and it is presented in table 4.25.

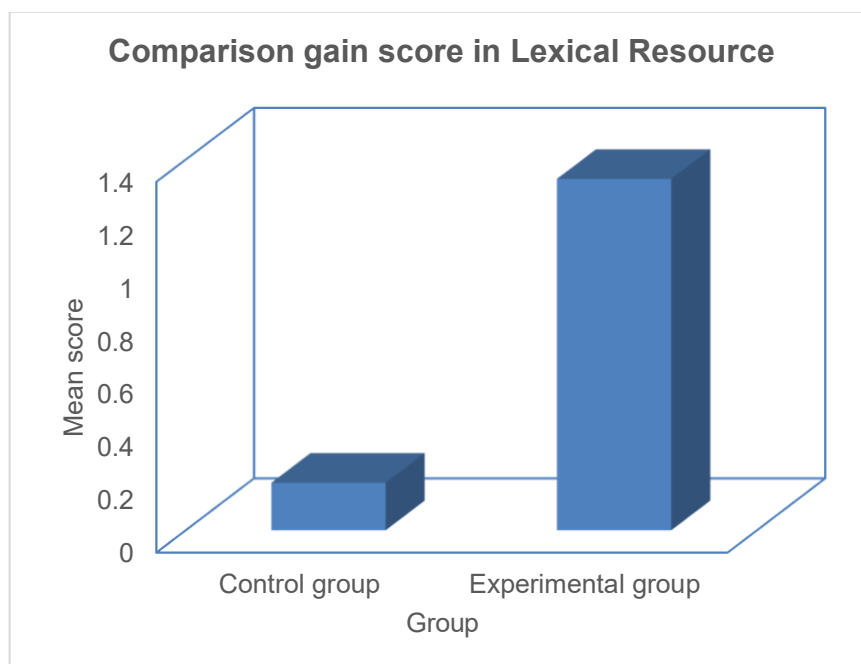
***Table 4.25: Comparison of mean gain achievement scores in lexical
resource between control and the experimental groups***

Group	N	Mean	S. D	't'-value	P value
Control	453	.17	.48	27.537	.000
Experimental	492	1.32	.75		

The comparison of gain scores in lexical resource achievement between the experimental and control groups across the total sample highlights a considerable variation. The average gain score recorded for the control group, consisting of 453 participants, is 0.17, whereas the experimental group, comprising 492 participants, has an average gain score of 1.32. This results in a mean difference of 1.1484 in lexical resource achievement between the two groups. In terms of variability, the standard deviation is calculated as 0.48 for the control group and 0.75 for the experimental group. The computed t -value stands at 27.537, which surpasses the critical threshold of 1.96 at the 0.05 level of significance. Therefore, it can be inferred that there is a statistically significant difference in the gain scores related to lexical resource achievement between the experimental and control groups for the overall sample.

A graphical representation of the comparison of mean gain achievement scores in lexical resource between control and the experimental groups is presented in Figure 4.12.

Figure 4.12 Comparison of mean gain achievement scores in lexical resource between experimental and the control groups



Comparison of mean pre-test and post-test scores of lexical resources of the control group

The mean scores of the achievement in lexical resource for the total sample were compared to know the significance of difference between Pre-test and Post-test Scores of the control group after the experiment and it is presented in table 4.26.

Table 4.26: Comparison of mean pre-test and post-test scores of lexical resources of the control group

Test	N	Mean	S. D	t'-value	P value
Pre-test	453	2.36	.70	7.840	.000
Post-test	453	2.54	.61		

The control group recorded mean scores of 2.364 in the pre-test and 2.543 in the post-test for lexical resource achievement. The resulting mean difference between the pre-test and post-test scores is 0.179. The standard deviation for the control group is 0.708 in the pre-test and 0.617 in the post-test. The calculated *t*-value for the comparison between the pre-test and post-test scores is 7.84. Since this *t*-value exceeds the critical value of 1.96, it indicates that there is a statistically significant difference between the pre-test and post-test scores of the control group concerning lexical resource achievement at the 0.01 level of significance.

Comparison of mean pre-test and post-test scores of lexical resources of the experimental group

The mean scores of the achievement in lexical resource for the total sample were compared to know the significance of difference between Pre-test and Post-test Scores of the experimental group after the experiment, and it is presented in table 4.27.

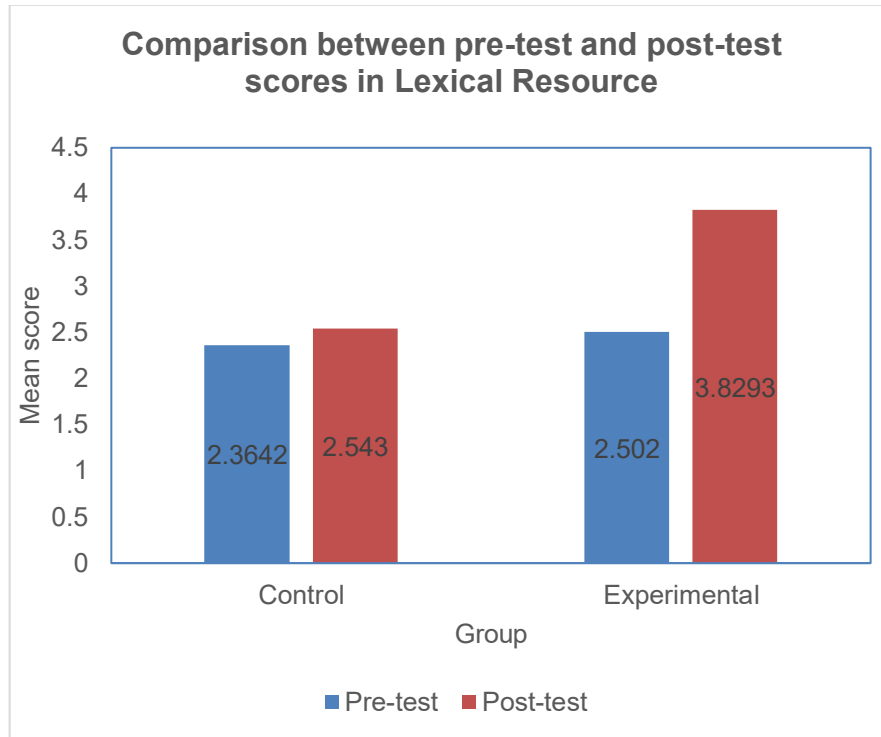
Table 4.27: Comparison of mean Pre-test and Post-test Scores of lexical resources of the experimental group

Test	N	Mean	S. D	't'-value	P value
Pre-test	492	2.50	.67	38.963	.000
Post-test	492	3.82	.64		

The experimental group demonstrated mean scores of 2.502 in the pre-test and 3.829 in the post-test for lexical resource achievement. The observed mean difference between the pre-test and post-test scores is 1.327. The standard deviation recorded for the pre-test is 0.679, while for the post-test it is 0.644. The computed *t*-value for comparing the pre-test and post-test scores is 38.963. Since this *t*-value is significantly greater than the critical value of 1.96, it confirms a statistically significant difference in lexical resource achievement between the pre-test and post-test scores of the experimental group at the 0.01 level of significance.

A graphical representation of the comparison between mean pre-test and post-test achievement scores in lexical resource of control and the experimental groups is presented in Figure 4.13.

Figure 4.13: Comparison of mean pre-test and post-test achievement scores in lexical resource of experimental and the control groups



Conclusion

The findings indicate that prior to the intervention, the control group recorded a mean achievement score of 2.3642 in lexical resource, whereas the experimental group had a slightly higher mean score of 2.502. Following the experimental treatment, the control group achieved a post-test mean score of 2.543, while the experimental group's mean rose substantially to 3.8293. The gain score in lexical resource for the control group was calculated as 0.1788, in contrast to the experimental group's gain score of 1.3272. An independent sample *t*-test revealed a statistically significant difference in the gain scores of lexical resource achievement between the two groups across the total sample. Thus, it can be concluded that the experimental intervention had a notably positive effect on enhancing lexical resource achievement among secondary school students.

Analysis of achievement scores of grammatical resources.

Comparison of Pre-test Scores

The pre-test scores of the achievement in grammatical resource for the total sample were compared to ensure the homogeneity of the experimental and the control group with respect to the initial academic achievement in grammatical resource and it is presented in table 4.28.

Table 4.28: Comparison of mean pre-test achievement scores in grammatical resource between the control and the experimental groups

Group	N	Mean	S. D	't'-value	P value
Control	453	2.75	.72	2.717	.000
Experimental	492	2.88	.71		

The mean pre-test scores reflecting achievement in grammatical resource for the control and experimental groups are 2.75 and 2.88 respectively, with corresponding standard deviations of 0.72 and 0.71. The calculated mean difference is 0.127. The *t*-value obtained from the statistical analysis is 2.717, which exceeds the critical value of 1.96 at the 0.05 level of significance. This result indicates a statistically significant difference between the pre-test scores of students in terms of grammatical resource achievement. In other words, the control and experimental groups show a notable disparity in their initial academic performance related to grammatical resource.

Therefore, it can be concluded that although the control and experimental groups are similar in terms of class level, they show marked differences in their grammatical resource achievement before the intervention. This implies that the students from both groups are homogeneous with respect to academic grade level but heterogeneous when it comes to their pre-test scores in grammatical resource achievement.

Comparison of Post-test Scores

The post-test scores of the achievement in grammatical resource for the total sample were compared to know the difference of the experimental and the control group with respect to the academic achievement after the experiment in grammatical resource and it is presented in table 4.29.

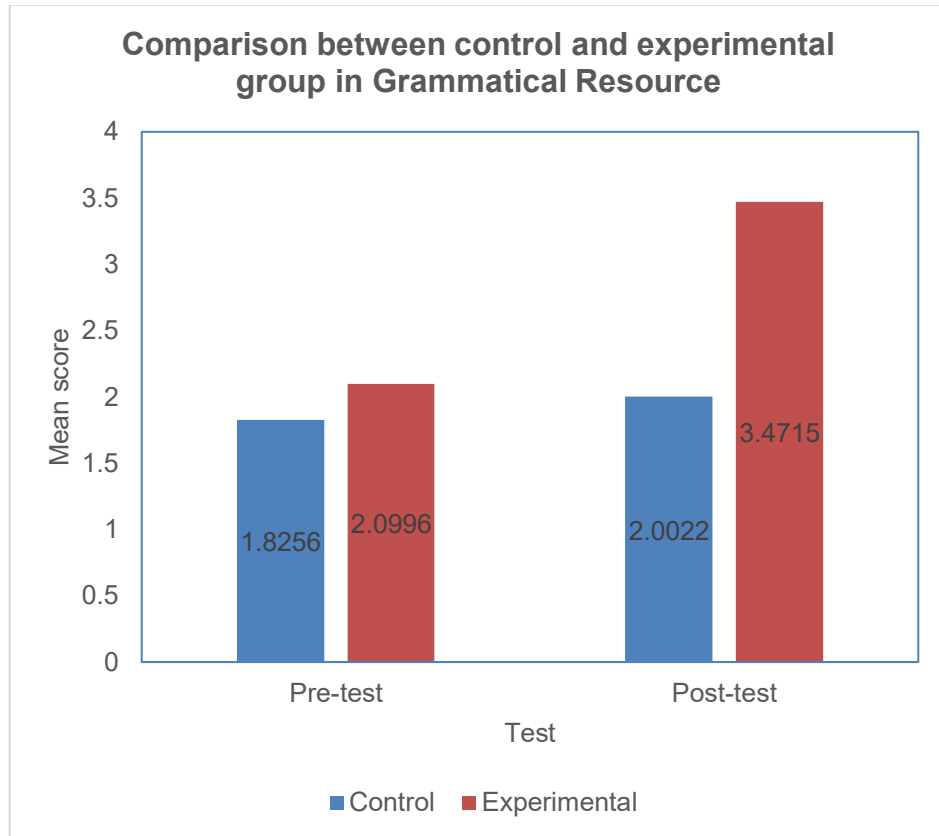
***Table 4.29: Comparison of mean post-test achievement scores in
grammatical resource between control and the experimental groups***

Group	N	Mean	S. D	't'-value	P value
Control	453	2.84	.66	34.678	.000
Experimental	492	4.26	.59		

A comparative analysis of the post-test scores related to achievement in grammatical resource between the experimental and control groups is presented in the table. According to the results, the control group attained a mean score of 2.84, whereas the experimental group achieved a higher mean score of 4.26. This indicates a mean difference of 1.42 between the two groups. The calculated standard deviation for the control group is 0.66, while that of the experimental group is 0.59. The computed *t*-value for the post-test comparison of grammatical resource achievement between the two groups is 34.678, which surpasses the critical value of 2.58 at the 0.01 level of significance. Therefore, it is evident that there exists a statistically significant difference in the post-test achievement scores in grammatical resource between the control and experimental groups.

A graphical representation of the comparison of mean pre-test and post-test scores achievement in grammatical resource between control and the experimental groups is presented in Figure 4.14.

***Figure 4.14: Comparison of mean pre-test and post-test achievement scores
in grammatical resource between experimental and the control groups***



Comparison of gain scores.

The gain scores of the achievement in grammatical resource for the total sample were compared to know the difference of the experimental and the control group with respect to the gain in academic achievement after the experiment in grammatical resource and it is presented in table 4.30.

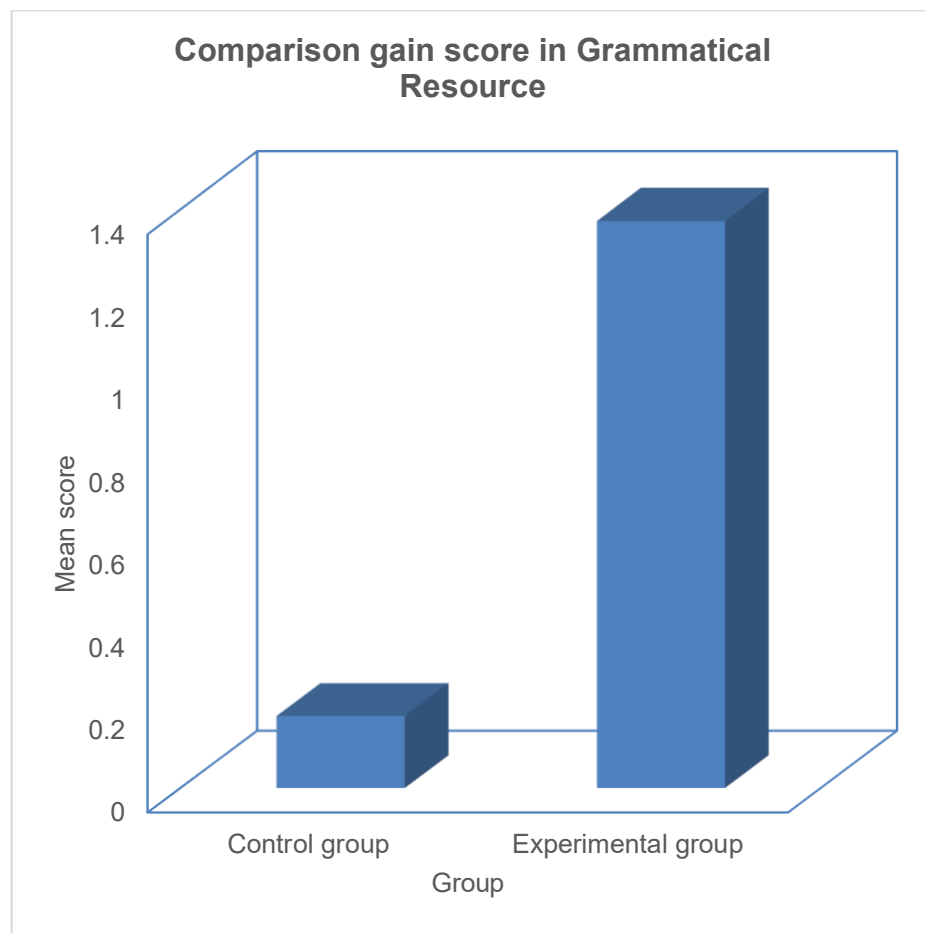
Table 4.30: Comparison of mean gain achievement scores in grammatical resource between control and the experimental groups

Group	N	Mean	S. D	't'-value	P value
Control	453	1.17	.44	30.536	.000
Experimental	492	1.37	.71		

The comparative analysis of gain scores in grammatical resource achievement between the experimental and control groups for the total sample reveals notable findings. The mean gain score for the control group, consisting of 453 participants, is 0.17, while the experimental group, comprising 492 participants, records a substantially higher mean gain score of 1.37. This results in a mean difference of 1.1954 in achievement in grammatical resource between the two groups. The standard deviation values for the control and experimental groups are 0.44 and 0.71 respectively. The computed *t*-value stands at 30.536, which is greater than the critical value of 1.96 at the 0.05 level of significance. Therefore, it can be inferred that there is a statistically significant difference in the gain scores related to achievement in grammatical resource between the experimental and control groups for the total sample.

Graphical representation of the comparison of mean gain achievement scores in grammatical resource between control and the experimental groups is presented in Figure 4.15.

Figure 4.15: Comparison of mean gain achievement scores in grammatical resource between experimental and the control groups



Comparison between mean Pre-test and Post-test Scores of grammatical resources of the control group

The mean scores of the achievement in grammatical resource for the total sample were compared to know the significance of difference between pre-test and post-test scores of the control group after the experiment and it is presented in table 4.31.

Table 4.31: Comparison between mean Pre-test and Post-test Scores of grammatical resources of the control group

Test	N	Mean	S. D	t'-value	P value
Pre-test	453	1.82	.62	8.429	.000
Post-test	453	2.00	.55		

The control group recorded a mean score of 1.82 in the pre-test and 2.00 in the post-test for grammatical resource. The calculated mean difference between the pre-test and post-test scores is 0.177. The standard deviation for the control group was 0.626 in the pre-test and 0.550 in the post-test. A t-value of 8.429 was derived from the comparison between the pre-test and post-test results. Since this t-value exceeds the critical value of 1.96, it indicates a statistically significant difference between the pre-test and post-test scores of the control group in terms of grammatical resource, at the 0.01 level of significance.

Comparison between mean pre-test and post-test scores of grammatical resources of the experimental group

The mean scores of the achievement in grammatical resource for the total sample were compared to know the significance of the difference between pre-test and post-test scores of the experimental group after the experiment and it is presented in table 4.32.

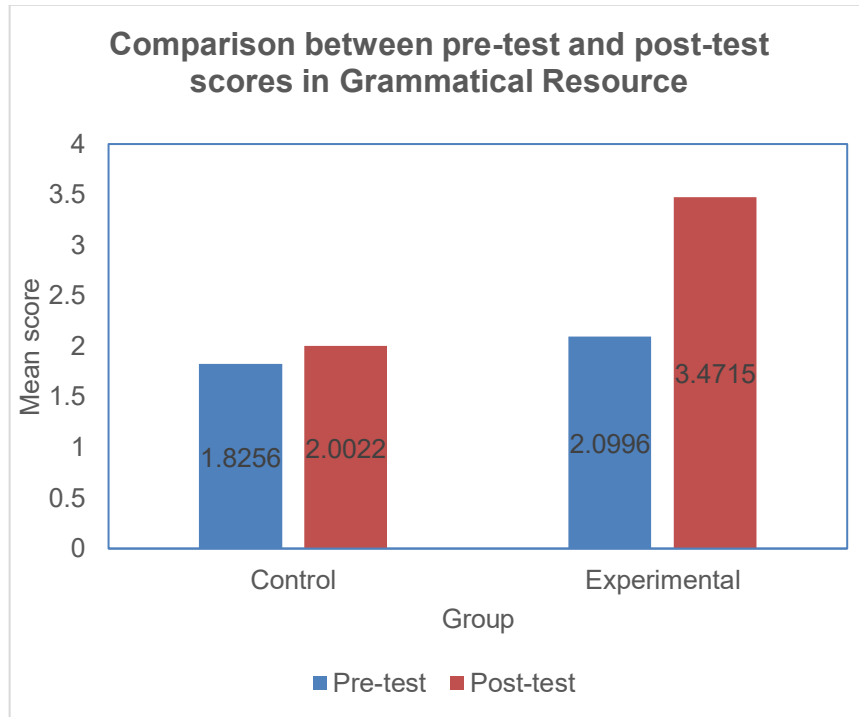
*Table 4.32: Comparison between mean pre-test and post-test scores of
grammatical resources of the experimental group*

Test	N	Mean	S. D	't'-value	P value
Pre-test	492	2.09	.65	42.568	.000
Post-test	492	3.47	.56		

The experimental group achieved a mean score of 2.09 in the pre-test and 3.47 in the post-test concerning grammatical resource. The difference in mean scores between the pre-test and post-test is 1.37. The standard deviation recorded for the experimental group was 0.65 in the pre-test and 0.56 in the post-test. A t-value of 42.568 was computed based on the comparison between the pre-test and post-test outcomes. Since this t-value surpasses the threshold of 1.96, it signifies that there is a statistically significant difference in grammatical resource scores between the pre-test and post-test of the experimental group at the 0.01 level of significance.

A graphical representation of the comparison between mean pre-test and post-test achievement scores in grammatical resource of control and the experimental groups is presented in figure 4.16.

Figure 4.16: Comparison of mean pre-test and post-test achievement scores in grammatical resource of the experimental and the control groups



Conclusion

The findings indicate that prior to the intervention, the control group had a mean achievement score of 1.8256 in grammatical resource, while the experimental group had a slightly higher mean of 2.0996. Following the intervention, the mean achievement score in grammatical resource rose to 2.0022 for the control group and to 3.4715 for the experimental group. The control group recorded a mean gain score of 0.1766, whereas the experimental group achieved a gain score of 1.372. Results from the independent sample t-test reveal a statistically significant difference in the gain scores of grammatical resource achievement between the experimental and control groups across the total sample. Therefore, it can be inferred that the experimental intervention had a notably positive impact on improving grammatical resource achievement among secondary school students.

Analysis of achievement scores of Creative Writing

Comparison of pre-test scores

The pre-test scores of the achievement in creative writing for the total sample were compared to ensure the homogeneity of the experimental and the control group with respect to the initial academic achievement in creative writing and it is presented in table 4.33.

Table 4.33: Comparison of mean pre-test achievement scores in creative writing between control and the experimental groups

Group	N	Mean	S. D	't'-value	P value
Control	453	2.75	0.72	2.717	.000
Experimental	492	2.88	0.71		

The mean pre-test scores for achievement in Creative Writing were 2.75 for the control group and 2.88 for the experimental group, with corresponding standard deviations of 0.72 and 0.71. The difference in mean scores between the two groups is 0.127. The computed t-value is 2.717, which exceeds the critical value of 1.96 at the 0.05 level of significance. This result indicates a statistically significant difference in the pre-test scores of students concerning achievement in Creative Writing. It suggests that the two groups had a notable variation in their initial academic performance in creative writing.

Therefore, it is concluded that while the experimental and control groups were comparable in class level, they exhibited significant differences in creative writing achievement prior to the experiment. The students of both the experimental group and the control group belong to a homogeneous group based on class and non-homogenous in their pre-test achievement scores in creative writing.

Comparison of Post-test Scores

The post-test scores of the achievement in creative writing for the total sample were compared to know the difference between the experimental and the control groups with respect to the academic achievement after the experiment in creative writing and it is presented in table 4.34.

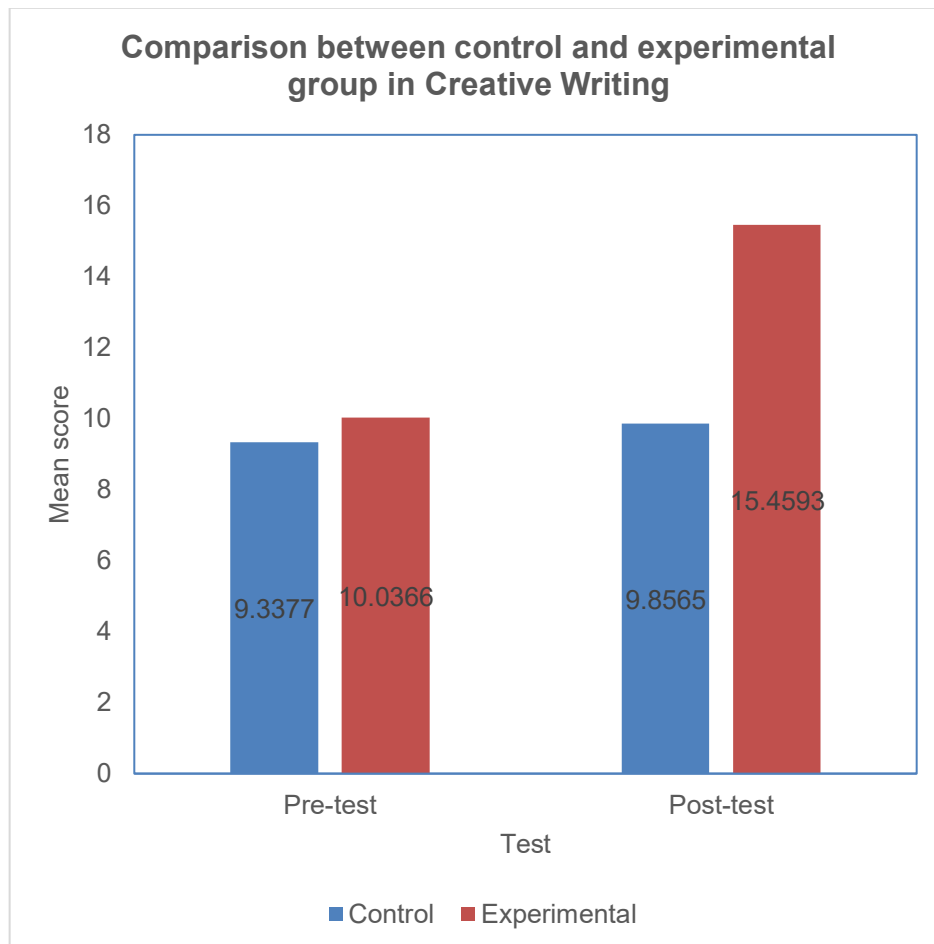
Table 4.34: Comparison of mean post-test achievement scores in creative writing between control and the experimental groups

Group	N	Mean	S. D	t'-value	P value
Control	453	9.85	1.82	47.306	.000
Experimental	492	15.45	1.81		

The table presents a comparison of creative writing achievement scores between the experimental and control groups based on the post-test results. The control group obtained a mean score of 9.85, whereas the experimental group achieved a higher mean score of 15.45. The difference in mean scores between the two groups is 5.6. The standard deviation was calculated as 1.85 for the control group and 1.81 for the experimental group. The t-value derived from the post-test scores comparing achievement in creative writing between the two groups is 47.306, which exceeds the critical value of 2.58 at the 0.01 level of significance. Therefore, a statistically significant difference exists between the post-test scores of the control and experimental groups in terms of achievement in creative writing.

A graphical representation of the comparison of mean pre-test and post-test achievement scores in creative writing between control and the experimental groups is presented in Figure 4.17.

***Figure 4.17: Comparison of mean pre-test and post-test achievement scores
in creative writing between experimental and the control groups***



Comparison of gain scores

The gain scores of the achievement in creative writing for the total sample were compared to know the difference between the experimental and the control group with respect to the gain in academic achievement after the experiment in creative writing and it is presented in table 4.35.

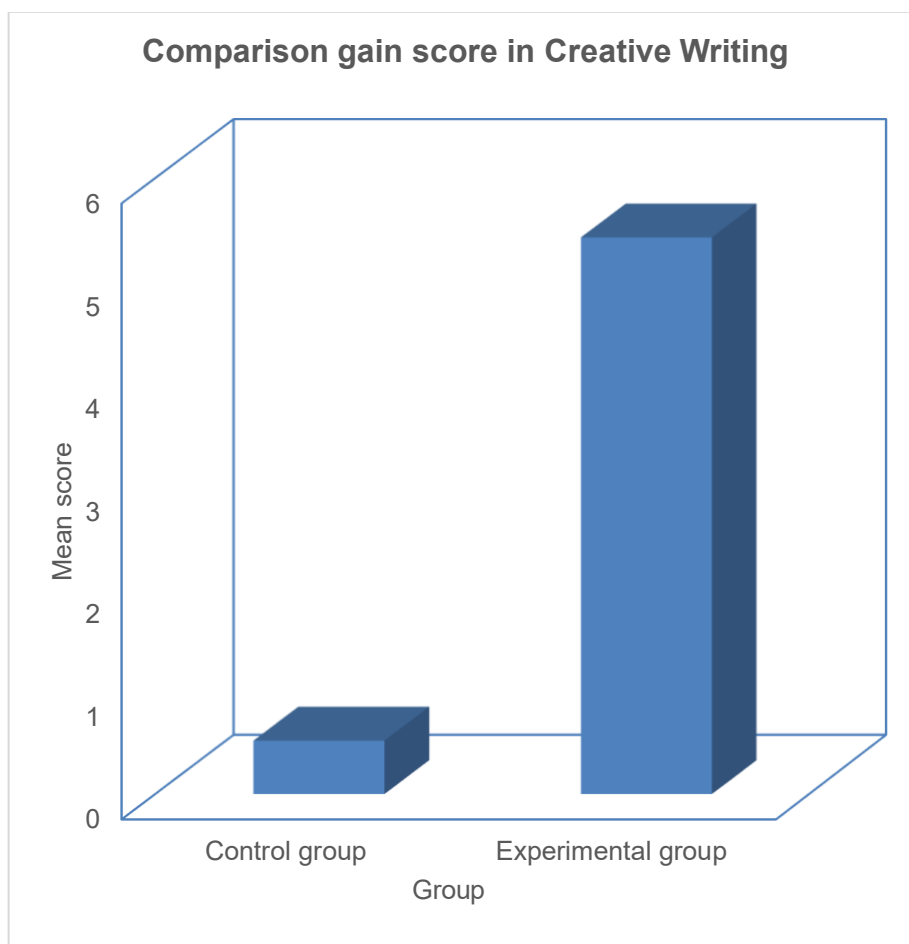
Table 4.35: Comparison of mean gain achievement scores in creative writing between control and the experimental groups

Group	N	Mean	S. D	't'-value	P value
Control	453	0.51	.89	50.050	.000
Experimental	492	5.42	1.90		

The comparison of gain scores in achievement in creative writing between the experimental and control groups for the entire sample is presented here. The control group, consisting of 453 participants, recorded a mean gain score of 0.5188, while the experimental group, with 492 participants, achieved a mean gain score of 5.4228. The resulting mean difference in achievement in Creative Writing between the two groups is 4.904. In terms of standard deviation, the control group had a value of 0.89, whereas the experimental group showed a standard deviation of 1.9019. The computed t-value stands at 50.050, which is greater than the critical value of 1.96 at the 0.05 level of significance. Thus, a statistically significant difference is evident in the gain achievement scores in creative writing between the control and experimental groups for the total sample.

A graphical representation of the comparison of mean gain achievement scores in Creative Writing between control and the experimental groups is presented in Figure 4.18.

Figure 4.18: Comparison of mean gain achievement scores in creative writing between experimental and the control groups



Comparison between mean pre-test and post-test scores of creative writing of the control group

The mean scores of the achievement in creative writing for the total sample were compared to know the significance of the difference between pre-test and post-test scores of the control group after the experiment and it is presented in table 4.36.

Table 4.36: Comparison between mean pre-test and post-test scores of creative writing of the control group.

Test	N	Mean	S. D	t'-value	P value
Pre-test	453	9.33	2.13	12.388	.000
Post-test	453	9.85	1.82		

The control group recorded mean scores of 9.337 in the pre-test and 9.856 in the post-test for creative writing. The mean difference between the pre-test and post-test scores amounts to 0.519. The standard deviation for the control group was 2.136 during the pre-test and 1.822 during the post-test. A t-value of 12.388 was obtained from the comparison between the pre-test and post-test scores. Since this t-value is greater than the critical value of 1.96, it indicates a statistically significant difference in the Creative Writing scores of the control group before and after the intervention at the 0.01 level of significance.

Comparison between mean pre-test and post-test scores in creative writing of the experimental group

The mean scores of the achievement in creative writing for the total sample was compared to know the significance of difference between pre-test and post-test scores of the experimental group after the experiment and it is presented in table 4.37.

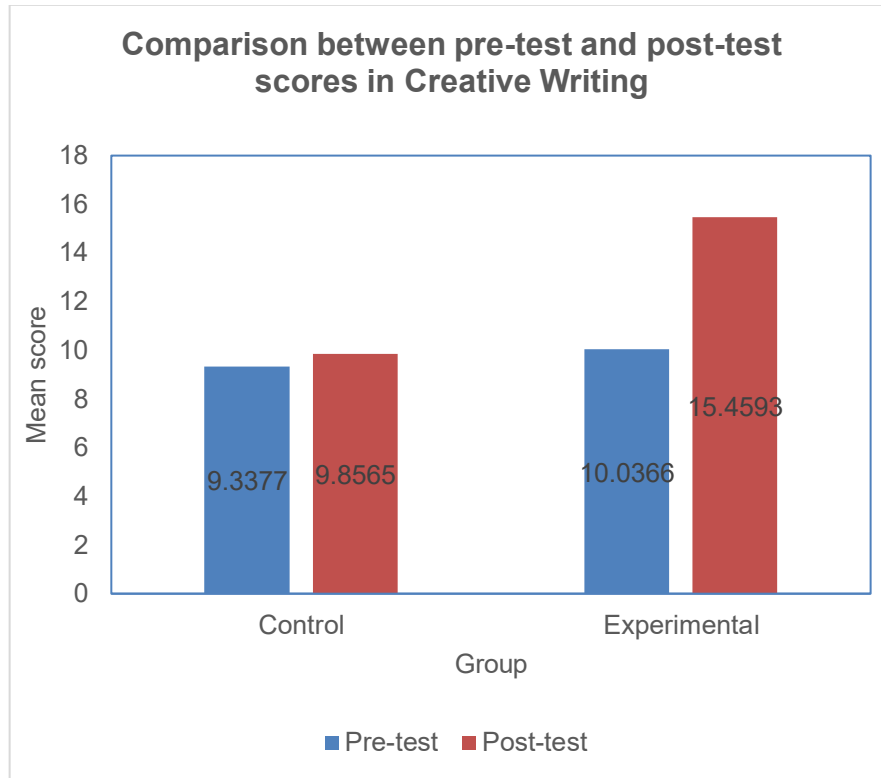
Table 4.37: Comparison between mean pre-test and post-test scores in creative writing of the experimental group

Test	N	Mean	S. D	't'-value	P value
Pre-test	492	10.03	2.14	63.243	.000
Post-test	492	15.45	1.81		

The experimental group achieved mean scores of 10.03 in the pre-test and 15.45 in the post-test for creative writing. The difference between the pre-test and post-test mean scores is 5.423. The standard deviation recorded for the experimental group was 2.14 in the pre-test and 1.81 in the post-test. A t-value of 63.243 was obtained through the comparison of the pre-test and post-test results. Since this t-value exceeds the critical value of 1.96, it indicates a statistically significant difference in Creative Writing scores for the experimental group before and after the intervention, at the 0.01 level of significance.

Graphical representation of the comparison between mean pre-test and post-test achievement scores in creative writing of control and the experimental groups is presented in figure 4.19.

***Figure 4.19: Comparison of mean pre-test and post-test achievement scores
in creative writing of the experimental and the control groups***



Conclusion

The findings indicate that prior to the implementation of the experiment, the control group had a mean achievement score of 9.3377 in creative writing, while the experimental group recorded a slightly higher mean of 10.0366. Following the experiment, the control group's mean score increased to 9.8565, whereas the experimental group's mean rose significantly to 15.4593. The calculated mean gain score for the control group is 0.5188, in contrast to 5.4228 for the experimental group. The results from the independent sample t-test reveal a statistically significant difference in the gain achievement scores in creative writing between the control and experimental groups for the overall sample. Therefore, it can be concluded that the experimental intervention had a meaningful and positive impact on improving creative writing performance among secondary school students.

4.3. Qualitative Insights Derived from the Study

The quantitative findings of the research were further reinforced and validated through detailed qualitative classroom observations conducted particularly during the intervention phase of the study. During the initial sessions of the experiment, a number of students appeared hesitant, passive, and less enthusiastic toward creative writing activities. However, as the intervention gradually progressed, noticeable behavioural and academic changes became visible among the learners. Students who were previously reluctant to participate began to show genuine curiosity, active involvement, and sustained attention during classroom activities. It became increasingly evident that the confidence level of the learners improved significantly once the CGI animation-assisted learning activities were systematically introduced into the classroom environment.

The integration of animation sequences, visual prompts, and digital storytelling elements created a more stimulating and learner-friendly atmosphere that encouraged students to express their ideas more freely and creatively. Learners willingly participated in storytelling sessions with remarkable enthusiasm, imagination, and emotional involvement. Their written outputs clearly reflected that they had benefitted from the visual stimuli, animated sequences, and collaborative brainstorming activities provided during the intervention. Many students demonstrated better narrative organisation, richer vocabulary usage, improved descriptive abilities, and greater originality in their creative compositions compared to their earlier performance.

Another significant qualitative observation was the transformation of classroom interaction patterns. The classroom environment gradually became more collaborative, interactive, and student-centred. Learners frequently engaged in meaningful peer discussions during brainstorming sessions, exchanged ideas with confidence, and supported one another during creative writing practices. Such collaborative participation promoted not only language learning but also communication skills, social interaction, and critical thinking abilities among the students. These qualitative observations strongly suggest that CGI-assisted creative writing pedagogy enhanced learner engagement, motivation, emotional involvement, and active participation,

thereby contributing to measurable academic improvement and a more meaningful learning experience.

4.4. Unexpected Findings during the intervention

Although the overall findings of the study provided highly encouraging indications regarding the effectiveness of CGI-assisted creative writing pedagogy in secondary school classrooms, certain unexpected patterns and challenges were also identified during the experimental phase. A small number of students demonstrated only limited improvement in creative writing performance despite their active participation in brainstorming sessions and classroom interactions. This observation indicates that active participation alone may not always guarantee equal levels of academic improvement among all learners.

Additionally, during the initial stages of the intervention, some participants appeared to focus more on the entertainment dimension of the animations rather than on narrative development and academic learning outcomes. Their attention was occasionally diverted toward the visual excitement, sound effects, and dramatic elements of the animations instead of concentrating on plot construction, character development, and creative expression. As a result, they required continuous guidance, monitoring, and reminders from the teacher to maintain academic focus and to engage more effectively in peer discussions and creative writing activities.

These difficulties may have emerged due to variations in individual linguistic proficiency, differences in learning pace, inadequate exposure to information and communication technology-assisted learning methods, and varying levels of digital familiarity among learners. Furthermore, certain students required more time and personalised support to adapt themselves to multimedia-supported learning environments. These observations clearly indicate that while multimedia-supported pedagogy possesses substantial instructional potential, its effectiveness may vary according to learner characteristics, classroom management strategies, digital literacy levels, and the pedagogical competence of teachers in integrating technology meaningfully into classroom instruction. Therefore, the successful implementation of

Cognitive and Creative Impact of CGI Animation: Analysis and Interpretation of Student Engagement

CGI-assisted pedagogy requires careful planning, balanced instructional supervision, and continuous learner support to achieve maximum educational outcomes.

Chapter 5

Advancing ELT through CGI Animation: Key Findings, Pedagogical Recommendations and Future Directions

Chapter 5

Advancing ELT through CGI Animation: Key Findings, Pedagogical Recommendations and Future Directions

5.1 Introduction

The preceding chapter presented a systematic analysis and interpretation of the data. In this chapter, a summary of the study is provided. Then the results obtained are reviewed. The study's findings, recommendations, suggestions, and teaching implications are presented. Finally, an assessment and future scope of the study are also provided.

Writing is a channel that helps people to express their thoughts and feelings. It is an important skill that enables students to express their thoughts and ideas very effectively. It is regarded as one of the crucial components in learning a second language. As such, attention must be given to improving this important ability through regular practice. In this technology-rich environment, writing has grown so popular because most people these days prefer to communicate via computers and mobile phones which permeate every aspect of their lives, especially the lives of young people.

In a second language classroom, most students write about a certain topic with assistance from their teacher, and the teacher subsequently edits their work. This results in a writing process that is more teacher-centered than student-centered. Conversely, a computer-based writing environment allows students to interact and communicate with their teacher and with one another simultaneously. Numerous studies have demonstrated how utilizing computers in writing classes improves student performance and reduces errors.

The field of computer graphics is very broad, and during the past few decades, it has seen significant evolution and development, with its output growing at an accelerating pace. The development has been considerable over the years due to its

Advancing ELT through CGI Animation: Key Findings, Pedagogical Recommendations and Future Directions

growing popularity, advancements in hardware and software, the creation of new algorithms to generate structures or elements.

The way that languages are taught and learned has changed significantly as a result of technology's ongoing development. These days, many software programs are available to students to help them improve their language proficiency. The experiment's findings made it abundantly evident that using computers to write enhanced students' enthusiasm and interest. As would be predicted, students in the experimental group performed better when comparing their knowledge sources—the computer, the web, and their teacher—versus the control group, which relied solely on the textbook and teacher. This is mostly because they could draw from a larger variety of sources and found it easier to complete the editing process mechanically, which led to a higher quantity of written drafts and longer compositions. In conclusion, the integration of technology in the classroom improves students' writing abilities since it is a wonderful help while writing, and teachers may utilise advanced technologies to provide children with a variety of writing experiences.

To get to the discussion stages, all pertinent study data have been processed and examined. Using CGI as a visual stimulus, students were invited to explore their ideas and narrations creatively. A topic cue and a film featuring morally complex and action-packed stories served as the foundation for the instruction. The students came from a variety of educational backgrounds; some had mediocre to excellent writing abilities, but they did not seem to be motivated to write in their usual classrooms or at home. Numerical scores were used to collect the data, which were then interpreted to create charts that displayed the percentage and overall value of each writing area. Pre-test and post-test results were combined into a comparative bar graph to draw conclusions about how the CGI animation affected the selected students' writing abilities. The information provided insight into the writing abilities of the population regarding coherence, structure, fluency, and content. Consequently, to determine the effectiveness of the teaching materials and creativity, feedback was produced through discussions, interviews, and evaluations with external supervisors.

Advancing ELT through CGI Animation: Key Findings, Pedagogical Recommendations and Future Directions

When the total scores from the pre-and post-tests were compared, it was evident that most of the population had performed better in the post-test. While considering the post-test scores, the challenges the students faced appeared negligible since their scores increased regardless of the difficulties or expectations they had before the research, however the pre-test overall score showed that the diverse abilities had a direct impact on the students' performances. The population was able to follow instructions and produce good results in creative writing tasks during the intervention and post-test because they were able to make a connection between their personal experiences and the writing prompts provided. This connection not only enhanced their engagement but also allowed them to express their thoughts more clearly, ultimately reflecting their improved scores.

As a teaching tool, scaffolding approaches in CGI integrated interventions support Vygotsky's zone of proximal development, which is supported by the research methodology. The primary objective of the research was achieved, as the students demonstrated that using computer-generated imagery (CGI) animation to teach creative writing produced favourable results. The CGI animations sparked their curiosity about writing, which was previously remained hidden. With the support of visual input, their active minds were able to revive their creativity in the classroom through the diverse and stimulating interactions.

Through a review of the literature, the research sought to establish a link between Piaget's cognitive development process and the operational stages of a child's learning journey. Based on the data analysis, it was determined that the age range selected for the study demonstrated children's capacity for negotiation, reasoning, and content development in response to their environment and exposure to various settings. The children's active participation in writing with the help of the precise tools and encouragement offered throughout the learning process was another finding that bolstered the discussion of this research. Rather than being caged up in a classroom with teachers and literature that demanded constant control, the workshops allowed the young minds to feel active and in their sphere.

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The assessment indicated that the students had successfully interpreted the stories they watched using good vocabulary and had grasped most of the animation's parts. Since the population for this project was limited to students, the resources gathered and analysed were adequate. However, most teachers who were part of the research suggested that having access to additional videos in a variety of genres would be beneficial for future use of computer graphics as a teaching tool. The literature consulted to facilitate the research's findings demonstrated that many other countries have already employed films and visual aids to encourage young students to write creatively. Additionally, the research amply demonstrated the potential for CGI animations to be implemented and made available to a larger audience within the Indian educational system. Additionally, it was observed that the learner-centered environment and instruction used throughout the study encouraged young minds to actively participate for a while, with inclusion being viewed as the most important thing for students to experience. The children who possessed above-average language skills demonstrated consistent writing tactics that included coherence, content and originality

The study proved that technology is an effective instrument for teaching writing in the classroom. In addition to traditional approaches, educators can leverage technology and cutting-edge methods to instruct writing. They can engage with students on social media platforms and provide feedback using technology, which helps the students' writing processes. The results also suggest that teachers have benefited from using technology to explore novel concepts and methods when teaching writing. As a result, educators feel comfortable picking up new abilities and expanding their ICT expertise to use in their instruction.

This perspective emphasises the importance of evidence- based practices in enhancing teaching effectiveness and student outcomes. By engaging with research, educators can adapt their method to better meet the diverse needs of their students. The process of discovering, designing, and developing action research has proven to be a valuable and insightful step in the researcher's personal growth and enjoyment of education. It makes sense that the research's conclusion attempted to fill in knowledge

gaps, find and develop solutions, and open doors to inclusive teaching and learning so that all students feel included in language classes.

5.2 Summary of the Study

This study was carried out to assess the effectiveness of computer-generated imagery-based animation videos in enhancing the creative writing skill of secondary school students. A pre-test and post-test method was used for conducting the study. Students in the control group were taught English lessons using non-CGI method. But students in the experimental group were exposed to computer-generated imagery-based animations to transact the content and help them write various discourses. In this study, two tests were administered; a pre-test before the intervention programme and a post-test after it. To identify the effectiveness of imagery-based animations in enhancing the creative writing skill of students at secondary level, an intervention programme was designed in this study.

5.3 Findings

The study began with a pre-test where the students from both the control and the experimental groups were given a task to write an alternative ending to the short story 'Adventures in a Banyan Tree' written by Ruskin Bond. An introductory session about the plot, setting, character development etc., was given with the help of a projector and Power Point presentation. Once the pre-test was completed, the answers were evaluated and the scores were analysed. It was clear from the pre-test that students had only vague ideas about how to write a different ending to a story. Some students performed well while others lacked clarity in the discourse.

After the pre-test, the experimental groups from all the selected schools received the intervention programme. In the intervention phase, students were introduced to several animated stories, advertisements and short films created through computer-generated imagery animation. The students were introduced to different characters and were asked to write about their features, to identify the key vocabulary and to outline the plot and settings of the story. Students wrote down character

development and other details that they identified from the animated videos. The interactive sessions were very effective as the animated videos were appealing, and they caught the attention of the students for the whole session. Once the intervention sessions were completed, students were given additional tasks to write an alternative ending to the stories they watched.

After the intervention, students of both the control and the experimental groups were given the same task, and their scores were analysed. Results clearly indicated that students in the experimental groups in all the schools performed well in the post-test, showing improvement in lexical resource, grammar, and coherence and cohesion. The investigator gained many insights when both the results of pre-test and post-test were compared. The following findings were recorded as the result of the analysis of the data presented in the previous chapter.

1. The overall review of section A (table 4.1) concludes that students in the control and experimental groups performed almost same in the pre-test. The task's difficulty level was almost equal. The mean pre-test scores of the experimental and control groups are 10.03 and 9.34, respectively, with standard deviation of 2.14 and 2.13.

2. In the overall evaluation of section B (table 4.2) it is concluded that the experimental group of students who received the intervention using computer generated imagery-based animation videos performed better than the control group who did not receive any special intervention during the research. The scores achieved by the experimental group were better than those of the control group members.

3. The study also showed that students in secondary schools face many difficulties in creative writing skills, including *grammatical resource, cohesion and coherence, lexical resource, and task focus*. Many students tend to commit mistakes in sentence construction too. The pre-test revealed significant challenges for students in creative writing, particularly in grammatical resource and the development of coherence and cohesion.

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4. In the overall evaluation of the pre-test and post-test scores, it was clear that computer generated imagery-based animation integrated into second language (English) classrooms is very effective in improving the imagination and lexical resources of the students. They also help them to understand the key grammatical elements easily with the help of animated characters in an interactive mode.

5. The research concluded that exposure to CGI animation videos has a notable influence on secondary students and it positively impacts their vocabulary development. The storytelling technique used in computer-generated imagery-based animation videos helps the students to catch words and usages very fast. Moreover, such videos stir their imagination, thus helping them to use words and phrases very confidently while writing.

6. Motivation and involvement: The research made it clear that the students who underwent the intervention phase were motivated by the computer-generated imagery-based animation videos, and their interest in such classes is appreciable. CGI videos also ensure the involvement and engagement of students throughout the class. Compared to non-CGI classrooms where the teacher takes the role of key speaker most times, computer-generated imagery-based animation videos integrated into classrooms proved to be highly effective and ensured the participation of children at various stages of different sessions. The visual and interactive nature of computer-generated imagery-based animation videos captures the attention of the students, thus helping them to learn with more fun and enthusiasm. The storytelling method used in CGI animation videos help students explore creative ideas, which result in higher levels of motivation and involvement in the teaching learning process.

7. Integration of technology in English classrooms: The study also proved that, unlike conventional classrooms, technology integrated classrooms are very useful for teaching difficult language skills like creative writing. The visual representation element in the information and technology integrated classrooms is worth mentioning, as they are very effective in capturing the attention of young learners. The storytelling method, which is the major attraction of ICT-integrated classrooms, also proved to be effective in improving the creative writing skills of secondary school students.

8. Integration of 21st century learning skills: An overall view of the intervention phase with the help of computer-generated imagery-based animation videos and the performance of the students in the post-test demonstrated that almost all the 21st century learning skills; collaboration, critical thinking, creativity, and communication, as envisaged in the National Education Policy 2020 (NEP 2020), can be effectively inculcated in CGI animation integrated classroom. Technology integrated language classrooms facilitate collaboration and teamwork. They also help to improve the communication skills of students. Computer-generated imagery-based animation classrooms also help children to think creatively by finding solutions to many problems by themselves. The research also proved that the creative writing skill of students in English is enhanced, which was obvious in the post-test phase of the research.

9. Develop a positive attitude towards writing: Writing is a difficult language skill for students, especially in the secondary school age. It was clear from the study that unlike non-CGI classrooms, technology integrated classrooms are very effective in developing a positive attitude in students towards creative writing. In the intervention phase, the students in the experimental group completed the given tasks after the screening of CGI animations very fast. The students took part in the activities like writing an alternative ending to stories, very interestingly with proper vocabulary and grammatical elements. The compositions were cohesive too. In the computer-generated imagery-based animation integrated classrooms, students take writing as an interesting and enjoyable practice making them more confident.

10. Multimodal Approach: From an overview of the post-test, it was clear that computer-generated imagery-based animations provide secondary school students with a multimodal platform for expressing their creativity in both writing and thinking. In an animated video, sounds, visuals, text, and animation are combined to facilitate a better understanding of the concepts and even language elements. This factor helps the students to acquire very good vocabulary, thus equipping them with the ability to write freely with proper coherence and cohesion. The multilevel characteristics of computer-generated imagery-based animations are surely a great advantage for students in both rural and urban areas alike.

11. **Storytelling and power of imagination:** It was very clear from the study that computer-generated imagery-based animations stimulate the imagination of students helping them to enhance their ability to create vivid pictures and their narratives. Students who underwent the intervention using CGI animations showed improved storytelling skills by visualising their ideas and thus creating their own interesting narratives. It was also clear that students developed their power of imagination and they were able to narrate their stories modelling the ones they watched on the screen. The extended story writing activities conducted were very effective as children took an interest in the sessions with confidence.

12. **Descriptive writing skills:** Computer-generated imagery-based animation helps students develop their descriptive writing skills also as they get details about the characters, settings, etc from the videos. Students in the experimental group exhibited enhanced creative writing skills during the experiment. Their ability to create vivid and engaging descriptions by the visuals they watched in the classrooms proved that CGI-based animations are very effective in enhancing the creative writing skills of the students to a great extent.

13. **Language Development:** It was proved in the study that computer-generated imagery-based animation could improve the language development of students at a faster level. All four language competencies, namely listening, speaking, reading, and writing could be improved well through a technology-integrated second language classroom. In a technology integrated classroom, vocabulary acquisition takes place at a faster level as the visual impact of such classes on children is very high. Computer-generated imagery-based animation, through its combination of visual and textual elements, effectively supports early learning.

14. **Improved visual literacy skills:** It became evident that exposure to CGI animations led to a measurable improvement in students' visual literacy, as evidenced by their ability to analyse and visualise information in their written tasks.

15. **Emotional impact on children:** The multimodal approach of CGI animations can enhance the emotional resonance of students in creative writing in

English. The thoughts and feelings of the characters in the visuals influence the students, and in turn, they tend to incorporate the real feelings and emotions they observed in their piece of writing. The facial expressions, body language, and other visual elements in computer-generated imagery-based animations help students portray different emotions with proper vocabulary. This helps students to improve the depth of their storytelling skills, enhancing their creative writing skills.

16. Create a suitable atmosphere and mood for creative writing: An overall view of the study proved that computer-generated imagery-based animations help to create a suitable atmosphere for writing. It also helps in positive mood creation by encouraging students to feel with the characters and setting they watch on screen.

17. Dynamic action: An overall view of the study also proved that computer-generated imagery-based animations can intensify the emotional impact of actions and moments in the story. This will help students to develop strong emotional bonds with the characters in the stories and help students to transform their strong emotions into creative writing. The dynamic action sequences in computer-generated imagery-based animations also help students to concentrate on classroom activities to a great extent.

The findings of the present research hold broader pedagogical implications that extend far beyond the immediate experimental context of the study. The results strongly emphasise the need for wider implementation of multimedia-integrated creative writing practices in secondary school classrooms across educational institutions in the country. The study validates several important recommendations proposed in the National Education Policy 2020 and the Kerala Curriculum Framework 2023, particularly those related to learner-centred, competency-based, technology-integrated, and activity-oriented education. These educational frameworks advocate the development of creativity, critical thinking, collaboration, communication abilities, and problem-solving skills among adolescent learners in an era characterised by rapid technological transformation, digital expansion, and unprecedented advancements in animation technology and Artificial Intelligence tools.

The findings further indicate that animation-integrated instructional strategies can function as highly effective scaffolding mechanisms for learners who experience difficulties in conventional text-based writing activities, especially within second-language classroom environments. Visual narratives, animated sequences, and AI-supported prompts appear to reduce learner anxiety and stimulate imagination, thereby enabling students to generate ideas more confidently and organise their thoughts more effectively. Such approaches may particularly benefit students who struggle with abstract thinking, vocabulary limitations, or lack of motivation in traditional writing classrooms.

The study also demonstrates that in an educational environment increasingly shaped by digital culture, multimedia communication, and visual learning practices, traditional instructional methods alone may no longer adequately address the learning preferences, cognitive engagement patterns, and creative expectations of present-generation learners. Consequently, the meaningful integration of CGI animation, AI prompt writing, multimedia storytelling, and digital narrative practices into language classrooms may contribute significantly toward the development of imagination, narrative competence, emotional expression, creativity, and higher-order thinking skills among learners. These approaches not only make learning more engaging and interactive but also prepare students to function effectively in a technologically advanced and communication-oriented global society.

5.4. Suggestions and Recommendations

The present Ph.D. thesis has explored the effectiveness of computer-generated imagery-based animation videos in enhancing the creative writing skills of secondary school students. After a comprehensive literature review, data collection, and analysis, several findings have been arrived at paving the way for educators and policymakers to understand the effectiveness of CGI-based animation-integrated second language classrooms in improving the creative writing ability of students in English. The findings are motivating and encouraging as they shed light on the endless possibilities of technology integrated classrooms in developing the language skills of secondary school students, especially in the case of writing proficiency. In the finding session, the key

features of CGI animation integrated classrooms were highlighted, and the research outcomes provide valuable insights for teachers in fostering students' creative abilities.

This section delivers a set of actionable recommendations, developed based on the study's outcomes. The recommendations outlined here are aimed at educators, policymakers, and curriculum developers who are interested in incorporating modern technologies in the second language classrooms to make teaching-learning process more effective and attractive. The recommendations are also aimed at teachers at secondary schools who find it a difficult task to develop the creative writing skills of students in English. The present study which explored the relationship between CGI animation and creative writing, proposes the following recommendations.

1.Integrate CGI animation videos into English language curriculum: For enhancing the creative writing skills of secondary school students in English, educators shall integrate computer-generated imagery-based animation assignments and activities in the secondary school curriculum. This practice may include giving the students extended activities based on the CGI integrated classrooms, like writing an alternate ending to an animated story, preparing English subtitles for the videos, writing scripts for theme-based CGI animation videos, etc. Once students are engaged with the attractive world of CGI animation, they can develop their language abilities, exercise their creativity, and enhance their talent in the English language.

2.Training sessions for teachers and students: Workshops highlighting the benefits of computer-generated imagery-based animations shall be conducted for both teachers and students. This will help them understand that computer-generated imagery-based animation tools and packages are very essential in modern day second language classrooms. Teachers will be empowered to use CGI-based animation tools confidently in classrooms. Moreover, the integration of technology in English classrooms is the need of the hour. This will help teachers to take the benefits of computer-generated imagery-based animation to engage students in creative writing practice.

3. Provide access to CGI animation tools: Educators and policymakers shall ensure that second language classrooms are integrated with technology and lessons are taught with the help of computer-generated imagery-based animation videos. Schools can develop their own software packages and let the children learn with the support of technology. Experimentation with CGI animations in second language classrooms will help students develop language competencies easily.

4. Facilitate interaction with industry experts: Live interactive sessions with experts in the field of information and communication technology (ICT) will inspire both teachers and students to use CGI animations in classroom practices, thus giving a tint of professionalism to teaching-learning process. Experts in the field can share their experience with students and teachers and they can also impart knowledge about the latest trends in the field. To enhance students' language competencies, incorporating real-world examples is crucial. Interesting and informative interactive sessions, such as guest talks, meet the maestro events, and virtual Question and Answer sessions, can facilitate this.

5. Research and evaluation: More studies are needed to understand the long-term effect of computer-generated imagery-based animation videos on children's creative writing. More research is needed to identify the impact of computer-generated imagery-based animation on students' academic performance and overall performance in studies. In this regard, educators can promote further research and shall incorporate the findings and recommendations into the existing curriculum framework.

6. Facilitate peer feedback and assessment: Arranging feedback sessions for peers will help to integrate computer generated imagery-based animation into creative writing tasks. In these situations, students will be able to give constructive feedback to their peers by giving importance to creative writing content and visual aspects of CGI animation. Peer feedback ensures active engagement and deep learning. It also enables peers to critically analyse the feedback provided, thereby strengthening their understanding of the content. Peer feedback in technology integrated classrooms will also help increase motivation. The thought that their peers will scrutinise their writing will help students to produce quality work. Peer feedback will also help to develop

critical thinking skills, which will help students to develop language competencies, especially writing.

7.Introduce CGI animation as a storytelling tool: Computer-generated imagery-based animations can be incorporated into second language classrooms to make creative writing more engaging and meaningful. The visual engagement that CGI animations provide will create a supportive and stimulating environment for creative writing activities. In addition to enhancing learners' imagination and narrative writing skills, the use of CGI animations can also contribute to the improvements of students' overall language proficiency.

8.Provide a platform for self-expression: A conducive learning environment that encourages free expression accelerates student learning. CGI animations offer this platform, enabling students to delve into visuals, themes, settings, and characters, thereby fostering their imaginative abilities. Computer-generated imagery-based animation-based language practices will help students to unleash their creativity, helping them to develop their writing style. So, it is advisable to provide students with suitable platforms by integrating CGI technology into the teaching learning process.

9.Encourage more research: The present research mainly focused on the impact of computer-generated imagery-based animation on the creative writing skills of secondary school students. The same study can be carried out at higher secondary and college levels to identify the impact of CGI among those groups of students. Similarly, studies shall be encouraged to identify the impact of AI prompt engineering for honing other language competencies of students like communication and listening skills. As it is proven that CGI can enhance the creative writing skills of secondary school students, it may also be assumed that AI prompt engineering integrated classrooms will be effective in enhancing the listening, speaking, reading, and writing skills of students.

10. Introduce structured multimedia-assisted creative writing pedagogy

Educational institutions may introduce structured multimedia-assisted creative writing pedagogy to enhance the English language skills of secondary school students.

Policy makers should encourage the integration of AI-assisted language learning strategies along with CGI animation and digital storytelling within the existing curriculum framework. Systematic orientation programmes and continuous professional training regarding multimedia pedagogy, prompt engineering techniques, and technology-assisted creative writing practices should be provided to stakeholders so that classroom practices remain aligned with contemporary pedagogical developments in language education.

11. Strengthen and ensure adequate multimedia infrastructure

Schools across the country should also be equipped with smart classroom facilities including projectors, reliable internet connectivity, interactive digital devices, and animation resources to facilitate experiential learning and process-oriented teaching practices. Furthermore, the assessment of creative writing should move beyond traditional pen-and-paper models by integrating AI-assisted continuous and comprehensive evaluation practices capable of measuring creativity, originality, and learner engagement more effectively.

12. Recommendations for the geographic zone.

Kerala remains one of the leading states in India in terms of Information and Communication Technology integrated classrooms and digitally enabled educational environments. The state has invested substantially in creating a digital-friendly atmosphere within public schools located in both urban and rural areas. In the special context of Kerala, the present study recommends greater integration of CGI animations and AI prompt engineering techniques into second-language classrooms to enhance the creative writing abilities of students in English.

The strong ICT infrastructure available in Kerala provides a favourable foundation for establishing animation-assisted creative learning environments in government and aided schools. Nevertheless, special attention should be given to improving ICT infrastructure in schools located in coastal, tribal, and socio-economically disadvantaged regions.

Localised multimedia content may also be incorporated to address the educational needs of learners from such backgrounds and make the teaching-learning process more engaging, inclusive, and result-oriented. In addition, collaborative partnerships among schools, higher education institutions, SCERT Kerala, KITE, and technology hubs such as Technopark can facilitate sustainable models of multimedia-assisted learning frameworks for secondary school education.

The findings of the present study indicate significant implications within the evolving educational frameworks proposed by the National Education Policy 2020 and Kerala Curriculum Framework 2023. Both policy documents strongly advocate experiential learning, creativity, critical thinking, problem-solving abilities, and process-oriented approaches as essential components of contemporary education.

The positive outcomes of the present research suggest that policy makers may consider integrating multimodal and technology-assisted learning practices more systematically into the secondary educational system. Curriculum developers may focus on incorporating digital storytelling, visual narrative construction, AI-assisted creative writing tasks, and multimedia resources into English language textbooks and classroom practices to enhance learner engagement and maximise learning outcomes.

At the institutional level, government agencies such as the State Council of Educational Research and Training (SCERT) and Kerala Infrastructure and Technology for Education (KITE) may design specialised teacher training programmes to equip language teachers with modern pedagogical strategies including multimedia-assisted creative writing pedagogy. Policy makers may also prioritise equitable digital learning infrastructure in government and aided schools to reduce the cognitive burden of learners and ensure equal access to educational technology across urban and rural educational institutions.

Further studies shall be encouraged to understand the effectiveness of computer-generated imagery-based animation for teaching grammatical aspects too. Many second language teachers find it difficult to teach grammatical components in secondary classrooms, and CGI can be an effective tool for them to transact language elements in classrooms. It is proved from the study that computer-generated imagery-

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based animation videos are capable of motivating and encouraging students and ensuring the participation of students in teaching learning process.

A separate study can be carried out to check the effectiveness of computer-generated imagery-based animation videos in other subjects too. Difficult subjects like mathematics and science can be effectively taught with the help of CGI tools. Further research shall also be encouraged to examine teachers' attitudes toward integrating technology in second language classrooms, with particular emphasis on exploring the differences between traditional language classrooms and technology-integrated classrooms, especially in the context of teaching English.

A study among the students in government schools and private schools may also be carried out to identify the difference in attitude among teachers and students towards computer-generated imagery-based animation videos integrated into the teaching-learning process. All these studies may further help educators and policymakers to device different strategic plans for improving the language competencies of students among all age groups. A curriculum framework with technology integrated classrooms, especially in the case of second language learning, is the need of the hour. Integrating technology into the present curriculum is very urgent as learners are competent in developing technologies. In today's technology-driven world, a curriculum framework that directly addresses the needs and perspectives of learners is essential for long-term relevance. This necessitates immediate and collaborative action.

Implementing these recommendations will directly benefit hundreds of students nationwide, offering them enhanced opportunities for language acquisition. Moreover, it will provide policymakers and educators with critical insights to revitalize technology integration within second language classrooms across India. This initiative is not merely a pedagogical adjustment; it is a transformative step, poised to unlock the linguistic potential of a generation.

5.5. AI-Prompt Writing and Future Directions in Creative Writing Pedagogy

The findings of this research, which establish the pedagogical effectiveness of CGI animation in enhancing creative writing skills among secondary school students, extend beyond conventional instructional paradigms. One of the most significant contributions lies in the potential intersection between CGI-based creative writing instruction and the emerging field of *AI prompt writing*. As artificial intelligence tools such as ChatGPT, DALL·E, Gemini, Bing, and other generative platforms become more accessible in educational settings, the use of well-structured prompts tailored for student engagement and narrative development emerges as a transformative pedagogical strategy for teaching creative writing in English.

AI prompt writing refers to the deliberate design and customization of text inputs given to artificial intelligence models to elicit meaningful, relevant, and imaginative outputs. When integrated into a creative writing curriculum that already leverages CGI animation for visual storytelling, prompt writing can serve as a powerful bridge between visual cognition and linguistic expression. Students exposed to animated content can be guided to generate AI prompts based on the visuals, character arcs, plot sequences, or emotional tone of CGI narratives. This multimodal interaction fosters deeper engagement with story structure, encourages vocabulary expansion, and sharpens students' ability to translate abstract ideas into coherent prose.

One of the unexpected, yet promising, outcomes of this study is the realization that CGI animation, when paired with AI tools, fosters a dynamic environment for *prompt engineering*, an emergent digital literacy that aligns closely with creative writing objectives. Through classroom implementation, students begin to grasp how subtle variations in prompt phrasing—such as the use of sensory verbs, descriptive modifiers, or narrative tones—affect the output generated by AI models. This fosters not only critical thinking and linguistic experimentation but also a meta-awareness of writing as a process of negotiation between intention, language, and audience. In this way, the current research supports a redefinition of writing instruction: from static essay-based composition to an interactive and iterative process that mirrors the real-world use of digital storytelling tools.

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Moreover, AI prompt writing creates opportunities for personalized learning. When students use CGI animations to create unique story premises or character dialogues, and then craft tailored prompts for AI models to expand upon, they receive immediate feedback in the form of generated content. This feedback loop can be harnessed by educators to scaffold student progress, offering differentiated support according to each learner's strengths and gaps. For instance, a student who struggles with dialogue writing may use prompts to study AI-generated conversations based on CGI characters, analysing tone, pacing, and coherence. This technique empowers students to reflect, revise, and reframe their writing strategies, thereby reinforcing fundamental skills while introducing advanced techniques such as genre bending, metaphor construction, and nonlinear narration.

Importantly, the integration of AI prompt writing into CGI-based storytelling does not replace the role of the teacher or the value of original student authorship. Instead, it functions as an amplifier of creativity that provides students with varied linguistic expressions, narrative directions, or stylistic possibilities that they might not have considered independently. This allows students to develop a more nuanced understanding of authorial voice, style imitation, and story architecture. It also offers a platform for exploring multilingual storytelling, and cross-disciplinary integration with subjects like history, science, or ethics.

In the broader context of 21st-century skill development, this research suggests that AI prompt writing-when paired with CGI-enhanced learning-can foster adaptive communication, digital fluency, and transmedia literacy. As students learn to craft prompts and critically assess AI-generated outputs, they become active participants in a new literacy landscape that emphasizes creative collaboration between human imagination and machine intelligence. This aligns with national educational frameworks that advocate for experiential, inquiry-based, and tech-integrated pedagogy. It also opens possibilities for future curriculum development, teacher training modules, and classroom toolkits centered on AI-assisted storytelling.

The insights gained from this study demonstrate that CGI animation not only improves creative writing skills among secondary students but also acts as a catalyst

for innovation in AI-integrated writing instruction. Future researchers and educators can build upon these findings to explore best practices for prompt design, ethical considerations in AI-assisted writing, and assessment models that capture the hybrid nature of human-AI co-authorship. Ultimately, the synergy between visual storytelling and prompt engineering holds immense potential to redefine the contours of creative expression in the digital age.

5.6. Integration of AI-Prompt Engineering: A Classroom-Based Exploration

Expanding on the core findings of this research, a supplementary experiment was conducted at Government Vocational Higher Secondary School (GV&HSS), Vithura, Thiruvananthapuram. This pilot project introduced AI prompt engineering into the English classroom, offering a novel method to reinforce creative writing through interactive, image-based storytelling motivated by the findings of CGI animation-based writing sessions.

As part of the classroom experiment, students were guided to reinterpret the story "The Snake and the Mirror" by Vaikom Muhammed Basheer in the class 10 English Reader using AI image-generation tools. Platforms such as *Google Gemini*, *Bing Image Creator*, and *Anuvadini* were employed, enabling learners to create visual representations of narrative moments in the story by crafting descriptive prompts in English. These prompts facilitated the transformation of textual content into visual media, with students depicting scenes such as the anxious doctor's encounter with the snake or his introspective moment before the mirror.

This immersive exercise not only deepened textual comprehension but also bolstered several key language skills:

Vocabulary Development: Students were encouraged to incorporate apt and contextually appropriate terms, thereby enriching their descriptive language. *Precision in Adjective and Adverb Usage:* Crafting detailed prompts required specific modifiers to accurately convey mood, setting, and action, thus enhancing students' command over language.

Improved Narrative Structuring: The demand for clarity in visual depiction fostered logical thinking and a better grasp of narrative flow and scene composition.

The process of drafting, evaluating, and refining prompts-based on the output quality-echoed essential writing processes like editing and revision. Peer review and collaborative refinement further nurtured communication skills and collective learning. This initiative highlighted how AI prompt engineering can serve as a contemporary extension of creative authorship. By merging imagination with digital output, students engaged in a process that was both intellectually stimulating and practically rewarding. The success of this experiment suggests promising applications for AI-supported writing instruction across varied educational settings.

5.7. AI Prompt Engineering: A New Frontier for English Writing Instruction

Prompt engineering is the practice of crafting effective and specific inputs-called *prompts*-to guide artificial intelligence (AI) systems like language models, image generators, or virtual assistants to produce desired outputs. In the context of education, prompt engineering involves designing questions, tasks, or instructions that elicit meaningful, creative, and accurate responses from AI tools. When thoughtfully applied, prompt engineering becomes a powerful pedagogical strategy, especially in English writing instruction, where clarity, creativity, and contextual sensitivity are essential. English writing instruction traditionally emphasizes grammar, vocabulary, structure, and creativity. AI prompt engineering intersects with all these elements by offering learners a collaborative digital environment where they can test their language, explore stylistic options, and receive immediate feedback. For instance, a student can use an AI model to generate different versions of a descriptive paragraph based on a carefully written prompt, allowing them to observe the impact of specific words, tone, or narrative perspective.

This iterative process of drafting and refining prompts builds core writing competencies. When a student modifies a prompt to make it more precise-by adding adjectives, clarifying intent, or specifying genre-they engage in critical thinking about language. AI, in turn, offers outputs that reinforce or challenge their choices,

encouraging revision, refinement, and experimentation. As a result, learners not only write more but also become more reflective about the writing process itself.

In English classrooms, prompt engineering can be introduced as both a technical and creative activity. Students can be tasked with designing prompts that produce specific types of writing: a horror story, an image, a persuasive argument, or a poetic description. These tasks enhance vocabulary acquisition, reinforce grammatical structures, and develop genre awareness. Educators can also encourage students to use AI to visualize scenes, summarize texts, or expand story ideas—activities that bridge comprehension and composition.

Combining prompt engineering with image-generating AI tools and CGI adds a multimodal layer to writing. Students can write prompts to create visual scenes from literary texts or their own stories using tools like Bing Image Creator or Google Gemini. This integration nurtures spatial thinking and narrative imagination, essential skills in digital storytelling.

5.8. Pedagogical Benefits and Alignment with Education Policy

The possibilities of AI prompt engineering align closely with the goals of progressive educational policies such as India's National Education Policy (NEP) 2020, and Kerala Curriculum Framework 2023 which promote creativity, digital literacy, personalized learning, and experiential pedagogy. Prompt engineering supports inclusive and adaptive learning—students work at their own pace, receive real-time support, and experience success in their own voice. It empowers learners as active creators rather than passive consumers of content.

Moreover, the teacher's role evolves from information-giver to learning facilitator, guiding students to think critically, communicate clearly, and collaborate meaningfully. AI prompt engineering complements these shifts by fostering student agency, curiosity, and innovation. It is not merely a technological trend—it represents a paradigm shift in how writing is taught, practiced, and valued in educational spaces. When integrated with purpose and pedagogy, it can cultivate a new generation of

learners who are not only skilled writers but also thoughtful communicators, digital citizens, and creative thinkers. As schools prepare students for an AI-augmented future, prompt engineering will undoubtedly become a cornerstone of future-ready language education.

In conclusion, the integration of CGI animation and AI prompt engineering into English language education marks a transformative step in 21st-century pedagogy. CGI enriches textual interpretation through visualization, while prompt engineering empowers students to craft precise, purposeful language that guides intelligent systems—developing not only their creative expression but also critical digital literacy. Together, these tools foster a learner-centric environment where imagination, communication, and technology converge. As this research demonstrates, such innovations do more than enhance writing—they reshape how students engage with language, enabling deeper comprehension, autonomy in learning, and a future-ready skillset aligned with contemporary educational goals.

5.9. Future Directions and Educational Implications

The dual incorporation of CGI animation and AI prompt writing in English instruction presents exciting opportunities for reshaping language education. These tools enable students to merge textual interpretation with visual and interactive experiences, cultivating digital storytelling skills while reinforcing foundational literacy. Further studies may examine the long-term impacts of such technologies on student performance, particularly in academic writing and critical thinking. Additional areas of research might explore how AI tools can be adapted for differentiated instruction, addressing the varied linguistic needs of learners across proficiency levels. Moreover, the development of structured training programs for educators on integrating CGI and AI tools will be essential to ensure consistent and effective classroom implementation. Curriculum developers and policymakers may consider these findings while framing future-ready educational models.

In conclusion, the strategic and thoughtful integration of CGI animation and AI prompt engineering into the English language curriculum marks a transformative advancement. These innovations not only enhance creativity and engagement but also empower learners with the skills necessary to navigate and contribute meaningfully to a technologically rich world. Through this redefinition of narrative creation and expression, the classroom becomes a space where traditional literacy converges with digital fluency-preparing students for a future shaped by imagination, innovation, and informed communication.

5.10. Limitations and Scalability of the intervention

While the study provides valuable insights, it is not without limitations. The research was carried out in a specific geographical area and educational context. The study also focussed on the measurable aspects of writing and qualitative data such as creativity and originality. Other aspects could be explored deeply in future investigations. Another issue that emerged as a study constraint was the inability of the conclusions gained to definitively state whether a CGI-based teaching approach may inspire higher-end students to continue pursuing creative tales in the absence of reading material.

During the analytic stages, it was noted that although the qualitative approach indicated motivation as a component of development, the students with stronger writing skills did not exhibit significant differences in their quantitative outcomes. Also, certain limitations may hinder the large-scale implementation of the proposed recommendations. Inadequate infrastructure in several public schools across the country may become a major challenge for policy makers. Access to internet connectivity, CGI resources, AI-based platforms, and digital learning facilities etc still vary considerably among educational institutions across the country.

Similarly, teacher competency, learner-centred pedagogical practices, digital literacy levels, and institutional support systems may influence the successful implementation of the findings. Therefore, the scalability of the intervention largely

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depends upon systematic institutional planning, investment in appropriate technological infrastructure, professional training for teachers, and sufficient curriculum flexibility. Future research in this field may focus on examining long-term implementation strategies capable of establishing sustainable multimedia-assisted and AI-driven learning environments within second-language classrooms in India.

Conclusion

Conclusion

This research investigated the effectiveness of computer-generated imagery-based animation videos in enhancing the creative writing skills of secondary school students in English. It shed light on the benefits of integrating CGI animation videos in second language classrooms to improve the storytelling process. It was proved in the study that computer-generated imagery-based animation videos can improve the language competencies of secondary school students in general and creative writing skills in particular. The response of the students and teachers who participated in the study evidenced that computer-generated imagery-based animation videos have an outstanding capacity to transform English language classrooms into a truly technology integrated environment. In a CGI integrated classroom, the learning atmosphere itself is enhanced and students get motivated and inspired. The visual power of CGI animation videos effectively captures students' attention and fosters deeper engagement with the tasks assigned in class. This in turn helps students to largely improve their language skills. Students develop a deeper bonding with the characters and settings making the English classrooms more attractive and productive.

The study examined the pedagogical potential of CGI animations in a second language classroom. With the strong theoretical framework of multimodal learning and cognitive pedagogy, the study proved the effectiveness of CGI animation in enhancing the creative writing skills of secondary school students. The research sought to align classroom pedagogy with the cognitive preferences and real-world experiences of the learners. The findings of the study validate the effectiveness of CGI animation as a transformative tool for enhancing the writing proficiency of secondary school students in English.

The primary objective of the study was to investigate whether CGI animation could enhance the English writing skills of students in secondary classrooms when compared to non-CGI methods of teaching. The findings of the study provided compelling evidence that CGI based animation has a significant impact on students' creative writing skills. In all the language proficiency rubrics-task focus, grammatical resource, lexical resource and coherence and cohesion- students in the experimental

group demonstrated substantial improvement in post-test. Statistical analysis using SPSS confirmed that the improvement was not incidental but statistically significant.

Substantial gains were observed in the experimental group in richer vocabulary use, lexical variety. The visual stimuli, character development, and settings in the animations helped students to acquire vocabulary in a meaningful environment. Improvement in grammatical resources was also evident in the study. Unlike most of the second language classrooms where grammar rules are taught mechanically, the CGI animation integrated intervention helped students with better sentence construction, tense usage, and syntactic accuracy. The most important improvement, however, was in coherence and cohesion. Participants in the experimental group exhibited improved narrative fluency, use of cohesive devices and structured the narratives logically. As a result of all these, students' compositions became organised, fluent, and logical.

The result of the research underscores the significance of CGI animation in a language pedagogy as it supports dual coding by engaging learners both visually and verbally. It can be used in second language classrooms especially when transacting difficult language discourses. The multimodal nature of CGI based animation reduces the cognitive load of students and facilitates engaging sessions with the participation of students.

The findings of the research also highlighted the affective dimension of teaching learning process. Students in the experimental group showed greater attention span, confidence, and motivation during the intervention phase. The visual narratives helped them to make the often challenging and intimidating tasks like writing more enjoyable and participatory in the intervention phase.

As new trends in education evolve rapidly, educators should seek possibilities of applying technology integrated pedagogy in a second language classroom rather than considering it just as a tool. CGI based animation when strategically integrated, has the potential to redefine second language classroom experiences and transform students into contributors and not passive listeners.

Writing is a difficult task for secondary school students. Many studies proved that conventional classrooms where the teacher takes the lead role and students, in most times, act as just passive listeners are not suitable for enhancing the creative writing skill of secondary school students. As creative writing is a complex skill, meticulous planning and a suitable learning environment are essential. The visual storytelling technique used in animations, especially in computer-generated imagery-based animation videos, is a great advantage for the language learners and teachers alike. For students, animations act as a safety valve, as they can interact with the characters in their imagination.

The study proved that computer-generated imagery-based animation can break down the barriers for children in communication and writing practices. They encourage collaboration and teamwork among learners and teachers and facilitate productive exchange of ideas among students. Peer influence is also a major benefit of computer-generated imagery-based animation integrated classrooms. Technology integrated classrooms that make use of the possibilities of CGI not only enhance the creative writing skill of students but also improve their storytelling ability thus facilitating an effective teaching learning process. CGI animation videos are very interesting and interactive and they motivate students to come out with their latent talents in speaking and writing.

The study also emphasises the responsible use of technology integrated classrooms. On one hand, technology provides all possible learning experiences to the learners and help them to grab global opportunities through English communication and creative writing skills. On the other hand, it may also hinder the descriptive writing skills of students, as addiction to visual elements may bar their power of imagination. All technology integration in classroom should be conducted under the direct supervision and assistance of teachers. Students are vulnerable to different types of addictions, and the cyber world is such an attractive milieu where students may fall victim to many frauds unless they are assisted and accompanied by teachers. We cannot compromise the core concepts of teaching learning process for technology.

The result of the study indicated that the students had successfully interpreted the visual stimuli using a good vocabulary and had grasped most of the animation's content. They gave the characters names and used better language to describe the scene and made fantastic additions to story writing, and the animations undoubtedly had a positive effect on the younger audience. Since the population for this project was limited to students, the resources gathered and analysed were adequate. However, many teachers suggested that having access to additional videos in a variety of genres would be beneficial for future use of computer graphics as a teaching tool. The literature consulted to facilitate the research's findings demonstrated that numerous other nations have already employed brief films and visual aids to encourage young students to write creatively. Additionally, the research amply demonstrated the potential for these tools to be implemented and made available to a larger audience within the Indian educational system. Additionally, it was observed that the learner-centred environment and instruction used throughout the study encouraged young brains to actively participate for a while, with inclusion being viewed as the most important thing for students to experience. The children who possessed above-average language skills demonstrated consistent writing tactics that included coherence, content, originality, and creativity.

Students who experience difficulties in creative writing should be encouraged to participate actively in peer-review and collaborative writing activities. Such practices enable learners to receive constructive feedback from their peers, gain alternative perspectives, and develop greater confidence in expressing their ideas. Children who participate in varied classroom practices will eventually improve their writing abilities given enough time and resources. In this research, students with high scores were able to engage with a wider range of genres and exhibited greater creativity and originality in their writing. This exceptional talent pool will likely produce important future educators and leaders who will uphold diversity in today's culture. Encouraging students to explore multiple genres can contribute to the development of inclusivity and appreciation of diversity from an early stage of education. In the era of directional change, the integration of such practices into Indian secondary classrooms has considerable pedagogical potential. Therefore, the present research may be regarded as

a valuable contribution towards promoting innovative strategies to teaching creative writing and extending these practices to a wider educational context.

EFL writing skill assessment is a challenging assignment that calls for a thorough and methodical approach. The goals and objectives of the learning process should be reflected in the explicit standards, criteria, and guidelines that underpin the assessment procedure. The writing abilities of EFL students can be evaluated using a variety of techniques and resources, including essay exams, portfolio evaluations, peer reviews, and self-evaluation. Standardised tests are one popular tool that evaluates EFL students' writing ability based on preset norms and criteria. Studies have indicated that evaluating the writing abilities of EFL students can be difficult because of several variables, including language ability, cultural background, and previous writing experiences. As a result, when creating the assessment tasks and tools, it is crucial to take these elements into account. Assessments come in a variety of forms, including formative, summative, and diagnostic. After making a few little adjustments, the general comprehension of this discussion can lead one to conclude that the research was successful and that it can be used in a learning context with a larger audience. Young learners can be encouraged to creatively explore their narrative styles and integrate writing into their everyday learning journeys by instructors of young learners and language teachers through the extensive use of CGI as a teaching tool. All things considered, inclusion in a language classroom can be deemed beneficial for all sorts of learners, irrespective of the student's learning impairments, as it fosters a diverse social environment and is demonstrated to excite young children's individuality.

Despite the research's perceived benefit, there were some significant limitations that became apparent when the experimental sessions were being made. First, the pre-test analysis revealed that the students' syntax, fluency, vocabulary, and conventions were generally greater than those of most typical pupils attending Indian public schools. This is explained by the knowledge that most of the selected schools were well equipped with information and communication devices. Teachers in most of these selected schools familiarised the students with modern ICT integrated teaching

strategies. Therefore, to get better findings, the population have been drawn from a much wider range of educational backgrounds.

In this study, technology has been utilised as an effective strategy to teach creative writing in secondary school classes. Educators in the selected schools were capable of utilising technology and cutting-edge methods to instruct writing. They engage with students on social media platforms and provide feedback using technology, which helps the students' writing processes. The results also suggest that teachers have benefited from using technology to explore novel concepts and methods when teaching writing. As a result, educators feel comfortable picking up new abilities and expanding their ICT expertise to use in their instruction. In this day and age, where face-to-face connections between students and teachers are decreasing due to a global pandemic that has forced schools to close, modern teaching approaches are also critical.

Online learning is gradually becoming more common. This study focused on the technical and psychological factors that influence students' adoption of technology and whether they will make the extra effort to learn those that will improve their academic and technical writing. The available tools and apps that can help students write better were identified. Numerous tools and applications have been discovered to assist students in enhancing their academic understanding. Nonetheless, a variety of factors could influence students' plans to use those technologies in their writing.

The results of the study showed that students' desire to learn academic writing using technology is influenced by their attitudes towards digital technology, computer self-efficacy, and perceived value. It also depends on their availability to these technologies and how user-friendly their interfaces are. Students in the experimental group are motivated to put in extra effort to improve academic writing using technology when they see the writing itself as having worth and when they have a positive attitude towards it. That is, pupils will be motivated to master academic writing if they see writing as having a high perceived value and have positive attitudes towards it.

For many educators, educational research has long been seen as a crucial learning curve. The process of discovering, designing, and developing experimental

research has proven to be a valuable and insightful step in the researcher's personal growth and enjoyment of education. It makes sense that the research's conclusion attempted to fill in knowledge gaps, find and develop solutions, and open doors to inclusive teaching and learning so that all students feel included in language classes.

The influence of using computer-generated imagery (CGI) as a teaching and motivational tool for a select group of students attending government and aided learning institutions was underlined by the research's conclusion. It also looked at how well social interaction works as a motivator for young students to write freely outside of teacher-centred school environments. The research revealed a way to address students' low motivation to learn and a shift from the conventional teaching strategies that focused mostly on grammar and spelling. Ultimately, the study closed the knowledge gap regarding writing challenges and motivation to write, as well as how to develop a creative, engaging, and successful teaching strategy that can be applied to a broader range of language learners, ideally starting in the primary school years in countries like India.

Not only can creative writing be deemed appropriate for educational settings, but it can also serve as a means of navigating daily life, pursuing artistic endeavours, and inspiring learning. Young minds can learn these ideas through creative expression. Thus, it is evident from the research's conclusion that the use of visual stimulation, less manual instruction, more incentive, and student-centred learning had an impact on the writing.

In a nutshell, the study helped to identify the symbiotic relationship between creative writing in English and computer-generated imagery-based animation videos. It also sheds light on the endless possibilities of integrating technology in English classrooms, especially for the secondary school students. Further research to identify the transformative nature of CGI animations should be encouraged and the findings should be analysed to create the next generation of active and creative storytellers.

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Appendices

Appendix 1

List of Publications

Journal Name	Indexed	Paper Title
Forum for Linguistic Studies	Scopus (Q2)	Enhancing Creative Writing Skills in Secondary School Students through Prompt Engineering and Artificial Intelligence
International Research Journal of Management, Sociology and Humanities	UGC	Computer Generated Imagery Based Cognitive Pedagogy for Enhancing Creative Writing Skills of Secondary School Students.
<u>Book</u> Publisher: Insight Publica, Kozhikkodu, Kerala		Title: THE GREAT SHIFT <i>(Lexicons of Survival: Exploring the Anthropocene through Emerging Terms and Trends in Climate Fiction)</i>
International journal of Psychological Rehabilitation	Scopus Indexed till 2020	Dark Humour and Lost Identities in the Novels of Anees Salim

Appendix 2

List of Conferences

Conference Name	Organizer	Paper Title
National Conference on Quality and It's Assurance in Modern studies: Emerging Trends for Research in the Digital Era	Sunrise University, Alwar, Rajasthan	Prompting Creativity: A Study on the Effectiveness of CGI and Prompt Engineering in Secondary School Creative Writing Education.
Two-Day National seminar on Literature and Philosophy	Dept. Of English, Baba Ghulam Shah Badshah University, Rajouri-J&K	Dark Humour and Lost Identities in the Novels of Anees Salim
One-Day Virtual Conference on Cultural Representations in 21 st Century Literature	The New College (Autonomous) , Chennai	Computer Generated Imagery Based Animation: A Cognitive Pedagogy for Enhancing the Creative Writing Skills of Secondary School Students
Two-Day National Conference on Reimagining Popular Narratives	Milad-E-Sherief Memorial College ,Kayamkulam, Kerala in collaboration with KERALA SAHITHYA ACADEMY	Descriptive Green and the Planet in Peril: Interlinking Eco-Washing, Polycrisis, and the Triple Planetary Emergency

Appendix 3

Worksheet

Video: *Mouse Trap – Cheese Advertisement*

Class: _____ **Name:** _____ **Date:** _____

Watch and Note

Watch the video carefully **until 0:29 seconds**.

While you watch, write down **words and phrases** that you notice — actions, objects, feelings, or anything that stands out.

Words and Phrases I Noticed:

Create Your Own Ending

Now, imagine what might happen next!

Use the words and phrases you noted to help you write your own version of the story's ending.

My Alternative Ending:

Watch the Real Ending

Now, watch the full video and see how the real story ends.

Compare and Reflect

Answer these questions in a few sentences:

1. How is your ending different from the real one?

2. Which ending do you like better? Why?

3. What message do you think the real video wanted to give?

Student Feedback – Your Thoughts About Using Videos in Class

Please tick (✓) or circle the option that best shows what you feel.

Question	 Yes	 Not Sure	 No
1. I enjoyed watching the video in class.	☐	☐	☐
2. The video helped me understand the story better.	☐	☐	☐
3. Watching the video made learning more fun.	☐	☐	☐
4. I felt interested and curious to know what happens next.	☐	☐	☐
5. I would like to learn through videos and animations again.	☐	☐	☐

Write a few lines about your experience:

1. What did you like most about today's video activity?

2. What did you learn from this activity?

3. How can videos or animations make English lessons more interesting?

Researcher Checklist

Observation Focus	Indicators	Yes / No	Notes / Evidence
1. Engagement	Students watched the animation attentively and reacted emotionally/verbally.	☐	
2. Comprehension	Students identified meaningful words and phrases related to visuals or actions.	☐	
3. Creativity	Students used imagination to construct a coherent and original alternative ending.	☐	
4. Language Use	Students demonstrated appropriate vocabulary, sentence structure, and sequencing.	☐	
5. Collaboration	Students discussed or shared ideas effectively with peers (if in groups).	☐	
6. Critical Thinking	Students compared their version with the real ending thoughtfully.	☐	
7. Emotional Connection	Students expressed curiosity, surprise, or empathy while watching.	☐	
8. Pedagogical Effectiveness	The animation supported comprehension, imagination, and participation.	☐	

Researcher Remarks:

Appendix 4

Lesson Plan – CGI-assisted creative writing practice.

Creative Writing Lesson Plan Based on a CGI Animation Video

Class: Standard IX

Duration: 1 Period

Strategy: Freeze Frame Technique with Imaginative Ending Task

Theme

Creativity, Imagination, Critical Thinking, Hope, Resilience, and Presence of Mind

About the Visual Text

This lesson uses a CGI animation video showing a tiny mouse trapped inside a mousetrap after being tempted by cheese. Instead of giving up, the mouse carefully observes the situation, appears weak for some time, regains energy, and finally escapes cleverly from danger. The lesson is redesigned as a creative writing activity to develop students' imaginative thinking and narrative writing skills through CGI animation.

The visual power of CGI helps learners observe details, understand emotions, predict possibilities, and creatively extend the storyline beyond the original ending. The “black out” or “freeze frame” scene becomes the turning point where learners imagine and construct their own ending to the story. The activity promotes visual literacy, creative expression, emotional engagement, and collaborative learning while integrating technology-supported pedagogy into the English classroom.

Learning Objectives

Students will be able to:

- observe visual clues and emotional expressions carefully.
- predict and imagine events creatively.
- develop imaginative endings for a visual narrative.
- express ideas confidently through creative writing.

- connect visual experiences with real-life situations.
- enhance vocabulary, sequencing, and descriptive writing skills through CGI-assisted learning.

Activity Steps/ Process	Response/Assessment
<u>Classroom Process</u> Informal Interaction The teacher interacts naturally with students: • Have you ever made a quick decision and later regretted it? • Have you ever escaped from a difficult situation cleverly? • Do you think even small creatures can survive through intelligence? • Have you ever imagined a different ending for a story or film? Students respond freely and share experiences. Entry Activity Without giving any explanation, the teacher draws a simple mousetrap on the board and places a tiny piece of cheese beside it. The teacher remains silent for a few moments and asks: • What story do you think is hidden here? • Why does danger sometimes appear attractive? • What may happen if someone acts without thinking?	

- Can intelligence help us escape difficult situations?

Teacher says:

“Today we are entering a small but mysterious world through a CGI animation video. Watch every movement carefully because you will later become the creators of the story itself.”

Link Talk

“Stories do not always end where the screen becomes dark. Sometimes imagination begins where the video stops. Today, you are not just viewers; you are storytellers who will continue the journey of the trapped mouse through your own creativity.”

Activity – Freeze Frame 1: The Trap (0:28 sec)

Scene:

The mouse eagerly eats the cheese and suddenly becomes trapped.

The teacher pauses the video exactly at the trapping moment. The screen turns black for a few seconds, creating suspense and curiosity.

Interaction Questions:

- What do you think the mouse is feeling now?
- Did the mouse expect this danger?
- Why do people sometimes act without thinking?
- If you were the mouse, what would you do now?

• Is this really the end of the story? Expected Responses: • The mouse feels frightened and shocked. • It may try to escape. • It may lose hope for some time. • It may think of a clever plan. Teacher's Reflection: “Sometimes one careless moment may trap us in problems. But every difficult situation also gives us a chance to think differently.” Activity – Freeze Frame 2: The Silent Plan (0:59 sec) Scene: The mouse suddenly becomes silent and motionless. It looks weak and tired. The teacher freezes the screen again. Pair / Group Interaction: Students discuss possibilities in pairs or groups. Questions: • Why do you think the mouse stopped struggling? • Is the mouse really weak or is it planning something? • Can silence become a form of strength? • What quality do you admire in the mouse? • What may happen next?	
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Expected Responses: • The mouse may be pretending. • It may be observing the trap carefully. • The mouse is patient and intelligent. • Clever thinking can overcome danger. Teacher’s Reflection: “Wise thinkers do not panic immediately. Patience, observation, and planning often become the strongest tools for survival.” Creative Writing Task – Imaginative Ending After Black Out Scene Scene: At the most suspenseful moment, the teacher stops the CGI video before the original ending is shown. The screen becomes black. Teacher Instruction: “Now the story belongs to you. Imagine what happens next after the black out scene. Does the mouse escape? Does someone help it? Does the trap break? Or does something completely unexpected happen?” Writing Task: Students individually write an imaginative ending for the video in about 150–200 words. Teacher Guidelines for Students: • Give a suitable ending to the story. • Use creativity and imagination freely.	
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• Include feelings, actions, and descriptions. • Use dialogue if necessary. • Try to make the ending meaningful, surprising, emotional, or inspiring. Focus Areas: • Creativity • Sequencing of ideas • Descriptive language • Emotional expression • Originality Role of CGI Animation: The CGI animation supports learners by providing vivid visuals, emotional engagement, realistic movement, suspense, and imaginative stimulation. The visual experience helps students construct richer descriptions and more creative narrative possibilities. Student Presentation and Teacher Finalization Selected students present their imaginative endings aloud. The teacher appreciates originality, creativity, emotional depth, humour, suspense, and unique interpretations rather than focusing only on grammatical perfection. The teacher also highlights how different students created different endings from the same visual	
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experience, showing the power of imagination in creative writing. Review / Conclusion Teacher summarizes: “Today we discovered that imagination begins where ordinary viewing ends. The CGI animation helped us visualize emotions, actions, and suspense clearly, while creative writing allowed us to become storytellers ourselves. We learned that even a tiny mouse can inspire powerful ideas about courage, intelligence, patience, and hope.” Values / Understanding / Ideas This activity teaches learners the importance of patience, observation, resilience, and creative problem-solving. It also develops imagination, narrative thinking, emotional understanding, and confidence in self-expression. The integration of CGI animation makes the writing process more engaging, immersive, and meaningful for secondary school learners. Extended Activity Students create their own freeze-frame creative writing activity using another CGI animation clip, silent video, or scene from their textbook. They may also illustrate or digitally storyboard their imagined endings.	
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Appendix 5

Lesson Plan – Creative Writing using AI-Prompts

Class: Standard VIII

Unit: Unit III

Session: Creative Writing

Activity: Let's Recall and Recreate – Generating Images with AI Prompts

Duration: 1 Period

Learning Objectives:

Learners will be able to:

- Understand the concept of an AI prompt.
- Identify and use **adjectives** to add details.
- Read and comprehend instructional text.
- Convert poetic imagery into descriptive prompts.
- Use ICT tools to generate language

Activity steps/Process	Response/Assessment
Informal Interaction Teacher asks: • “How do you describe the moon?” • “What words make a picture clearer?”	

(Expected response: big, bright, beautiful → leads to adjectives) 2. Entry Activity (ICT) The teacher projects two prompts: ● “A child looking at the moon.” ● “A small child looking at a bright moon.” Students compare which is clearer. Teacher elicits: Describing words make pictures better. Link Talk Teacher says: “Today, we will read an instructional text about creating images using AI prompts. While creating prompts, we will learn how adjectives help us describe scenes better.” Model Reading by Teacher The teacher reads the instructional text aloud with emphasis on the steps. Track Reading by Students Students read silently: ● Underline difficult words ● Identify steps Glossary Reference ● prompt – description given to AI ● generate – create	
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● application – program ● URL – website address ● navigate – move through a webpage ● conversion – changing text to an image ● satisfied – pleased The teacher explains the meanings. Sharing Ideas Step 1: Teacher Demonstration (Simple Prompt) The teacher opens an AI image generator (projected): ● Canva ● Microsoft Bing Image Creator Teacher types: “A child looking at the moon.” Image appears. Teacher asks: ● “Is this a perfect picture?” ● “What can we add to make it more attractive??” Step 2: Teaching Adjectives (Grammar Integration) Teacher explains: Adjectives are describing words. They tell: ● Size (small, big) ● Colour (bright, blue)	
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● Feeling (calm, peaceful) ● Quality (beautiful, silent) The teacher highlights adjectives on the board. Step 3: Improving Prompt Using Adjectives (Think-Aloud) Teacher edits prompt: “A small child sitting near a window looking at a bright full moon in a peaceful night.” The teacher underlines adjectives: small, bright, full, peaceful New image appears → comparison. Teacher's conclusion: Adjectives improve imagery and prompts. Step 4: Literary Connection Teacher explains: ● Imagery → creating pictures using words ● Adjectives help imagery ● Poetry and prompts both use adjectives Megaphoning Doubts Students ask: ● Can we use many adjectives?	
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• Which adjectives are best? Teacher clarifies (use meaningful adjectives, not too many). Scaffolding Questions 1. What is an adjective? 2. Why are adjectives important in prompts? 3. Which adjectives improved the image? 4. What is imagery? 5. How do poetry and prompts connect? Student Activity Students: • Choose one poem scene • List 5 adjectives • Write: ○ Simple prompt ○ Detailed prompt using adjectives • Generate image (pair work) Student Presentation & Teacher Finalisation Students present: • Their adjectives • Prompt • Image The teacher highlights effective adjective use. Teacher finalises rule: Clear prompts = meaningful adjectives.	
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Review / Conclusion Teacher summarises: “Today, we read an instructional text, generated images using AI, and learned how adjectives help us describe scenes clearly. We understood that adjectives strengthen imagery in both poetry and prompts.”	
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Values / Understanding / Ideas

Students understand that language precision improves communication and creativity. They learn to use technology responsibly and recognise the role of descriptive vocabulary in expressing ideas. The activity encourages imagination, observation, collaboration, and confidence while showing how grammar supports meaningful, real-world digital tasks.

Assessment Questions

1. Write three adjectives for the moon.
2. Write one detailed prompt using adjectives.

Extended Activity (Course Book – Page 95)

B. What text prompt will generate the image below? Write it in the space provided.

Learners observe the CB and:

- Identify key details
- List adjectives
- Write a clear, descriptive prompt that could generate the image.

The teacher may allow learners to test their prompt using an AI image tool and refine it.

