

Digital literacy and Quest for the Transformation of Basic Education in Ebonyi State, Nigeria

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Abstract

The contemporary world has become a world where learners and teachers would acquire and disseminate knowledge from every part of the globe. The dissemination of knowledge across national boundaries to learners scattered in different learning environments are often driven by digital technology. This study focuses on the dynamics of digital literacy using secondary data that were randomly selected from the extant literature. It presents the challenges that hitherto undermined digital literacy before using Albert Bandura's social learning theory as the basis for the development of the study. The study found that digital literacy is fundamental for the transformation of science education in Ebonyi State Nigeria. It recommended multi-dimensional state and non-state interventions towards the strengthening of digital literacy in the state. The study is very important because it will provide policy posture for the government if adopted and it will encourage the teachers in isolated Ebonyi communities to adopt digital literacy as an approach to advance teaching and learning.

Key Words: *Digital literacy, science education, learning & Ebonyi State*

Introduction

Basic science has become a major discipline in the Nigerian education sector. It contributes largely towards the transformation of basic science education in different parts of the country. the need for Science education in the Nigerian state became imperative considering that the missionary education was largely catechetical. Unfortunately, the years after independence has the education sector largely undermined by the regional politics of that time. That was followed by the military dictatorship that gave fillip to the national negligence of the education sector. The implication was that science education was largely neglected for decades in the Nigerian development history.

To make matters worse, the introduction and development of the discipline was largely undermined by the lack of fund, lack of resources and other emerging problems like insecurity that have undermined the Nigerian state. It should also be noted that one of the problems of teaching and learning of Basic science as Nwankwo and Okoli (2023) noted is that the contents are not arranged in order of importance in science learning, making it difficult for teachers to teach and for students to learn as well. Again, Ikusika and Okoli (2023) accentuated that the fundamental unity of scientific thoughts and the avoidance of undue emphasis on the distinctions existing in various science disciplines makes it difficult to produce a precise and comprehensive textbook for Basic science. These problems make it difficult for science teaching with a consequent effect that has led to poor interest in learning basic and resultant unsatisfactory academic achievement.

Students' academic achievement in Basic science has although improved over time but has not met the expectation of teachers and researchers. There is still the problem of poor understanding of foundational concepts in Basic science. Students do not also learn the content of the subject enough to be able to relate it to reality thereby making the subject to be uninteresting to many of them. Students also lack the digital skills to utilize digital resources and improve their knowledge of Basic science, which is necessary in communicating with the outside world. The improvement of basic skills is fundamental for the improvement of academic achievement.

Also, a significant number of students who have low digital literacy experience social and intellectual isolation as a result of their inability to effectively engage with friends and family members who possess greater technological proficiency. Their isolationism is also worsened by their

inability to source learning materials from other parts of the globe. In short, they are often limited to the immediate environment that they find their self. They cannot assess further learning materials that are limitless in the digital space but are often confined with the limited number of offline and material resources around their learning environment. In academic communities and environments, such students according to Djawad, Suhaeb and Jaya (2018) often lose interest in learning and suffer severe academic set-backs which leads to poor academic achievement. Hence, the development of digital literacy is a crucial element in fostering social competence, which in turn has the potential to enhance interest and academic achievement in the field of Basic science. The employment of digital resources however, appears to bear some beneficial boost on students' interest in learning Basic science and would also lead to enhanced academic achievement.

Science education in this phase of fast advancements in todays' postmodern human societies has become the bedrock of national development. Although, science learning is introduced to children from lower basic level of education in Nigeria. It is studied at the upper basic level of education as a unifying whole under the subject Basic science. Basic science being the foundational subject combine nearly all aspect of science discipline, making the subject difficult to teach and learn at the basic education level. However, students through effective collaboration among themselves, with teachers and other adults, and through recourse to digital tools and technologies can enhance their academic achievements in the subject as well as the interest to continue to study its contents. To do so however requires a good level of social competence and digital literacy. The poor presence of digital resources for teaching and learning at basic schools in Ebonyi State makes this study imperative. The study therefore investigates into the nature of digital literacy and what constitutes its advantages to educational development of Basic science in Ebonyi State, Nigeria. This study uses Albert Bandura social learning theory to develop its content.

Theoretical Orientation

The social learning theory was propounded by Albert Bandura in 1977. The theory states that observers process and think about what they witness being modeled, which when combined with environmental factors results in the assimilation and imitation of positive or negative behaviours. Social learning proposes that individuals learn through the

observation of “models,” such as friends and family members, movie and television characters, or most significantly for educators; their teachers and other authority figures at school. Thus, the theory emphasizes observational learning. Observational learning is a key aspect of social learning theory, where individuals learn and adopt behaviours by observing others. This process often involves modeling after those who are similar, high-status, knowledgeable, rewarded, or nurturing figures in our lives. Students pay attention to some of these people (models) and encode their behaviour. At a later time, they may imitate (that is, copy) the behaviour they have observed.

Based on Bandura’s research, several factors enhance the likelihood of a behaviour being imitated. Students are more likely to model their behaviours after individuals who are similar to them. This is because they are more likely to identify with these individuals, making their behaviours seem more relevant and attainable. This can include similarity in terms of age, gender, ethnicity, or even shared educational interests and values. Again, students also imitate behaviours that are rewarded. Students who see that a model is rewarded for their behaviours are likely to imitate them, while behaviour resulting in negative outcomes is less likely to be copied. This is known as vicarious reinforcement. For instance, if a student sees that another student gets praised by the teacher for asking questions, they are likely to ask questions themselves.

Again, given the advancements in technology, a lot of social group exist on the internet which include academic social units intended for learning and dissemination of learning materials or for other purposes. Students take advantage of these social groups to create a social atmosphere for learning. Sometimes teachers may create online collaboration units in the internet where students can share knowledge and advance learning.

The implication of the study is that, whereas learning is facilitated quite easily in a social atmosphere where a teacher could model for the students, the students nevertheless need to be socially competent and digitally literate. Therefore, teachers of basic education ought to strive to model the intended learning for students, and employ digital tools to ensure the creative of a more robust social learning atmosphere. Implicit in the theory also, is the idea that teachers could cite examples of models who have utilized the content of learning materials in the creation and solution to societal problems, and in this way drive home the importance of the learning contents. This study is a qualitative research that was

developed using secondary data that were collected from different contemporary academic literatures.

Literature Review

Abbas, Hussain and Rasool (2019) carried out a study on digital literacy effect on the academic performance of students at higher education level in Pakistan. The purpose of current study was to explore the effect of digital literacy on academic performance of the students at higher education level. Five research questions guided the study. The design of the study was mixed method research (Abbas, Hussain and Rasool 2019). The population comprised the students of M.S/M.Phil & Ph.D. A sample of 800 students was selected randomly from 10 Universities. The instrument for data collection was questionnaire and semi-structured interviews. The validity and reliability of the scales were ensured through experts' opinion, pilot testing and Cronbach Alpha technique which yielded a coefficient of 0.83. Analysis of data was carried out using mean, standard deviation and Pearson correlation were used. Results revealed that digital literacy had significant effects on communication skills, research skills and confidence of the students and insignificant effect on students' CGPA (Abbas, Hussain and Rasool 2019). There was also a negative correlation between digital literacy and academic achievement. It was recommended that the general universities should plan various types of training, workshops and seminar to enhance students' interest in learning and practicing digital literacy and minimize various barriers to learning and practicing digital literacy. Unlike the reviewed study which was carried out using university students in Pakistan, the present study will be carried out using basic education students in Ebonyi state, Nigeria. The present study will analyse the data generated from the study using simple and multiple linear regressions and not Pearson correlation that established only correlation.

Dien and Thy (2022) conducted a study on digital literacy and study performance: The case of students in Ho Chi Minh City, Vietnam. The purpose of the study was to determine the prediction of performance by digital literacy. Two research questions and hypotheses guided the study. The design of the study was path-analytic modelling. The population of the study comprised university students in Ho Chi Minh City. The sample size for the study was 407 students. Instrument for data collection were Digital information literacy adopted from Ukwuoma, Iwundu and Iwundu (2016), Computer literacy scale by Boot et al (2015)

and Media Literacy scale by Alliance for a media Literate America (2010), digital competence scale by Abbas et al. (2019). The performance of the students was determined using Grade Point Average (GPA). The exploratory factor analysis and path-analysis was used for data analysis. The study showed a significant relationship between digital literacy and academic performance of students. It was concluded that digital literacy is a significant factor in students' academic achievement. The present study is related to the study by Dien and Thy (2022) in terms of determining the predictive association between digital literacy and academic achievement. The present study will not be carried out using university students in Vietnam but basic education students in Ebonyi state, Nigeria.

Naz, Raheem, Khan and Muhammad (2022) investigated the effect of digital literacy on the academic performance of university-level students. This purpose of the study was to determine how digital literacy influences the academic performance of university-level students in District Lahore, Punjab, Pakistan. Three research questions guided the study. The design of the study was descriptive survey research design. The sample size was 120 students in public sector universities from District Lahore. The instrument for data collection was a survey questionnaire. The responses were analyzed using Mean-difference statistics. The results show that students with digital knowledge or technological skills performed better than those without these skills. Female students with digital skills outperformed male students with a similar digital literacy level. It was recommended among other things, that all university-level students should be taught how to utilize library computers to locate reliable and authentic information for their research work. The present study differs from the study of Naz, Raheem, Khan and Muhammad (2022) because the present study focuses on predicting academic achievement in Basic science using digital literacy. The present study will not adopt the descriptive survey design but the predictive correlation design. It will be carried out using basic education students in Ebonyi state, Nigeria and not those in Pakistan.

Cabero-Almenara, Gutierrez, Guillen-Gamez and Gaete-Bravo (2022) carried out a study on digital competence of higher education students as a predictor of academic success. The purpose of the present study was to analyze the digital competence of Higher Education students, as a function of their academic performance, as well as to predict its significant predictors. Three research question and hypotheses guided the study. The design adopted in the study was ex-post factor.

The sample size for the study was 17,301 students from Chile in Latin America. The instrument for data collection was a questionnaire composed of a total of 30 items, classified into five endogenous and exogenous dimensions through a causal model, adapted from the works of Gutierrez-Castillo (2013), Gutierrez-Castillo and Cabero (2016) and Gutierrez-Castillo et al. (2017), was administered via online to the students. Analysis of data was done using regressions analysis and path-analysis. The results showed statistically significant differences in digital competence, as a function of repeating an academic year, with better scores for the latter. Also, factors such as the number of digital resources utilized for the teaching-learning process, the previous preparation for managing their studies, as well as the level of education of the parents, mainly the father, significantly had an influence on both types of students. It was recommended that emphases should be given to the importance of the development of an adequate digital competence which has an influence on the learning of the students and their posterior class promotion.

The study by Cabero-Almenara, Gutierrez, Guillen-Gamez and Gaete-Bravo (2022) is not related to the present study in purpose as the present study seeks also to determine the predictive association between digital literacy and academic achievement and not digital competence and academic achievement.

Although, the influence of social competence and digital literacy on academic achievement and interest in learning is partly establish in literature, the predictive value of these variables are not widely known. The role of the various dimensions of social competence both from students', parents' and teachers' views as well as the dimensions of digital literacy in academic achievement and interest in Basic science especially in Ebonyi state has not been explored to satisfactory indepths. More so, the understanding of the interaction between the predictor variables of digital literacy and social competence in predicting Basic science achievement and interest has remained vague. Thus, the need arises for an indepth investigation into the prediction association between social competence, digital literacy, interest and academic achievement of basic education students in Basic science in Ebonyi state.

Approach and Method

The research is a qualitative study. It is developed through the analysis of secondary existing literature on digital literacy. The literatures were

randomly selected from journal and book publications of scholarly writings across the globe. Focus was on publications made from 2015 to 2025 considering the continuous advancement in digital knowledge. Furthermore, the simplified and summarized research method of analysis that were both descriptive and thematic was used to develop the content of the study. Considering the theoretical basis of the study, the research design, approaches and strategies; paradigm and philosophy as well as the overall random sampling strategy emanated from empirical findings. The data presentation and the analysis were well-synchronised and contextualized. The results below will show the findings from the study.

Results

Despite the increasing significance of digital literacy in educational contexts, a considerable number of schools and colleges across the globe fail to provide sufficient training in digital literacy, nor do they frequently utilise digital tools as instructional and educational resources (Wei and Chou, 2020). In Ebonyi State and Nigeria at large, the high level lack of digital hardware and software have continued to undermine the development of the teaching and learning culture. This is because findings from the filed reveals that a significant number of student encounter difficulties in acquiring the essential digital skills required for accessing new knowledge via the Internet, which is necessary to engaging in research activities, or adequately preparing for their future professional endeavours.

The consequence of this phenomenon is a deficiency in digital literacy and competencies among adolescent learners, potentially impeding their opportunities for enhanced academic performance and having their interest in learning aroused and sustained. However, it should be stated that the lack of these digital equipment in many of the government and private-owned institutions has worsened the quest for digital literacy. This lack in digital infrastructure therefore pushes the minds of the learners completely away from digital excellence and make them very passive to the digital learning culture. It should be noted that the near total lack of digital hardware amongst the schools in rural parts of Ebonyi state naturally disenfranchises the learner from the advantages of digital literacy. The government at all levels in the Nigerian state tend to politicize education and learning. They do everything to give it minimal support and funding. The implication is that many of the government schools at the basic education level have become moribund

thereby pushing many parents to opt for the private-owned schools. The fact that politicians that should develop the education sector focuses primarily on the interest of the politicians implies that they have created the leaning lacuna that the operators of the private learning schools capitalize on, in order to make huge profit on the illiteracy rate of the people.

The situation of poor digital knowledge gets worse by the reality of the business posture that is often adopted by many of the private school owners. Their primary interest becomes to maximally make gains and exploit as many available parents and sponsors of learners in order to keep their educational business going. The implication becomes that some of the owners of schools in Ebonyi state cares minimally on how to strengthen basic science education. In order cases, excuses are given by individual and government bodies that the widespread insecurity due to high level cases of inter-communal conflicts, armed robbery and other forms of criminal activities have led to the looting of the digital equipment that they posed. This is because the Ebonyi environment has been characterized by multiple armed inter-communal conflicts, which undermined teaching and learning in the schools and colleges located within those environments (Ani, 2017; Ani, 2019; Ani & Uwizeyimana, 2022; Ani, 2023; Ani, 2024). Few of such schools that have digital equipment were completely burnt down due to the conflict dynamics. In Ezillo, the Special Science school was partly shot down and later relocated with some of the science equipment damaged. The school at Ezza Effum conflict zone was also largely destroyed. The other schools within the Obeagu Isu, Igbeagu and other conflict zones witnessed massive exodus of students. Hence, conflict was not only undermining digital literacy in Ebonyi State but it has remained a major threat towards the development of sustainable education culture.

However, it is worthy of note that in contemporary times, there exists a plethora of technological devices and contraptions that have been made feasible via remarkable advancements in technology throughout the course of history. While the foundational subjects of reading, writing, and arithmetic, commonly referred to as the three R's, continue to serve as the fundamental pillars of education, the capacity to acquire knowledge and engage in effective communication has undergone transformation in response to societal and technological advancements. Nikou and Aavakare (2021) noted that while fundamental skills in reading, writing, and mathematics remain crucial, it is imperative to prioritise the development of digital literacy as well.

Conclusion

The lack of digital equipment and how it directly impacts learning have remained a major challenge for the Nigerian education sector. The problem became obvious during the Covid 19 global lockdown when education was largely digitally transmitted and that left many schools and pupils to be short-changed in Nigeria. This study focuses on the challenges and place of digital literacy in development of education in Ebonyi State. This study focuses on digital literacy and how it would advance science education in Ebonyi State. It presents strong argument in favour of the need to advance digital knowledge in the Ebonyi State educational sector. The study started by revealing that the educational sector of the state and Nigeria at large has been undermined by multiple problems ranging from lack of funding to the lack of necessary resources towards the promotion of science and technology education. Consequently, the study used the Bandura theory of social learning to argue that education in the country can be improved through social learning from the immediate environment. Thus, it is not out of place to argue that digital literacy skills are crucial in enabling users to comprehend the significance of safeguarding their online information and the potential perils associated with cyber-attacks. Individuals have the ability to employ various security measures, such as firewalls, antivirus software, and two-factor authentication, in order to safeguard their digital assets.

Hence, it is imperative for educators to modify their pedagogical approaches in order to accommodate the informal learning setting and provide precise descriptions of the diverse reading and writing processes associated with digital communication technologies. Consequently, both primary and secondary educators should strive to establish appropriate evaluation protocols that consider emerging technological improvements and, consequently, revised modes of communication (Kusumastuti & Nuryani, 2020). In conclusion, it can be argued that recent technology breakthroughs have a profound impact on both the modes of communication within modern society and the various practises that shape societal dynamics. Hence, it is imperative for educators to adapt their instructional practises to incorporate the development of digital literacies in the classroom, thereby facilitating the integration of students into society and equipping them with the necessary skills to actively participate as members of their community.

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