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.