Assessing the Perceived Impact of ICT on Children's Learning Outcomes in Ajeromi Ifelodun Local Government, Lagos State

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Abstract
The covid-19 pandemic has caused a sudden transformation globally. The education system had to adjust to remote teaching making teaching and learning go online. Though, a lot of advantages have been seen compared to the known traditional method. Many adverse effects accompanied the positive ones which should be given serious attention. Introducing ICT to children at an early stage if not properly monitored could lead to adverse effects on their lives and relationships with others. Therefore, this paper focused on the assessment of the perceived impact of ICT on children's learning outcomes in Ajeromi-Ifelodun local government area in Lagos State. The research posed three research questions using a descriptive research design. The participating pupils are seventy (70) and their parents filled the out questionnaire through a Google form. The instrument was subjected to content and face validity by experts. The content and reliability coefficient values of the instrument were 0.98 and 0.94 respectively indicating the high-reliability index. The findings of the study indicated that ICT though has advantages if not monitored the adverse effects could be devastating to children's learning outcomes. The study, therefore, recommended that government, parents, teachers, and other stakeholders should monitor the use of ICT in schools for children and provide a limit for its usage.

Keywords: Information and communication technology (ICT), Learning Outcomes, Adverse Impact

Introduction

COVID-19 pandemic has proven that Information Communication Technology (ICT) has been acknowledged to have helped in knowledge sharing, skills acquisition, dissemination of ideas and creativity in teaching and learning in the educational system among learners and teachers during the pandemic locked down (Olowe & Kutelu, 2014). Education has changed drastically with the influence of ICT both in the quality and quantity of teaching, learning and research (Aduwa-Ogiegbean & Iyamu, 2005). ICT via the Internet

has provided an avenue for information to be accessed through different means, ranging from mobile devices, which allow easier communication (Gur &Turel, 2022). ICT has helped improve learning and changed it progressively by moving away from the traditional methods of knowledge delivery to the contemporary learning experience (Afolabi, 2021). Many children born in this generation have access to interacting and using the internet effectively before going to school. This has influenced the efficiency and quality of teaching and learning (Malek, Abdullah, Mat Darus & Nursulistiyo, 2022). The use of ICT has been given priority in Nigeria since the COVID-19 Pandemic struck though the progress has not been equal (Afolabi, 2021).

Agbetuyi and Oluwatayo (2012) highlighted objectives of introducing ICT in the educational system include but are not limited to developing critical thinking and problem-solving approach, motivating learners to learn, creating career opportunities, developing ICT literacy, differentiated instruction and technology among others. In line with the stated objectives, many schools have incorporated ICT curricula into their school programme which has enhanced technological support for teaching, some schools have witnessed no improvement at all, while some were on the verge of the early phase of adoption (Asiegbu, Akudo & Emmasiegbu, 2021). During the pandemic, many homes and schools added electronic games, home computers and the Internet to older technologies like television and audio sound systems to keep the children engaged to avoid idleness. The major concerns are the influence of technology on children's education outputs and outcomes. Despite its numerous advantages, ICT has been judged to negatively influence children's learning outcomes. Many studies have stated that ICT influences children negatively by causing digital distractions, the excessive influx of information, loss and of focus on the core subject matter to mention a few (Clark (2006); Fried (2008) & Asiegbu (2015). These worries over the usage of ICT brought questions like how early the exposure of children to ICT should be (Nikolopoulou, Gialamas & Batsouta, 2010). What influences will it have on general development whether positively or negatively on children? (Gur & Turel, 2022). Plowman, Mcpake and Stephen (2008) found that using ICT could be harmful to children if not properly managed. Clark (2006); Fried (2008); and Asiegbu, (2015) stated educators need to support children's learning from risks and threats when exposed to online content.

Alaba (2011) pointed out that learning from real-life experiences makes learning more meaningful to children rather than learning through ICT, especially if the content is not so suitable for the children. Studies from Caron and Gley, (2004); Kanat (2019); Peper and Harvey (2018); and Tas (2015) stressed the negative impact of ICT on children in the early stages of development who cannot navigate through the massive information database. Therefore, picking appropriate and useful information for them and disregarding what is not useful poses a challenge to children. This big problem makes them susceptible and vulnerable, causing more confusion instead of learning. This study, therefore, investigated the perceived adverse impact of ICT on children's learning outcomes in Ajeromi-Ifelodun Local Government Area, Lagos state.

The outbreak of the COVID-19 pandemic has made ICT to be a household name through which many heterogeneous people can be reached for information dissemination at a specific time (Garba, Singh, Yusuf & Ziden, 2013). Many children have access to learn so many things from the educative programmes through ICT. There is, however, documented concern about the safety and negative effects of ICT particularly with children's exposure to ICT content if not properly monitored and controlled by parents and guardians. Children can learn so many bad things from ICT content if not censored. The social space has changed the narrative where absolute control over the children's use of ICT is nearly impossible (Caron, & Gely, 2004). Parents, teachers, and guardians do not have absolute control over their wards' usage of ICT gadgets. Therefore, this study investigated the perceived impact of ICT on children's learning outcomes in Ajeromi-Ifelodun Local Government Area of Lagos State.

Purpose of the Study

The aim of this study is to investigate the perceived impact of adverse effects of information technology on children's outcomes in the Ajeromi-Ifelodun Local Government Area.

Specifically, this research is aimed at achieving the following objectives:

i. Examine the perceived impact of ICT on children's learning outcomes.

ii. Identify measures that should be put in place to minimize the perceived adverse impact of ICT on children's learning outcomes.

iii. Assess the roles of parents, guardians, and other stakeholders in minimizing the perceived adverse impact of ICT on children's learning outcomes.

Research Questions

i. What are the perceived impact of ICT on children's learning outcomes?
ii. What are the measures that can be put in place to minimize the perceived impact of ICT on children's learning outcomes?
iii. What are the roles of parents, guardians and stakeholders in minimizing the perceived impact of ICT on children's learning outcomes?

Methodology

The descriptive research design was used for this study. The study population are primary school pupils' parents in Ajeromi-Ifelodun, Ajegunle Local Government Area of Lagos State. Despite the national relevance of the study, the study is limited to the Local Government Area. A total number of 70 (seventy) pupils' parents (42 males and 28 females) participated and were used as the sample for this study. The participating schools were purposively selected with the stated criteria.

i. Schools with ICT facilities
ii. Schools using ICT to teach their pupils during the pandemic period till now.
iii. Schools having computer laboratories.
iv. Schools with pupils of age bracket 5-12
v. Schools with qualified computer teachers

Ten schools met the stated criteria. After using a purposive sampling technique to select the participating schools, the researcher used a random sampling technique to select the number of males and females who participated in the study. Though, the main target is the parents who completed the questionnaire via Google Forms. The research assistant through teachers have earlier informed their parents in writing about the research study and a WhatsApp platform was generated to connect all parents of participating pupils. WhatsApp created is for this research only. Pupils used formed about 5% of the total population. This helped to minimize sampling error and meaningful generalization.

A questionnaire with a total of 20 (twenty) items was used as the main instrument for the data collection. The content and face validity of the instrument were carried out by six early childhood and three ICT experts. The item content validity index was obtained to be 0.98 using item analysis, indicating a high score. The item content validity score of 0.98 and above is considered as good for content validity. A total of 134 questionnaires have two sections, A and B, Section A has the demographic background of the respondents and Section B questions focused on the perceived impact of ICT on children's learning outcomes. The respondents chose their answers to section B based on a 4-Likert scale ranging from strongly agreed=4, Agreed=3, Disagreed=2 and strongly Disagreed=1. The items of the questionnaire were developed by the researcher according to the chosen topic while other questions were adopted and modified to suit the research. The reliability of the instrument was determined by using the test-re-test method. They were administered to pupils of another district local government area far away from Ajeromi- Ifelodun. 50 participants participated and questionnaires were sent to their parents through Google form after two weeks of the first administration. The Google form was used to send a questionnaire to the participants' parents through the already-created WhatsApp platform.

The platform was set to run for a period of two weeks which was expected that all should have been filled out and submitted the questionnaire. One hundred and thirty questionnaires were sent out through the WhatsApp platform earlier created and only seventy returned. All filled questionnaires were collated and analysed. The data collated data were analysed using each item's mean, frequency, and percentage values. The standard deviation was used to determine the closeness of from mean. The decision-making was based on a cut of 2.5 with a mean item with a mean score of 2.5 and above was accepted while any mean score of below 2.5 was rejected.

Results

The findings of this research were based on the responses of the participants.

Table 1: Demography information of the respondents

Variable	Option	Frequency	%
Gender	Male	28	50.0
	Female	42	50.0
	Total	70	100.0

Source: Field Survey 2022. n = 70.

Table 1 showed that 28 (40.0%) of the respondents are Male while 42 (60.0%) are females making a total of seventy (70) respondents.

Research Question 1: What are the perceived impact of ICT on children's learning outcomes?

Table 2: Perceived Impact of ICT on Children's Learning Outcomes

Items	Mean	SD	Relative Mean	Remark
It is appropriate for children to depend on the use of technology for all academic activities.	3.71	0.46	1.26	Agreed
Children are addicted to computers and spend more time on them than necessary.	3.59	0.58	1.21	Agreed
ICT prevents children from doing their homework.	3.57	0.65	1.21	Agreed
ICT discourages children from learning with the belief that knowledge acquisition is difficult.	3.50	0.72	1.19	Agreed
ICT could lead to knowledge overload.	3.40	0.55	1.15	Agreed
ICT can divert children from learning the essential things in the subject matters.	3.29	0.87	1.11	Agreed
ICT in the classroom creates the impression that learning is unnecessary.	3.24	0.81	1.10	Agreed
Information available on the internet could be confusing to children without guidance.	3.24	0.89	1.10	Agreed
Children exposed to ICT tend to develop a wayward behaviour.	3.23	0.90	1.09	Agreed
ICT helped to inculcate self-expression and handwriting skills in children.	3.17	1.01	1.07	Agreed
ICT has reduced the reasoning skills in children	3.17	0.74	1.07	Agreed
Implementing ICT policy in schools to replace conventional method of teaching made learning purposeful and convenient.	2.87	1.12	0.97	Agreed
Shutting off technology at a specified time every day can limit unnecessary exposure to ICT on children.	2.84	0.85	0.96	Agreed
Children should learn majorly through ICT	2.66	1.15	0.90	Agreed
Social media such as TikTok, Face book and YouTube are better ways of learning for children.	2.63	0.87	0.89	Agreed
Shutting down technology at a specified period is appropriate.	2.50	1.00	0.85	Agreed
ICT has brought lots of distractions, and misleading and misguided information.	2.33	1.02	0.79	Disagreed
Implementing ICT to replace conventional education	2.23	0.94	0.75	Disagreed

Items	Mean	SD	Relative Mean	Remark
discourages learning.				
The use of ICT has impacted negatively on children.	2.09	1.00	0.71	Disagreed
ICT encourages low quality of education.	1.79	0.90	0.60	Disagreed
ICT has some destructive and immoral contents.	2.95	0.27	1.00	Agreed

Source: Field survey, 2022

Mean Decision-1.00 - 1.75 = SD, 1.76 - 2.50 = D, 2.51 - 3.25 = A, 3.26 - 4.00 = SA

Table 2 showed that parents with a mean of 3.71 agreed that it is appropriate for children to depend on the use of technology in all their academic activities in and outside the classroom. Parents with mean 3.59 agreed that children are addicted to computers and spend more time on them than necessary. Also, parents with 3.50 mean value agreed that ICT discourages children from learning with the believe that knowledge acquisition is difficult. The use of technology has been emphasized and reinforced in schools across different age grades since the outbreak of COVID-19 pandemic for a resilient educational system. Likewise, parents with mean value of 3.40 agreed that ICT could lead to knowledge overload. There are many contents on the internets from different sources many available. Parents with mean of 3.29 agreed that ICT divert children attention from learning the essential things in the subject matter. Parents with mean 3.24 agreed that ICT creates impression that learning in the classroom is unnecessary. Most of the contents are available on the internets for them to learn. However, parent with mean 3.24 agreed that despite the availability of the contents that are made by different authors, they could be confusing to children without proper guidance. Parent with a mean 3.23 agreed that children exposed to ICT tend to develop a wayward behaviour. Children are exposed to different contents and websites uncontrolled. Parents with 3.17 mean value agreed that ICT helped to inculcate self-expression and writing skills in children. Parent with a mean 3.17 agreed that ICT has reduced reasoning level of children. Parents with a mean of 2.87 agreed that the implementation of ICT policy in schools to replace the conventional method of teaching made learning more purposeful and convenient. In contrary, parents with a mean of 2.33 disagreed that the implantation of ICT policy to replace conventional method of teaching discourages learning by children. Furthermore, parents with a mean 2.84 agreed that shutting down technology at a specific time everyday can limit the influence of the use of ICT on children while parents with a mean of 2.50 also agreed that shutting technology

down at a specific period is appropriate. Also, parent with a mean 2.66 agreed that children should learn majorly through ICT. Parents with a mean 2.63 agreed that social media such as TikTok, Facebook and YouTube are better ways of learning for children. Parents with a mean of 2.33 disagreed that ICT has brought lots of distractions, misleading and misguided information. In the same vein, parents with a mean of 2.09 disagreed that the use of ICT has impacted negatively on children. Parents with a mean of 1.79 disagreed that children taught with ICT have low quality education while parents with a mean of 2.95 agreed that ICT comes with destructive and immoral contents.

Research Question 2: What are the measures that can be put in place to minimize the perceived impact of ICT on children's learning outcomes?

Table 3: Perceived measures to minimize adverse impact of ICT on children's learning outcomes.

Items	Mean	SD	Relative Mean	Remark
Parents must set limits and impose rules and consequences to protect children from the internet contents.	3.59	0.58	1.21	Agreed
It is very appropriate to install parental control filtering software and tracking programmes.	3.40	0.55	1.15	Agreed
Kids should be taught appropriate online ethics and cyberbullying to minimize the adverse effects of ICT.	3.29	0.87	1.11	Agreed
Monitoring and limiting the use of ICT devices will minimize the adverse impact of technology on children's learning.	3.24	0.81	1.10	Agreed
Setting up policies to checkmate the excessive use of ICT in education for children.	3.24	0.89	1.10	Agreed
Monitoring children social media sites will minimize negatives impact of ICT.	3.23	0.90	1.09	Agreed
Parents should be computer literate to checkmate children overuse of ICT.	3.17	1.01	1.07	Agreed

Source: Field survey, 2022

Mean Decision-1.00 - 1.75 = SD, 1.76 - 2.50 = D, 2.51 - 3.25 = A, 3.26 - 4.00 = SA

Table 3 revealed that parents with a mean of 3.59 agreed limits and imposition rules and consequences to protect children from the internet should be done by them, where there are good and bad sources of information. Parents with a mean of 3.40 agreed that it is appropriate to install parental control, filtering software and track programmes. Parents

with a mean of 3.29 agreed that kids should be taught online ethics and cyberbullying to minimize adverse effect of ICT. Also, parents with a mean of 3.24 agreed that monitoring and limiting the use of ICT devices will minimize the adverse impact of technology on children's learning. Parent with a mean of 3.24 agreed that setting up policies to check mate the excessive use of ICT in education will curb negative impact of ICT on children's learning outcome. Parents with a mean of 3.23 agreed that monitoring children on social media site will reduce the negative impact of ICT on children. Furthermore, parents with a mean of 3.17 agreed that they should be computer literate to checkmate their wards on overuse of ICT to minimize negative impact.

Research Question 3: What are the roles of parents, guardians, and stakeholders in minimizing the perceived adverse impact of ICT on children's learning outcomes?

Table 4: Roles of parents, guardians, and other stakeholders in checkmating the adverse impact of ICT on children's learning outcomes.

Items	Mean	SD	Relative Mean	Remark
Parents and teachers should monitor and limit children's usage of ICT devices.	3.59	0.58	1.21	Agreed
Teachers and educators should make only academic-based services available to children on the computer.	3.40	0.55	1.15	Agreed
Government and curriculum planners should mandate technology companies to customise specific information to meet only educational needs of children.	3.29	0.87	1.11	Agreed
Parents should supervise their children use of computers and digital devices to reduce access to harmful online content.	3.24	0.81	1.10	Agreed
Setting up policies to checkmate overuse of ICT in education at early stage.	3.24	0.89	1.10	Agreed
Policy on the usage of social media sites for children should be enacted by the government	3.23	0.90	1.09	Agreed

Source: Field survey, 2022

Mean Decision-1.00 - 1.75 = SD, 1.76 - 2.50 = D, 2.51 - 3.25 = A, 3.26 - 4.00 = SA

Table 4 showed that parents with a mean of 3.59 agreed that it is the responsibility of parents and teachers to monitor and set limit of children's usage of ICT in order to reduce its adverse effects on children's learning. Again, Parents with a mean of 3.40 agreed that teachers and educators should make only academic-based services available for children use on the computers. Parent with a mean of 3.29 agreed that government and curriculum

planners should mandate technology companies to customise specific information to meet only educational needs for children. Parents with a mean of 3.24 agreed that they should supervise and monitor their children use of computer and digital devices to reduce access to harmful contents on the sites. Likewise, parents with a mean of 3.24 agreed to setting up of policies to check mate overuse of ICT in education especially at early stage. Parents with a mean of 3.23 agreed that policy on the usage of social media sites for children should be enacted by the government.

Discussion of findings

The study revealed that most of the respondents agreed that the perceived adverse impact of ICT on children's learning outcomes is with mean score of 2.95>2.5 (mean decision). This implies that many of the respondents in Ajeromi-Ifelodun Local Government Area of Lagos State are of the opinion that introduction of ICT has negative adverse effects on their children. This is in line with the findings of Israel, (2014) that stated that using ICT in schools may cause distractions among learners when hooked, which may further lead to loss of the subject matter contents and poor academic achievement. This is in contrary to the finding of Yusuf and Onasanya (2004), that the use of ICT will improve teaching and learning effectiveness. The study further revealed that ICT will make students to be active learners, creative thinkers and enlarge the learning community through collaboration.

The findings also showed that setting limits and imposing rules will minimize the perceived adverse impact of ICT on children's learning outcomes. This negates the finding of Cemiloglu, Almoyarad, McAloney and Ali (2022) which stated that measures for combatting the menace of ICT usage by children should include psycho-social, software mediated and the combined measures. They went further that combined measure might result in a countermeasure of ICT addiction and overuse. However, Raj (2021) found out that digital addiction is a global concern affecting children's physical, emotional and social well-being and schools should play a significant role by setting a guide to solving the excessive use of ICT in the classrooms.

Furthermore, the findings revealed the highlighted roles of parents, guardians, and stakeholders in checkmating the perceived adverse impact of ICT on children's learning outcomes. The perceived roles include monitoring and setting limits on the usage of ICT

devices, allowing only academic-based services software on the ICT gadget, customizing the ICT gadget for only the educational needs of children, developing policies to checkmate ICT in education and limiting children's access to social networks. This is in line with the findings of Basel et al (2020) that the use of digital devices for children has led to series of problems causing psychological and physical damage to children because of overuse of ICT contents in the classrooms. In the same vein, Cimke, Gurkan and Sirganci (2023) found that parents often stated dissatisfaction with their children's misuse of gadgets and sought solutions on curbing the menace. However, Rode (2009) supported that parents should support and develop digital skills that will ameliorate possible digital risks to ensure online safety of their children.

Conclusion

This study has revealed some of the factors responsible for the perceived adverse impact of ICT on children's learning outcomes in ICT. Technology provides opportunities for ideal learning yet if ignored especially when it has to do with children's education can harm their academic performance and development. Thus, parents should set limits and impose rules with consequences by tracking programmes and installing parental control software to minimize the negative impact. Parents and other stakeholders can also help to minimize the perceived adverse effect of ICT by being computer literate to teach the children to appropriate online behaviours and social media sites to visit. The state government and education agencies should create programmes and applications in the curriculum that will be spread over most of the topics in the scheme, that will foster creativity, support collaborative learning, provide more challenging work, and even give the children access to remedial lessons.

Recommendations

Based on the findings of the study, the following recommendations are made.

i. Parents should monitor, supervise, and regulate their children use of ICT and devices while at home.
ii. Teachers should monitor the use of ICT in the classroom and prevent its overuse by children.
iii. Government should set policies to control the use of non-educational site for children at their early stage of development.

iv. Curriculum planners should not totally rely on ICT for teaching and learning in the classroom for children.

v. Online ethics should be taught before exposing children to ICT use in the classroom.

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