



INFLUENCE OF PRINCIPALS' AWARENESS OF DIGITAL LITERACY ETHICS ON ADMINISTRATIVE EFFECTIVENESS OF SECONDARY SCHOOLS IN CROSS RIVER STATE, NIGERIA



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Abstract

The study investigated influence of principals' awareness of digital literacy ethics on administrative effectiveness of secondary schools in Cross River State, Nigeria. Two research objectives with corresponding research questions and null hypotheses guided the study. The study employed descriptive survey research design. The sample for the study consisted 299 principals, selected through census sampling. A researcher-developed questionnaire titled 'Digital Literacy Ethics and Administrative Effectiveness Questionnaire (DLEAEQ)', was used for data collection. The instrument was validated by experts in the Faculty of Education, University of Calabar and tested for reliability using split-half method and a coefficient of 0.81 was realised. The data collected was analyzed using frequency counts, mean scores, and standard deviation for research questions, while Chi-square goodness of fit was used for testing all the null hypotheses at 0.05 level of significance. The study found that principals' awareness of cybersecurity and data privacy had influence on administrative effectiveness of secondary schools in Cross River State. The study concluded that principals' awareness of digital literacy ethics significantly influences administrative effectiveness of secondary schools in Cross River State, Nigeria. Based on the findings, recommendations were made, among others, that the principals should increase their capacity in managing cybersecurity in their places of work in order to contribute to administrative effectiveness for sustainable national development.

Keywords: Awareness, Digital Literacy, Ethics, Administrative Effectiveness

Introduction

Information and data are vital for every administrator, manager or principal if they must perform their tasks effectively and efficiently. With the coming of the digital age, there has been a dramatic increase in the volume of such information sources, which have become more frequently accessible in digital formats. The need to have digital literacy has therefore, become more obvious. The capacity to present and produce content within the digital environment is considered a vital qualification for the twenty-first-century (Kaeophanuek, et al. 2018). Digital literacy is a subset of skills under the broad ICT literacy scope. Digital literacy skills are regarded as very vital in connecting to the world of knowledge and information. According to Sadiku, et al. (2016), it has been referred to as internet literacy, information literacy, cyber literacy, computer literacy, and so on. Kim and Yang (2016) viewed internet literacy as the ability to access, understand, and produce information [from the worldwide web]. Atmojo, et al. (2022) see digital literacy as the knowledge and skills required on using

digital media like as Google, YouTube, e-books, as well as communication tools such as cell phones and laptops to find, evaluate, use, create, and use information correctly, wisely, intelligently, carefully, precisely, and lawfully. In essence, from these various definitions, digital literacy is an essential skill, broader than computer literacy.

Literacy as a concept has equally evolved over the years. As computers and digital technology came into existence, literacy also took on new or wider definitions. Literacy in form of digital technology, voice, image, data or packaging, and storing of all kinds of messages with coding came with the development of computer technologies and communication devices (Ayhan, 2017). Digital literacy is a process that reposes on knowledge literacy, internet literacy, and web literacy. At the same time, digital literacy also finds its own place as being a systematic obligation. Developing technology and massified structures necessitate digital literacy (Allen, 2016).

Management of information in form of digital literacy is also a very significant part of an administrator's tasks in collaboration with government's efforts. For instance, to reduce the digital divide and enhance technological inclusion, various digital literacy programs such as the National Information Technology Development Agency (NITDA) have been introduced with the purpose, among others, to equip vulnerable populations with essential digital skills to navigate the internet and improve employment prospects.

However, it is the concern of educational managers and teachers that there should be ethical use of these technologies because, associated with this expanded possibility comes additional risks such as cyberbullying, identity theft and online harassment (Ukpong, 2023), as well as knowledge gaps in form of a digital divide, and other challenges. By fostering digital literacy and promoting cyber ethics, educational institutions can become responsible, informed, and capable of navigating the challenges and opportunities of the digital world. Scholars such as Hakimi et al. (2021) also acknowledged that the digital shift raises ethical concerns and challenges to several stakeholders in the education subsector. Educational institutions as one of the institutions that prepare students to confront and overcome existing challenges in the 21st century have an important role in developing students' digital literacy skills (Atmojo, et al., 2022). Therefore, it was advised that educators increase their awareness and proficiency in accordance with standards, particularly those pertaining to digital literacy (Spante, et al. 2018). In states such as Cross River State, Nigeria, awareness of these ethical applications of digital literacy in schools for administrative effectiveness raises concerns.

Ethics as a specialised term, is concerned about the norms of human moral behaviour. Ethics is defined as the practical sciences of morality of human conduct (Biswal, 2016). Ethics in school encompasses the domain of behaviour that is exhibited by schools to distinguish between right and wrong. However, with the evolution of the internet and digital world, the lines between virtual and physical world become blurred. Nevertheless, it is becoming increasingly expedient to understand digital and cyber ethics even as students become more digitally literate. Cyber ethics refers to the moral principles that guide behaviour in the digital world. Broad spectrum of issues are covered under cyber ethics, including respecting intellectual property, avoiding plagiarism, protecting personal information, and behaving responsibly on social media. Samaranayake (2024) affirmed that the ethical practices in a digital environment include responsibility, transparency, accountability, and the integration of higher order thinking skill. The anonymity provided by the internet can sometimes lead to behaviours that would not be acceptable in the physical world. For instance, cyberbullying, hacking, and the spread of misinformation are just a few examples of unethical behaviours that can have serious consequences. The need to instil and manage cyber ethics in schools as part of their digital literacy education becomes expedient.

Scholars such as Polis (2023) examined the ethical implications of cybersecurity, including issues like privacy, data protection, and security, while evaluating the current state of ethical principles in the field of cybersecurity. The author averred that ethical principles play a crucial role in guiding individuals to act responsibly and thoughtfully as they offer guidance on treating others with respect and engaging in actions that benefit all parties. Formosa, et al. (2021) created a set of principles framework for CSE that is based on beneficence, non-maleficence, autonomy, justice, and explicability.

Beneficence: Cybersecurity technologies should be used to benefit humans, promote human wellbeing, and make our lives better overall; non-maleficence: Cybersecurity technologies should not be used to intentionally harm humans or to make our lives worse overall; autonomy: Cybersecurity technologies should be used in ways that respect human autonomy. Humans should be able to make informed decisions for themselves about how that technology is used in their lives; justice: Cybersecurity technologies should be used to promote fairness, equality, and impartiality. It should not be used to unfairly discriminate, undermine solidarity, or prevent equal access; explicability: Cybersecurity technologies should be used in ways that are intelligible, transparent, and comprehensible, and it should also be clear who is accountable and responsible for its use” (Formosa et al., 2021).

Other principles or ethics of cybersecurity include respect for privacy and confidentiality; responsibility for harm; fairness and impartiality; honesty and transparency; vulnerability disclosure; responsibility for security; responsibility for training; responsibility for continuing education; respect for intellectual property; and responsibility for ethical decision-making (Macnish & van der Ham, 2020). Data privacy is also a concern in digital literacy. Data privacy can be seen as the right of individuals to maintain confidentiality and control over their personal information (Rath & Kumar, 2021). The protection of data that can identify an individual, such as name, address, phone number, financial information, medical history, and so on are some of the concerns of data privacy (Sukenti, 2023); (Salamah, 2023) and (Hermansyah, 2023). Thus, principals of secondary schools, including those in Cross Rivers State, Nigeria can leverage on them to engender their ability to effectively administer their schools.

Administrative effectiveness is a broad term that connotes attainment of set goals as well as cost saving measures. Wokoma (2023) sees administrative effectiveness as the extent to which organizations achieve their objectives with minimum expenditure of time and money. In addition, the extent to which the goals of secondary education are being met can be used as a measure of principals’ overall administrative effectiveness. Wokoma (2023) identified some of the main characteristics of administrative effectiveness to include effective decision making, effective communication, delegation of duties, disciplinary ability, motivation, a good public relation, effective supervision, and evaluation and so on. School Principals occupy the highest position in a secondary school subsystem. The principal, as the person at the pinnacle of affairs in secondary school occupies a pivotal position. According to Oyewole et al. (2020), the principal is the person expected to interpret policies, execute instructional programmes, see to staff development and ensure adequate and proper management of the school. They are required to carry out various tasks in form of planning, organising, directing, staffing, coordinating, reporting, and budgeting. Most of these tasks have evolved both in volume and complexity. The complexity and volume of such tasks can be tackled with the innovative tools and capabilities embedded in digital literacy.

However, studies have shown that there is low level of awareness among educationists in sub-Saharan Africa in ICT-related skills (Amuche & Iyekekpolor, 2014). Jongsermtrakoon and Nasongkhla (2015) also affirmed that, among educators, the concept of digital literacy, and the concept of the awareness in information ethics, which described ethical use of others with regard to information privacy, accuracy, property and accessibility are the must-have skills in the use of Open Education Resources (OER), but such skills are lacking. Awareness by principals is a concern to researchers because ethical awareness is one of the five dimensions of digital literacy. Kumari (2024) stated that under digital citizenship, understanding one's rights and responsibilities as a digital citizen, including ethical behavior, online safety, respect for intellectual property, and awareness of privacy issues are among the five broad indicators.

Various scholars have carried out studies to establish the influence of digital literacy as well as ethical awareness of digital literacy among workers and the academic community. Atmojo et al (2022) evaluated the level of digital literacy among teachers in the Central Java Indonesian classroom. It was a descriptive qualitative case study involving 6 teachers at elementary school in Surakarta as the subjects which were chosen through purposive sampling by using digital literacy framework based on the Instant Digital Competence Assessment (IDCA) perspective. It classifies digital literacy into three dimensions,

namely technology, cognitive, and ethics. The results showed that the digital literacy level of classroom teachers is in the very low in most categories.

Altinsoy and Boyraz (2024) examined secondary school students' perceptions of moral values in the digital environments (MVDE) and digital literacy (DL). The study used a quantitative methodology and correlational survey design encompassing 250 participants. Results show that participants' perceptions of DL are mostly high, while their perceptions of MVDE are mostly intermediate. The study concluded that DL and MVDE help people become effective and better citizens in the digital world, much like moral values do in real life. Kumari (2024) carried out a study on Digital Literacy and its role in 21st Century Education, encompassing skills such as information literacy, media literacy, and digital citizenship. The study concludes that fostering digital literacy equips learners with essential competencies to thrive in a digitally connected world, enhancing their academic success and preparing them for future professional endeavours.

Putra, et al. (2023) carried out a study on the effect of digital literacy and transformational leadership on employee performance in the department of Population and Civil Registration of the City of Padang. The authors used a saturated sample technique, which meant that the entire population is used as a sample 74 people. Structural Equation Modelling (SEM) was used for data analysis. The results of the study show that indirectly digital literacy affects employee performance through mediation of innovative work behaviour.

Amidst proliferation of internet and digital platforms in the educational space, there arises the need for more functional mechanisms to regulate the way and manner users interact and apply such technologies. Despite the existence of policy documents prescribing best practices and possible repercussion for violations, creating more awareness may be the most practicable place to begin from. Heads of schools, therefore, are seen as significant stakeholders in the process of enforcing such policies on digital literacy. It therefore becomes expedient to how much awareness school heads possess, vis-à-vis the attainment of administrative effectiveness. This is the focus of this paper.

Statement of the Problem

The need to increase awareness of digital literacy ethics in educational systems cannot be overemphasized due to the many real-life and theoretical advantages associated with it. Ethical concerns continue to arise when learners and workers are exposed to innovations such as digital literacy, and administrators such as principals of secondary schools must provide leadership and management on how such literacy can be safely applied. There are observed cases of students and staff being exposed to cyberbullying, pornographic material, plagiarism, data privacy breaches, and several other instances of unethical use of digital literacy. The extent to which principals are aware of the ethical considerations pertaining these offshoots of digital innovations in the school system have become concerning.

Despite existing guidelines on the proper use of internet and information resources, reports still abound about unethical uses, which compromise safety, wellbeing, academic integrity and intellectual property in the school system. If the aspirations of sustainable national development must be achieved, principals' awareness of digital literacy ethics may need to be interrogated to ascertain how well they are poised to manage ethical uses of digital literacy. The researchers therefore deemed it wise to conduct a study on influence of principals' awareness of digital literacy ethics on administrative effectiveness of secondary schools using principals of public secondary schools in Cross River, Nigeria.

Purpose of the Study

The main purpose of the study was to investigate influence of principals' awareness of digital literacy ethics on administrative effectiveness of secondary schools in Cross River State, Nigeria. Specifically, the study sought to:

- i. Examine the influence of principals' awareness of cybersecurity ethics on administrative effectiveness of secondary schools in Cross River State, Nigeria.

- ii. Ascertain the influence of principals' awareness of data privacy ethics on administrative effectiveness of secondary schools in Cross River State, Nigeria.

Research Questions

The following research questions guided the study:

- iii. What is the influence of principals' awareness of cybersecurity ethics on administrative effectiveness of secondary schools in Cross River State?
- iv. What is the influence of principals' awareness of data privacy ethics on administrative effectiveness of secondary schools in Cross River State?

Hypotheses

The following null hypotheses were tested at 0.05 level of significance:

1. There is no significant influence of principals' awareness of cybersecurity ethics on administrative effectiveness of secondary schools in Cross River State?
2. There is no significant influence of principals' awareness of data privacy ethics on administrative effectiveness of secondary schools in Cross River State?

Methodology

Descriptive survey design was adopted for this study. The population of the study was 299 principals of secondary schools in Cross River State, Nigeria (Department of Planning, Research and Statistics, Cross River State Ministry of Education (CRSMoE), 2025). The entire population was used because of the manageable size, hence there was no sampling. The instrument for data collection was a questionnaire titled 'Digital Literacy Ethics and Administrative Effectiveness Questionnaire (DLEAEQ). The instrument was developed by the researchers, validated by experts in the Faculty of Education, University of Calabar and tested for reliability using split-half method. A coefficient of 0.81 was realised, which was esteemed to be reliable.

The instrument was designed on a four-point rating scale of Strongly agreed (SA), Agreed (A), Disagreed (D), and Strongly disagreed (SD). They were scored 4, 3, 2 and 1 respectively in two clusters of five items each. Using four research assistants who were adequately briefed on the modalities of the research, the researchers administered and collected the completed questionnaires from the respondents using the direct delivery method. Data generated from the study were analysed using both descriptive and inferential statistics. Descriptive statistics of mean and standard deviation were used to answer the research questions. 2.50 was set as the criterion mean for the research questions, while inferential statistics of chi-square goodness of fit was used to test null hypotheses at 0.05 level of significance. Chi-square goodness of fit tested frequency of responses on the influence of principals' awareness of cybersecurity ethics on administrative effectiveness, and influence of principals' awareness of data privacy ethics on administrative effectiveness. The decision rule was that if chi square calculated was greater than chi square tabulated, reject null hypothesis. Also, if p value is less than 0.05, reject null hypothesis.

Results and Discussions

Research Question 1: What is the influence of principals' awareness of cybersecurity ethics on administrative effectiveness of secondary schools in Cross River State?

Table 1: Mean Ratings of Respondents on Influence of Principals' Awareness of Cybersecurity Ethics on Administrative Effectiveness of Secondary Schools in Cross River State.

S/N	ITEM	N	Mean	Std. Dev.	Decision
1	respect for privacy and confidentiality while handling digital information can lead to administrative effectiveness	297	2.53	0.74	Agree
2	taking responsibility for training of persons how to comply to digital security issues can enhance administrative effectiveness	297	2.67	0.69	Agree
3	Digital literacy which observes respect for intellectual property helps in achieving administrative effectiveness	297	2.75	0.68	Agree
4	Using Cybersecurity technologies in ways that respect human autonomy guarantees administrative effectiveness	297	2.66	0.82	Agree
5	Administrative effectiveness can be achieved if principals take responsibility for ethical decision-making such as giving precedence over any potential financial or other benefits when making decisions	297	3.25	0.93	Agree
Cluster Mean and SD			2.77	0.73	Agree

Analysis of data as presented in Table 1 above shows the influence of principals' awareness of cybersecurity ethics on administrative effectiveness of secondary schools in Cross River State. Data analysis revealed that principals are aware that respect for privacy and confidentiality while handling digital information can lead to administrative effectiveness (2.53; SD = 0.74); Respondents also agreed to the remaining four of the items with mean scores ranging from 2.66 – 3.25, which are above the benchmark of 2.50. The table also revealed close Standard Deviation values ranging from .68 – .93, showing that the respondents were homogeneous in their responses. The grand mean of this cluster is 2.77 and SD = .73, indicating that, most principals are aware that observing cybersecurity ethics influences administrative effectiveness, amongst other things.

Research Question 2: What is the influence of principals' awareness of data privacy on administrative effectiveness of secondary schools in Cross River State?

Table 3: Mean Ratings of Respondents on Influence of Principals' Awareness of Data Privacy Ethics on Administrative Effectiveness of Secondary Schools in Cross River State.

S/N	ITEM	N	Mean	Std. Dev.	Decision
6	obtaining, collecting, or analysing data from persons through lawful, legitimate and fair means is necessary for administrative effectiveness	297	2.84	0.87	Agree
7	Requests or proposals for data access should be tailored to a specific purpose in order to enhance administrative effectiveness	297	2.68	0.95	Agree
8	Administrative effectiveness can be achieved if principals ensure data management throughout the data lifecycle and prevent any unauthorized use, disclosure or breach of personal data.	297	2.60	0.86	Agree

9	Validating data for accuracy, relevancy, sufficiency, integrity, completeness, usability, validity and coherence, and being up to date influences administrative effectiveness.	297	2.78	0.78	Agree
10	Being open, transparent (in a clear and non-technical language), and accountable about the existence, nature, anticipated period of retention and purpose of data use influences administrative effectiveness.	297	3.41	0.84	Agree
Cluster Mean and SD			2.86	0.88	Agree

Table 3 shows the influence of principals' awareness of data privacy ethics on administrative effectiveness of secondary schools in Cross River State. Analysis revealed that obtaining, collecting, or analysing data from persons through lawful, legitimate and fair means is necessary for administrative effectiveness ($x = 2.84$; $SD = 0.87$). Respondents also agreed to the remaining four of the items, with mean scores ranging from 2.60 – 3.41, which are above the benchmark of 2.50. Standard Deviation values were also very close, ranging from .68 – .93 showing that there was homogeneity in the responses. The cluster mean of 2.86 and $SD = .88$, suggests high level of awareness that data privacy ethics can influence administrative effectiveness of secondary schools.

Hypotheses Testing

Hypothesis One: There is no significant influence of principals' awareness of cybersecurity ethics on administrative effectiveness of secondary schools in Cross River State

Table 2: Chi-square Test on Influence of Principals' Awareness of Cybersecurity Ethics on Administrative Effectiveness of Secondary Schools in Cross River State.

Awareness of cybersecurity ethics			
	Observed N	Expected N	Residual
Disagree	113	148.5	-97.5
Agree	184	148.5	97.5
Total	297		

Test Statistics

	Awareness of cybersecurity ethics
Chi-Square	27.332 ^a
Df	1
Asymp. Sig.	.000

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 148.5.

Table 2 showing Chi square goodness of fit test to determine respondents' perception on influence of principals' awareness of cybersecurity ethics on administrative effectiveness of secondary schools followed the general population. Distribution of respondents significantly differed from that of the general population, since the expected frequencies were 148.5 for each distribution but 113 (disagreed) and 184 (agreed) were observed from the responses. Thus, $\chi^2 (df = 1, N = 297) = 27.332, p = < .001$. The calculated value of the Chi square is 27.322, and this value is significantly greater than the table value of chi square of 3.841 at $N=297, df=1$. Therefore, the null hypothesis suggesting no significant influence of principals' awareness of cybersecurity ethics on administrative effectiveness of secondary schools was rejected.

Hypothesis Two: There is no significant influence of principals' awareness of data privacy ethics on administrative effectiveness of secondary schools in Cross River State

Table 4: Chi-square Test on Influence of Principals' Awareness of Data Privacy Ethics on Administrative Effectiveness of Secondary Schools in Cross River State.

Awareness of data privacy ethics			
	Observed N	Expected N	Residual
Disagree	98	148.5	-135.5
Agree	199	148.5	135.5
Total	297		

Test Statistics

	Awareness of data privacy ethics
Chi-Square	42.521 ^a
Df	1
Asymp. Sig.	.000

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 148.5.

Table 4 showing Chi square goodness of fit test to determine respondents' perception on the variables followed the general population. The observed and expected frequencies for each response group are presented. Distribution of respondents significantly differed from that of the general population, since the expected frequencies were 148.5 for each distribution, but 98 (disagreed) and 199 (agreed) were observed from the responses. Thus, $\chi^2 (df = 1, N = 297) = 42.521, p = < .001$. The calculated value of the Chi square is 42.521, which is significantly greater than the table value of chi square of 3.841 at $N=297, df=1$. Therefore, the null hypothesis suggesting no significant influence of principals' awareness of data privacy ethics on administrative effectiveness of secondary schools was rejected.

Discussion of Findings

Findings on the influence of principals' awareness of cybersecurity ethics on administrative effectiveness in secondary schools shows that principals' awareness of cybersecurity ethics has significant influence on administrative effectiveness in secondary schools. This finding agrees with that of Altinsoy and Boyraz (2024), who examined secondary school students' perceptions of moral values in the digital environments (MVDE) and digital literacy (DL), and found that DL and MVDE help people become effective and better citizens in the digital world. This finding also corroborates the views of Polis (2023) whose study on the ethical implications of cybersecurity, including issues like privacy, data protection, and security, concluded that cybersecurity ethical principles play a crucial role in guiding individuals to act responsibly and thoughtfully as they offer guidance on treating others with respect and engaging in actions that benefit all parties.

Also, findings on influence of principals' awareness of data privacy ethics on administrative effectiveness in secondary schools shows that principals' awareness of data privacy ethics has significant influence on administrative effectiveness in secondary schools. This supports the findings made by Putra et al. (2023) who investigated the effect of digital literacy and transformational leadership on employee performance and found that digital literacy affects employee performance through mediation of innovative work behaviour.

Conclusion

The study set out to examine the Influence of Principals' Awareness of Digital Literacy Ethics on Administrative Effectiveness of Secondary Schools in Cross River State, Nigeria. Based on the findings of the study, the study concludes that principals' awareness of digital literacy ethics has influence on administrative effectiveness of secondary schools in Cross River State, Nigeria. The implication of this is that, awareness of ethical practices in all aspects of educational practices have a strong way of enhancing the effectiveness, as well as way and manner school heads can improve on their administration.

Recommendations

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

1. More awareness should be created among principals of secondary schools on the need for complying with digital literacy and cybersecurity ethics as a strategy to enhance administrative effectiveness in secondary schools.
2. Principals of secondary schools should constantly update their knowledge on ethical use of digital literacy in form of data privacy regulations in order to enhance their rating on administrative effectiveness.

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