

**THE ROLE OF AI IN ENGLISH LANGUAGE TEACHING AT
SECONDARY LEVEL: POSSIBILITIES AND CHALLENGES**

DISSERTATION

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Declaration

I, **Kalyan Kumar**, hereby declare that the dissertation titled " **THE ROLE OF AI IN ENGLISH LANGUAGE TEACHING AT SECONDARY LEVEL: POSSIBILITIES AND CHALLENGES** " has been conducted by me during the academic year 2024-2025 under the guidance of Associate Prof. **Dr. Sanjay Kumar Pandagle**, Department of Education, Regional Institute of Education, National Council of Educational Research and Training (NCERT), Bhopal, Madhya Pradesh.

I confirm that this research work is original and authentic, and it does not include any part of work that has been submitted for the award of any degree at Barkatullah University or any other university, except where due citation has been provided. Whenever contribution on others is involved, every effort is made to indicate this clearly, with due reference to the literature, and acknowledgement. I assert the statements made and drawn are an outcome of my dissertation work.

I further declare that the result presented in the study and the considerations made there in contribute in general to the advancement in understanding educational interventions.

Place: RIE, Bhopal

Kalyan Kumar

Date: 17 June 2025

CERTIFICATE

This is to certify that the content of this dissertation entitled “**The Role of AI in English language Teaching at Secondary level: Possibilities and Challenges**”, is the original research work of **Mr. Kalyan Kumar**, B.Ed.-M.Ed. (Session 2022-2025), bearing Roll number 2306600320 has carried out under my guidance at Regional Institute of Education, NCERT, Bhopal for the partial fulfillment of degree of B. Ed-M.Ed. (Integrated) of Barkatullah University Bhopal.

I further certify that the work has not been submitted either partly or fully to any other University or institution for the award of any degree.

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Abbreviation

Abbreviation	Full Form
AI	Artificial Intelligence
ELT	English Language Teaching
NEP	National Education Policy 2020
TPACK	Technological Pedagogical Content Knowledge
NLP	Natural Language Processing
ITS	Intelligent Tutoring Systems
SDG4	Sustainable Development Goal 4
NCERT	National Council of Educational Research and Training
CBSE	Central Board of Secondary Education
DIKSHA	Digital Infrastructure for Knowledge Sharing
ICT	Information and Communication Technology
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations International Children's Emergency Fund
AI for All	Artificial Intelligence for All (Indian Government Initiative)
NITI Aayog	National Institution for Transforming India Aayog
KV	Kendriya Vidyalaya
AR/VR	Augmented Reality / Virtual Reality
EdTech	Educational Technology
PISA	Programme for International Student Assessment
UI	User Interface

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1 CHAPTER 1: INTRODUCTION

1.1 Introduction

With the rapid advancement of Artificial Intelligence (AI), the landscape of education is evolving swiftly, particularly in how languages are now taught in modern era. Globalization and the Fourth Industrial Revolution have brought us new creative opportunities along with the new aspect of technological challenges. It plays a crucial role in transmitting information through text, pictures, and sound which can be used in teaching-learning processes. The rapid expansion of technology and digital applications that characterizes the “4th Industrial Revolution” is changing the way we live, work – and learn.

According to Rahman (2009, p. 343), artificial intelligence (AI) produces computer programs that filter knowledge and do independent tasks like computing or student search. Artificial intelligence (AI) creates "intelligent" objects like computer systems (online platforms) and robots that operate and respond similarly to human brains (Karsenti, 2019). Machine intelligence is another name for artificial intelligence (AI) (Mehrotra, 2019). In English Language Teaching (ELT) at the secondary school level, AI presents a futuristic possibility, such as personalized learning experiences, automated assessments, and enhanced student engagement, automated monitoring. AI technologies have been increasingly included into ELT to improve motivation, efficiency and accessibility of teaching and learning. Along with the emergence and growth of Natural Language Processing (NLP), which combines computer science and linguistics, and enables computers to understand and generate human language, both spoken and written (Kumar Attar & Komal, 2022, p. 285), more advanced language learning software, able to communicate with language learners in a manner that greatly resembles human communication, has been developed and put into use as a result of developments in AI.

AI-powered applications, platforms and assistants have been incorporated into the teaching and learning of languages, such as Duolingo, Coursera, Babbel, ChatGPT, Roseta Stone, Bhasha Sangam app, Linguist, Grammarly or Google Assistant. They offer customized learning content and immediate feedback to students. AI can offer personalized learning programs and language exercises adapted to different students' needs, proficiency levels and learning styles, and provide immediate personalized

feedback on student's vocabulary, grammar and pronunciation, which not only makes language learning more interactive but also helps students achieve better results. This also contributes to increased learner autonomy in developing their English language proficiency. AI has the potential to provide personalized learning experiences by creating contents to individual learner needs, offering immediate feedback through automated assessments, and enabling immersive language learning experiences through speech recognition and AR/VR tools. However, despite these opportunities, there are significant challenges. These include the lack of necessary resources, teacher preparedness, and ethical concerns regarding data privacy and the role of AI in the classroom. In recent years, AI-powered language learning tools have gained significant attention due to their potential to revolutionize language teaching and learning. Teachers may face a lack of training on how to effectively use AI tools.

Additionally, schools may struggle with inadequate resources, and there may be ethical concerns regarding privacy and the possible replacement of human instruction with AI also they might have inadequate funds. The integration of AI in English Language Teaching (ELT) presents us a promising yet complex area, containing both benefits and challenges at the same time. It has potentials to promote personalisation and better learning outcomes in English language teaching. Whereas its high infrastructural costs become hurdles for the developing nations. The integration of AI in English language teaching at the secondary level offers significant possibilities. It has the potential to enhance personalized learning, make assessments more efficient, and boost student engagement. However, for AI to fully realize its potential, schools must address challenges such as the digital divide, teacher training, and ethical concerns regarding AI's role in education. It should provide a comprehensive understanding of both the opportunities and challenges, offering a concrete recommendation for how to come up with complexities and harness the benefits of AI in ELT. This research aims to explore both the potential and the challenges involved in incorporating AI into English language teaching for secondary school students. By understanding the benefits and addressing the challenges, this study seeks to offer a practical solution for optimizing AI integration in ELT at secondary stage in India.

1.2 Title of the Study

The role of AI in English language teaching at secondary level: Possibilities and challenges.

1.3 Background of the Study

The 21st century an era of digital revolution reshaping every aspect of life, including how educational learning experiences is transacted and experienced. Among the most transformative technologies of this century, Artificial Intelligence (AI), which encompasses systems capable of simulating human cognitive functions such as reasoning, problem-solving, and language processing is now reshaping the destiny of human world. AI has moved beyond theoretical constructs and is now being applied in practical, pedagogically relevant ways—particularly in English Language Teaching (ELT).

AI's significance lies in its adaptability and ability to personalize instruction in real-time, which is a major shift from traditional teaching models. The adaptive nature of AI allows it to respond to learner's quest instantaneously, identifying knowledge gaps and customizing resources accordingly .It paves a great path for individualised learning instructions. This capacity for personalization is especially valuable in ELT, where learners often vary widely in their language proficiency, motivation levels and learning styles. Furthermore, it can democratize access to quality instruction by providing scalable solutions that transcend the limitations of human resource constraints. It empowers teachers by taking over time-consuming, repetitive tasks like grading grammar or identifying sentence structure issues, allowing educators to focus more on facilitating higher-order thinking and critical literacy skills.

As digital literacy becomes integral to educational development, nations are now equipping their future citizens with AI based competencies. The Government of India promotes the 'AI for All' initiative, aiming to democratize technology use across society to foster innovation and economic growth. India is recognized as a leader in technology and Artificial Intelligence, with Stanford University ranking it among the top four countries in AI capabilities alongside the US, China, and the UK. Additionally, GitHub highlights India's prominence in the developer community, noting its significant contribution of 24% to global AI projects. It is not only an emerging domain of study but also an enabler of deeper learning in traditional subjects. With its capacity to track student progress, identify learning gaps, and offer immediate feedback, can plays a crucial role in individualized learning pathways.

English, as a global lingua franca, serves as a critical medium in academic, professional and social spheres. In India, where linguistic diversity is both a strength and a challenge, mastering English can significantly enhance a student's academic trajectory, employment prospects and social mobility. English language proficiency is often regarded as a gateway to socioeconomic advancement. It facilitates access to better higher education institutions, global employment opportunities and even mobility within India's increasingly English-oriented bureaucratic and corporate sectors. Yet, widespread disparities in English learning outcomes still prevalent, often dictated by geographic location, school type and socioeconomic status of the individuals. Students in government schools—more specific in rural and semi-urban areas—frequently encounter obstacles such as outdated curricula, large class sizes, inadequate teacher training and lack of access to supplementary teaching learning materials. These challenges contribute to systemic inequities in language teaching.

The integration of AI into classrooms is a global trend. In countries like Finland, Singapore, and South Korea, AI is embedded within the national curriculum to foster digital literacy, computational thinking, and subject-specific mastery. These countries have implemented Intelligent Tutoring Systems (ITS), natural language processing tools(NLP) and adaptive learning platforms with notable success. Finland, for instance, incorporates AI-driven learning analytics into curriculum planning, allowing educators to make data-informed decisions about student progress. Singapore's use of AI in blended learning environments has enhanced student autonomy and engagement, while South Korea's integration of AI-powered writing assistants into English instruction has led to measurable improvements in student performance.

In India, the journey toward AI-enhanced education is at an intermediary stage. While India's National Education Policy (NEP) 2020 envisions a digitally empowered educational system that integrates emerging technologies, including AI, ground-level implementation—especially in government schools—remains a significant challenge. Though urban private schools have begun experimenting with AI-based platforms, public institutions often lack the necessary digital infrastructure, consistent internet connectivity and trained educators to effectively utilize such tools. The digital divide continues to widen the educational gap, marginalizing students who could most benefit from these innovations. This highlights the urgency of designing cost-effective, scalable and culturally contextualized AI interventions for public education systems.

This study focuses on the potential use of AI tools in enhancing story writing skills among Class 9 students at Kendriya Vidyalaya, Pusa, Bihar. Creative writing is a higher-order linguistic task that involves cognitive flexibility, imagination, syntactic accuracy and coherent expression. It engages multiple dimensions of language use—grammar, vocabulary, structure and creativity—making it an ideal domain for evaluating the pedagogical value of AI. It is also a metacognitive process involving planning, drafting, revising and reflecting. In educational research, writing is often viewed as a window into cognitive and linguistic development. Therefore, story writing serves not only as a measure of language proficiency but also as an indicator of a student’s ability to synthesize information, construct arguments and communicate effectively.

Traditional teaching often falls short in supporting the process-oriented nature of writing, particularly in under-resourced classrooms where teacher feedback is limited and peer collaboration is minimal. Students are typically taught to reproduce pre-learned formats, with little emphasis on creativity, drafting or revision. These approaches undermine students’ confidence and inhibit the development of authentic voices. Feedback, when given, is often delayed or focused narrowly on grammar and punctuation, neglecting broader issues like coherence, style and narrative progression. This is where AI-based writing tools offers a change in thinking—they promote writing as a process and empower students to take ownership of their work.

Here, AI tools like ChatGPT (for idea generation and dialogue modelling), Grammarly (for grammar and style correction) and Microsoft Copilot (for structural coherence) can act as scalable, supplementary teaching agents. ChatGPT enables students to brainstorm story ideas, develop plots, and construct dialogues by simulating conversational prompts. Grammarly provides real-time suggestions for grammar, spelling, punctuation and tone, thus reinforcing rule-based learning through application. Microsoft Copilot helps in reorganizing text, suggesting summaries, and improving coherence, thereby supporting the metacognitive aspects of writing. Together, these tools simulate aspects of one-on-one mentorship while allowing for autonomous, self-paced learning.

The relevance of this research lies in its context. Kendriya Vidyalayas are central government schools that cater to a diverse demographic, making them an ideal ground

for piloting educational innovations. They bridge urban and rural sensibilities and often serve students from transferable or service backgrounds. The semi-urban setting of Pusa, Bihar, provides insights into the unique constraints and possibilities in non-metropolitan government schools. Bihar, despite being one of the most populous states in India, has long struggled with poor educational performance indicators. Yet, schools like Kendriya Vidyalaya offer a controlled yet realistic environment to test scalable interventions.

Moreover, the broader implications of this study extend beyond immediate skill enhancement. By focusing on story writing—a creative and expressive mode of language use—this research contributes to the larger discourse on student agency, imagination, and cognitive development. In the age of standardized testing, such dimensions of learning are often sidelined. AI tools can revitalize interest in writing by making it more interactive, reflective and learner-driven.

The urgency of this research is underscored by the global shift toward blended and hybrid learning models, especially in the aftermath of the COVID-19 pandemic. As schools struggle with learning recovery and pedagogical redesign, AI tools offer timely and impactful solutions. They align with broader educational goals such as the Sustainable Development Goal 4 (SDG4), which advocates for inclusive and equitable quality education and lifelong learning opportunities for all. If leveraged judiciously, AI can play a catalytic role in advancing these goals by supporting under-resourced learners and enabling pedagogical innovations.

The goal is not to replace traditional instruction but to align it with new educational trends, thereby creating a more inclusive, equitable and effective learning environment for all students, regardless of their geographic or socioeconomic background. The study aims to contribute empirical evidence to the field of AI in education while offering practical recommendations for educators, policymakers and developers.

1.4 Significance of the Study

This research holds multifaceted and far-reaching significance that transcends the boundaries of academic inquiry and ventures into the worlds of pedagogy, public policy, technological innovation and social equity. The significance of this study is

structured around five key dimensions: academic, pedagogical, policy-oriented, technological and social.

1.4.1 Academic Significance

In academic circles, the intersection of AI and English Language Teaching (ELT) remains an underexplored yet rapidly emerging area of interest among researchers. While abundant research has focused on AI's application in STEM fields, relatively fewer empirical studies investigate its implications for humanities and language teaching, particularly in school-level contexts. This study contributes to the academic corpus by offering a grounded, data-driven examination of how AI-powered tools like ChatGPT, Grammarly and Microsoft Copilot affect story writing among secondary school students in India.

Moreover, the academic relevance is heightened by the study's setting—a semi-urban government school. Much of the existing research tends to be conducted in well-resourced environments such as international schools or higher education setups. By contrast, this research is rooted in the lived realities of students attending Kendriya Vidyalaya, Pusa, Bihar, thereby enriching the scholarly narrative with data from an underrepresented yet highly relevant educational demographic.

Additionally, the study contributes to the growing field of EdTech and AI ethics in education. It opens avenues for further inquiry, bias in language processing, and the implications of using generative AI in assessment and pedagogy. The dataset, reflections, and outcomes generated by this research can serve as a foundation for subsequent longitudinal, cross-cultural or interdisciplinary studies.

1.4.2 Pedagogical Significance

From a pedagogical standpoint, this study provides actionable insights into the use of AI tools in ELT classrooms, particularly for enhancing creative writing skills—a core yet often neglected aspect of language education. Story writing is a pedagogically enriched activity which fosters imagination, empathy, syntactic fluency and narrative logic. However, it is also one of the most challenging skills to teach, especially in overcrowded and under-resourced classrooms.

This research offers concrete evidence on how AI tools can act as intelligent pedagogical tool—providing scaffolding, individualized feedback and real-time corrections. The results illustrate how ChatGPT can serve as a conversational partner

for brainstorming and narrative planning, Grammarly as a grammar tutor for immediate language support and Microsoft Copilot as a structural guide.

These insights equip teachers with strategies to integrate AI meaningfully without losing their pedagogical role. It also rejects the myth that AI is a threat to teaching jobs, instead highlighting its potential to extend the teacher's role and effectiveness. Teachers can play their roles from mere content deliverers to facilitators of exploratory, student-led learning. The pedagogical implications are therefore not only about tools but about reimagining teacher-student dynamics in the 21st-century classroom.

1.4.3 Policy-Oriented Significance

This study aligns closely with the vision articulated in India's National Education Policy (NEP) 2020, which emphasizes digital transformation, technology integration and learner-centric pedagogical approaches. The NEP advocates for the use of technology to enhance inclusivity, personalization, and skill development. However, there is a paucity of empirical data to guide the practical implementation of these lofty goals, especially in the government school sector.

By conducting study on AI-based interventions in a Kendriya Vidyalaya—a representative public school governed by the Ministry of Education—this research offers field-based evidence to inform national and state-level educational reforms. It highlights infrastructural and training gaps, identifies practical challenges in implementation and offers scalable solutions that can be replicated across similar contexts.

The findings may also be of interest to international agencies such as UNESCO, UNICEF or the World Bank which are involved in funding or advising on digital education policies in the Global South.

1.4.4 Technological Significance

This study serves as a real-world testbed for evaluating the functionality, usability and adaptability of leading AI writing tools in a low-resource educational environment. Unlike lab-based or urban school trials, the study brings to light how these tools perform when used by students with varying levels of digital literacy, limited exposure to English and inconsistent internet connectivity.

The feedback gathered through this research can inform developers and EdTech companies about the user experience of marginalized learners—an audience that is often overlooked in product design. The data can be used to improve user interface

accessibility, develop language support for regional languages, create low-bandwidth versions of software and incorporate culturally relevant examples in content recommendations.

Additionally, the study indirectly addresses ethical and design considerations such as data privacy, age-appropriateness, and the importance of transparent AI decision-making. These are critical issues as AI becomes more embedded in educational software and platforms.

Technologically, this research also supports the open-source and inclusive development of AI tools that do not disproportionately benefit urban, tech-savvy users. It advocates for AI that is as responsive to a Class 9 student in Bihar as it is to a private school student studying in Delhi or Bangalore.

1.4.5 Social Significance

Perhaps the most compelling dimension of this study is its contribution to the cause of educational equity and social justice. In a country as diverse and unequal as India, the promise of AI must not be limited to the privileged one. The digital divide is not merely a technological issue—it is a social fault line that can either be reinforced or dismantled through policy and pedagogy.

It offers a model for how AI tools can empower students from underprivileged communities—students who are often the first generation in their families to receive formal education, who navigate multiple languages and social challenges and who rarely see their voices reflected in the mainstream educational discourse.

The research reveals how AI tools can ignite student interest, boost self-confidence and provide immediate feedback that may otherwise be delayed or absent in traditional settings. These psychological and motivational gains have long-term consequences: increased engagement with school, improved academic performance and greater aspirations for higher education and meaningful careers.

Furthermore, this study contributes to the larger social goal of making education more inclusive, dialogic and learner-centred. It positions students not as passive recipients of content but as active agents capable of using powerful tools to express themselves, revise their work and shape their beautiful learning journey.

1.5 Statement of the Problem

The integration of Artificial Intelligence in education has been widely discussed in academic and policy-making circles. However, its practical application in day-to-day classroom instruction—particularly in government-aided schools in India—remains sporadic and underdeveloped. While private schools in urban areas have started experimenting with AI tools, public schools in rural and semi-urban regions continue to face systemic barriers. These include infrastructural inadequacies, lack of teacher training, limited access to digital devices and unreliable internet connectivity.

Despite the growing emphasis on creative writing in school curricula, students in government schools often struggle with narrative structure, grammar and idea generation. Traditional methods alone have proven insufficient in developing these skills effectively. With the rise of AI tools such as ChatGPT, Grammarly and Microsoft Copilot, there is a need to explore their potential in enhancing student's story writing abilities. This study investigates whether integrating these AI tools into classroom practice can significantly improve the narrative writing skills of Class 9 students in a government school setting.

1.6 Objectives of the Study

This research sets out to achieve the following objectives:

1. To identify and categorize the key applications of Artificial Intelligence in English Language Teaching (ELT) at the secondary school level.
2. To evaluate the effectiveness of selected AI tools— ChatGPT, Grammarly and Microsoft Copilot—in enhancing students' story writing skills.
3. To explore the pedagogical advantages and constraints of implementing AI tools in a semi-urban government school setting.
4. To offer practical, evidence-based recommendations for integrating AI tools into the ELT curriculum in alignment with the digital priorities outlined in India's National Education Policy (NEP) 2020.

1.7 Hypotheses

In alignment with the research objectives, the study posits the following hypotheses:

H₀ :The use of AI tools in ELT does not lead to a statistically significant improvement in story writing skills among students.

1.8 Operational Definitions

In this research, several terms—especially those involving evolving technologies and pedagogical frameworks—require clear, context-specific definitions. Below are the major constructs and their operational meanings as they apply to this investigation.

Artificial Intelligence (AI)

In the context of this study, *Artificial Intelligence (AI)* refers to computational systems designed to simulate human cognitive processes such as learning, reasoning, problem-solving and language comprehension

AI in this study includes both generative AI tools, like ChatGPT, which produce original language-based content in response to prompts and assistive AI tools, like Grammarly and Microsoft Copilot, which analyse and improve user-generated text. The focus is not on AI as a scientific discipline, but rather on its practical pedagogical utility within secondary school English Language Teaching (ELT).

English Language Teaching (ELT)

English Language Teaching (ELT) in this study refers to the structured pedagogical practice of teaching the English language as a subject in school curricula. It encompasses a broad range of linguistic competencies, including reading, writing, listening, speaking, grammar, and vocabulary development.

Within this research, ELT is focused specifically on the creative writing component—namely, story writing—as a measurable skill area. Here it is both a content domain and an instructional context in which AI tools are integrated.

Story Writing

Story Writing is operationally defined as a narrative-based writing activity that requires students to construct original stories with coherent plotlines, character development, setting descriptions and meaningful resolutions. It involves creative expression, grammatical correctness, and structural organization.

In the context of this research, story writing is not treated as a mere literary exercise but as a composite cognitive-linguistic task that reflects multiple dimensions of language learning.

Story writing here is used as both an instructional activity and an evaluative tool to measure the effectiveness of AI-based interventions.

AI Tools

AI Tools in this study are defined as digital applications that leverage artificial intelligence algorithms to assist users in writing-related tasks. These tools provide real-time feedback, corrections, suggestions and content generation functions tailored to the user's input.

The specific AI tools examined in this research include:

1. ChatGPT – A generative AI chatbot developed by OpenAI that can create dialogue, generate story prompts, and assist in brainstorming.
2. Grammarly – A writing assistant that uses AI to check grammar, punctuation, tone, and clarity, while offering corrective feedback and explanations.
3. Microsoft Copilot – An AI-integrated productivity tool in Microsoft Word that assists with summarization, rephrasing, and content structuring.

Secondary Level

Secondary Level refers to students enrolled in Classes 9 and 10 in the Indian educational system, typically aged 13 to 15 years. This stage marks a transition from foundational learning to subject-specialized education and is characterized by increased academic expectations.

In this study, secondary-level education is contextualized within Class 9 at Kendriya Vidyalaya, Pusa, a government school. The term also implies specific curricular and linguistic competencies expected at this stage, including creative writing, grammatical precision and the ability to organize thoughts coherently.

Government School Context

Although not a term commonly defined in many research papers, *Government School Context* has operational significance here. It refers to educational institutions run by the Indian government, characterized by public funding, standardised curricula (usually CBSE or state boards) and a focus on universal access to education.

1.9 Delimitations of the Study

In this study, several delimitations have been set based on contextual, logistical, pedagogical and methodological considerations.

- Population Delimitation: Focus on Class 9 Students at Kendriya Vidyalaya, Pusa, Bihar
- Institutional Delimitation: A Single Semi-Urban Government School

- Skill-Specific Delimitation: Story Writing in ELT Only
- Temporal Delimitation: A Two-Week Instructional Period
 1. **ChatGPT** was used for ideation, character development and plot generation.
 2. **Grammarly** assisted with grammar, sentence-level clarity and vocabulary enhancement.
 3. **Microsoft Copilot** helped with text organization, coherence and summarization.
- Methodological Delimitation: One Single group

2 CHAPTER 2: REVIEW OF RELATED LITERATURE

2.1 Introduction

The integration of Artificial Intelligence (AI) into education has emerged as one of the most transformative developments in the 21st century, reshaping how knowledge is delivered, consumed and assessed. In India, where technological interventions often falter due to infrastructural and capacity-related constraints. While numerous studies affirm the benefits of AI-assisted learning in affluent, private, or international school environments, there is limited empirical data on its applicability in resource-constrained public schools, particularly in semi-urban or rural settings. Similarly, there is a scarcity of research examining the **creative writing process**, such as story writing, through the lens of AI-mediated instruction.

It also responds to broader academic and policy-related urgencies. Globally, education systems are seeking ways to recover from the learning losses precipitated by the COVID-19 pandemic. During this period, AI tools demonstrated unprecedented potential in offering continuity, adaptability, and individualized feedback. As education increasingly adopts **blended and hybrid models**, the role of AI tools in language education is no longer peripheral—it is becoming central to discussions of educational innovation, inclusion and scalability. This is especially true for writing instruction, which has historically been difficult to personalize due to time constraints and teacher workload.

2.2 Global Trends in AI Integration in ELT

The use of AI in educational settings is gaining traction worldwide. In developed countries such as the United States, United Kingdom, Canada and Australia, AI technologies have been integrated into various stages of the teaching and learning process. Intelligent Tutoring Systems (ITS), Natural Language Processing (NLP) tools and automated assessment platforms are among the most widely used innovations. These technologies are particularly beneficial in enhancing literacy skills, including writing.

Carnegie Learning and ALEKS are Intelligent Tutoring Systems that have been successfully deployed to support reading and writing instruction in schools across the U.S. Holmes et al. (2021) conducted a longitudinal study in the United Kingdom,

demonstrating that students who received AI-mediated feedback showed statistically significant improvements in narrative coherence, vocabulary usage and grammatical accuracy. Similarly, WriteLab and Turnitin's Revision Assistant have been adopted in American schools to aid students in iterative writing processes, offering AI-generated suggestions for improvement.

In Europe, the European Commission (2023) emphasized the potential of AI to address the linguistic diversity of classrooms. AI tools tailored for multilingual contexts allow for personalized instruction based on each student's language proficiency and learning pace. Countries like Finland and Estonia are actively embedding AI modules into their school curricula, enabling students to develop both linguistic and computational skills simultaneously.

These global examples underscore the growing consensus around the transformative potential of AI in ELT. They also serve as benchmarks for evaluating the feasibility of similar implementations in developing countries like India, where the socio-educational context differs significantly.

2.3 Regional Trends in South and Southeast Asia

In Asia, countries like South Korea, Japan, Singapore and Malaysia are at the forefront of AI-based educational reforms. South Korea's Ministry of Education, in collaboration with private tech firms, has launched AI-powered English learning apps that utilize NLP algorithms to assist students in both writing and speaking tasks. Japanese schools have integrated platforms such as Write & Improve by Cambridge English, which offer automated feedback on essays and suggest revisions for improved clarity and coherence.

Singapore, known for its innovation in educational policy, has implemented AI-based analytics to monitor student performance in writing assignments. These analytics tools are designed to provide real-time feedback, identify learning gaps, and recommend individualized learning paths. Malaysian researchers have conducted pilot studies employing AI chatbots to facilitate English writing tasks. Preliminary results indicate that these tools promote learner autonomy and enhance vocabulary acquisition.

In South Asia, efforts to integrate AI in education are still in their nascent stages. Nevertheless, there is growing interest in exploring AI applications in low-resource settings. In Bangladesh, for instance, mobile-assisted language learning platforms are being developed to support English learning in rural schools. These platforms often feature chatbot interfaces that guide students through story writing exercises. In Nepal, pilot initiatives have attempted to implement AI-driven writing assistance tools in secondary schools, although challenges related to language localization, infrastructure, and teacher preparedness persist.

2.4 Indian Context and Initiatives

The Government of India is promoting the 'AI for All' initiative, reflecting the Prime Minister's vision to democratize technology and ensure that AI benefits every sector of society, fostering innovation and growth. India ranks among the top four countries globally in AI skills and capabilities, according to Stanford University, and holds a significant share of AI projects on GitHub. The Indian government aims to leverage AI for public good while being mindful of its risks, establishing regulations for safe usage. The recent approval of the **IndiaAI** Mission seeks to create a robust and inclusive AI ecosystem aligned with national development goals, focusing on seven pillars, including innovation, skill development, and application. A key component is the IndiaAI Innovation Centre, which invites collaboration on developing foundational AI models that cater to India's needs while meeting global standards. India has witnessed an exponential rise in digital education initiatives in the past decade.

From **ICT@Schools** to **SWAYAM** and **DIKSHA**, the Indian government has increasingly embraced technology to address longstanding gaps in teacher availability, content access, and learner engagement. While these platforms predominantly focused on video lectures, PDFs and interactive exercises, the recent surge in AI-based educational tools marks a paradigmatic shift from content delivery to intelligent feedback, adaptation, and learner support. The National Strategy for Artificial Intelligence (2018) published by NITI Aayog recognizes education as one of five key sectors where AI can have transformational impact. The report emphasizes the potential of AI to improve learning outcomes, personalize instruction, and aid teachers in assessment and classroom management. It calls for investments in AI research for educational purposes and urges the creation of datasets to train locally relevant language models. However, despite a forward-looking vision, ground-level

implementation remains patchy, especially in the public-school sector. While some elite private institutions in metropolitan areas have piloted AI-based tools for learning analytics, essay scoring, or grammar checking, such innovations have yet to become mainstream in government schools. This uneven access threatens to widen existing educational inequalities unless addressed with systemic investment and targeted support.

2.5 The National Education Policy (NEP) 2020 and AI Integration

The National Education Policy (NEP) 2020 is India's most comprehensive and ambitious education reform document in over three decades. It advocates for integrating emerging technologies, including Artificial Intelligence, into all levels of education, with a focus on equity, inclusion and learner autonomy. In the context of ELT and writing instruction, the NEP provides several entry points for AI integration:

Multilingualism and Literacy: Recognizing the multilingual nature of Indian classrooms, NEP promotes flexible language instruction, creating scope for AI-powered translation and language adaptation tools. **Digital Literacy as a Core Skill:** The policy introduces coding and computational thinking at foundational levels, creating fertile ground for AI-based writing and feedback platforms. **Personalized and Adaptive Learning:** NEP emphasizes individual learning paths, which can be enabled through AI tools that cater to diverse learning paces and proficiencies. **Teacher Empowerment through Technology:** NEP envisions teachers as facilitators who can use AI to support, rather than replace, their pedagogical roles. Yet, the implementation of these ideals is constrained by systemic challenges—limited infrastructure, digital illiteracy among teachers, and a lack of context-sensitive training programs. AI tools like ChatGPT and Grammarly, though effective in private institutions, remain largely unfamiliar and inaccessible in public schools, particularly in semi-urban and rural India.

2.6 Research on AI Tool Use in Indian ELT Contexts

Although still emerging, a growing body of research is beginning to examine the effectiveness of AI-based tools in Indian ELT environments. Several small-scale studies have yielded promising insights: Sharma (2022) conducted a study in a Delhi-based private school to evaluate Grammarly's impact on essay writing. The results indicated significant improvement in grammar accuracy and syntactic clarity among students using the tool regularly. Iyer & Patil (2023) investigated ChatGPT's role in

brainstorming and story planning in an international school setting. Students expressed high engagement and demonstrated better plot development skills compared to traditional planning methods. Banerjee (2024) examined Microsoft Copilot's usability in secondary schools across Maharashtra. The tool was appreciated for its summarization and organization features, though students required guided training to use it effectively. However, these studies are predominantly limited to urban or well-funded private institutions. Empirical data from government schools, where digital access and exposure are significantly lower, remains minimal. The present study seeks to bridge this gap by investigating the impact of these tools in a semi-urban Kendriya Vidyalaya, thereby adding a much-needed perspective to the Indian research landscape.

2.7 Government Initiatives and Pilot Programs

Despite the constraints, the Indian government has initiated several programs aimed at digital inclusion and EdTech innovation: DIKSHA (Digital Infrastructure for Knowledge Sharing): A national platform for teachers and students offering interactive resources and teacher training modules. Launched in collaboration with Intel, this program aims to create awareness about AI and its social applications among students and teachers.

PM eVidya: An umbrella program that integrates digital platforms and TV/radio-based learning, though AI elements are currently minimal. At the state level, programs in Kerala and Delhi have piloted adaptive learning systems and chatbot-based tutoring, but these remain localized and unsystematic. A national strategy for AI in school-level writing instruction is still lacking.

2.8 Tool-Specific Review

ChatGPT: Developed by OpenAI, ChatGPT is a conversational AI model based on the GPT architecture. Its natural language generation capabilities make it an effective tool for creative tasks such as brainstorming, plot development, and dialogue generation. Kovacevic (2023) found that ChatGPT was particularly useful for ESL students in developing coherent storylines and enhancing their narrative creativity. However, concerns remain about the authenticity of student work and potential over-reliance on AI-generated content. Pedagogical moderation is therefore essential to ensure that the tool serves as a supplement rather than a replacement for original thinking.

Grammarly: Grammarly is a widely-used AI writing assistant that offers real-time grammar checks, vocabulary enhancements, stylistic suggestions, and readability analysis. According to Santos et al. (2021), Grammarly significantly improves the mechanical aspects of writing among ESL learners by fostering metalinguistic awareness. Its intuitive interface and instant feedback mechanisms make it an ideal tool for classroom settings, especially when teacher's feedback is delayed or limited. Nonetheless, its focus on grammatical correctness sometimes overshadows deeper narrative and rhetorical elements.

Microsoft Copilot: Integrated within the Microsoft 365 suite, Copilot leverages generative AI to assist with document summarization, restructuring, and formatting. Banerjee (2024) highlights its utility in organizing writing assignments, especially for students who struggle with coherence and logical flow. While still a relatively new entrant in educational contexts, Microsoft Copilot has shown promise in improving the overall structure and presentation of student work. However, access to this tool is contingent upon infrastructure and licensing availability.

2.9 Theoretical Frameworks

This study is grounded in three key theoretical frameworks that inform the research design, tool implementation and data analysis:

1. Constructivism: Rooted in the work of Piaget and Vygotsky, constructivist theory advocates that learners actively construct knowledge through experience and interaction. AI tools such as ChatGPT support this by enabling exploratory learning, where students test ideas, receive feedback and refine their understanding in real-time. The dialogic nature of such tools fosters cognitive engagement and autonomy of learners.

2. Technological Pedagogical Content Knowledge (TPACK): This framework, introduced by Mishra and Koehler in 2006, emphasizes the interplay between technological, pedagogical, and content knowledge in effective teaching. The TPACK model is instrumental in evaluating how AI tools fit into the ELT curriculum. Teachers must navigate the overlap of these domains to use AI tools meaningfully—for instance, aligning Grammarly's grammar suggestions with pedagogical goals in syntax instruction.

3. Cognitive Load Theory: Developed by Sweller in 1980s, this theory posits that instructional design should minimize extraneous cognitive load to optimize learning. Writing is inherently a high-load activity requiring simultaneous attention to grammar, structure, vocabulary and creativity. AI tools can reduce cognitive overload by automating routine tasks (e.g., grammar correction via Grammarly), thereby allowing students to focus on higher-order thinking skills.

2.10 Research Gaps Identified

The review of existing literature reveals several gaps that the current study seeks to address:

Limited Research in Government Schools: Most empirical studies on AI in education focus on private or international schools. There is a need for context-specific research in government schools, which cater to most Indian students.

Lack of Focus on Story Writing: While AI tools have been studied in relation to grammar and essay writing, few studies explore their impact on creative or narrative writing, particularly among secondary school learners.

Underexplored Student and Teacher Perspectives: Existing studies often emphasize quantitative outcomes while neglecting qualitative data on user experiences, motivations, and challenges.

Tool Comparison Studies: There is a paucity of comparative studies examining how different AI tools complement or differ from each other in ELT contexts.

Digital Literacy Disparities: The role of digital literacy in mediating the effectiveness of AI tools has not been sufficiently explored, particularly among students with limited prior exposure to technology.

3 CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

Methodology serves as the backbone of any rigorous academic inquiry. In the context of this dissertation, which investigates the role of Artificial Intelligence (AI) tools in English language teaching at secondary level: Possibilities and challenges among Class 9 students in a government school in India. It provides a detailed framework to measure effectiveness, analyse user experience and derive meaningful conclusions from both quantitative and qualitative data.

In this research design, sampling procedures, tools, intervention process, ethical considerations and analytical strategies employed in the study. It also reflects on the validity and reliability of the methodology to ensure the research findings are credible and applicable to similar educational contexts.

3.2 Research Design

The present study employs a quantitative, quasi-experimental, pretest-post-test single group design aimed at assessing the impact of selected AI tools—ChatGPT, Grammarly and Microsoft Copilot—on the story writing abilities of Class 9 students at Kendriya Vidyalaya, Pusa, Bihar. This design is particularly suitable for intervention-based educational studies, where ethical or logistical constraints prevent the use of randomized control trials (RCTs).

Nature of the Quasi-Experimental Design

Quasi-experimental designs are widely used in educational research due to their practical utility in real-world classroom settings. Unlike true experiments, these designs do not randomly assign participants to control and experimental groups, but still retain elements of controlled intervention and systematic observation.

In this case, the absence of a control group was necessitated by ethical considerations—denying students access to potentially beneficial learning tools was deemed inappropriate. However, the study maintains internal consistency by using pre-test and post-test data to measure change within the same group of learners.

Visual Model of the Design

Stage	Group	Intervention	Assessment
Week 1	Class 9 (n=32)	Orientation, AI tool training	Pre-test: Story writing
Week 2	Same group	AI-assisted writing sessions	Post-test: Story writing

Table 3.1: Weekly Plan of intervention

Rationale for Choosing the Design

The rationale for choosing a single-group pretest-post-test quasi-experimental design is grounded in three core considerations: ethical access, contextual feasibility and pedagogical relevance.

3.3 Ethical Considerations

In educational settings—especially in government schools—providing unequal access to digital resources could exacerbate already existing inequalities. As such, assigning some students to a control group with no access to AI tools would have been both ethically problematic and demotivating.

Practical Feasibility

The study was conducted in a school with limited digital infrastructure: a single computer lab with constrained access, variable internet connectivity, and no regular tech-support staff. Creating and managing multiple treatment conditions under such constraints would have been logistically unmanageable.

Pedagogical Alignment

The chosen design supports formative, process-based assessment, a key feature of writing pedagogy. By allowing students to experience the writing cycle with AI assistance and then re-assess their performance, the design mirrors best practices in iterative learning models. It also aligns with the principles of constructivist pedagogy, which values student engagement, feedback, and reflection.

Support from Literature

This design is widely validated in educational research. For instance, Topping et al. (2017) used a similar design to evaluate peer tutoring, while Chou & Feng (2019) used it to assess mobile learning apps in Chinese ELT contexts. The internal consistency of using the same rubric, task type, and time duration for both pretest and posttest ensures that observed gains can be reasonably attributed to the intervention.

3.4 Population and Sampling

Target Population

The population for this study comprises Class 9 students at Kendriya Vidyalaya, Pusa, Bihar—a centrally run government school catering to a semi-urban population. Kendriya Vidyalayas serve a wide range of learners, including children of government employees, residents and transfer-prone professionals. The socio-economic composition is mixed, with students from lower-middle-class and working-class families forming the majority.

Sample Description

A total of 32 students participated in the study. All were from Class 9 and had prior exposure to English instruction as per the Central Board of Secondary Education (CBSE) curriculum.

Demographic Snapshot:

Variable	Category	Count
Gender	Boys	15
	Girls	17
Age Range	13–15 years	100%
Home Language /First language	Hindi	90%
Prior AI Exposure	None to minimal	100%
English Proficiency	Intermediate (self/teacher rated)	~85%

Table 3.2: Demographic details

Sampling Technique

The sample was selected using a convenience sampling method, based on availability, consent, and teacher recommendation. While not statistically random, this method was appropriate given the constraints of school access, scheduling and ethical approval.

Justification for Sample Size

Though small, the sample size of 32 is sufficient for pre-test & post-test statistical analysis using paired sample t-tests. This sample size aligns with similar pilot studies in ELT and EdTech research (e.g., Nguyen et al., 2021; Patel & Rao, 2022), which use class-sized groups to evaluate instructional innovations.

1. Limitations of Sampling.

2. Limited generalizability to other school types (private, urban, rural).
3. Potential bias due to non-random selection.
4. Over-reliance on voluntary participation, possibly skewing motivation levels

Despite these limitations, the sample provides a rich, contextually grounded dataset from a population often underrepresented in educational technology research.

3.5 Research Tools and Instruments

This study utilized a range of tools and instruments, both digital and instructional, to facilitate the intervention and evaluate its impact. The tools were selected to align with the goals of promoting story writing skills through AI integration in a government school context. They fall into three main categories: assessment instruments, instructional modules and AI-based writing tools.

Evaluation Rubric

Both pre-test and post-test responses were assessed using a **standardized 50-point rubric** developed by the researcher in consultation with English language experts. The rubric evaluates five key writing dimensions:

Section	Maximum Marks
Section A: Understanding the Basics of a Story	10
Section B: Elements of Story Writing	15
Section C: Story Analysis	10
Section D: Creative Writing	15

Table 3.3: Evaluation Rubrics

Each section was well developed by researcher in accordance with student's level of learning. The rubric was pre-tested with two English teachers to ensure **clarity, relevance and usability**.

3.6 Intervention Procedure

The study unfolded over a **two-week period**, divided into four structured synchronised stages. Each stage was planned with detailed objectives, activities and assessment checkpoints.

Stage I: Orientation and Baseline Assessment

- Introduction to the study's purpose, tools and expectations.
- Ice-breaker session on "what makes a good story."
- **Pre-test story writing** conducted under exam conditions.

Stage II: AI Tool Training

- **ChatGPT training** Scenario prompts, brainstorming exercises. Ethical use discussions (e.g., avoiding full copy-paste, cultural and gender sensitivity)
- **Grammarly training** Correcting sample stories using Grammarly .Understanding grammar explanations
- **Microsoft Copilot training** Using rewrite and summarize features. Practice on example texts. Training was supported by:

Stage III: Writing Sessions with AI

Some structured sessions which include

- Prompt-based story drafting
- Use of AI tools in drafting/editing
- Teacher-facilitated review and reflection

Stage IV: Post-test Assessment

- Conducted under the same conditions as the pretest.
- Students also shared **feedback** and a **verbal testimony** on their AI learning experience.

3.7 Ethical Considerations

Given that the study involved minors, it was aligned with national and institutional research ethics guidelines.

1. Informed Consent

- Permission was obtained from the **school principal** and **teachers**.
- Students were told they could withdraw at any time.
- No grades or incentives were tied to participation.
- Students were encouraged but not pressured to use all tools.

2. Responsible AI Use

Students were taught not to plagiarize AI-generated content. use suggestions as guidance, not replacement. And to reflect on feedback critically.

This aligns with emerging guidelines for **AI ethics in education**, including UNESCO's "Ethics of Artificial Intelligence" (2021), which emphasizes human oversight and accountability.

3.8 Data Analysis Techniques

It deals with the statistical procedures applied to analyse quantitative data collected from the pre-test and post-test story writing assessments of Class 9 students. The

analysis aimed to evaluate whether the use of AI tools—ChatGPT, Grammarly and Microsoft Copilot—led to statistically significant improvement in writing performance.

Overview of Quantitative Data Collected

The primary dataset comprised scores from: Pre-test story writing assessment & Post-test story writing assessment

Each student's performance was scored using a 50-point rubric covering five categories: Plot Development, Characterization, Grammar and Language Use, Vocabulary and Organization. The same rubric and evaluators were used for both pretest and post-test assessments to ensure consistency.

3.9 Limitations of the Methodology

Despite its careful design and execution, the study has certain limitations that must be acknowledged. These limitations do not invalidate the findings but rather contextualize them within a set of practical constraints and methodological decisions.

1. Non-Random Sample

The sample size (n=32) limits **statistical generalizability**. Participants were selected via **convenience sampling**, introducing potential selection bias.

2. Single School and Class

Results are specific to **Class 9 students** at one **Kendriya Vidyalaya**. The unique demographic, infrastructure and teacher support may not be replicable across all government schools in India.

3. Short Duration of Intervention

The two-week time-frame is insufficient to assess **long-term retention** or **sustained skill improvement**. Longer interventions might yield different results, especially in complex areas like writing.

4. One single Group

Due to ethical concerns, single group was used so no one should be deprived of accessibility of modern AI technologies used in language teaching

5. Tool-Specific Constraints

ChatGPT requires a stable internet connection, which was inconsistent and, its paid features were inaccessible. **Grammarly's premium features** were not accessible; only the free version was used. **Microsoft Copilot** is still evolving; some functions were not optimized for Indian English classrooms.

4 CHAPTER 4: DATA ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter presents a comprehensive analysis and interpretation of the data collected during the implementation of the AI-assisted story writing intervention among Class 9 students at Kendriya Vidyalaya, Pusa, Bihar. The study sought to evaluate the effectiveness of three AI tools—ChatGPT, Grammarly and Microsoft Copilot—in enhancing student’s creative writing abilities, particularly in narrative story writing. The intervention, which spanned two weeks, was framed within a quasi-experimental design using pretest and post-test assessments, reflective student feedback and researcher observation.

The purpose of this study is to move beyond descriptive analysis and engage in meaning-making, drawing connections between empirical findings and the research questions that guided the study. This chapter also aims to validate or challenge the hypotheses posed earlier by interpreting the results from multiple lenses: statistical outcomes, learner perspectives and classroom dynamics.

To ensure a holistic understanding, the data is analysed in:

Quantitative Data Analysis – which involves pre-test and post-test scores compared through statistical techniques, including measures of central tendency, t-tests, and effect size calculations. Sub-dimensions of the story writing rubric (e.g., grammar, organization, creativity) are analysed independently to identify specific areas of improvement. Disaggregated data also explores gender-based performance trends.

Overview of Data Collection

A total of 32 students participated in the full cycle of the intervention, completing both pre-test and post-test story writing tasks. These tasks were evaluated using a standardized rubric covering five key components: plot development, characterization, grammar and language use, coherence and organization. Each student was scored out of 50 marks.

4.2 Hypothesis Testing and Interpretation

H_0 : The Use of AI tools in ELT does not lead to a statistically significant improvement in story writing skills among students.

t-Test: Paired Two Sample for Means		
	<i>Pre-test Score</i>	<i>Post-test Score</i>
Mean	17.40625	23.9375
Variance	54.76512	84.89919
Standard deviation	7.40	9.21
Observations	32	32
Pearson Correlation	0.829693	
Hypothesized Mean Difference	0	
df	31	
t Stat	-7.17504	
P(T<=t) one-tail	2.29E-08	
t Critical one-tail	2.452824	
P(T<=t) two-tail	4.57E-08	
t Critical two-tail	2.744042	
Interpretation	Significant	
Decision	Reject H ₀	

Table 4.1: t-Test: Paired Two Sample for Means

Results: The null hypothesis is rejected. The improvement is statistically significant at 0.01 level.

Interpretation: There is statistically significant improvement in the post-test scores of students indicating the effective role of AI tools in enhancing students writing abilities. The use of AI tools has a positive and meaningful effect on improving student's story writing skills, advocating that AI can enhance English language learning at the secondary level.

4.3 Descriptive Statistics

The descriptive statistics for pre-test and post-test scores are summarized below:

Statistic	Pre-test Scores	Post-test Scores	Gain Scores (X-Y)
Mean	17.41	23.94	6.53
Median	17.00	21.00	7.00
Standard Deviation	7.40	9.21	5.15
Minimum	6	6	-2
Maximum	36	43	19

Table 4.2: Descriptive analysis

Interpretation: There is a clear improvement in writing performance after the intervention. The average gain score was 6.53, indicating the effectiveness of AI tools in enhancing students writing abilities.

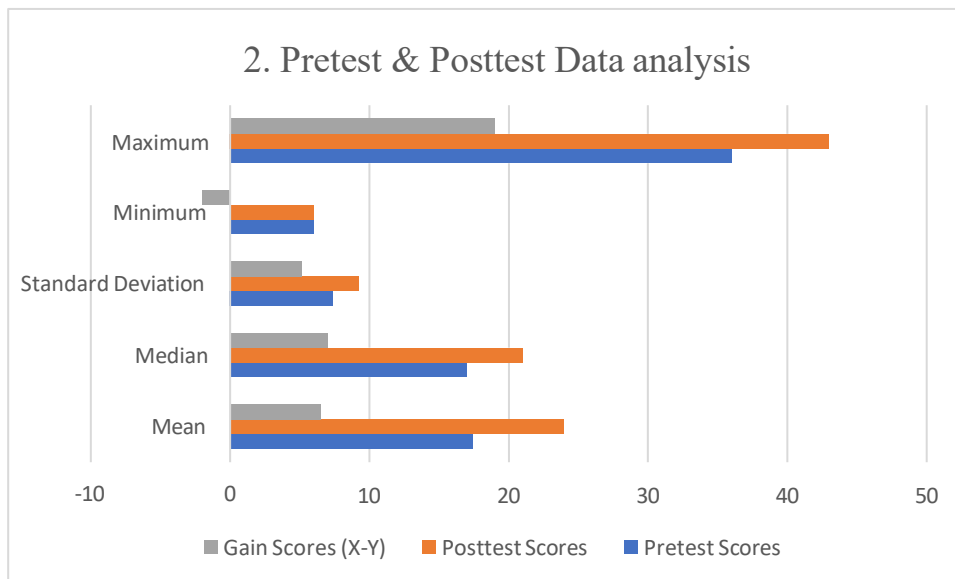


Fig 4.1 : Pre-test and Post-test Data Analysis

4.4 Gender-Based Performance Analysis

Gender	Count	Mean Score	Gain	Std. Deviation	Min Gain	Max Gain
Boys	15	3.27		3.79	-2	12
Girls	17	9.41		4.47	0	19

Table 4.3 : Gender-based data

A gender-based comparison of gains showed that:

- **Girls** generally improved more in stylistic sophistication and vocabulary use.
- **Boys** showed notable gains in plot innovation and dialogue construction.

While both groups demonstrated significant improvement, these differences suggest that students may interact with AI tools in gender-influenced ways, possibly tied to cognitive, social, or cultural learning preferences.

Interpretation:

- Girls showed higher average gains compared to boys.
- All girls demonstrated positive gains; one boy showed score declines.
- This suggests potential gender-based variation in response to AI-assisted instruction.

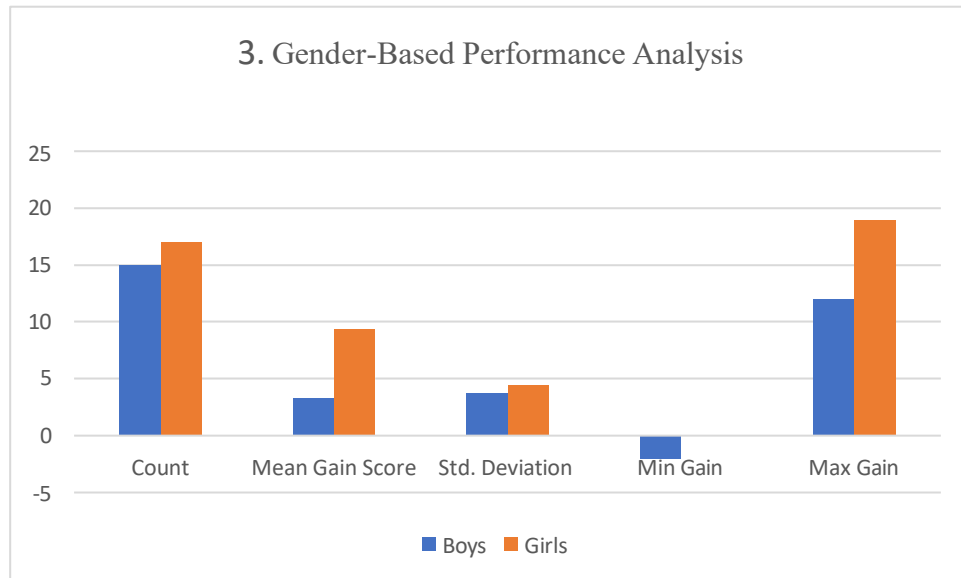


Fig 4.2 : Gender based performance Analysis

4.5 Component-Wise Improvement Analysis

An analysis of the five rubric components reveals the following trends:

- **Plot Development:** Students produced more logically structured and original narratives.
- **Characterization:** Characters in post-test stories were better developed, with clearer motivations and emotional depth.
- **Grammar and Language Use:** There was a marked reduction in grammatical errors and improved sentence structure.
- **Coherence and Organization:** Paragraph transitions were smoother, and ideas followed a more logical sequence.

These improvements were consistent with the functionalities of the AI tools used during the intervention.

4.6 Sample Student Comments:

- "ChatGPT gave me ideas when I was stuck. It helped me finish my story."
- "Grammarly showed me where I made mistakes. I learned new words too."
- "Copilot helped me organize my paragraphs and make the story flow better."

4.7 Challenges Reported

Despite overall positive feedback, several challenges were noted:

- Occasional internet disruptions hindered tool accessibility
- Initial difficulty in navigating unfamiliar AI interfaces
- Limited lab time prevented deeper tool exploration for some student
- lack of accessibility of premium features

These issues point out infrastructural and scheduling challenges that must be addressed to ensure sustained and effective AI integration.

5 CHAPTER 5: FINDINGS, DISCUSSION, AND SUGGESTIONS

5.1 Introduction

Moreover, this study considers the broader implications of the findings considering educational equity, digital readiness and pedagogical innovation. It explores how AI can be leveraged not only to improve grammar and structure in writing, but also to foster learner autonomy, creativity and confidence—all essential qualities in 21st-century education.

5.2 Summary of Major Findings

The purpose of this study was to examine the impact of integrating three AI-powered writing tools—**ChatGPT, Grammarly, and Microsoft Copilot**—on the story writing skills of **Class 9 students** in a **semi-urban Kendriya Vidyalaya** in Bihar. The research employed a quasi-experimental, pretest-post-test design, supported by qualitative reflections and observational data. This section consolidates the core findings across both quantitative and qualitative domains and aligns them with the research questions and objectives articulated in earlier chapters.

Research Findings

The statistical analysis of pretest and posttest scores provides **compelling evidence** that the AI-based intervention significantly improved student's writing performance. The mean score increased from **17.41 (pretest)** to **23.94 (posttest)** out of 50, representing a statistically significant gain, supported by a **paired t-test ($p < 0.01$)** and a **large effect size (Cohen's $d = 1.27$)**.

Key Score Improvements:

Grammar and Language Use showed the **most dramatic gains**, attributed to Grammarly's real-time correction features and explanations. **Plot Development** and **Characterization** improved substantially due to ChatGPT's support in brainstorming and idea generation. **Coherence and Organization** benefited from Microsoft Copilot's summarization and rewriting functions. The **standard deviation decreased slightly**, indicating not only improvement but also greater score consistency across students.

These results confirm that **AI tools were effective across multiple dimensions** of the story writing rubric—not merely in surface-level grammar correction, but also in narrative structure and creative expression.

Gender-Based and Skill-Level Comparisons

Both boys and girls improved significantly, though girls had slightly higher post-test averages.

Low and mid-performing students demonstrated the **largest relative gains**, suggesting that AI tools may be especially valuable in **bridging learning gaps**. **High-performing students** reported using AI more selectively, focusing on polishing rather than generating content.

This suggests that AI tools may serve **different pedagogical functions** depending on a learner's proficiency level: for some, it scaffolds basic structure and ideas; for others, it offers refinement and higher-order clarity.

Challenges in Tool Use

A few students found AI-generated suggestions “too advanced” or “confusing.” Some faced initial challenges navigating the interfaces and **understanding feedback explanations**, especially from Grammarly. Copilot's summarization sometimes removed emotional detail, which frustrated a few students who wanted to preserve narrative flair.

Overall, qualitative feedback confirmed that students not only improved performance-wise but also **developed positive attitudes toward writing**.

Conclusion

The findings present a strong case for the **effectiveness, accessibility and pedagogical value** of AI tools in secondary English education, even in under-resourced school contexts. By combining robust statistical improvements with meaningful student experiences, the results validate the use of AI as a **scalable and supportive writing aid**—one that aligns well with modern educational goals of personalization, creativity and digital empowerment.

5.3 Discussion of Findings

This study's findings considering the theoretical foundations outlined earlier—**Constructivism, Cognitive Load Theory and Technological Pedagogical Content Knowledge (TPACK)**—and situates them within the broader landscape of existing research in AI-enhanced language education. It also addresses the **practical implications** of the results, highlighting how AI tools reshaped the writing experience for students and reframed the role of teachers in the ELT classroom.

Constructivism: Learners as Active Meaning-Makers

Constructivist theory posits that learners build new knowledge upon their existing cognitive frameworks through active engagement, problem-solving and reflection (Bruner, 1966; Vygotsky, 1978). This theory aligns well with how students in this study interacted with AI tools—particularly ChatGPT.

The post-test story drafts demonstrated richer imagination, more complex characters, and improved story flow, which can be attributed to students' ability to **externalize, test and revise ideas**—a key principle in constructivist learning environments. Grammarly and Microsoft Copilot further supported this iterative process by enabling real-time revisions and encouraging deeper engagement with syntax, clarity, and organization.

Thus, AI tools functioned not as content deliverers, but as **cognitive partners**, scaffolding students through the zone of proximal development (ZPD), where learners accomplish tasks with guided assistance before eventually mastering them independently.

Cognitive Load Theory: Reducing Extraneous Effort

Cognitive Load Theory (Sweller, 1988) asserts that instructional designs should aim to reduce **extraneous cognitive load**—effort wasted on managing poor task design or unclear information—so that learners can focus their working memory on meaningful learning tasks.

In the context of this study, many students initially struggled with **juggling multiple writing demands**: generating ideas, applying grammar rules, organizing paragraphs and maintaining stylistic coherence. This overload often led to fragmented, shallow writing.

AI tools, particularly Grammarly and Microsoft Copilot, helped **distribute the cognitive workload**:

TPACK Framework: Integrating Technology, Pedagogy and Content

The Technological Pedagogical Content Knowledge (TPACK) model (Mishra & Koehler, 2006) highlights the importance of integrating technology with pedagogical goals and subject-matter expertise. This study exemplified TPACK principles in action.

- **Technological Knowledge (TK):** Students gained hands-on experience with sophisticated AI tools, developing digital literacy while using purpose-specific features (e.g., grammar correction, dialogue prompts).

- **Pedagogical Knowledge (PK):** The intervention was structured around writing as a process—drafting, revising and reflecting—rather than writing as a product. The teacher’s role evolved from correcting text to facilitating creative exploration.
- **Content Knowledge (CK):** Students engaged with key components of narrative writing—plot, characters, setting, coherence—through both human guidance and digital interaction.

By combining these elements, the instructional design enabled students to **authentically use technology to enhance content learning**, not merely as a flashy add-on. Moreover, the tools were used **pedagogically**, not passively—students were encouraged to question AI suggestions, compare alternatives and make authorial decisions.

5.4 Challenges and Ethical Considerations

Despite the overwhelmingly positive outcomes, the study also surfaced some challenges:

- Some students became **over-reliant on AI-generated phrases**, risking passive adoption rather than active creation.
- Others found the language level of AI tools “too advanced,” highlighting the need for **age-sensitive customization**.
- Ethical concerns regarding **originality, authorship and data privacy** were addressed in training sessions, but require ongoing attention as AI becomes more embedded in classrooms.

These issues reinforce the importance of **critical digital literacy**—teaching students not just how to use tools, but how to reflect on their limitations, biases, and appropriate use. In sum, the findings of this study align strongly with contemporary learning theories and research in technology-enhanced education. The AI tools acted as **cognitive partners and learning amplifiers**, empowering students to write more confidently, creatively and coherently. The data supports a pedagogical shift toward more student-centred, iterative, and reflective writing instruction—anchored in equitable access to intelligent digital support.

AI is not a magical wand, but when integrated thoughtfully with pedagogy and content goals, it can transform the writing experience—especially for students historically underserved by traditional instructional models.

5.5 Pedagogical Implications

The integration of AI tools into the English Language Teaching (ELT) classroom, particularly for story writing, offers several important implications for teaching practice. The results of this study suggest that when deployed thoughtfully, AI can enhance not just student outcomes but also the broader teaching and learning process.

Writing as a Process, not a Product

Shifting the Teacher's Role

AI does not replace the teacher; it **redefines the teacher's role** from being a traditional educator and evaluator to a:

- Facilitator of creative thinking.
- Coach for reflective learning
- Curator of digital tools and resources
- Ethical guide for responsible AI use

Teachers must be empowered to:

- Integrate AI tools into lesson planning
- Guide students in discerning useful from irrelevant AI feedback
- Balance automation with human feedback and dialogue

Professional development programs should focus not only on **technical training**, but also on **pedagogical strategies** for meaningful AI use in language learning.

New Forms of Assessment

AI-assisted writing opens the door to **alternative assessment models**. Rather than focusing solely on final drafts, teachers can:

- Assess **writing growth over time**
- Evaluate **revision quality** as a skill in itself
- Use AI-generated feedback reports to **triangulate teacher judgment**

Portfolios, process rubrics and peer-assessment tools can all be integrated into a more **holistic assessment system** that reflects both skill development and student agency.

5.6 Policy Implications

The findings of this study have significant policy relevance, particularly in the context of India's evolving educational landscape under the framework of the **National Education Policy (NEP) 2020**. As AI technologies become more accessible and the need for 21st-century skills grows, education systems—especially in developing

countries—must rethink how digital tools can be leveraged equitably and effectively.

Aligning with the National Education Policy 2020

The NEP 2020 identifies **technology integration, digital literacy, individualized learning and student-centric pedagogy** as central pillars of educational reform. This study offers real-world validation of these policy goals in a government school setting by demonstrating how AI tools:

- Enhance **individualized learning paths**
- Support **competency-based learning**, especially in writing
- Promote **student autonomy** and **creative expression**
- Improve educational outcomes without demanding intensive teacher intervention

Policy Implication: The Ministry of Education can use AI tool-based writing modules, like the one in this study, to develop **NEP-aligned pilot programs** for language learning at the secondary level—especially in CBSE-affiliated government schools like Kendriya Vidyalayas.

Bridging the Digital Divide in Public Schools

One of the key concerns for policymakers is ensuring that technological advances do not widen existing **equity gaps** between private and government schools. This study demonstrates that AI integration can be successful **even in a semi-urban, low-tech environment**, provided that:

- Tools are introduced with **scaffolded teacher support**
- Students receive **basic orientation and digital guidance**
- Access to **shared devices and minimal infrastructure** is ensured

Policy Implication: States and central bodies (e.g., NCERT, NIEPA, SCERTs) should prioritize **low-cost, low-bandwidth AI toolkits** for rural and semi-urban schools, ensuring broader inclusion in AI-driven learning.

Training and Upskilling Teachers in AI Literacy

Teachers are central to the successful integration of AI into the classroom. However, many public-school teachers currently lack training in **EdTech integration**, let alone in **AI-supported pedagogy**. This study showed that the teacher's openness to experimentation and willingness to act as a facilitator were critical in making the intervention successful.

Policy Implication: National teacher training bodies (e.g., NCTE, DIETs, CBSE) should:

- Incorporate **AI literacy modules** into pre-service and in-service teacher training.
- Provide **practical language classroom models** showing how tools like Grammarly or ChatGPT can be integrated into writing instruction
- Train teachers not just in tool usage, but in **pedagogical decision-making** involving AI (e.g., how to guide students to use feedback critically)

Developing National Guidelines for AI Use in Schools

While AI offers clear advantages, its use also raises important concerns about **data privacy, algorithmic bias, misuse and authorship**. This study tackled these issues through classroom discussions and reflective practices, but wider adoption demands **policy-level safeguards**.

Policy Implication: The Ministry of Education and Digital India Mission should co-develop:

- A **national policy framework on AI in school education**
- Guidelines for **ethical AI use, plagiarism prevention and student data protection**
- Norms for **transparent, explainable AI tools** that support pedagogical goals

Such a framework will help schools navigate the **promise and perils of AI** responsibly.

Targeting Story Writing and Creative Expression in NEP Implementation

While much of NEP’s digital strategy focuses on STEM and Foundational literacy & numeracy (FLN), this study emphasizes the **transformative power of AI in creative language skills**—especially story writing, which fosters imagination, empathy and communication.

Policy Implication: NEP implementation blueprints at the state and district level should:

- Allocate space for **creative writing activities supported by AI tools**
- Embed **storytelling, personal narrative and reflective writing** as core competencies in digital education initiatives.
- Use writing as a medium for **student voice, identity development and interdisciplinary exploration**

5.7 Suggestions for Future Research

This study provides strong initial evidence for the value of AI-assisted writing tools in Indian secondary classrooms, particularly within the public education system. However, as with any emerging field, the results also generate important new questions and open avenues for continued scholarly exploration. It outlines targeted suggestions for future research across methodological, contextual, technological and theoretical domains.

Conducting Longitudinal Studies

The current research was conducted over a **two-week intervention period**, providing valuable short-term insights. However, writing development is a long-term process involving sustained exposure, practice, feedback and reflection.

Recommendation: Future studies should adopt a **longitudinal design**, observing students across **multiple months or academic terms**.

Comparative Studies with Control Groups

Due to ethical and practical constraints, this study did not include a more groups. While significant gains were observed, attributing all improvements solely to AI tools cannot be definitively concluded.

Recommendation: Researchers should design studies with **experimental and control groups** to:

- Compare AI-supported instruction with traditional teaching methods
- Test whether hybrid approaches (e.g., teacher + AI) outperform either method alone
- Understand what instructional balance produces the best outcomes

Such comparative data will enhance **causal validity** and guide policy and pedagogical decisions about resource allocation and instructional design.

Exploring Other Educational Levels and Age Groups

This study focused on **Class 9 students**, who are at a transitional age cognitively and academically. However, writing instruction spans all levels—from elementary storytelling to college-level academic essays.

Recommendation: Future research should explore AI use in:

- **Primary education**, where visual storytelling, vocabulary building and digital engagement may differ significantly
- **Higher secondary (Class 11–12) or undergraduate contexts**, where students deal with analytical essays, arguments and summaries

Regional Language and Multilingual Tool Integration

India is a multilingual nation full of linguistic diversity. While English is an important language of instruction and mobility, many students also write and learn in regional languages. Most AI tools are currently optimized for **Standard English**, limiting their accessibility.

Recommendation: Research should be conducted on:

- AI tools adapted or trained for **Hindi, Bengali, Tamil, Marathi** and other major Indian languages
- The role of AI in **translanguaging environments**, where students shift between languages

Gender, Equity, and Inclusion-Focused Research

While this study briefly touched on gender differences in performance, deeper inquiry is needed into how AI tools affect learners from marginalized groups—such as girls in rural areas, first-generation learners or students with learning disabilities.

Recommendation: Future research should examine:

- How **gender, socioeconomic status, and digital access** intersect in AI tool adoption
- How AI can be used to support **inclusive writing pedagogy** for neurodivergent learners or students with special needs

5.8 Limitations of the Study

While this research provides valuable insights into the effectiveness of AI-assisted writing tools in a government school context, it is important to recognize and critically reflect on its limitations. These limitations do not undermine the significance of the findings, but rather **frame the boundaries** of their applicability and underscore the complexity of educational research in real-world environments. Acknowledging these constraints also sets a more transparent foundation for future investigations and policymaking.

The study was conducted in a **single Kendriya Vidyalaya school in Pusa, Bihar**, which is a relatively better-resourced government institution compared to rural or municipal schools. While it offered a semi-urban and mixed socio-economic context, it still does not fully capture the **diversity of India's public education system**, which includes:

- Remote tribal areas
- Urban slums

- Private unaided schools
- Government-run schools with minimal infrastructure
- Short Duration of Intervention
- Tool-Specific and Feature-Based Constraints
- Digital Literacy Gaps
- Researcher Involvement and Potential Bias
- Lack of Language Diversity in AI Interaction

5.9 Conclusion

The central aim of the study was to explore whether the integration of AI-based writing tools—**ChatGPT**, **Grammarly** and **Microsoft Copilot**—could enhance story writing skills among Class 9 students in a **semi-urban Indian government school setting**. Based on a carefully structured intervention and analysis of data, the results are not only affirming but also inspiring in their broader implications.

The study found a **statistically significant improvement** in student’s writing scores following the use of AI tools, with specific gains in grammar, organization and creativity. Beyond test scores, students reported feeling more confident, motivated and engaged in the writing process. Teacher observations confirmed these behavioural and attitudinal shifts. Most importantly, the intervention succeeded in a **non-elite, under-resourced educational context**, showing that AI tools can offer **inclusive, scalable solutions** to long-standing instructional challenges.

The discussion of findings grounded these outcomes in established theories like **Constructivism**, **Cognitive Load Theory** and the **TPACK framework**, demonstrating that AI can act as a cognitive partner, feedback mechanism and instructional scaffold. These tools not only enhanced technical aspects of writing but also **redefined classroom dynamics**, shifting the teacher’s role from mere evaluator to facilitator and the student’s role from passive writer to autonomous active creator.

The **pedagogical implications** are transformative: AI-supported writing promotes revision, enhances learner agency, enables differentiated support and aligns well with 21st-century skill development. Equally important are the **policy implications**—the results offer a compelling case for integrating AI into the NEP 2020 roadmap, CBSE curricula and teacher training programs. With thoughtful investment, partnerships and ethical safeguards, AI can become a core component of India’s digital education revolution.

It also offered a **realistic reflection on the study's limitations**, including sampling scope, tool constraints and contextual specificity. These limitations, however, do not diminish the value of the findings—they instead provide a transparent foundation for **future research**, which can expand, validate and refine the work begun here.

Summing up, this study demonstrates that AI-assisted writing instruction is not only effective but also **equitable, engaging and educationally sound**—when implemented with care, purpose and sensitivity to learner's needs. It reaffirms that even in government schools, with modest infrastructure and limited exposure, students can thrive when given access to the right tools, the right guidance and the right opportunities.

As the future of education becomes increasingly digital, this research adds an important voice to the conversation—reminding us that **technology, when humanized through pedagogy, has the power to unlock potential, amplify creativity and democratize learning** for all.

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7 Annexure I: Pre-test for Story Writing (Class 9)

Total Marks: 50

Duration: 50 Minutes

Name of the Student:

Gender:

General Instructions for Students:

- Write your answers neatly.
- Manage your allotted time wisely. Allocate more time for Section D as it carries the most marks.
- Use your imagination and creativity in the story-writing activity.

Section A: Understanding the Basics of a Story (10 Marks)

1. Define the following terms (2×2=4 Marks):

- a. Plot
- b. Character

2. Choose the correct answer (1×4=4 Marks):

Term	Options
Setting	i. The time and place where the story happens.
Conflict	ii. The central message or idea of the story.
Resolution	iii. The main problem or challenge faced by the characters.
Theme	iv. How the problem in the story is solved.

Choose the correct combination:

- A. 1-i, 2-ii, 3-iii, 4-iv
- B. 1-iv, 2-iii, 3-ii, 4-i
- C. 1-i, 2-iii, 3-iv, 4-ii
- D. 1-i, 2-iv, 3-iii, 4-ii

3. Choose the most appropriate answer (2 Marks):

A well-written story should:

- a. Have a list of random events.
- b. Follow a clear sequence of events with a beginning, middle, and end.
- c. Only include a happy ending.
- d. Focus only on dialogue.

Section B: Elements of Story Writing (15 Marks)

4. Short Answer Questions (5×3=15 Marks):

- a. Why is the opening of a story important?
- b. Explain the role of a protagonist in a story.
- c. What is the significance of descriptive language in storytelling? Give an example.
- d. How does a writer develop suspense in a story?
- e. Mention one difference between first-person and third-person narration.

Section C: Story Analysis (10 Marks)

5. Read the following excerpt and answer the questions (2×5=10 Marks):

"The old clock struck midnight as Sara walked quietly down the hallway. The house was very quiet, except for the soft sound of the wooden floorboards creaking under her feet. Suddenly, she heard a faint whisper behind her, "Don't turn around."

- a. Identify the setting (Background/Scene) of the story.
- b. Who is the protagonist in this excerpt?
- c. Which narrative technique (first-person/third-person) has been used here?
- d. How does the writer create suspense in the story?
- e. Suggest a possible theme (Subject) for the story.

Section D: Creative Writing (15 Marks)

6. Story Writing Activity (15 Marks):

Write a short story (150–200 words) based on one of the following prompts (consider local/regional variance):

- a. "One day, I found a mysterious box in my backyard..."
 - b. "In a small village, there was a house no one dared to enter..."
 - c. "The moment I stepped onto the train, I knew something was wrong..."
-

8 Annexure II: Post-test for Story Writing (Class 9)

Total Marks: 50

Duration: 50 Minutes

Name of the Student:

Gender:

General Instructions for Students:

- Write your answers clearly.
- Manage your allotted time wisely. Allocate more time for Section D as it carries the most marks.
- Use your imagination and creativity in the story-writing activity.

Section A: Understanding the Basics of a Story (10 Marks)

1. Define the following terms with examples (2×2=4 Marks):

- a. Antagonist
- b. Climax (Critical moment)

2. Choose the correct answer (1×4=4 Marks):

Term	Options
Rising Action	i. Events that build tension and lead to the climax.
Foreshadowing	ii. A hint or clue about what will happen later in the story.
Flashback	iii. A scene that takes the narrative back to a past event.
Point of View	iv. The perspective from which the story is told.

Choose the correct combination:

- A. 1-i, 2-ii, 3-iii, 4-iv
- B. 1-iv, 2-iii, 3-ii, 4-i
- C. 1-i, 2-iii, 3-iv, 4-ii
- D. 1-i, 2-iv, 3-iii, 4-ii

3. Choose the most appropriate answer (2 Marks):

Which of the following is an example of narrative language?

- a. "The cat is black."
- b. "The dark, mysterious cat silently crept across the room; its golden eyes glowing."
- c. "The cat ran fast."
- d. "The black cat sat."

Section B: Elements of Story Writing (15 Marks)

4. Short Answer Questions (5×3=15 Marks):

- a. What is the role of the setting (Background) in a story?
- b. Why is conflict (Dilemma) essential in a story?
- c. How can a writer make characters more relatable to readers?
- d. Explain how dialogue/language can help develop a character in a story.
- e. What is the importance of a resolution (conclusion/ending) in a story?

Section C: Story Evaluation (10 Marks)

5. Read the following excerpt and answer the questions (2×5=10 Marks):

"The storm continued as Mia held the map tightly. Her heart beats fast because this was her only chance to find the treasure. Just as she reached the cave, she heard footsteps behind her—she was not alone."

- a. Identify the conflict/dilemma in this excerpt.
- b. What is the tone (mood) of this passage?
- c. Suggest a possible resolution to the story.
- d. How does the writer create tension in this excerpt?
- e. Propose a title for this story based on the excerpt.

Section D: Creative Writing (15 Marks)

6. Story Writing Activity (15 Marks):

Write a short story (150–200 words) based on one of the following prompts:

- a. "As soon as I opened the letter, my world turned upside down..."
- b. "In the heart of the dense forest, I found an ancient castle..."
- c. "A group of friends on a camping trip discovers that the woods are home to an ancient evil..."