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Investigating the influence of parental involvement and technology on literacy development

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Abstract

This study examines the impact of parental involvement and technology exposure on the academic motivation of high school students in Kogi State, Nigeria. Guided by two research questions and two null hypotheses, it adopted a correlational survey design. The population included 2,735 Senior Secondary School 2 (SSS2) students, with a sample of 213 determined using the Taro Yamane method. Data were collected via the Senior Secondary Students Academic Interest Questionnaire (SSSAIQ), with Cronbach's Alpha reliability coefficients of 0.88 and 0.94. Findings revealed that family influence significantly boosts students' academic interest, with digital resources like educational apps enhancing motivation. However, excessive social media use negatively affected study motivation. The study recommends that school administrators in Kogi State launch campaigns to educate parents on their critical role in fostering academic interest and success among high school students.

Keywords: Family influence, Technology factors, Academic interest, Senior Secondary School Students

Introduction

Literacy development, encompassing reading, writing, and critical comprehension skills, forms the bedrock of academic success and lifelong learning. In Nigeria, where educational disparities persist across urban and rural divides, the role of parental involvement and technology in shaping literacy outcomes among high school students is increasingly critical. Kogi State, a North-Central Nigerian hub with a population of over 5.2 million (NBS, 2023), exemplifies these challenges. Its 60% rural demographic and limited educational infrastructure amplify barriers to literacy, with only 45% of secondary students achieving basic reading proficiency (WAEC, 2024). Despite global recognition of parental engagement and digital tools as catalysts for learning, their combined influence in semi-urban African contexts like Kogi remains underexplored.

The problem lies in the intersection of inconsistent parental involvement and uneven technology access, which undermines literacy development and academic motivation. Traditional Nigerian parenting often prioritizes economic survival over educational engagement, particularly in rural areas where 70% of parents lack secondary education (NBS, 2023). Concurrently, while technology via smartphones and educational apps has surged, with 45% internet penetration in Kogi (NCC, 2023), its misuse (e.g., excessive social media) may detract from literacy gains. These dynamics pose a dual challenge: leveraging family support and digital resources to boost motivation while mitigating technology's distractions.

Existing literature, from Vygotsky's (1978) socio-cultural theory to recent studies (2023–2025), underscores parental involvement's role in scaffolding learning and technology's potential to enhance engagement. Yet, gaps persist: Nigerian studies (e.g., Okeke, 2019) focus on urban settings, neglecting Kogi's rural-urban mosaic, and few integrate both variables quantitatively. This study addresses these voids by examining how parental involvement and technology exposure shape academic motivation among 2,735 Senior Secondary School 2 (SSS2) students in Kogi, using a correlational survey with 213 participants. Findings reveal family influence as a significant driver and highlight technology's dual role constructive via educational apps, corrosive via social media distractions.

Guided by research questions on the extent of family and technology impacts, and testing null hypotheses via regression, this study proposes a framework blending socio-cultural and technology acceptance models. It aims to inform policy for Kogi's 250 secondary schools, fostering literacy through targeted parental campaigns and regulated tech use.

The article unfolds with a literature review, Kogi's educational context, methodology, findings, discussion with a novel framework, policy recommendations, and a conclusion.

Literature Review: Parental and Technological Pillars of Literacy

Socio-Cultural Theory: Vygotsky's (1978) framework posits that learning is a social process mediated by interactions with more knowledgeable others, like parents. Parental involvement through homework support or motivational dialogue creates a zone of proximal development, enhancing literacy. In Nigeria, where extended families often co-parent, this theory resonates, though cultural nuances (e.g., deference to elders) shape engagement (Ogunlade, 2022).

Self-Determination Theory (SDT): Ryan and Deci (2000) argue that motivation thrives on autonomy, competence, and relatedness. Parental encouragement fosters relatedness, boosting students' drive to read and write, while technology (e.g., apps) supports competence via interactive learning. SDT explains why excessive social media may undermine intrinsic motivation by fostering external validation (Akinwale, 2024).

Technology Acceptance Model (TAM): Davis's (1989) TAM highlights perceived usefulness and ease of use as drivers of tech adoption. Educational apps like Duolingo are embraced when students see literacy benefits, but social media's ease diverts focus, a trend noted in Nigeria (Eze, 2023).

Parental Involvement and Literacy

Classic studies (Epstein, 1995) outline six involvement types: parenting, communicating, volunteering, learning at home, decision-making, and community collaboration. In Nigeria, learning at home (e.g., reading supervision) correlates with 20% higher literacy scores (Adeyemi, 2018). Rural parents, however, face barriers: 65% cite time constraints due to farming (Okeke, 2019). Recent data (2023) show parental engagement boosts motivation by 30% in urban Lagos, but Kogi-specific studies are absent (Olatunji, 2023).

Technology's role in literacy is well-documented. Early work (Papert, 1980) lauded computers for interactive learning; today, apps enhance vocabulary by 15% (Chen et al., 2023). In Nigeria, 60% of students use smartphones for education, but 80% spend over 3 hours daily on social media, reducing study time (A4AI, 2023). A 2024 study found social media lowers motivation by 25% in rural schools (Vitalis, 2024).

Gaps and Contributions

Global literature (e.g., Hill & Tyson, 2009) links parental involvement to academic outcomes but overlooks Nigeria's rural constraints. Technology studies focus on access, not motivation impacts (Selwyn, 2016). In Kogi, with 250 secondary schools and 40% literacy gaps, no study integrates both variables quantitatively, a void this research fills.

Kogi's Educational Landscape: Opportunities and Challenges

Kogi State, spanning 29,833 km², blends urban centers like Lokoja with rural zones like Idah. Its 250 secondary schools serve 150,000 students, with SSS2 students (2,735 in 2023) critical for WAEC exams (Kogi State Ministry of Education,

2023). Literacy rates lag: 45% proficiency versus Nigeria's 62% average (WAEC, 2024). Rural schools, 60% of the total, face teacher shortages (30:1 ratio) and outdated libraries (70% pre-2000 books).

Internet access is 45% (urban 70%, rural 25%), with 85% of students owning smartphones (NCC, 2023). Power outages (18 hours/day rural) limit tech use, yet apps like U-Lesson are adopted in 20% of urban schools (local survey, 2024). Parental involvement is uneven: 55% of rural parents never attend PTA meetings, citing economic pressures (NBS, 2023). Cultural norms, valuing early marriage over education for girls, further dampen engagement (UNICEF, 2023).

Method

A correlational survey design examined two research questions:

To what extent does parental involvement influence SSS2 students' academic motivation?

How do technology factors (educational apps, social media) affect motivation?

Two null hypotheses were tested:

H01: Parental involvement has no significant effect on academic motivation.

H02: Technology exposure has no significant effect on academic motivation.

Population and Sample: The population comprised 2,735 SSS2 students across Kogi's 21 local government areas. Using Taro Yamane's formula ($n = \frac{N}{1 + N(e^2)}$), a sample of 213 students (95% confidence, 5% error) was selected via stratified random sampling (urban: 60%, rural: 40%).

Instrument: The Senior Secondary Students Academic Interest Questionnaire (SSSAIQ) measured motivation (dependent variable), parental involvement (e.g., homework help, encouragement), and technology use (app frequency, social media hours). Scales used 5-point Likert items ($\alpha = 0.88$ for parental, 0.94 for technology).

Data Collection: Administered in four schools (Lokoja, Okene, Idah, Ankpa) in March 2025, with trained enumerators ensuring compliance. Response rate: 98%.

Analysis: Pearson correlation and multiple regression via SPSS tested relationships. Descriptive statistics contextualized findings. **Ethics:** Informed consent, anonymity, KSU IRB approval. **Limitations:** Self-report bias; cross-sectional design.

Parental and Technological Influences Unveiled

Descriptive Insights

Sample Profile: 213 students (55% male, 45% female; mean age: 16.2 years). **Parental involvement:** 40% high (urban bias), 45% moderate, 15% low (rural skew). **Technology use:** 65% used educational apps weekly (e.g., U-Lesson), 80% spent >2 hours daily on social media.

Motivation Levels: Mean academic interest score: 3.6/5. Urban students scored higher (3.9) than rural (3.2), reflecting resource disparities.

Correlational Analysis

Parental Involvement: Pearson's $r = 0.58$ ($p < 0.01$), indicating a moderate positive correlation with motivation. Specific

acts (e.g., reading discussions) raised interest by 25% (survey item 5).

Technology Factors: Educational apps correlated positively ($r = 0.45$, $p < 0.01$), while social media showed a negative correlation ($r = -0.32$, $p < 0.05$). Students using apps >3 hours/week scored 20% higher on motivation.

Regression Results

Variable	β	Std. Error	t	p	R ²
Parental Involvement	0.52	0.07	7.43	<0.001	0.34
Educational Apps	0.38	0.09	4.22	<0.01	0.28
Social media	-0.25	0.06	-4.17	<0.05	0.15

H01 Rejected: Parental involvement explains 34% of motivation variance ($p < 0.001$).

H02 Partially Rejected: Educational apps positively predict motivation (28%), but social media negatively impacts it (15%).

Qualitative Notes: Interviews ($n=20$) revealed parents' motivational talks boosted confidence, while social media distracted 70% of rural students due to poor digital literacy.

Synthesizing Influences and Proposing a Framework

Findings confirm parental involvement as a linchpin, aligning with Vygotsky's scaffolding and Epstein's involvement model. The 34% variance explained mirrors global trends (Hill & Tyson, 2009) but highlights Kogi's rural deficit. Technology's dual role apps enhancing, social media detracting extends TAM, suggesting context-specific adoption strategies (Eze, 2023).

Proposed Framework: Literacy Motivation Nexus

Inputs: Parental involvement (communication, learning support); technology (apps, social media).

Processes: Scaffolding (parental), engagement (tech-driven).

Outputs: Academic motivation, literacy gains.

Moderators: Urban-rural divide, parental education, digital literacy.

Policy Recommendations

Parental Engagement Campaigns: Schools to host quarterly PTA workshops, targeting rural parents with literacy roles (e.g., storytelling). Model: UNICEF's Nigeria Learning Passport (2023).

Digital Literacy Programs: Integrate app-focused training in curricula, reducing social media misuse. Budget: 5% state education funds (NBTE, 2023).

Infrastructure Boost: Expand solar-powered ICT hubs in rural schools, per Rwanda's model (World Bank, 2023).

Monitoring Metrics: Annual surveys to track motivation and literacy gains, aligning with SDGs.

Patterns and Impacts

Urban-Rural Divide: Urban parents, often civil servants, engaged more (65% attended PTAs) than rural farmers (25%), per survey data. This aligns with Okeke (2019), noting economic pressures limit rural involvement. Case study: In Lokoja's Crowther Memorial College, parents' weekly reading clubs raised motivation scores by 30% (school records, 2024). Rural Idah schools, however, reported only 10% parental engagement, with students citing fathers' absence due to farming.

Forms of Involvement: Communication (motivational talks) was most impactful ($r = 0.62$), followed by homework support ($r = 0.48$). Qualitative data: A female student noted, "My mother's stories about her school days make me want to read more" (Interview 8). Fathers' involvement, however, was lower (20% active), reflecting patriarchal norms prioritizing income over education (UNICEF, 2023).

Cultural Nuances: Igala and Ebira parents used oral traditions (proverbs, storytelling) to motivate, boosting interest 15% more than non-cultural methods (survey item 12). This echoes Vygotsky's cultural mediation, suggesting indigenous practices as untapped resources.

Technology's Role: Opportunities and Pitfalls

Educational Apps: U-Lesson and Khan Academy, used by 65% of students, improved vocabulary by 18% (pre/post-tests). Urban students accessed apps via school Wi-Fi, while rural students relied on costly data (₦500/week, 10% of family income; A4AI, 2023). Case study: Okene's Government Secondary School piloted U-Lesson, raising English scores 22% in 2024. Social Media Detractions: 80% of students spent >2 hours daily on WhatsApp and TikTok, reducing study time by 1.5 hours (survey item 15). Rural students, with less parental oversight, reported higher distraction (90% vs. 70% urban). A male student noted, "I start with U-Lesson but end up on TikTok for hours" (Interview 12). Regression confirms social media's negative β (-0.25), aligning with Vitalis (2024).

Digital Divide: Rural schools lacked computers (80% had none), and power outages disrupted app use. Urban

schools, with 30% computer access, showed 25% higher tech-driven motivation (survey data).

Interaction Effects

Regression interaction terms revealed parental involvement amplifies tech benefits: Students with high parental support and app use scored 40% higher on motivation than those with low support ($p < 0.01$). This synergy suggests a multiplicative effect, per SDT's relatedness-competence link (Ryan & Deci, 2000).

Bridging Gaps and Building Bridges

Theoretical Synthesis

The 34% variance from parental involvement validates Vygotsky's socio-cultural scaffolding, as parents act as mediators in Kogi's collectivist culture. The 28% tech contribution (apps) supports TAM's usefulness construct, while social media's negative effect reflects SDT's undermining of intrinsic motivation. These findings extend global studies (Hill & Tyson, 2009) to Kogi's context, where rural constraints amplify challenges.

Contextual Insights

Kogi's rural-urban divide mirrors Nigeria's broader digital and educational inequities (A4AI, 2023). Urban success (e.g., Crowther's reading clubs) suggests scalable models, but rural barriers economic pressures, low parental education require tailored interventions. Social media's 15% negative variance underscores the need for digital literacy, as rural students lack guidance to navigate tech productively (Vitalis, 2024).

Case Studies: Grounding Findings in Kogi's Reality

Urban Success: Crowther Memorial College, Lokoja Crowther, serving 1,200 students, implemented a 2024 parental reading program, with 50% of parents attending bi-weekly sessions. Students used U-Lesson for English, raising literacy scores by 22% (school data). Motivation scores reached 4.2/5, driven by parental encouragement (e.g., mothers reading novels with daughters). Social media use was moderated via school workshops, reducing distractions by 30%.

Rural Challenges: Idah Community Secondary School

Idah's 800 students faced 18-hour power outages, limiting app access. Only 10% of parents engaged, citing farming duties. Social media dominated (3 hours/day), lowering motivation to 3.0/5. A pilot app program in 2024 failed due to data costs, underscoring infrastructure gaps.

Comparative Analysis

Urban schools' success stems from resources and parental education (40% tertiary-educated vs. 10% rural). Rural schools need mobile-based apps and offline solutions, per Rwanda's model (World Bank, 2023).

Policy Recommendations: A Roadmap for Kogi

Parental Engagement Initiatives: Launch state-wide campaigns via radio (70% rural reach) to educate parents on literacy roles. Model: Ghana's Parent-Teacher Literacy Pact (UNESCO, 2023). Budget: ₦50 million annually, 3% of education funds.

Digital Literacy Curriculum: Integrate app training and social media management into SSS2 syllabus, targeting 80% student coverage by 2030 (NBTE, 2023).

Infrastructure Investment: Deploy 100 solar-powered ICT hubs in rural schools, reducing access gaps by 50% (World Bank, 2023).

Monitoring and Evaluation: Annual literacy audits using SSSAIQ metrics, aligned with SDG 4 (quality education).

Broader Implications: Scaling Beyond Kogi

Kogi's findings resonate with Nigeria's 36 states, where 40% of students face literacy deficits (WAEC, 2024). The parental-tech synergy model can inform national policies, especially in rural North-Central zones. Globally, sub-Saharan Africa's 33% digital literacy gap (ITU, 2023) underscores the need for context-specific interventions.

Future research should explore:

- 1) Longitudinal impacts of parental programs.
- 2) Gender-specific effects, given girls' lower literacy rates (UNICEF, 2023).
- 3) Cost-effectiveness of ICT hubs.

Conclusion

This study illuminates the potent interplay of parental involvement and technology in fostering literacy development among Kogi's SSS2 students. With parental influence driving 34% of motivation and technology's dual role shaping outcomes, the findings underscore the need for integrated strategies. The proposed framework, rooted in socio-cultural and acceptance theories, offers a blueprint for Kogi and beyond, urging schools to harness family and tech resources while mitigating distractions. By addressing rural-urban disparities and cultural nuances, this research paves the way for literacy gains, aligning with Nigeria's educational aspirations.

Detailed Insights and Future Directions. This study illuminates parental involvement and technology's pivotal roles in literacy development among Kogi's SSS2 students. By rejecting null hypotheses, it underscores family as a 34% driver of motivation and technology's dual impact. The proposed framework and recommendations offer a roadmap for policy, urging Kogi to harness cultural and digital assets for literacy gains. Future research should explore longitudinal effects and gender dynamics.

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