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TECHNOLOGIES IN LITERACY EDUCATION RESEARCH

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ABSTRACT

The paper highlights the role of technologies in literacy education research. Literacy is defined as the ability to read, write, compute, and connect with people in any setting by using communication devices effectively. The notion of literacy is complex; it is a social construction with varying connotations for different ethnic groups throughout history. Nigeria's efforts to promote literacy started in the 1940s when government schools started offering evening classes. In Kano, the Holy Trinity Anglican School started providing evening sessions in 1940. Meanwhile, in the Udi District of what is now Enugu State, District Officer Edward Rowland Chadwick initiated an experiment in literacy and community development in 1942.Research on literacy education includes a broad spectrum of studies and inquiries into several facets of literacy, such as writing, reading, and associated abilities. Effective teaching strategies, the effects of literacy interventions, the growth of reading and writing skills, and the more general socio-cultural and cognitive components of literacy should all be investigated by researchers in the field. Modern literacy education relies heavily on technologies, which provide creative tools and resources to improve instruction, learning, and the development of literacy abilities. The research on literacy education has been greatly impacted by technological improvements, which have given learners new tools and approaches to investigate learning facets. Furthermore, since literacy education research explores the dynamic and evolving nature of literacy in the digital age, technologies can make a huge contribution to that evolution. Researchers can carry out creative and significant research to help develop more effective and modern teaching-learning strategies for literacy education. Digital storytelling platforms, interactive whiteboards, online reading platforms, word processing programmes, speech-to-text technology, augmented reality (AR) and virtual reality (VR), gamified learning platforms, adaptive learning systems, podcasting and audio resources, digital literacy and internet resources, and collaborative writing tools are some of the common technologies used in teaching and learning that this paper identifies.

Keywords: Literacy, Literacy Education, Literacy Education Research, Technologies in Literacy Education

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Introduction

literacy is the ability to read, write, compute, and use communication technology effectively to communicate with others in any setting. The notion of literacy is complex; it is a social construction with varying connotations for different ethnic groups throughout history (Aderinoye, 2018). According to Rintaningrum (2023), the term literacy encompasses a complex of language and thinking skills as well as a range of habits, attitudes, interests, and body of knowledge that may be applied in a variety of circumstances and for a variety of reasons. Literacy has evolved from its traditional definition as a collection of skills related to reading, writing, and math to include the ability to recognise, comprehend, interpret, create, and communicate in an increasingly digital, text-mediated, information-rich, and dynamic environment (UNESCO, 2021). A person's level of proficiency in a particular task or field of labour, as well as the expansion of options and the growth of humanity overall, are all determined by their level of literacy. In addition, it can be used to improve most lifeskill competencies and empower others (Ojokheta & Oladeji, 2018). For individuals, groups, and communities to function effectively, people must be literate in order to engage in literacy-related activities (Sarumi & Olajide, 2018). In addition to reading and writing, modern literacy also encompasses the acquisition of skills required for survival in the job (Adelore & Ojedeji, 2019). Employers, for example, now need candidates to have computer literacy and multi-media-related abilities (Odiaka & Ajiye, 2021).

Thus, is impossible to analyze any field of endeavour without first recognising its facts, vocabulary and actions, since literacy is the cornerstone of the Education for All movement and the foundation for all subsequent learning (Omolewa, 2018). To effectively communicate and interpret in modern society, one must possess a certain level of literacy (Aderinoye & Momoh, 2018). Critical thinking abilities are developed more easily with literacy (Odiaka, 2016). Literacy is of paramount importance to human development, as it plays a critical role in shaping individuals, societies, and economies. It goes beyond the ability to read and write; it encompasses comprehension, communication, and critical thinking skills. Literacy empowers individuals to access knowledge and information independently. It enables them to make informed decisions, take charge of their lives, and pursue their aspirations (UNESCO, 2020).

Literate individuals are better equipped to navigate the challenges of life and have greater control over their destiny. Literacy is the foundation of formal education. A literate population can actively participate in various learning opportunities, leading to improved educational outcomes. People may gain new skills, adjust to changing conditions, and maintain their competitiveness in the labour market thanks to it, which also promotes continuous learning (Hanemann, 2016). Improved health outcomes are associated with literacy. It improves people's

comprehension of health information, empowering them to seek medical attention and make better decisions. When it comes to managing chronic ailments, preventing diseases, and comprehending medicines, health literacy is very important. For social interaction and effective civic engagement, literacy is a prerequisite. It makes it possible for people to be informed citizens, comprehend their rights and obligations, and actively engage in the political process in democracies (Wicht, Rammstedt& Lechner, 2021).

People with literacy skills can be constructive change agents and contribute to the development of their communities. One of the main forces behind economic growth is literacy. A workforce with greater literacy is more adaptive and productive, which boosts economic growth and lowers poverty rates. It encourages entrepreneurship and innovation, two things that are essential to a healthy economy. Gender equality and literacy are strongly related. Gender inequality has been sustained in many nations because women and girls have always faced obstacles to education. Encouraging literacy for all genders, societies can realize the full potential of their population and move closer to gender equality. On the other hand, illiteracy can result in social exclusion and marginalization (World Literacy Summit, 2018). Reading fosters empathy and understanding between people from different backgrounds, which increases social cohesion and lowers conflict. It can be an effective instrument for advancing stability and peace. Languages, customs, and cultural information can be passed down from one generation to the next thanks to literacy. It is essential to preserving cultural identity and legacy.

Digital literacy is necessary in the present era to fully engage in society. To interact, communicate, and obtain information online, people must be able to use technology efficiently. Consequently, the foundation of social, economic, and personal development is literacy, a fundamental human right. To support literacy and ensure that everyone, regardless of background or circumstances, has access to high-quality education, governments, communities, and organizations must collaborate. According to Reder, Gauly, and Lechner (2020), investing in literacy is an investment in a more promising, inclusive, and sustainable future for humanity. Any country may progress by using literacy as a vital instrument because it can inspire people to take action and raise their knowledge of the fundamental problems affecting their communities and way of life. Everyone in Nigeria was obliged to acquire knowledge, whether formal or informal, as literacy education has been identified as a crucial instrument for the country's development.

This was highlighted in the country's National Policies on Education in 2004 and 2007. As knowledge acquisition and literacy are presently necessary for rapid development, Goal 4.6 of the 2030 Sustainable Development Agenda lists literacy as one of the main goals (UNESCO, 2021). The future generation can benefit from

literacy by being better prepared for situations that have not yet been thought of, careers that have not yet been invented, and technology that has not yet been manufactured. The Organization for Economic Cooperation and Development (OECD), 2018 states that literacy can foster curiosity, imagination, resilience, self-control, respect for the opinions, perspectives, and values of others, as well as the capacity to keep going despite obstacles in order to navigate through uncertainty. Acquiring literacy skills can give learners a sense of direction and equip them with the abilities to make positive changes in their own lives, the lives of others, and the world at large.

Additionally, the Global Youth Awareness Team (2020) states that they believe literacy may help raise public awareness of various aspects of life and help people find better solutions to societal problems like ignorance and poverty. However, literacy is more than just a phenomenon of the economy; it also shapes human thought and direction in all spheres within the larger community. Instilling in people a sense of morality, a sense of justice, fair play, optimism, and the innate ability to survive in larger society is the aim of literacy. People have a right to the knowledge required to read and write, as literacy is vital to the advancement and development of any nation. Literacy plays a major role in improving the physical, psychological, economic, political, social, cultural, and educational elements of human life.

Every nation's advancement depends on literacy as both a means and a foundation (Nkamnebe & Nkamnebe, 2018). In order to help people, achieve their goals, increase their knowledge and potential, and actively participate in their communities and larger society, literacy entails a continuum of learning. It is critical to keep in mind that literacy is assessed at several proficiency levels in a range of areas, such as writing, reading, numeracy, and other life skills. Literacy is essential in improving and acquiring the life and employability skills required to getting a paid job (Ajiye, 2022). Possessing literacy skills is also a requirement for pursuing further education and training, as well as for gaining transferable technical and vocational skills that improve one's chances of getting a good job. Individuals with limited reading comprehension tend to work in low-skilled occupations and have fewer career options (Ajiye, 2022). (Edeh and Omokhabi, 2019).

Adults with low literacy are 2.5 times more likely to be unemployed than their more literate colleagues (Global Youth Awareness Team, 2020). People who lack literacy are also more susceptible to illnesses (Ajiye, 2022).

Literacy Education in Nigeria

Nigeria's efforts to promote literacy started in the 1940s when government schools started offering evening classes. The Holy Trinity Anglican School in Kano started offering evening classes in 1940, and in 1942, Edward Rowland Chadwick, the district officer in charge at the time, launched an experiment in

literacy and community development in the Udi District of what is now Enugu State. These facts, according to Aderinoye (2004), provided support for the claim. To elaborate, Anyanwu (1980) revealed that, starting in 1943, the colonial authorities actively sought to replace the indigenous and Islamic adult education programmes with Western adult education programmes in an attempt to garner Nigerian support and donations for the war effort. At the end of World War II in 1945, there was also a greater need for literacy instruction. Consequently, in 1946, Nigeria appointed a veteran soldier, Major A.J. Carpenter, who had taught literacy in the army, as its first mass education officer. This was a 10-year mass literacy campaign, the first of its kind in the country, with the aim of making the majority of the population literate. The Nigerian government did not start another initiative to promote literacy until Chief A.Y. Eke was the minister of education from 1974 until 1984.

Regretfully, a number of issues, including inadequate money, difficulty hiring instructors, inadequate literacy training, and a lack of understanding of the principles of literacy, contributed to the failure of this attempt (Sarumi, 2005). On September 8, 1982, the Shehu Shagari government initiated a second ten-year national literacy campaign. The Lteracy Decade was declared by this project to span the years 1982–1992. September 8th has been observed as National Mass Literacy Day in Nigeria. The Federal Government's mandate to establish the Adult and Non-Formal Education Agency in 1987 to supervise literacy teaching in all of the Federation's states, including the Federal Capital Territory (Abuja), was another momentous occasion.

Additionally, the National Primary Education Commission was founded in 1993 to monitor basic literacy in the formal educational system, and the Nomadic Education Commission was established in 1989 to oversee the fundamental education of children of migrants and nomads. In 1990, the National Commission for Mass Literacy was founded with the aim of eliminating illiteracy in Nigeria; it commenced full operations in 1991. Additionally, on September 8, 1992, the Babangida administration restarted the National Mass Literacy Campaign and declared 1990–2000 to be another Literacy Decade (Aderinoye, 2004).

Literacy Education Research

Research on literacy education includes a broad spectrum of studies and inquiries into several facets of literacy, such as writing, reading, and associated abilities. Effective teaching strategies, the effects of literacy treatments, the growth of reading and writing skills, and the more general socio-cultural and cognitive components of literacy are all topics that scholars in the field of literacy should investigate (Rintaningrum, 2019). The cognitive and linguistic processes involved in the early phases of literacy acquisition, including the growth of young children's vocabulary, phonemic awareness, and comprehension abilities, should be the subject of research. Research ought to

concentrate on the elements that affect reading comprehension as well, like background knowledge's importance and the intricacy and fluidity of the text. Researchers also look into ways to help people of different ages understand more.

Effective writing instruction techniques, such as the benefits of process-oriented writing instruction and feedback techniques, should also be investigated in research. To measure literacy skills and find efficient methods of evaluating reading and writing competency in a variety of populations, several researchers have created and validated assessments (Irawan, Adawiyah, Zubaidah, and Arsih, 2023). To support struggling readers and writers, studies in literacy education should look into the efficacy of literacy interventions, such as reading programmes, tutoring initiatives, and technology-based interventions (Insa, Gonzalez, Inesta, 2016). Research can be utilized to investigate how linguistic variety and cultural factors affect literacy instruction and acquisition in multilingual and multicultural situations. Because digital technologies are becoming more and more important, scholars studying literacy education should also look into how people learn digital literacy skills and how technology affects writing and reading habits.

Research on literacy teaching for people with special needs, such as those who have dyslexia, learning disabilities, or other difficulties, should also look at successful inclusive education practices (Henshon, 2015). Effective ways to get tutors ready to teach literacy skills can also be investigated through literacy education research, as can continuous professional development programmes aimed at improving instructors' literacy instruction strategies. Looking at community-based literacy programmes and household literacy practices, literacy education researchers can also explore the role that families and communities play in fostering literacy development (Beghetto, 2017). Research can also investigate the connection between socioeconomic characteristics and reading abilities, looking at how literacy affects social, economic, and professional results as well as proposing solutions for literacy disparities. In addition to examining the effects of adult literacy programmes on community development and individual empowerment, research on adult literacy can also concentrate on efficient techniques for teaching literacy skills to adults, even those with low literacy levels (Tsai, 2022).

Scholars can also investigate the developments in neuroscience that help explain the cerebral processes that underpin the development of literacy as well as the effects of brain-based therapies on the abilities of writing and reading. Research on literacy instruction ought to be multidisciplinary, incorporating ideas from sociology, psychology, linguistics, education, and other disciplines (Pellegrino & Hilton, 2023). Improving our knowledge of literacy processes and providing

educators, policymakers, and other stakeholders in literacy education with evidence-based methods should be the main objectives.

Technologies in Literacy Education

Digital technology refers to devices such as computers, tablets, and cell phones, as well as the myriad of digital activities that children engage in today, such as surfing the internet, visiting social networking sites, chatting, and playing video games (Omokhabi, 2021).Digital technology use is a broad term that encompasses a range of tools, services, and usage patterns that have grown and are rapidly changing the way people live (Omokhabi,2023) Modern literacy education relies heavily on technologies, which provide creative tools and resources to improve instruction, learning, and the development of literacy abilities. Technology integration in literacy instruction can offer chances for individualized instruction, engagement, and skill development in line with the requirements of 21st-century literacy. To guarantee the intended literacy growth, it is crucial to carefully incorporate these tools into teaching and learning in literacy education (Zhang, Sun, Gao, & Fang, 2019). Among the important technologies employed in literacy instruction are:

Educational Apps: - Mobile apps that are intended to teach reading to learners of all ages offer dynamic and captivating content. Activities for reading, writing, phonics, and vocabulary development are frequently included in these apps.

Digital Storytelling Platforms: - Digital storytelling platforms that let learners write and share stories combine text with multimedia (pictures, sounds, and videos) to improve literacy. These resources help foster communication and innovation.

E-Books and Digital Libraries: - A vast array of reading materials in electronic format can be accessed through e-books and digital libraries. These readily available materials encourage learners to read independently by being accessible on computers, iPads, and e-readers. Interactive

Whiteboards: - Tutors can design dynamic classes that involve learners in literacy activities by using interactive whiteboards in literacy classrooms. These interactive whiteboards support group projects, multimedia presentations, and interactive writing and reading exercises.

Online Reading Platforms: - A huge selection of interactive digital books with comprehension exercises, quizzes, and interactive elements can be found on platforms like Epic and Reading A- Z. These platforms allow for individualized instruction and accommodate a range of reading levels.

Word Processing Software: - Word processors that offer tools for creating, revising, and formatting written work, such as Microsoft Word and Google Docs, improve writing abilities. Features that allow for collaborative editing can also encourage learner collaboration and feedback.

Speech-to-Text Technology: - Word processors that offer tools for creating,

revising, and formatting written work, such as Microsoft Word and Google Docs, improve writing abilities. Features that allow for collaborative editing can also encourage learner collaboration and feedback.

Augmented Reality (AR) and Virtual Reality (VR): - Immersion reading experiences can be produced with AR and VR technologies. Engaging learners with virtual field trips, interactive storytelling, and 3D visualisations can improve comprehension and increase learning engagement.

Online Learning Platforms: - Learning management systems (LMS) and online platforms like as Google Classroom offer tutors a virtual workspace where they may set assignments, exchange resources, and evaluate the literacy abilities of individual learners. These platforms are able to facilitate remote and blended learning settings.

Digital Dictionaries and Thesauruses: - Digital dictionaries and thesauruses can facilitate vocabulary building and linguistic exploration. They are accessible as online apps or mobile apps and offer instant access to word meanings, synonyms, and antonyms.

Gamified Learning Platforms: - Gamification features in literacy platforms and applications increase the fun factor of learning. In an engaging and competitive setting, game-based exercises can also inspire adult learners to hone their writing and reading comprehension skills (Noroozi, Dehghanzadeh & Talaee, 2020).

Adaptive Learning Systems: - Personalized training tailored to each learner's needs is made possible by adaptive learning technologies that leverage data analytics. These systems can be used to tailor the material and difficulty level for adult learners based on their performance, giving them individualized help.

Podcasting and Audio Resources: - Podcasts and other audio materials improve language development and listening abilities. For storytelling and communication purposes, learners can make their own podcasts and tutors can use audio material in their classes.

Digital Literacy and Internet Resources: - In the current day, teaching digital literacy skills is essential. It can be utilized by learners to their advantage to properly browse online resources, assess material critically, and participate in online conversation.

Collaborative Writing Tools: - Real-time collaborative writing platforms, Google Docs, Microsoft Teams, and other tools allow learners to collaborate together on assignments. Under the leadership of the tutor, this can encourage peer editing and collaboration among the learners (Slavin, 2022).

Challenges to Technology Adoption in Literacy Education Research

One of the obstacles to the adoption of technologies in literacy education research is digital divide in the area of access disparities where many educational researchers lack access to necessary devices and internet

connectivity for software updates, there is also a concern about equity which results in unequal learning opportunities, particularly hindering researchers in rural and underprivileged areas. Inadequate training on integration of technology into literacy instructions and researches have resulted in limited digital literacy, where some adult education researchers are unable to use technological tools effectively. Another issue is the high cost and upkeep of sophisticated edtech tools and software institutions struggle to update and maintain their digital infrastructure over time. Another problem is andragogical concerns which arise when technology is utilized as a replacement for effective teaching-learning and experiential learning rather than as an addition (Unesco, 2022).

The irony is that some of these tools are not in line with literacy andragogy and curriculum goals. Concerns regarding data privacy and ethics are another issue as using educational platforms frequently entails gathering data. Opposition to change: Traditional literacy researchers are frequently dubious of digital approaches and some researchers and institutions may be reluctant to embrace new technologies out of a lack of time a fear of change or mistrust. The fact that many digital literacy tools are still in the experimental stage and do not yet have standardized evaluation frameworks makes it harder to evaluate the literacy outcomes that come from digital interventions. The integration of digital tools in education research is also hindered by contextual and cultural constraints. The majority of edtech tools are created in Western contexts which may mean they lack cultural relevance in other areas. Additionally, language diversity may be an issue if the tools are not appropriately localized (Hutchison & Reinking, 2011).

Solutions to the Problem of Technology Adoption in Literacy Education Research

Bridging the digital divide through collaborations with government and non-profit organisations to subsidize internet and device access for marginalized communities is one of the practical solutions to the difficulties of integrating technologies in literacy education research. Community tech hubs with ICT centers are established in literacy centers, schools and libraries to provide digital tools to learners' tutors and researchers. In addition, there is need to encourage frequent workshops and training programmes for educators and researchers on digital tools for literacy development, this can help build digital literacy skills. Digital skills should also be incorporated into the curriculum from an early age (Spencer & Juliani 2017).

The use of open-source tools to create affordable and sustainable tech solutions should be promoted. Low-bandwidth technologies such as Kolibri by Learning Equality which offers offline access to educational content and is frequently utilized in under-resourced areas should also be developed. Platforms like Google Workspace Edmodo and Moodle should also be taken into consideration to cut costs. Additionally, it's necessary to combine tech-based methods with conventional literacy instruction such as digital narratives electronic books. The issue of technology integration in education

research can also be resolved by localizing content managing data and obtaining assistance from NGOs and the government (Hutchison & Reinking 2011).

Conclusion

The literature on literacy instruction has been greatly impacted by technological developments, which have given learners new resources and approaches to investigate hitherto undiscovered aspects of learning. Furthermore, since literacy education research explores the dynamic and evolving nature of literacy in the digital age, technologies can make a huge contribution to that evolution. Newer and more effective teaching-learning activities in literacy education practices can be informed by the creative and significant research that scholars do.

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