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LEVERAGING PBWORKS TO FOSTER COLLABORATIVE WRITING SKILLS AMONG UNDERGRADUATE IN FEDERAL POLYTECHNIC, UGEP, CROSS RIVER STATE, NIGERIA

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Abstract

This study explores the efficacy of PBworks, a web-based collaborative platform, in enhancing collaborative writing skills among undergraduate students at Federal Polytechnic, Ugep, Cross River State, Nigeria. Utilizing a quasi-experimental design, the research engaged 80 undergraduates from diverse academic disciplines in a 12-week intervention. The experimental group used PBworks for collaborative writing tasks, while the control group employed traditional face-to-face methods. Data were collected through pre- and post-intervention writing assessments, focus group discussions, and surveys. Findings revealed a significant improvement in the experimental group's writing proficiency (MD = 16.72, $t(78) = 7.124$, $p < .05$) and collaborative skills, with enhanced peer interaction and feedback quality. Demographic analysis indicated no significant influence of gender or age on outcomes, though academic discipline moderately affected engagement levels. The study underscores PBworks' potential to foster collaborative learning in resource-constrained settings, recommending its integration into Nigerian polytechnic curricula to enhance writing skills and teamwork. Limitations include technological access barriers and the study's single-institution focus. Future research should explore longitudinal impacts and scalability across diverse institutions.

Keywords: PB works, collaborative writing, undergraduate students, quasi-experimental design, writing skills, technology-enhanced learning

Introduction and Literature Review

Effective communication, particularly in written English, is a critical skill for academic and professional success in Nigeria, where English serves as the lingua franca and the medium of instruction in higher education (Ogbonna & Eze, 2023). At Federal Polytechnic, Ugep, a relatively new institution in Cross River State, Nigeria, established to produce graduates equipped with technical and professional competencies, the development of writing skills is paramount (Naijadirectory, 2024). However, undergraduates often struggle with writing due to its complex demands on linguistic accuracy, coherence, and critical thinking, compounded by the challenges of learning English as a second language (Anyanwu, 2024). Traditional writing instruction, characterized by teacher-centered approaches and individual assignments, has proven inadequate in fostering the collaborative and critical thinking skills required in modern workplaces (Olowe, 2011). This study investigates the potential of PBworks, a web-based collaborative platform, to enhance collaborative writing skills among undergraduates at Federal Polytechnic, Ugep, addressing the need for innovative, technology-driven pedagogical strategies in resource-constrained settings.

Collaborative writing, defined as the process by which multiple individuals jointly produce a text through shared responsibility and interaction, promotes critical thinking, peer learning, and effective communication (Storch, 2013). According to Vygotsky's (1978) social constructivist theory, learning is a social process where interaction with peers facilitates cognitive development

and skill acquisition. In this context, digital tools like PBworks offer transformative potential by enabling real-time collaboration, version tracking, and structured peer feedback, creating a dynamic environment for writing development (Hsu & Lo, 2018). PBworks, a wiki-based platform, allows users to co-author documents, comment on drafts, and track changes, fostering a collaborative ecosystem that aligns with constructivist principles (Yundayani et al., 2020). Its accessibility and user-friendly interface make it particularly suitable for educational settings, including those with limited technological infrastructure.

The global shift toward technology-enhanced learning has spotlighted wikis as effective tools for collaborative writing. For instance, Anyanwu (2024) conducted a study at a Nigerian university in Enugu State, finding that PBworks significantly improved undergraduates' writing proficiency, with a mean score increase of 15.53 points ($t(92) = 6.316$, $p < .05$) compared to traditional methods. The study attributed this improvement to PBworks' ability to facilitate peer interaction and iterative feedback. Similarly, Hsu and Lo (2018) explored wiki-based writing among second-language learners in Taiwan, reporting enhanced writing quality due to increased opportunities for peer editing and reflection. Their findings indicated a 20% improvement in coherence and argumentative structure among participants using wikis ($F(1,56) = 8.214$, $p < .05$). Yundayani et al. (2020) further demonstrated that PBworks improved collaborative writing skills among vocational students in Indonesia, with participants citing the platform's commenting and revision features as key to success.

Despite these promising findings, the application of wiki-based tools in Nigerian polytechnics, particularly in semi-rural settings like Ugep, remains underexplored. Nigeria's educational system faces significant challenges, including inadequate technological infrastructure, large class sizes, and limited teacher training in digital pedagogy (Ekundayo & Ajayi, 2009). Federal Polytechnic, Ugep, located in a semi-rural area with a population density of approximately 1,200 students and constrained resources, exemplifies these challenges (Naijadirectory, 2024). Moreover, cultural factors, such as a preference for individualized learning and limited exposure to collaborative technologies, may hinder adoption (Olowe, 2011). Yet, the institution's mandate to produce globally competitive graduates necessitates innovative approaches to skill development, particularly in writing, which is essential for technical documentation, project reports, and professional communication.

Recent literature highlights additional benefits of wikis in fostering soft skills. For example, Al-Jarf (2022) found that wiki-based collaborative writing enhanced students' teamwork and problem-solving abilities, with 78% of participants reporting improved confidence in group tasks. In Nigeria, Adeyemi and Adeyemo (2023) noted that digital platforms like PBworks can bridge resource gaps by providing accessible, low-cost solutions for collaborative learning. However, challenges such as unreliable internet connectivity and varying levels of digital literacy among students and instructors must be addressed to ensure effective implementation (Okafor & Nwosu, 2021). These studies underscore the need for context-specific research to evaluate the efficacy of PBworks in semi-rural Nigerian polytechnics, where technological and socio-economic constraints may differ from urban settings.

This study fills a critical gap by examining how PBworks can enhance collaborative writing skills among undergraduates at Federal Polytechnic, Ugep. By leveraging the platform's collaborative features, the research aims to address the limitations of traditional writing instruction and contribute to the growing body of evidence on technology-enhanced learning in developing contexts. The study also explores the influence of demographic factors, such as gender, age, and academic discipline, on the effectiveness of PBworks, providing insights into its applicability across diverse student populations.

Methodology

Research Design

This study adopted a quasi-experimental pre-test/post-test control group design to assess the impact of PBworks on collaborative writing skills. The design allowed for comparison between an experimental group using PBworks and a control group using traditional methods, ensuring robust evaluation of the intervention's effectiveness.

Population and Sample

The study was conducted at Federal Polytechnic, Ugep, Cross River State, Nigeria, during the 2024/2025 academic session. The population comprised 1,200 undergraduates across various departments, including Computer Science, Business Administration, and Agricultural Technology. Using stratified random sampling, 80 students were selected, ensuring representation across gender, age, and academic disciplines. The sample was divided into two groups: 40 in the experimental group (using PBworks) and 40 in the control group (using face-to-face collaboration).

Table 1

Demographic Characteristics of Participants

Variable	Category	Experimental Group (n=40)	Control Group (n=40)
Gender	Male	22 (55%)	20 (50%)
	Female	18 (45%)	20 (50%)
Age	18–21	15 (37.5%)	16 (40%)
	22–25	20 (50%)	19 (47.5%)
	26+	5 (12.5%)	5 (12.5%)
Academic Discipline	Computer Science	12 (30%)	14 (35%)
	Business Admin.	15 (37.5%)	13 (32.5%)
	Agric. Technology	13 (32.5%)	13 (32.5%)

Data Collection

Primary data were collected using three instruments:

- Writing Proficiency Test (WPT): A standardized test assessing grammar, coherence, and argumentative structure, administered as pre- and post-tests. The test was validated by three English language experts, yielding a Cronbach's alpha of 0.89.
- Collaborative Skills Survey (CSS): A 20-item questionnaire measuring peer interaction, feedback quality, and task coordination, with a reliability coefficient of 0.92.
- Focus Group Discussions (FGDs): Conducted with 10 participants from the experimental group to explore qualitative experiences with PBworks.

The intervention lasted 12 weeks, with the experimental group using PBworks to collaborate on argumentative essays, while the control group worked in physical groups without digital tools. Pre-tests were administered in Week 1, followed by weekly writing tasks. Post-tests and surveys were conducted in Week 12, with FGDs held in Week 13.

Data Analysis

Quantitative data from the WPT and CSS were analyzed using descriptive statistics (mean, standard deviation) and inferential statistics (independent t-tests, ANCOVA) to compare group performance. Qualitative data from FGDs were transcribed and analyzed thematically to identify patterns in user experiences. SPSS Version 25 was used for quantitative analysis, while NVivo 12 supported qualitative coding.

Results

Quantitative Findings

The pre-test scores showed no significant difference between groups ($t(78) = 0.214$, $p = .831$), confirming baseline equivalence. Post-test results revealed a significant improvement in the experimental group's writing proficiency ($M = 78.45$, $SD = 6.32$) compared to the control group ($M = 61.73$, $SD = 7.14$), with a mean difference of 16.72 ($t(78) = 7.124$, $p < .05$). ANCOVA, controlling for pre-test scores, confirmed PBworks' significant effect on writing outcomes ($F(1,77) = 50.672$, $p < .05$, $\eta^2 = .397$).

Table 2

Pre- and Post-Test Writing Proficiency Scores

Group	Pre-Test Mean (SD)	Post-Test Mean (SD)	Mean Difference	t-value	p-value
Experimental (PBworks)	60.12 (6.85)	78.45 (6.32)	18.33	7.124	.000
Control (Traditional)	59.88 (7.02)	61.73 (7.14)	1.85	0.892	.374

The CSS indicated higher collaborative skills in the experimental group (M = 82.15, SD = 5.67) compared to the control group (M = 68.42, SD = 6.89), with a significant difference ($t(78) = 9.321$, $p < .05$). Demographic analysis showed no significant gender ($p = .612$) or age ($p = .453$) effects, but Computer Science students exhibited slightly higher engagement (M = 84.23) than Business Administration (M = 81.56) and Agricultural Technology (M = 80.12) students ($F(2,37) = 3.214$, $p = .049$).

Qualitative Findings

Thematic analysis of FGDs identified three key themes:

- Ease of Collaboration: Students appreciated PBworks' real-time editing and commenting features, which streamlined group work.
- Feedback Quality: Peer reviews on PBworks were more constructive due to anonymity and structured comment sections.
- Technical Challenges: Sporadic internet access and limited digital literacy posed initial barriers, though training mitigated these issues.

Discussion

The findings align with prior research, such as Anyanwu (2024), which reported PBworks' efficacy in improving writing skills (MD = 15.53, $p < .05$). The significant improvement in the experimental group's scores underscores PBworks' ability to foster collaborative learning, supporting Vygotsky's (1978) theory that social interaction enhances cognitive development. The platform's features, such as version control and shared workspaces, facilitated active engagement, addressing the limitations of traditional methods noted by Olowe (2011).

Demographic analysis revealed that academic discipline influenced engagement, likely due to Computer Science students' familiarity with digital tools. The absence of gender and age effects suggests PBworks' broad applicability. However, technical challenges highlight the need for robust infrastructure in semi-rural settings like Ugep, corroborating Ekundayo and Ajayi's (2009) findings on technological barriers in Nigerian education.

Conclusion

This study demonstrates that PBworks significantly enhances collaborative writing skills among undergraduates at Federal Polytechnic, Ugep. The platform's interactive features promote peer learning, feedback quality, and writing proficiency, offering a viable solution for resource-constrained institutions. Despite technical challenges, the intervention's success underscores the potential of technology-enhanced learning in Nigerian polytechnics.

Recommendations

- Curriculum Integration: Polytechnics should integrate PBworks into writing courses to foster collaborative skills.

- Infrastructure Investment: Institutions should improve internet access and provide digital literacy training to maximize platform benefits.
- Longitudinal Studies: Future research should explore long-term impacts and scalability across diverse Nigerian institutions.
- Faculty Training: Educators should be trained to facilitate PBworks-based instruction effectively.

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