

Investigating the Influence of Digital Technology on the Academic Performance of in-School Adolescents in Anambra State, Nigeria

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Abstract

This study investigates the impact of digital technology on the academic performance of In-school adolescents in Anambra state. The study examines the extent to which digital technology influence academic performance of In-school adolescents in Anambra state. The study adopts a descriptive research survey design, the research also carried out a Pilot study using a test-retest method and tested using Cronbach alpha to determine the reliability of the research instrument. The population of the study is 129, 129 thus; the researcher adopts Taro Ya mani sample size formula to obtain the view of respondents numbering 400 using structure d questionnaire designed in a 5 points Likert scale. The analytical tools employed comprised descriptive statistics. Finding revealed that digital device and screen time management practices among in-school adolescents is an indispensable part of adolescent life has both positive and the negative health wellbeing, physical and mental consequences as well as academic impact. Adolescents spend a lot of time with digital devices and are exposed to several scenes of violence in almost all type of digital internet linking media content. Premised on this finding, the study recommends that Academic programs/contents in our secondary schools should be restructured. It should be more practical, fact-finding and problem solving than just theoretical. This will make the adolescents who at this stage of life are filled with life and energy to spend most of their time even at home in solving academic problems rather than spending hours assessing various social sites and watching films.

Keywords: Digital Technology, Academic performance, In-school, Adolescents

INTRODUCTION

Digital technology has become a modern-day reality particularly considering the need for increased interaction between and among people across the globe (Victor, 2020). Digital device involves all form of appliances which generate, store and transmit data into meaningful form. There is no gain saying the fact that digital technology enhances learning and academic performance of adolescence. Adolescence according to Desmond et al (2023) is a person who is at the transitional stage particularly between childhood and adult age. In this era of globalization, frequent interaction between technology and adolescent development has become fundamental issue (Stockdale et al,2022). This research therefore investigates the impact of digital technology on the performance of in-school adolescents in Anambra State South- East, Nigeria. Again, digital devices and usage is becoming increasingly integral to the academic and social phenomenon, understanding their impact on young adult mental and physical health (Abeele et al., 2018). The unique socio-cultural dynamics and varying levels of digital access in this study area provide a distinctive context for interrogating these influences (Abeele et al, 2018, Achimugu et al, 2021 & Aldridge & McChesney 2018).

More so, digital technology offers broadened opportunities for advancing learning and communication, but it also presents potential hazards that could affect adolescent well-being (Khouja et al, 2019). In Anambra State, where social media tools, smartphones and other digital tools are increasingly among adolescents, it is therefore essential to explore how these technologies transform their daily lives. Again, constraints like digital addiction, cyberbullying and its effects of screen time on academic performance and mental health are critical areas of concern that requires in-depth research (Holland & Tiggman, 2016).

The recent advancement in scientific discoveries has made the entire world a global village, driving a demand for rapid information access and fostering the development of modern technologies (Leblanc et al, 2015). In this century, students are engrossed to a world intertwined with internet access and digital devices, often without structured guidance on how to maximize these resources effectively (Smith, Green, & White, 2008). This environment has significantly contributed to the phenomenon of "pathological technology use" (PTU), characterized with adolescents displaying addictive behaviors towards technological media, that can be likened to addiction patterns observed in substance abuse (Orben & Przybylski, 2019, Uchenna & Audu, 2022, Malik & Audu, 2023).

As digital technology becomes an integral part of adolescent identity and social status, the challenge lies in balancing the benefits of connectivity with the potential risks associated with excessive utilization. This balance is crucial for ensuring that digital advancements contribute positively to students' academic and personal development while mitigating adverse effects on their well-being.

Statement of the Problem

In recent years, the integration of digital technology in educational settings has become increasingly prevalent, notably impacting adolescents in Anambra State, Nigeria. While digital tools such as smartphones, tablets, and computers offer enhanced access to educational resources and improved learning experiences, they also present significant challenges related to students' mental, emotional, and social wellbeing. Preliminary observations indicate that some students benefit from these technologies, while others face risks including increased screen time, cyberbullying, and social isolation (Altia et al, 2017).

The core issue is to find a balance that optimizes educational benefits while addressing potential negative effects. This requires a comprehensive approach to digital literacy, well-defined guidelines for technology use in schools, and robust support systems for students' mental health (Williams, 2012). The current gap in research on the specific impacts of digital technology on adolescents' wellbeing in Anambra State further complicates the development of effective strategies and interventions. Therefore, educators, parents, and policymakers need to collaborate to create an environment where digital technology enhances educational outcomes without exacerbating problems such as digital addiction and diminished face-to-face social skills. This calls for investigation, hence this study sought to investigate the influence of digital technology on the wellbeing of in-school adolescent in Anambra state. For a socio-dynamic economy like Anambra, research like this hopefully helps to drive a more academic driven environment with full utilization of digital economy. Hence, it is expedient this research is conducted.

Research Objectives

1. To evaluate the preferred digital gadget usually used by in-school adolescents in Anambra State and to find out the extent they use them.
2. To ascertain the amount time in-school adolescent students spend digital devices in Anambra State.

LITERATURE REVIEW

Digital technology is seen as all form of appliances, tools or equipment that is used to processed data (Adeniyi & Kolawole, 215). Therefore, digital technology according to Hartney (2022) digital technology include computers, tablets, software application, as well as other transmittable mobile devices.

Again, Osazee-Odia (2016), Oladunjoye and Audu (2021) noted that digital technology involved digital media and entertainment applications used for learning, entertainment, payment gateways, networking and communication technologies such as internets, WIFI, Bluetooth and cryptocurrencies. Digital technological devices according to Ahmadi and Zeinali (2018) and Boadhene et al (2019) enhances human existence including teaching and learning in terms of reduction of carbon footprint, increased efficiency and performance innovative customers and client experience, providing opportunities for new entrepreneurial idea as well as broadening accessibility to information and education. To this end, it has become evidently clear that digital technology plays a critical role to human society.

Kim et al (2017) and Masthi et al (2019), Cureau et al (2017) argued that digital technology is characterized by digital data which is the chronological process of transmitting data into meaningful form. Again, Holly et al (2022), Aldridge, McChesney (2018) noted that digital technology significantly relied on electronic devices which facilitate transmission of data and other form of information as well as software applications which carry out duties and core responsibilities in form of operating system mobile append productivity software. Additionally, digital technological devices enable the storage and effective management of data such as creation storage and retrieval thereby facilitating effective and efficient information management (Ebere Adu, 2015). In addition, digital technology is exposed to network and communication through the cloud and it involves automation and algorithm procedure through the medium of artificial intelligence and advanced technology.

This assertion was concurred by Olajide et al (2020) and NCC (2019) which do not only advance such ideological view but also concludes that digital technology involves scalability and flexibility, frequent evolution of innovativeness as well as provision of a sustainable atmosphere for a data- driven decision making.

Adolescents according to the World Health Organization (WHO) (2023) are seen as the period between the age of ten through nineteen for a person. The adolescence according to OECD (2016) and MAAS (2017) is faced with some unique features such as emotional changes inform of emotional instability, puberty as well as social changes which propel their physical social and psychological wellbeing. The World Health organization noted that adolescence can be broadly categorized into the early adolescence which is between the ages of ten to thirteen, the middle adolescence which is between the ages of fourteen to sixteen and the late adolescence which is between the ages of seventeen to twenty-two. Thus, the adolescence age is critical to the physical, social and psychological wellbeing of the individual hence such stage requires proper integration of conscious techniques in ensuring that exposing them to digital technologic are well patterned towards securing their mindsets.

Additionally, Biematokska et al (2017) and Gilbert et al (2018) conclude that digital technology plays a critic role in enhancing the social educational and emotional wellbeing of adolescence. To this end, it improves social interaction through frequent communication, creation and sustenance of online communication as well as through collaboration a promotion of teamwork. Additionally, digital technology improves access to education, enhances personalized learning as well promotion of platform for self-improvement. Finally, through the instrumentality of digital

technology the adolescence has access to emotional expression and supports, provision of avenue for self-care and improvement of mental health. This implies that the application of digital technology greatly enhances the academic performance of adolescence. Thus, it can be concluded that digital technology is a potent tool in promotion of academic performance improved learning atmosphere as well as social integration.

Anambra Adolescent Access to Technology and Penetration

In Anambra, adolescent access to technology is expanding, though it remains uneven across the region. Urban areas, notably the state capital Awka, have experienced a significant increase in the availability and use of digital devices such as smartphones, tablets, and computers. This growth is driven by improvements in infrastructure and rising economic opportunities, which have made these devices more accessible to urban adolescents (Manago et al., 2022). These adolescents benefit from enhanced educational and social interactions facilitated by their digital connectivity. Conversely, rural areas in Anambra face more substantial barriers to technology access due to infrastructural and economic limitations. This disparity results in a pronounced digital divide, affecting the extent to which adolescents in these areas can engage with and benefit from digital tools.

The differential access to technology in Anambra highlights a broader urban-rural divide that has significant implications for adolescent development. In urban settings, adolescents are often exposed to a mix of global digital cultures and local traditions, which can influence their social interactions, educational opportunities, and personal development. These adolescents are more likely to navigate and integrate multiple cultural values, experiencing a dynamic blend of global and local influences that shape their identities. This exposure can facilitate a more nuanced understanding of global issues and diverse perspectives, potentially enriching their developmental experiences.

In contrast, adolescents in rural areas of Anambra may face a more homogenous cultural environment due to limited access to global digital content. Their technology use is more likely to be confined to local cultural contexts, with less opportunity to engage with broader global trends. This limited exposure can restrict their ability to integrate global and local values, potentially impacting their personal development and the formation of a cohesive identity (Erikson, 1963). The challenges of merging diverse value systems and the risk of developing bifurcated identities are more pronounced for rural adolescents, who may struggle with reconciling local cultural expectations with the minimal global influences they encounter.

Moreover, the digital divide in Anambra has implications for educational equity and opportunity. Urban adolescents benefit from better access to educational resources and online learning platforms, which can enhance their academic performance and future prospects. Rural adolescents, on the other hand, may face significant educational disadvantages due to their limited access to these resources. The gap in technology access underscores the need for targeted policies and interventions to address these disparities and ensure that all adolescents, regardless of their geographic location, have the opportunity to benefit from the advantages of digital technology (McKenzie, 2019). Addressing these inequities is crucial for supporting the development of a more integrated self and providing equal opportunities for all adolescents in Anambra.

THEORETICAL FRAMEWORK

This study is based on Uses and Gratification Theory (UGT) because of their importance to this case study as they will theoretically analyze the hidden facts concerning the topics.

Uses and Gratification Theory (UGT)

Uses and Gratification Theory (UGT) is anchored mainly on the view that media use served a variety of needs stemming from the personal social situation of the individual, Ordufia and Manalo (2019) describes uses and gratification as an idea that media use depends on the perceived satisfactions, needs, wishes, or motives of the perspective audience member, which are derived from psychological instincts (needs) such as information, relaxation, companionship, diversion and escape. Odgers et al, (2020) also states that uses and gratification has ‘social and psychological origins of needs which generate expectations of the mass media or sources which lead to differential patterns of media exposure or engagement in other activities resulting in needs gratifications’. However, the adult needs satisfied by the media include surveillance, excitement, guidance, relaxation, tension reduction, social integration, entertainment, escape, self and personal identity, social contact, and information acquisition.

Furthermore, UGT helps in understanding the influence of cultural and contextual factors on media use. In Anambra State, examining how local cultural, social, and economic conditions affect adolescents' media consumption and screen time management provides a more comprehensive view of their digital behaviors (Fletcher et al., 2020). This contextual insight emphasizes the importance of culturally relevant media literacy programs that empower students to make informed decisions about their screen time. This theory is relevant to the study because of its relevance and practical application.

RESEARCH METHODOLOGY

Research Design

This study adopts a descriptive survey research design. According to Osuala (2005), the survey research method has the advantage of "studying both large and small populations by selecting and studying samples chosen from the population to discover the relative incidence, distribution, and inter-relations of sociological and psychological variables." A survey research design is one in which a group of people or items is studied by collecting and analysing data from only a few people or items considered to be representative of the entire group. As a result, the design is considered most appropriate for use in this study because it intends to use representative samples of opinions to investigate the problem under study. The design will be suitable or appropriate for the study since information will be solicited through a questionnaire on issues relating to the study.

Study Area

Anambra State is a Nigerian state, located in the southeastern region of the country. The state was created on 27 August 1991. Anambra state is bounded by Delta State to the west, Imo State and Rivers State to the south, Enugu State to the east and Kogi State to the north. The State Capital is Awka, while the State's Largest City is Onitsha. The state name was formed in 1976 from the former East Central State.

Population of the Study

The population of this study comprised of a projected 129,129 adolescents residing in the entire local government areas of Anambra state according to National Population Commission Projection (NPC, 2022). However, due to limitations in time and resources, it was not feasible to include adolescents from all 21 LGAs. Instead, a subset of 10 LGAs was selected for the study using a random sampling technique, commonly referred to as the "lucky-dip" method.

A sample size of 400 was used for this study based on Taro Yamane's (1967) Simplified Formula to calculate the sample size. The equation is expressed as follows:

$$n = N / (1 + N (e)^2)$$

Where n = sample size, N is the population size, 1 is a constant, and e is the error margin of 0.05. Therefore, when this formula is applied to the population of Anambra State, we get the following:

Sample size:

$$129,129 / (1 + 129,129 (.05)^2)$$

$$129,129 / 129,130(0.0025)$$

$$129,129 / 322.8$$

$$n = 400$$

There are twenty-one (21) local government area councils in Anambra State. Due to the extensive nature of the study, simple random sampling was employed to determine the study sample. This technique was chosen because it gives each member of the study population an equal chance of being selected. The sample size was determined using simple random sampling, which selected ten (10) local government areas (LGAs) from the twenty-one (21) LGAs in Anambra State using a lucky dip. From these ten (10) LGAs, forty (40) adolescents between the ages of 13 and 18 were chosen from each LGA, resulting in a total of 400 adolescent students for the study. The selection of adolescent students was based on the belief that they are more likely to have access to and use digital technology.

The researchers personally administered the instrument to the respondents, with the help of research assistants. The research assistants were adequately briefed on the objectives of the study. The instrument was then administered and collected immediately by the researcher and the team of research assistants to ensure a 100% return of the entire instrument. This approach helped save time and costs while also providing respondents with the convenience of asking for clarification whenever needed.

A structured questionnaire was used to obtain data from the respondents. The questionnaire consists of statements that elicit data that were analysed quantitatively. The administered questionnaire consists of two sections A and B: section A elicits information on the respondents' bio-data, while section B seeks information that intends to answer the five research questions. The instrument is a 37-item structured questionnaire developed by the researcher titled "digital well-being and screen time management in school adolescents' questionnaires (DWSTMIAQ)". Research question one is going to elicit information on the types of digital gadgets used among in-school adolescents; research question two elicits information on the duration of daily and weekly screen time; research question three elicits information on the negative impact of prolonged screen time; and research question four elicits information on the positive impact of prolonged screen time among in-school adolescents in Anambra State.

Reliability of the Instrument

The reliability and internal consistency of the instrument was established by trial testing of the instrument methods. This will be done by administering 40 of the instruments to 40 adolescents from different communities in the Oji River local government area, which is outside of the study area. The instruments were collated and tested for reliability using Cronbach Alpha.

Method of Data Analysis

The data gathered were analysed using mean score ratings arranged in frequency tables. Research questions 1 and 2 were analysed using mean score ratings. To determine the acceptance of each item statement in the questionnaire, items with a mean rating of 2.50 and above were accepted, while any item with a mean score below 2.50 was considered rejected.

DATA ANALYSIS AND INTERPRETATION

Research Question One

Research Question I: What are the types of digital gadgets most frequently used by in-school adolescents in Anambra State, and the reasons for using the devices?

Table 1: Mean responses of respondents on the types of digital gadgets most frequently used by in-school adolescents in Anambra

S/N	ITEMS STATEMENTS	S A	A	D	S D	Mean	Rating
1.	Smart phone	188	176	20	16	3.35	Accepted
2.	Television	208	144	48	-	3.40	Accepted
3.	Gaming Console	224	124	36	16	3.34	Accepted
4.	Video Games	178	142	54	26	3.18	Accepted
5	Laptop or Desktop Computer	136	212	32	20	3.16	Accepted

(Survey, 2024)

From the responses of the respondents' the use of digital gadget is a common practice amongst Anambra in-school adolescent with all items carrying a mean score above 3.0. This shows the high level of acceptance of digital gadget in Anambra state, particularly in-school adolescent. This reveals that Smart phone, Television, Gaming Console, and Laptop or Desktop Computer are the types of digital gadgets most frequently used by in-school adolescents in Anambra State. it therefore means that Anambra in-school. And with a mean score of 3.40, it is safe to put that the digital gadget Television is slightly preferred than others.

Research Question Two

Research Question 2: What is the duration of daily and weekly including weekend and holiday screen time that in-school adolescent students spend using digital devices?

Table 2: Mean responses of respondents on Duration of daily and weekly screen time among in-school adolescent students

S/N	ITEMS STATEMENTS	S A	A	D	S D	Mean	Rating
6.	30 minutes per day	74	50	124	152	2.11	Reject
7.	Above 30 minutes	42	14	240	104	1.95	Reject
8.	1 hours	30	32	66	72	2.10	Reject
9.	2-3 hours	42	14	240	104	1.95	Reject
10	4-5 hours	136	212	32	20	3.16	Accept
11	Used once a week	220	140	28	12	3.40	Accept
12	Used twice a week	212	146	24	18	3.38	Accept
13	Used multiple times a week	246	106	40	8	3.47	Accept

(Survey, 2024)

Table 2 shows the duration of daily and weekly screen time among in-school adolescent students. The table reveals those that some in-school adolescent students use their digital devices 4-5 hours, some once a week, others twice a week and the remaining others multiple times a week as these had mean scores of 3.16 and above, while others that use their devices in 30 minutes per day, above 30 minutes, 1 hours and 2-3 hours had mean score below 2.5. this indicate that four items out of the eight items were positive.

With mean scores of 2.11, 1.95, 2.10, and 1.95, the digital usage habits of in-school adolescents in Anambra can be considered negative. This is further confirmed by the mean score of 3.16, which indicates that in-school adolescents spend 4-5 hours on their digital devices. However, mean scores of 3.40, 3.38, and 3.47 suggest that there is some element of control, possibly from parents, who dictate when the adolescents have access to their digital devices.

Discussion of Findings

The first finding of this study suggests that digital gadgets are not entirely new to in-school adolescents in Anambra State. In other words, adolescents in Anambra frequently use smartphones, televisions, gaming consoles, and laptops or desktop computers, with mean scores for all items exceeding 2.5. This indicates a high level of acceptance and use of digital gadgets among in-school adolescents in the state.

This finding strengthens the work of Abeele et al, (2018), who examined the use of social media by in-school adolescents in secondary schools across the South-East, with a focus on Anambra and Imo states. Babic et al (2017) found that students most commonly used platforms such as Facebook, WhatsApp, and 2go/Skype, while MySpace, Twitter, Badoo, blogs/websites, Google+, and social bookmarking sites were used less frequently. Therefore, it is important to recognize that access to social media is made possible by the widespread use of digital technologies, such as smartphones, laptops, desktop computers, smart televisions, and similar devices.

The results of this study indicate that in-school adolescents in Anambra State spend a considerable amount of time on digital devices, with an average screen time of 4 to 5 hours daily, as reflected by a mean score of 3.16. Additionally, a mean score of 3.47 suggests that this usage occurs multiple times a week, further highlighting the high frequency of digital gadget use among adolescents in the region. This finding aligns with the research of Manago et al. (2019), which examined the relationship between screen addiction and stress. The significant screen time observed in this study suggests a level of addiction, as 4-5 hours of screen time multiple times a week is generally considered indicative of excessive use.

At this point, it is crucial to recognize that addiction to digital technology carries negative consequences, as evidenced by the findings of this study. The research indicates that digital gadgets are heavily used by adolescents in Anambra, with usage ranging from moderate to excessive levels, ultimately leading to addictive behaviors. When considering the negative impacts, all survey items yielded mean scores above 2.50, signifying that the presence of modern digital technology has significantly affected the adolescents' lives. Specifically, it has distracted them from their academic responsibilities. The study also found that adolescents are frequently exposed to misleading information, which has detrimental effects on their academic performance, particularly during exams. Moreover, their physical and mental well-being is also negatively impacted.

Conclusion

The study has successfully proved that digital device and screen time management practices among in-school adolescents is an indispensable part of adolescent life which has both positive and the negative health wellbeing, physical and mental consequences as well as academic impact. Adolescents spend a lot of time with digital devices and are exposed to several scenes of violence in almost all type of digital internet linking media content. This study has made available relevant knowledge into the digital well-being and screen time management practices among in-school adolescents in Anambra State. These days a huge number of secondary school adolescents now have access to digital devices that could be damaging or blessing as the case may be. The challenging aspect is that the addictive use of these digital breeds into these young and uncontrollable people into sedentary and violent lifestyle content which pose as a great danger in the society.

The work also assembled cultural aspect which the digital wellbeing cultural value systems usually improves the adolescent lifestyles and heightens the need or cultural application in Anambra.

Recommendations

Based on the findings of this study, the following recommendations are offered:

1. Academic programs/contents in our secondary schools should be restructured. It should be more practical, fact-finding and problem solving than just theoretical. This will make the adolescents who at this stage of life are filled with life and energy to spend most of their time even at home in solving academic problems rather than spending hours assessing various social sites and watching films.
2. The Nigerian communication commission should regulate/screen the content and quality of programs transmitted via different social media platforms/sites to reduce or minimize to the barest minimum transmission of violent contents.

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