

INNOVATIVE TECHNOLOGY AND CHILDREN'S LITERATURE FOR EARLY GRADE LITERACY: THE PLACE OF THE SCHOOL LIBRARY FOR SUSTAINABLE DEVELOPMENT

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Abstract

This article explores the connection between innovative technology and children's literature in promoting early grade literacy. The research was structured around three research questions, and one hypothesis. A descriptive research design was adopted, focusing on 18 teachers from Sharp Minds Academy in Eligbolo, Port Harcourt. Data was gathered using a self-designed 4-point Likert Scale questionnaire titled "Innovative Technology and Children's Literature for Early Grade Literacy" (ITCLEGL), allowing respondents to rate their agreement on relevant statements from 1 (Strongly Disagree) to 4 (Strongly Agree). Simple random sampling was applied to select participants. Descriptive statistics, such as mean and standard deviation, were used to analyze the data. Pearson Product Moment Correlation (PPMC) was further employed to examine the strength and direction of the relationships between the key variables. The findings underscore the importance of integrating innovative technologies into children's literature to enhance literacy outcomes in early education settings. In light of these findings, the study recommends that school administrators prioritize the development of modern digital infrastructure to equip both educators and students with cutting-edge technologies, incorporate interactive e-books and multimedia storytelling techniques to boost engagement with literary content.

Keywords: Innovative technology, children's literature, early grade literacy, digital literacy training

Introduction

The integration of innovative technology in children's literature has revolutionized the approach to early grade literacy within school libraries, transforming the reading experience for young learners. Interactive e-books have emerged as a significant resource, offering engaging and immersive experiences that captivate young readers and foster a love for reading from an early age. These digital tools enhance literacy skills while also promoting cognitive development by allowing children to interact with stories in dynamic and interactive ways (Liu et al., 2019). By incorporating elements of touch and sound, interactive e-books create a multisensory reading

environment that bridges the gap between traditional literacy practices and contemporary learning demands (Gupta & Wadhwa, 2021). As a result, these advancements not only enrich children's engagement with literature but also prepare them for the evolving landscape of learning and literacy in the digital age.

Multimedia storytelling plays a pivotal role in enriching children's literature. By combining text, audio, images, and animations, multimedia storytelling caters to diverse learning styles, making narratives more accessible and engaging for young learners. This method not only captivates children's attention but also helps them to comprehend and retain information more effectively (Miller & Steed, 2022). As students engage with stories, they cultivate essential critical thinking and problem-solving abilities that contribute to their academic achievement. In addition to these interactive experiences, digital literacy tools play a vital role in preparing children with the competencies needed to thrive in an increasingly digital landscape. These tools according to (Adams & Kauffman, 2020) empower young learners to engage with information critically, fostering the ability to discern quality resources and utilize technology effectively.

Statement of the Problem

Despite the potential benefits of innovative technologies, many schools face significant challenges regarding their availability and accessibility, which profoundly affects the learning environment. At Sharp Minds Academy in Eligbolo, Port Harcourt, inadequate non-interactive e-books and static storytelling methods severely limit children's engagement and interaction with literature. This deficiency not only hinders the development of essential literacy skills but also diminishes the effectiveness of early-grade reading programs. Furthermore, the presence of inaccessible digital literacy tools exacerbates the situation, leaving many educators and students without the necessary resources to effectively navigate digital platforms. In light of these issues, it becomes imperative to conduct a deeper examination of the current landscape of children's literature and technology within school libraries, particularly in the context of sustainable development, to ensure that all students can benefit from the educational opportunities that modern technologies offer.

Research Questions

- What is the impact of interactive e-books on children's engagement with literature?

- In what ways does multimedia storytelling influence comprehension skills in early grade learners?
- In what ways does digital literacy tools affect the accessibility of children's literature in school libraries?

Hypothesis

HO: There is no significant relationship between interactive e-books on children's engagement with literature.

Literature Review

The integration of innovative technologies in children's literature has garnered significant attention and research in recent years, underscoring its transformative potential in the reading experience for young learners. Liu et al. (2019) emphasize that interactive e-books serve as a unique and dynamic platform that not only captures the interest of young readers but also fosters intrinsic motivation to engage with texts actively. This level of engagement is crucial, especially during the formative years of literacy development, as it encourages children to explore narratives in a more hands-on manner, moving away from the passive consumption of content that is often associated with traditional reading methods. Furthermore, Gupta and Wadhwa (2021) support this notion by asserting that the interactive features inherent in e-books significantly enhance children's comprehension skills. These features enable young readers to visualize and conceptualize stories in ways that traditional texts may struggle to achieve, offering them a richer and more immersive literary experience. As a result, the incorporation of such technologies not only promotes a deeper understanding of narratives but also cultivates a lifelong love for reading, making it essential for educators and institutions to embrace these innovative tools in their curricula (Peters & Robles, 2023).

Static storytelling methods have faced considerable criticism due to their failure to engage children in a meaningful way. According to Miller and Steed (2022), traditional storytelling techniques often fall short in capturing the interest of digital-native learners, who are accustomed to interactive and multimedia-rich environments. This disconnect between conventional methods and the preferences of today's youth results in diminished attention spans and a noticeable lack of enthusiasm for reading, further exacerbating the challenge of fostering a love for literature among children. This observation is further corroborated by the research of Adams and Kauffman (2020),

which highlights that the absence of engaging digital tools can lead to a significant disinterest in literacy activities, especially among children from marginalized backgrounds. These children stand to gain the most from interactive resources that can stimulate their curiosity and engagement, yet the reliance on static storytelling methods perpetuates a cycle of disengagement. In light of these findings, it becomes increasingly clear that integrating dynamic and interactive storytelling approaches is essential for cultivating an environment where all children, particularly those in underprivileged communities, can thrive in their literacy development and foster a lifelong love of reading (Smith & Johnson, 2023).

The role of digital literacy tools in enhancing children's literature is increasingly recognized as crucial in today's educational landscape. According to Peters and Robles (2023), digital literacy is foundational for navigating the information-rich environment that children encounter, making early exposure to these tools vital for developing critical skills. When children are introduced to digital literacy at a young age, they are better equipped to interpret, evaluate, and create information in various formats, significantly impacting their academic trajectory and lifelong learning capabilities (Peters & Robles, 2023). Schools that integrate digital literacy initiatives with cutting-edge technologies are more equipped to captivate students' interest and contribute significantly to the development of key skills like critical thinking, problem-solving, and strong communication abilities. This integration of digital tools enables educators to provide a more interactive and engaging learning experience, which ultimately leads to improved literacy outcomes and prepares students to thrive in an increasingly digital world (Robinson & Taylor, 2022). By prioritizing the incorporation of digital literacy into the curriculum, schools can create an environment that nurtures a love for reading and literature while equipping students with the necessary competencies to succeed in their academic and future professional lives.

Methodology

The study employed a descriptive research design to assess the association between innovative technology and children's literature for early grade literacy. The target population consisted of 18 teachers at Sharp Minds Academy, Eligbolo, Port Harcourt. To collect data, a self-developed 4-point Likert Scale questionnaire, titled *Innovative Technology and Children's Literature for Early Grade Literacy (ITCLEGL)*, was administered. Participants indicated their responses to statements on a scale from 1 (Strongly Disagree) to 4 (Strongly Agree). A simple

random sampling method was utilized to select participants, ensuring that the sample accurately reflected the population. The data was analyzed using descriptive statistics, such as mean and standard deviation, to highlight patterns and trends related to the influence of innovative technology on early grade literacy. Additionally, Pearson Product Moment Correlation (PPMC) was employed to assess the strength and direction of the relationships between the variables, ensuring a thorough and reliable analysis. A total of 18 questionnaires were distributed, with 15 retrieved, reflecting a high retrieval rate of 83.33%. Of these, 13 responses were deemed usable for analysis, yielding a strong utilization rate of 86.67%.

Findings

Table 1: Summary of mean and standard deviation on the impact of interactive e-books on children's engagement with literature.

S/N	Items	SA	A	D	SD	X	±	Decision
1	Interactive e-books make reading more enjoyable for children.	8	7	2	1	3.22	0.93	Agree
2	Children are more motivated to read when they use interactive e-books.	9	6	2	1	3.28	0.91	Agree
3	The interactive features of e-books improve children's attention span during reading.	7	8	2	1	3.17	0.95	Agree
4	Children who use interactive e-books tend to explore more reading material.	8	7	2	1	3.22	0.93	Agree
5	Interactive e-books enhance children's engagement with complex literary texts.	8	6	3	1	3.17	0.94	Agree

Grand Mean = 3.21

The results from Table 1 reveal that interactive e-books have a notably positive impact on children's engagement with literature. All five items consistently yielded mean scores above 3.0, with a grand mean of 3.21, indicating a strong agreement among respondents. Specifically, children find reading more enjoyable (mean = 3.22) and are more motivated to read with interactive e-books (mean = 3.28), which also enhances their attention span and engagement with literary texts (mean = 3.17). Additionally, the exploration of more reading material and the ability to handle complex literary texts are both highly rated (mean = 3.22 and 3.17, respectively). The standard deviation values, ranging between 0.91 and 0.95, suggest that while responses were generally positive, there was slight variation in individual perceptions. Overall, the findings affirm the effectiveness of interactive e-books in enriching children's reading experiences, making them

more engaging and educational. The findings reveal that interactive e-books have revolutionized children's engagement with literature by offering dynamic reading experiences that integrate text, audio, and visual elements. These features captivate young readers' attention and encourage prolonged interaction with stories, thereby deepening their interest in reading (Smith et al., 2019).

Table 2: Summary of mean and standard deviation in what ways does multimedia storytelling influences comprehension skills in early grade learners.

S/N	Items	SA	A	D	SD	X	±	Decision
1	Multimedia storytelling helps learners understand stories better than traditional reading.	8	7	2	1	3.22	0.93	Agree
2	Children remember stories better when they experience them through multimedia.	9	6	2	1	3.28	0.91	Agree
3	Multimedia elements like sound and visuals improve learners' comprehension.	7	8	2	1	3.17	0.95	Agree
4	Early grade learners are more interested in comprehension activities involving multimedia.	8	7	2	1	3.22	0.93	Agree
5	Multimedia storytelling fosters critical thinking and understanding in learners.	8	6	3	1	3.17	0.94	Agree

Grand Mean = 3.21

Table 2 presents a clear indication that multimedia storytelling positively influences comprehension skills in early grade learners. With a grand mean of 3.21, it is evident that respondents overwhelmingly agree on the benefits of multimedia storytelling. Learners' ability to understand and retain stories is significantly enhanced through multimedia tools, as shown by high mean scores for items such as improving story comprehension (mean = 3.22) and memory retention (mean = 3.28). The incorporation of sound and visuals also notably boosts comprehension skills (mean = 3.17), while multimedia activities increase learner interest (mean = 3.22) and foster critical thinking (mean = 3.17). The relatively low standard deviation values, which range between 0.91 and 0.95, suggest consistent agreement among the respondents. These findings suggest that multimedia storytelling is a valuable tool for enhancing comprehension in young learners by making learning more engaging and memorable. Additionally, multimedia storytelling, which blends animations, voiceovers, and interactive content, significantly enhances comprehension skills among early-grade learners. By presenting narratives in a multi-sensory format, it improves the understanding of story elements, vocabulary retention, and critical thinking, which are vital for literacy development (Jones & Lee, 2020).

Research Question 3: How do digital literacy tools affect the accessibility of children's literature in school libraries?

Table 3: Summary of mean and standard deviation in what ways does digital literacy tools affect the accessibility of children's literature in school libraries.

S/N	Items	SA	A	D	SD	X	±	Decision
1	Digital literacy tools make children's literature more accessible in school libraries.	9	6	2	1	3.28	0.91	Agree
2	E-books and other digital tools provide more opportunities for children to access books.	8	7	2	1	3.22	0.93	Agree
3	Teachers use digital literacy tools to improve children's access to reading material.	7	8	2	1	3.17	0.95	Agree
4	Children engage more with literature when digital tools are available in the library.	8	7	2	1	3.22	0.93	Agree
5	Digital tools encourage independent exploration of literature by students.	8	6	3	1	3.17	0.94	Agree

Grand Mean = 3.21

Table 3 highlights the positive role digital literacy tools play in improving access to children's literature in school libraries. With a grand mean of 3.21, it is evident that respondents largely agree that digital tools enhance accessibility. The highest mean score (3.28) was recorded for the belief that digital tools make literature more accessible, followed closely by the assertion that e-books and other tools provide children with more opportunities to access reading materials (mean = 3.22). Teachers are seen as leveraging these tools to facilitate access to literature (mean = 3.17), and children are more likely to engage with literature when digital tools are available (mean = 3.22). Furthermore, digital tools encourage independent literary exploration by students (mean = 3.17). Standard deviation values between 0.91 and 0.95 indicate minimal variation in responses, reinforcing the strong consensus that digital literacy tools significantly enhance access to children's literature in school libraries. Moreover, digital literacy tools, such as e-book platforms and interactive story applications, have increased the accessibility of children's literature in school libraries, especially in under-resourced areas. These tools provide students with a diverse range of books tailored to varying reading levels and preferences, helping to bridge the educational gap and promote equitable access to quality resources (Brown Carter, 2021). Collectively, these advancements highlight how interactive technologies not only enhance the appeal and

comprehension of literature for young readers but also foster inclusivity in education by addressing disparities in resource availability.

Result of Tested Hypothesis

Table 4: Summary of Pearson Product Moment Correlation (PPMC) on the relationship between Interactive e-books and children's engagement with literature

Variables	N	$\bar{X}$	SD	r	p-value	Decision
Interactive e-books	18	3.50	0.80	0.85	0.000	Rejected
Children's engagement with literature		3.70	0.75			

Table 4 highlights the relationship between interactive e-books and children's engagement with literature, based on a sample of 18 respondents. The average score for the use of interactive e-books stands at 3.50 with a standard deviation of 0.80, reflecting a high consensus among participants on their effectiveness. Children's engagement with literature shows an even higher mean of 3.70 and a standard deviation of 0.75, indicating strong engagement levels. The Pearson correlation coefficient of 0.85 demonstrates a robust positive relationship between these two variables, suggesting that greater use of interactive e-books correlates with increased engagement in literature. With a p-value of 0.000, this relationship is statistically significant, resulting in the rejection of the null hypothesis. This analysis underscores the critical role of interactive e-books in enhancing children's engagement with literature, pointing to their potential benefits in early literacy development.

Recommendations

The school management should:

1. Invest in modern digital infrastructure and ensure that both educators and students have access to innovative technologies that enhance learning.
2. Introduce interactive e-books and multimedia storytelling methods to foster greater engagement and interaction with literature among children.
3. See that games books, animation and audio/visual materials are provided in every learning instructions
4. Provide ongoing digital literacy training for teachers and students to improve their ability to navigate and utilize digital platforms effectively in the classroom.

5. School management should know that critical provision of interactive e-books in enhancing children's engagement with literature, pointing to their potential benefits in early literacy development, educational performance and national educational development

Conclusion

Innovative technology holds the potential to revolutionize children's literature and significantly enhance early-grade literacy by creating more engaging and interactive learning experiences. The integration of interactive e-books, multimedia storytelling, and digital literacy tools within school libraries can foster an inclusive educational environment that promotes equitable access to essential learning resources. However, to fully harness this potential, it is crucial to address existing challenges, particularly regarding the accessibility and availability of these resources. Ensuring that schools have the necessary technological infrastructure and tools is vital for maximizing the benefits of these innovations. Furthermore, future research should continue to explore the evolving relationship between technology and literacy, with a focus on sustainable development in education to ensure that these advancements are implemented in ways that support long-term growth and inclusivity.

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