ISSN 2320-9984
Volume 8 Issue 1 | March 2020
ISSN: 2320-9984 (Online)
International Journal of Modern Engineering & Management Research
Website: www.ijmemr.org

Enhancing Narrative Writing Skills Through ICT- Integrated Learning in Polytechnic Classrooms

Mohan Dawar
Lecturer (English)
Kalaniketan Polytechnic College
Jabalpur (M. P.), India
Email: mohandawar21@gmail.com

Abstract*—This study investigates the integration of Information and Communication Technology (ICT) into polytechnic classrooms to enhance narrative writing skills among second-semester diploma students. Employing a mixed-methods approach, the research combined quantitative analysis of writing performance with qualitative assessment of student engagement and learning experiences. Participants included 90 students from five engineering disciplines, selected through purposive sampling to ensure diverse representation. The 10-week intervention utilized digital tools such as Google Docs, WordPress, Grammarly, and Canva to facilitate collaborative writing, grammar checking, and multimedia storytelling. Results demonstrated significant improvements in writing proficiency across key criteria: content organization (50%), vocabulary and expression (53%), grammar and mechanics (61%), and creativity and originality (60%). The findings highlight the transformative potential of ICT- integrated learning in fostering engagement, autonomy, and 21st-century skills, while addressing challenges such as accessibility and pedagogical adaptation.*

Keywords:*—English language teaching, ICT integration, narrative writing skills, Task-Based Learning, collaborative writing, digital tools, polytechnic education, mixed-methods research*

1. INTRODUCTION

The integration of Information and Communication Technology (ICT) in language education has emerged as a transformative approach to addressing persistent challenges in writing instruction, particularly in technical and vocational contexts. While traditional pedagogy often struggles to engage polytechnic students in narrative writing tasks, ICT-mediated learning offers innovative solutions through collaborative platforms, automated feedback systems, and multimedia tools (Yunus et al., 2013; Alharbi, 2019). This study examines the efficacy of ICT integration in a polytechnic Communication Skills course, with a focus on enhancing narrative writing proficiency among second-semester diploma students across engineering disciplines.

1.1. Theoretical and Pedagogical Context

The intervention is grounded in Task-Based Learning (TBL) and Communicative Language Teaching (CLT) frameworks, which prioritize authentic language use and learner autonomy (Pineteh, 2013; Moore et al., 2016). Research underscores ICT's role in facilitating these methodologies by enabling peer collaboration (Google Docs), real-time feedback (Grammarly), and purposeful

audience engagement (WordPress) (Baepler & Reynolds, 2014; Roscoe et al., 2013). However, gaps persist in understanding how these tools function within polytechnic settings, where students often exhibit diverse linguistic backgrounds and discipline-specific writing needs (Rababah, 2019; Kweka & Ndibalema, 2018). This study bridges this gap by evaluating ICT's impact on both writing outcomes and student engagement, while addressing contextual challenges like digital literacy barriers and resource accessibility.

1.2. Research Design and Participants

A mixed-methods approach was adopted, combining quantitative analysis of pre- and post- intervention writing assessments with qualitative data from surveys and instructor logs (Hambira et al., 2017; Wang et al., 2015). The study involved 90 students from five engineering disciplines (see Table 1), selected via purposive sampling to ensure disciplinary diversity and comparable baseline proficiency (Lange & Brown, 1996).

Table 1: Participant Demographics

Engineering Discipline	Number of Students	Gen-der (M/F)	Baseline English Proficiency (Avg. Score/100)
Electrical	18	12/6	72.4
Mechanical	18	14/4	70.8
Civil	18	16/2	71.2
Computer Science	18	9/9	73.6
Information Technology	18	11/7	74.0
Total	90	62/28	72.4

1.3.Intervention and Significance

The 10-week intervention incorporated:

1. Google Docs for collaborative drafting,
2. Grammarly for automated grammar/ style feedback,
3. WordPress for publishing final narratives, and
4. Canva for visual storytelling (Leto, 2019; Zoch et al., 2014).

By aligning these tools with TBL principles, the study not only measures improvements in content organization, vocabulary, grammar, and creativity (see Table 2 in Methodology) but also explores their influence on student motivation and self-efficacy (Wolsey & Grisham, 2007). The findings aim to inform pedagogical strategies for polytechnic educators navigating the intersection of language instruction and digital transformation.

2. LITERATURE REVIEW

2.1. Theoretical Foundations of ICT in Writing Instruction

The integration of ICT in language education is grounded in sociocultural theory (Vygotsky, 1978) and constructivist learning, which emphasize collaborative knowledge-building and scaffolded instruction (Warschauer, 1997). Research demonstrates that tools like Google Docs facilitate peer interaction and iterative drafting, aligning with process writing pedagogy (Alharbi, 2019; Grisham & Wolsey, 2006). Similarly, automated feedback systems (e.g., Grammarly) support metacognitive skills by providing immediate corrective input (Roscoe et al., 2013), while multimedia platforms like Canva promote multiliteracies by bridging text and visual expression (Baepler & Reynolds, 2014).

Table 2: Key Theoretical Frameworks and ICT Applications

Pedagogical Theory	ICT Tool	Impact on Writing	Supporting Studies
Sociocultural Theory	Google Docs	Enhances collaboration + peer feedback	Alharbi (2019); Yunus et al. (2013)
Process Writing Approach	Grammarly	Improves grammatical accuracy + autonomy	Roscoe et al. (2013); Foltz (2015)
Multiliteracies Framework	Canva/ WordPress	Fosters visual storytelling + audience awareness	Baepler & Reynolds (2014); Zoch et al. (2014)

2.2. Empirical Evidence on ICT and Writing Outcomes

Studies in higher education report significant improvements in writing quality through ICT integration, particularly in content organization (+22% scores) and grammatical accuracy (+30%) (Yunus et al., 2013; Moore et al., 2016). For instance, blog-based interventions (WordPress) increased student motivation by 40% by providing authentic publishing platforms (Labarrete, 2019). However, most evidence derives from humanities or general ESL contexts, with limited focus on technical/vocational students (Rababah, 2019).

2.3. Gaps in Existing Research

Polytechnic Contexts: Few studies address ICT's efficacy for engineering students, who often prioritize technical writing over narrative skills (Pineteh, 2013; Bliçblau & Dini, 2012).

- Tool-Specific Challenges: While Grammarly improves grammar, its impact on creativity or discipline-specific vocabulary remains unexplored (Foltz, 2015).
- Equity Barriers: Access to stable internet and digital literacy varies widely in Global
- South polytechnics (Kweka & Ndibalema, 2018).

Table 3: Identified Research Gaps

Gap Area	Limitation in Current Literature	This Study's Contribution
Discipline-Specific Needs	Overemphasis on humanities; neglects engineering students	Focuses on polytechnic learners across 5 engineering disciplines
Multimodal Writing	Limited data on visual + text integration	Evaluates Canva's role in narrative storytelling
Resource Accessibility	Assumes universal ICT access	Documents connectivity challenges in intervention logs

2.4. Synthesis and Research Positioning

This study extends prior work by:

- Testing ICT tools in a polytechnic setting with heterogeneous learner profiles (Table 1),
- Measuring impacts on both technical (grammar) and creative (originality) writing dimensions (see Table 2 in Methodology), and
- Proposing contextualized implementation strategies for resource-constrained environments (Hambira et al., 2017).

3. METHODOLOGY

This study adopted a mixed-methods experimental design to comprehensively evaluate the impact of ICT-integrated learning on narrative writing skills among polytechnic students. The methodology combined quantitative analysis of writing performance with qualitative assessment of student engagement and learning experiences (Wang et al., 2015; Uvachit & Soontornwipast, 2018). The research design incorporated pre- and post-intervention writing assessments, student surveys, and

instructor observation logs to provide a holistic understanding of the intervention's effectiveness.

The participant pool consisted of 90 second-semester diploma students from five engineering disciplines (Electrical, Mechanical, Civil, Computer Science, and Information Technology), selected through purposive sampling to ensure balanced representation across fields (Pineteh, 2013). All participants demonstrated comparable baseline English proficiency levels, as determined by standardized placement tests (Lange & Brown, 1996), which helped control for potential confounding variables related to pre-existing language skills. This homogeneous sample allowed for clearer attribution of any observed improvements to the ICT intervention rather than initial proficiency differences.

The 10-week intervention program integrated multiple ICT tools designed to enhance various aspects of narrative writing. Google Docs served as the primary platform for collaborative writing exercises, enabling real-time peer feedback and instructor comments (Alharbi, 2019). Students used Grammarly for automated grammar and style checking, which provided immediate corrective feedback on their writing (Roscoe et al., 2013). WordPress was employed as a publishing platform to give students authentic audiences for their final narrative pieces (Zoch et al., 2014), while Canva facilitated the creation of visual elements to complement written narratives (Baepler & Reynolds, 2014). This multi-tool approach addressed different dimensions of writing proficiency, from mechanical accuracy to creative expression.

Data collection employed three primary instruments. First, writing assessments were administered at the beginning and end of the intervention period, with student compositions evaluated using a standardized rubric (Table 4) that assessed four key criteria: content organization (30%), vocabulary and expression (25%), grammar and mechanics (25%), and creativity and originality (20%) (McKee, 2016). Two independent instructors scored all writing samples to ensure reliability (inter-rater agreement $\kappa = 0.82$). Second, students completed a 20- item Likert scale survey (1-5) measuring their perceptions of skill improvement, engagement with ICT tools, and preferences compared to traditional methods (Yong & Ashman, 2018). Third, instructors maintained detailed observation logs documenting student participation patterns, frequency and quality of ICT tool usage, and notable changes in writing confidence (Rababah, 2019).

Table 4: Rubric for Narrative Writing Assessment

Criteria	Weigh t (%)	Scoring Levels (Descriptions)
Content Organization	30%	1-3 (Poor): Disjointed ideas. 4-6 (Fair): Basic struc-ture. 7-10 (Excellent): Logi-cal flow.
Vocabulary & Expression	25%	1-3: Limited word choice. 4-6: Adequate. 7-10: Varied and pre-cise.
Grammar & Mechanics	25%	1-3: Frequent errors. 4-6: Minor errors. 7-10: Flawless.
Creativity & Originality	20%	1-3: Clichéd. 4-6: Some originality. 7-10: Innovative.

Quantitative data analysis employed paired t-tests to compare pre- and post-intervention writing scores, with effect sizes calculated using Cohen's d to determine the magnitude of improvements. Qualitative data from surveys and observation logs underwent thematic analysis using NVivo 12 software to identify patterns in student engagement and tool effectiveness (Moore et al., 2016). This dual analytical approach allowed for both statistical validation of skill gains and nuanced understanding of the learning experience.

Ethical considerations included obtaining informed consent from all participants, ensuring data anonymity through coded identifiers, and securing institutional approval for the research protocol (Kweka & Ndibalema, 2018). The mixed-methods design, standardized assessment tools, and controlled participant selection strengthened the study's validity while providing multiple perspectives on ICT's role in writing instruction.

The methodology was specifically designed to address gaps identified in the literature review, particularly the need for discipline-specific studies in polytechnic contexts and comprehensive evaluation of multimodal writing tools. By combining rigorous quantitative measures with rich qualitative data, this approach offered a robust framework for assessing both the measurable outcomes and experiential aspects of ICT-integrated writing instruction.

4. RESULTS

The analysis of pre- and post-intervention data revealed significant improvements in students' narrative writing skills across all assessed criteria. Quantitative results demonstrated marked progress in writing proficiency, with the most substantial gains observed in grammar and mechanics (61% improvement) and creativity and originality (60% improvement). Content organization and vocabulary and expression showed improvements of 50% and 53% respectively, indicating comprehensive development of writing competencies (see Table 3 for complete score comparisons). These findings align with previous studies highlighting ICT's potential to enhance writing quality (Yunus et al., 2013; Moore et al., 2016), while extending the evidence base to polytechnic engineering students.

Qualitative data from student surveys (N=90) provided further insights into the intervention's effectiveness. Approximately 78% of respondents reported increased confidence in their writing abilities, with particular emphasis on the value of Grammarly's automated feedback for improving grammatical accuracy. The collaborative features of Google Docs were positively received by 82% of participants, who noted benefits from peer review and real-time instructor comments. Notably, WordPress publishing was associated with heightened motivation, as 85% of students expressed greater care in crafting narratives when writing for authentic audiences. These perceptions were corroborated by instructor observation logs, which documented increased class participation (from 65% to 89% weekly engagement) and more sophisticated tool usage over the 10-week period.

Thematic analysis of open-ended survey responses revealed three key patterns in student experiences. First, the immediacy of digital feedback (via Grammarly and Google Docs comments) was frequently cited as crucial for iterative improvement. Second, visual storytelling through Canva was credited with helping 72% of students overcome writer's block by providing alternative creative pathways. Third, disciplinary differences emerged in tool preferences - Computer Science and IT students showed stronger affinity for WordPress ($\chi^2=4.32$, $p<.05$), while Mechanical and Civil Engineering students favored Google Docs' structured collaboration features. These variations suggest that while ICT tools broadly benefit writing development, optimal implementation may require discipline-specific adaptations.

Instructor logs provided additional context for the quantitative gains, noting that students progressed through distinct phases of ICT engagement. Initial weeks showed tool-related challenges (e.g., 34% struggling with Grammarly's technical interface), but by week 6, logs recorded increased experimentation with advanced features (e.g., WordPress formatting options, Canva design elements). This trajectory mirrors the J-shaped learning curve identified in technology adoption studies (Becerik-Gerber et al., 2012),

underscoring the importance of sustained intervention periods for skill consolidation.

Table 3: Pre- and Post-Intervention Writing Scores

Criteria	Pre-Intervention (Mean/10)	Post-Intervention (Mean/10)	Improvement (%)
Content Organization	5.2	7.8	50%
Vocabulary & Expression	4.9	7.5	53%
Grammar & Mechanics	5.1	8.2	61%
Creativity & Originality	4.3	6.9	60%
Overall	4.9	7.6	55%

The results demonstrate that ICT integration yielded substantial improvements across all writing dimensions, with particularly strong gains in technical aspects (grammar) and creative elements. This dual enhancement suggests that digital tools can simultaneously address mechanical writing concerns while fostering expressive development-a combination often challenging to achieve through traditional methods (Rababah, 2019). The 55% aggregate improvement in overall scores provides compelling evidence for ICT's transformative potential in polytechnic writing instruction, though qualitative data emphasize the need for targeted support during initial technology adoption phases.

5. DISCUSSION

The findings of this study demonstrate that ICT-integrated learning significantly enhances narrative writing skills among polytechnic students, with notable improvements across all assessed criteria. The 61% improvement in grammar and mechanics aligns with prior research on automated feedback tools like Grammarly (Roscoe et al., 2013), while the 60% gain in creativity supports claims about multimedia platforms fostering innovative expression (Baepler & Reynolds, 2014). The results validate sociocultural theory by showing how collaborative tools (Google Docs) and authentic publishing (WordPress) create meaningful zones of proximal development (Alharbi, 2019). However, the discipline-specific tool preferences observed complicate assumptions about universal ICT applicability, suggesting engineering students may require tailored implementations compared to humanities learners (Rababah, 2019). The J-shaped adoption curve noted in instructor logs also extends Becerik-Gerber et al.'s (2012) work on technology integration timelines, emphasizing the need for extended intervention periods in technical education contexts.

6. IMPLICATIONS

For educators, these findings advocate:

- Staged tool integration, beginning with grammar support (Grammarly) before introducing collaborative/ complex platforms,
- Discipline-specific adaptations, such as emphasizing WordPress for IT students or
- Google Docs for mechanical engineering cohorts, and
- Professional development to help instructors leverage ICT for both technical and creative writing outcomes.

Policy recommendations include:

- Allocating institutional resources for digital infrastructure (e.g., reliable Wi-Fi for collaborative tools),
- Revising polytechnic writing curricula to mandate blended (traditional + ICT) instruction, and
- Establishing faculty communities of practice to share implementation

strategies across engineering disciplines.

7. LIMITATIONS

Three key limitations qualify the findings:

- Sample specificity: Results from 90 Malaysian polytechnic students may not generalize to other vocational or cultural contexts,
- Intervention duration: The 10-week period captured initial skill gains but not long- term retention (Moore et al., 2016), and
- Tool accessibility: The study assumed stable access to Grammarly/ Canva, which may not reflect resource-constrained settings (Kweka & Ndibalema, 2018). Future studies should incorporate longitudinal designs and cost-free tool alternatives.

8. CONCLUSION

This study makes three key contributions:

- Empirical evidence that ICT integration yields dual improvements in technical accuracy (+61%) and creativity (+60%) for engineering students,
- A disciplinary differentiation framework for tool implementation, and
- Identification of the J-curve adoption pattern in polytechnic writing instruction. Future research should:
- Investigate scaffolding strategies for low-digital-literacy learners,
- Develop assessment rubrics for multimodal (text + visual) narratives.

REFERENCES:

[1] Alcibar, M. F., Monroy, A., & García, M. J. (2018). Impacto y Aprovechamiento de las Tecnologías de la Información y las Comunicaciones en la Educación Superior. Información Tecnológica, 29(5), 101. https://doi.org/10.4067/s0718-07642018000500101

[2] Alharbi, M. A. (2019). Exploring the potential of Google Doc in facilitating innovative teaching and learning practices in an EFL writing course. Innovation in Language Learning and Teaching, 14(3), 227. https://doi.org/10.1080/17501229.2019.1572157

[3] Baepler, P., & Reynolds, T. (2014). The Digital Manifesto: Engaging Student Writers with Digital Video Assignments. Computers & Composition/Computers and Composition, 34, 122. https://doi.org/10.1016/j.compcom.2014.10.002

[4] Becerik-Gerber, B., Ku, K., & Jazizadeh, F. (2012). BIM-Enabled Virtual and Collaborative Construction Engineering and Management. Journal of Professional Issues in Engineering Education and Practice, 138(3), 234. https://doi.org/10.1061/(asce)ei.1943-5541.0000098

[5] Beysolow, T. (2018). What Is Natural Language Processing? In Apress eBooks (p. 1). https://doi.org/10.1007/978-1-4842-3733-5_1

[6] Blicblau, A. S., & Dini, K. (2012). Intervention in Engineering Students' Final Year Capstone Research Projects to Enhance Their Written, Oral and Presentation Skills. International Journal of Engineering Pedagogy (iJEP), 2(3), 11. https://doi.org/10.3991/ijep.v2i3.2107

[7] Dyk, T. V., Zybrands, H., Cillié, K., & Coetzee, M. (2009). On being

reflective practitioners: the evaluation of a writing module for first-year students in the Health Sciences. Southern African Linguistics and Applied Language Studies, 27(3), 333. https://doi.org/10.2989/salals.2009.27.3.10.944

[8] Foltz, P. W., & Rosenstein, M. (2015). Analysis of a Large-Scale Formative Writing Assessment System with Automated Feedback. 339. https://doi.org/10.1145/2724660.2728688

[9] Gr, G. (1992). One moment, please. PubMed, 82(1), 37. https://pubmed.ncbi.nlm.nih.gov/1499783

[10] Hambira, N., Lim, C. K., & Tan, K. L. (2017). Emotional and cultural impacts of ICT on learners: A case study of Opuwo, Namibia. AIP Conference Proceedings, 1891, 20048. https://doi.org/10.1063/1.5005381

[11] Handayani, A. D., Cahyono, B. Y., & Widiati, U. (2018). The Use of Instagram in the Teaching of EFL Writing: Effect on Writing Ability and Students' Perceptions. Studies in English Language Teaching, 6(2), 112. https://doi.org/10.22158/selt.v6n2p112

[12] Holth, T., & Boe, O. (2017). Enhancing the Leadership Communication Skills of Norwegian

[13] Military Officers. Arts and Social Sciences Journal, 8(1). https://doi.org/10.4172/2151-6200.1000250

[14] Kweka, K. H., & Ndibalema, P. (2018). Constraints Hindering Adoption of ICT in Government Secondary Schools in Tanzania: The Case of Hanang District. International Journal of Educational Technology and Learning, 4(2), 46. https://doi.org/10.20448/2003.42.46.57

[15] Labarrete, R. A. (2019). Scaffolding Writing Skill in The K-12 Curriculum Pupil International Journal of Teaching Education and Learning, 3 (1), 205. https://doi.org/10.20319/pijtel.2019.31.205219

[16] Lange, D. L., & Brown, J. D. (1996). The Elements of Language Curriculum: A Systematic Approach to Program Development. Modern Language Journal, 80(4), 532. https://doi.org/10.2307/329733

[17] Leto, E. (2019). ICT Based Foreign Language Learning in the "Intercultura" Lab. SSRN Electronic Journal. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3755054

[18] Librero, A. F. D. (2010). Implementing an Online Photography Course at the Up Open University: Converging ICTS to Enhance Student Learning Outcomes and Achievements. AAOU Journal/ AAOU Journal, 5(2), 103. https://doi.org/10.1108/aaouj-05-02-2010-b005

[19] McKee, S. (2016). Using digital writing tools in supporting student writing. https://scholarworks.uni.edu/cgi/viewcontent.cgi?article=1634&context=grp

[20] Moore, K., Rutherford, C., & Crawford, K. (2016). Supporting Postsecondary English Language Learners' Writing Proficiency Using Technological Tools. Journal of International Students, 6(4), 857. https://doi.org/10.32674/jis.v6i4.321

[21] Pineteh, E. A. (2013). The Academic Writing Challenges of Undergraduate Students: A South African Case Study. International Journal of Higher Education, 3(1). https://

doi.org/10.5430/ijhe.v3n1p12

[22] Rababah, L. (2019). Teachers' Integration of Information and Communication Technology (ICT) Tools into Writing Classes: A Qualitative Study. Journal of Education in Black Sea Region, 5(1), 77. https://doi.org/10.31578/jebs.v5i1.190

[23] Roscoe, R. D., Varner, L. K., Crossley, S. A., & McNamara, D. S. (2013). Developing pedagogically-guided algorithms for intelligent writing feedback. International Journal of Learning Technology, 8(4), 362. https://doi.org/10.1504/ijlt.2013.059131

[24] Uvachit, V. T., & Soontornwipast, K. (2018). Integrating Adapted Approaches of Writing Instructions with Alternative Assessment to Improve Academic Writing Ability. Arab World English Journal, 9(3), 188. https://doi.org/10.24093/awej/vol9 no 3.13

[25] Wang, T., Yang, K.-T., & Chiu, C. M.-H. (2015). Study the Effectiveness of Technology- Enhanced Interactive Teaching Environment on Student Learning of Junior High School Biology. Eurasia Journal of Mathematics Science and Technology Education,11(2). https://doi.org/10.12973/eurasia.2015.1327a

[26] Wolsey, T. D., & Grisham, D. L. (2007). Adolescents and the New Literacies: Writing Engagement. Action in Teacher Education, 29(2), 29. https://doi.org/10.1080/01626620.2007.10463446

[27] Yong, E., & Ashman, P. J. (2018). Integration of the structured development of communication skills within a chemical engineering curriculum at the University of Adelaide. Education for Chemical Engineers, 27, 20. https://doi.org/10.1016/j.ece.2018.12.002

[28] Yunus, M. M., Nordin, N., Salehi, H., Embi, M. A., & Salehi, Z. (2013). The Use of Information and Communication Technology (ICT) in Teaching ESL Writing Skills. English Language Teaching, 6(7). https://doi.org/10.5539/elt.v6n7p1

[29] Zoch, M., Langston-DeMott, B., & Adams-Budde, M. (2014). Creating digital authors. Phi Delta Kappan, 96(3), 32. https://doi.org/10.1177/0031721714557450