



Cyberethics Education in Open and Distance Learning: How Technology Shapes Responsible Digital Citizenship Among Generation Z Students

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Abstract:

Background: In the digital era, cyberethics education has become essential for fostering responsible digital citizenship.

Purpose: This study examines the role of technology in enhancing cyberethics education and shaping responsible online behaviours among Generation Z students enrolled in open and distance learning (ODL).

Method: Using the Technological Pedagogical Content Knowledge (TPACK) framework, a qualitative descriptive design was employed. Semi-structured interviews were conducted with six purposively sampled Gen Z students at the University of Ilorin Centre for Open and Distance Learning, Nigeria. Data were analysed using thematic analysis.

Result: Findings reveal that while participants are digital natives, their understanding and application of cyberethics vary considerably. Digital educational platforms emerged as significant influences on ethical behaviour. Technology holds strong potential for cyberethics education when integrated meaningfully into curricula and designed to promote ethical conduct. The study recommends revising technology education policies to embed cyberethics more effectively and implementing professional development programmes to equip educators with TPACK-aligned competencies.

Contribution: This study contributes empirically to the scarce literature on cyberethics in open and distance learning contexts within sub-Saharan Africa, extending the TPACK framework to cyberethics pedagogy. It also provides actionable, evidence-based recommendations for policy revision and educator training to bridge the gap between digital nativeness and ethical competence.

Keywords: cyberethics; digital citizenship; generation Z; Technological Pedagogical Content Knowledge; qualitative research; open and distance learning; Nigeria.

INTRODUCTION

In the digital era, technology has transformed the ways in which people communicate, learn, and interact on a global scale (Dunmade, 2022). As individuals, particularly younger generations, spend increasing amounts of time in digital environments, the need to cultivate a strong ethical framework for navigating online spaces has become urgent (Stavropoulous et al., 2021). Cyberethics, which concerns the

study of ethical principles in relation to computers and the Internet, has thus emerged as a critical area of inquiry, raising important questions about responsible technology use (Dunmade et al., 2022).

Generation Z, comprising individuals born between the mid-1990s and early 2010s, presents a particularly compelling population for study (Ayoobzadeh et al., 2024). Often described as digital natives, these students have grown up with digital connectivity as a standard feature of everyday life, resulting in interactions with technology that differ markedly from those of earlier generations. Their extensive engagement with online spaces highlights the necessity of understanding how cyberethics education can be effectively delivered to ensure that they not only navigate digital environments safely but also engage with them constructively (Ogunniran et al., 2022).

The Centre for Open and Distance Learning at the University of Ilorin provides an ideal setting for examining these issues. As an institution that integrates technology into its teaching model, it offers a valuable opportunity to explore how digital tools and platforms can influence the ethical development of students.

A qualitative descriptive approach was adopted to gain an in-depth understanding of student experiences. Data were collected through semi-structured interviews with a purposive sample of six Generation Z students, enabling a detailed exploration of their perspectives. Participants' voices are presented through direct quotations to maintain authenticity.

The study is underpinned by the Technological Pedagogical Content Knowledge (TPACK) framework, which emphasises that effective teaching arises from the integration of technological knowledge, pedagogical knowledge, and subject content knowledge. Analysing cyberethics education through this lens illuminates the pivotal role of educators in using technology to foster ethical understanding and behaviour among students.

LITERATURE REVIEW

Digital Natives and Cyberethics

Thangavel and Chandra (2024) defined "digital natives" as individuals who have grown up surrounded by digital technologies, in contrast to "digital immigrants" who adopt such technologies later in life. Generation Z, born approximately between 1997 and 2012, is often regarded as the first generation of true digital natives (Jayatissa, 2023).

From an early age, they have been immersed in digital technology, shaping their communication styles, learning preferences, and worldviews (Duisenbekova, 2023). However, assumptions that digital natives automatically possess advanced digital skills and ethical understanding have been challenged. While they may be proficient in technology use, they do not necessarily demonstrate a comprehensive understanding of its ethical implications (Selwyn, 2009).

Cyberethics Education and Digital Citizenship

As digital natives, Generation Z plays a central role in discussions of cyberethics education and digital citizenship. Cyberethics concerns understanding how to act legally and morally in online environments (Dunmade & Tella, 2023). The rise in cyberbullying, digital piracy, and inappropriate online behaviour has intensified the need for cyberethics education as a preventive measure (Dunmade, 2022). Developing responsible digital citizens requires equipping individuals with the knowledge and skills to navigate the online world ethically and safely (Prajapati & Kumar, 2022). Research indicates that although Generation Z is comfortable with technology, they require structured guidance to fully understand the ethical implications of their online actions (Hernandez-de-Menendez et al., 2020; Margaryan et al., 2011; Moore & Frazier, 2017). Their reliance on social media, online gaming, and digital communication presents unique challenges for promoting responsible digital citizenship (Confetto et al., 2023). Understanding these behaviours and attitudes is essential to designing effective cyberethics interventions.

Cyberethics in Education and Educator's Role in Cyberethics Instruction

Studies exploring the integration of cyberethics in education have highlighted both challenges and opportunities. Curriculum design, teaching strategies, and policy interventions significantly influence students' ethical behaviour online (Wang et al., 2022). Digital educational platforms provide opportunities for students to engage in ethical discourse and decision-making in ways that are relevant to their experiences (Raffaghelli et al., 2020). Educators occupy a central role in delivering cyberethics education, and professional development is crucial to ensure that they remain informed about emerging technologies and their ethical implications (van Petegem et al., 2021).

Impacts of Technology on Ethical Behaviour

Technology has a profound influence on behaviour, including ethical conduct. Digital platforms shape the attitudes and actions of young users both positively and negatively (Lee et al., 2020). The design and features of these platforms can affect ethical decision-making, influencing online conduct and interactions (Li et al., 2023; Yadlin-Segal et al., 2020). Understanding these effects is vital for developing interventions that promote responsible digital citizenship among Generation Z. The integration of educational technology and the guidance of educators are central to effective cyberethics instruction. The Technological Pedagogical Content Knowledge (TPACK) framework emphasises the combination of technological, pedagogical, and content knowledge in teaching (Koehler et al., 2013; Mishra & Koehler, 2008). Research highlights the need for professional development programmes to equip educators with the skills to embed cyberethics meaningfully into their teaching (Dunmade et al., 2023). Such programmes enable educators to navigate the complexities of teaching digital ethics and citizenship effectively.

Policy Implications and Curriculum Development

The literature also emphasises the importance of policy in integrating cyberethics education into curricula. Existing technology education policies may require revision to incorporate comprehensive cyberethics instruction that aligns with technological advances (Zammit, 2023). Collaborative efforts among policymakers, educators, and technologists are necessary to ensure that cyberethics education is relevant and effective in preparing Generation Z for responsible digital citizenship. Challenges include tailoring instruction to the diverse needs and understanding levels of students (Masenya, 2023) and conducting longitudinal studies to assess the impact of cyberethics curricula on behaviour. Comparative research across cultures and educational systems can further enhance understanding of global digital citizenship education.

METHOD

Research Design Overview

The study employed a qualitative descriptive research design to understand Generation Z (Gen Z) students' perspectives on cyberethics education facilitated by technology. This design was chosen for its ability to provide a comprehensive summary

of events in everyday terms of those events, allowing the researchers to interpret the behaviour of the participants from their viewpoint.

Study Participants

Six (6) participants were selected from the Gen Z student population at the Centre for Open and Distance Learning, University of Ilorin. Inclusion criteria were: (a) enrollment in the CODL programme, and (b) birth year between 1997 and 2012. Sample size was determined by data saturation, achieved after the sixth interview.

Investigator Description

The investigators were a team of researchers with backgrounds in ICT4 Dev, Information Science, cyberethics, and qualitative research methods. They approached the study with an understanding of the Technological Pedagogical Content Knowledge (TPACK) framework to frame their investigation.

Researcher-Participant Relationship

The researchers maintained a professional and neutral stance with participants, ensuring their relationship did not influence responses. Researchers were trained to avoid leading questions and to foster an environment where participants felt comfortable sharing honest and detailed accounts of their experiences.

Participant Recruitment and Selection

Participants were recruited through purposive sampling, targeting students who could provide rich, relevant, and diverse insights into the research questions. The recruitment method was utilising the social media platform by sending copies of the instrument to students through the class WhatsApp platform.

Data Collection

Data was collected through semi-structured interviews, allowing flexibility in discussing topics while ensuring that all relevant areas of inquiry were covered. The interview items were designed to encourage participants to reflect on their experiences, perceptions, experiences with technology in learning environments, and perceptions of how technology influences cyberethics education.

Interview Questions

1. What is cyberethics, and why is it essential now that we use the Internet so much?
2. Do you think using technology changes how you see and follow cyberethics daily, especially as a student?
3. How has the University of Ilorin used technology and online tools to teach you about cyberethics?
4. Can you tell me when technology helped you learn about cyberethics? How did it help you understand better?
5. What problems have you faced when trying to use cyberethics online or with digital learning tools?
6. How can we use technology to help students act better and more ethically online?
7. What should lecturers do to teach cyberethics well with technology? Are there any good or bad ways you have seen this done?
8. Has your school or lecturers given you special lessons on cyberethics? If so, how has this changed how you act online?
9. How should we change the cyberethics lessons to improve them for students like you?
10. What do you think the future looks like for teaching cyberethics with technology, and what do lecturers and schools need to make it happen?

Data Registration and Transformation

Interviews were audio-recorded with participant consent and transcribed verbatim to ensure accuracy in data representation. The transcripts were then anonymised to protect participant confidentiality. Field notes and reflective journals were also maintained during data collection to capture non-verbal cues and researcher observations.

Data Analysis Strategies

Interviews were transcribed verbatim and analysed using thematic analysis following Braun & Clarke's (2006) six-phase framework. Transcripts were coded independently by two researchers to ensure intercoder reliability ($\kappa = 0.84$). Data analysis followed a qualitative description approach. Initially, researchers read the transcripts multiple times to achieve immersion and understand the whole. Transcription errors, speech duplications, verbal fillers and grammatical errors were removed and

summarised. Participant responses were documented verbatim. The findings were validated through member checking, where participants were allowed to review and comment on the themes identified by the researchers to ensure that their perspectives were accurately represented. This process enhanced the credibility and trustworthiness of the study's results.

RESULT

The analysis of interviews with six Generation Z students at the University of Ilorin revealed a nuanced understanding of cyberethics and its relevance in the digital age. All respondents consistently defined cyberethics as the study of appropriate and responsible behaviour online, highlighting the moral implications of digital interactions. One participant noted, *"Cyberethics is the study of how we should behave online and the moral implications of our actions. It's crucial today because with the rise of social media and online interactions, our behaviour can have far-reaching consequences."* Similarly, another observed, *"I see cyberethics as the principles that guide our interactions on the Internet. With so much information shared online, having ethical guidelines is more important than ever."* These perspectives underscore the participants' awareness of the ethical challenges inherent in contemporary online engagement, consistent with arguments by Carter et al. (2021) regarding the societal need for ethical guidelines in digital spaces.

Participants expressed that their daily engagement with technology had significantly influenced how they conceptualised and practised cyberethics. One respondent explained, *"Definitely! As a student, I find myself constantly connected. I often think about how my digital footprint reflects on me and how important it is to act responsibly."* Another reflected, *"Using technology has definitely shifted my perspective. I feel more accountable for my actions online now than before."* These insights align with the work of Olipas (2023) and Conrad et al. (2024), who highlight that digital immersion increases awareness of online accountability and ethical behaviour among students.

The University of Ilorin's integration of online tools and platforms to teach cyberethics was positively received. Respondents cited online modules, interactive discussions, webinars, and case studies as particularly effective. One student remarked, *"The university has created webinars and online workshops that address various aspects of cyberethics, which have been quite informative."* Another noted, *"I appreciate that CODL includes cyberethics in our reading materials. Online quizzes and discussions help reinforce*

the concepts." Such pedagogical strategies are consistent with Hingle and Johri (2024) and Akanbiemu et al. (2024), who emphasise experiential learning and interactive engagement as central to ethical education in digital contexts.

Participants also reflected on specific instances where technology facilitated their learning. One student shared, *"I remember a project where we had to analyse the ethical implications of a social media campaign. It really opened my eyes to how our online actions can impact others."* Another explained, *"Using online simulations helped me understand the real-life implications of unethical behaviour. It was eye-opening."* These examples illustrate the role of technology in providing concrete, context-rich experiences that enhance comprehension of abstract ethical principles (Dunmade & Tella, 2023).

However, challenges in applying cyberethics were identified. Misinformation, difficulty discerning reliable sources, and the speed of online interactions were highlighted as significant barriers. One respondent remarked, *"One challenge is the prevalence of misinformation online. It's hard to navigate and often leads to ethical dilemmas when sharing content."* Peer pressure was also noted, Another respondent remarked: *"I've encountered a lot of peer pressure online, which makes it difficult to adhere to ethical standards."* These issues reflect findings by Humpretch (2020) and Santhosh and Thiyagu (2024), emphasising that while digital tools can support learning, they also create ethical challenges that require vigilance.

Suggestions for improving cyberethics education were consistently oriented towards interactivity and engagement. Respondents recommended gamification, role-playing, peer-led discussions, and real-life case studies. One student stated, *"Incorporating more current events and real-life case studies could make the lessons more engaging and relevant."* Another proposed, *"I think we should have more workshops that allow for hands-on learning. Role-playing scenarios could make the lessons more relatable."* These recommendations support Zhong (2023) and Reneses (2023), who argue that immersive and participatory methods enhance ethical reasoning and practical understanding.

Finally, respondents envisaged a future where cyberethics is central to digital literacy curricula, supported by continuous lecturer training and innovative educational technologies. One participant said, *"The future looks promising, but we need better resources and training for all of us. Schools should invest in digital literacy programs that incorporate cyberethics."* Another added, *"I see a future where cyberethics becomes a core*

part of digital literacy. Schools need to prioritise this in their curricula." These insights indicate a clear demand for ongoing professional development and institutional support, echoing Dunmade (2022) and Davis (2014) on the critical role of educators and technology in shaping responsible digital citizenship.

Four main themes emerged from the analysis, summarised in Table 1.

Table 1. Summary of Thematic Findings

Theme	Sub-themes	Frequency (n)
Understanding of cyberethics	Moral behaviour, online accountability, consequences of digital actions	6
Technology as a learning tool	Webinars, online modules, case studies, simulations	6
Challenges in applying cyberethics	Misinformation, peer pressure, speed of online interactions	5
Recommendations for improvement	Gamification, role-play, peer-led discussions, real-life cases	6

In summary, the four themes above reveal that while Gen Z students at the University of Ilorin demonstrate awareness of cyberethics, their ability to apply ethical principles consistently is constrained by peer pressure, misinformation, and the rapid pace of online interactions. Technology emerges simultaneously as a catalyst for ethical learning and a source of ethical challenges, underscoring the need for deliberate pedagogical design.

DISCUSSION

The findings from this study highlight the critical role of cyberethics education within a digitally immersive academic environment. Participants' clear understanding of cyberethics as the study of moral behaviour online confirms previous literature suggesting that awareness of online ethics is increasingly recognised as essential in contemporary society (Carter et al., 2021). The emphasis respondents placed on responsible online engagement reflects the notion that students today are not only consumers of technology but also active agents whose behaviour contributes to digital norms (Olipas, 2023).

Technology emerged as both a medium and a catalyst for ethical awareness. Participants' narratives indicate that their engagement with online learning modules,

case studies, webinars, and simulations significantly shaped their ethical reasoning. As one respondent explained, "During an online seminar, we discussed the consequences of cyberbullying, which really highlighted the importance of ethical behaviour." This aligns with Hingle and Johri (2024), who argue that experiential, technology-mediated learning strengthens students' ability to apply abstract ethical concepts to real-world scenarios. Similarly, Akanbiemu et al. (2024) suggest that interactive and participatory learning environments enhance ethical decision-making by situating students in realistic contexts.

The impact of peer influence and rapid information flow on ethical conduct underscores the complexity of cyberethics education. Students reported encountering peer pressure and the challenge of evaluating online information, noting that these factors sometimes led to ethical lapses. As one respondent noted, *"Sometimes, the speed of online interactions leads to hasty decisions that aren't ethical. It's a real struggle."* This observation is consistent with Humpretch (2020) and Santhosh and Thiyagu (2024), who contend that the fast-paced, interconnected nature of digital spaces can amplify ethical risks, necessitating deliberate pedagogical interventions.

Participants offered practical strategies to enhance cyberethics education. The emphasis on gamification, interactive simulations, and role-playing scenarios resonates with research by Zhong (2023) and Reneses (2023), who suggest that immersive learning experiences improve ethical reasoning and internalisation. Peer-led discussions and collaborative learning were also highlighted as effective mechanisms to foster reflection and shared accountability, supporting Alem (2022) and Slade and Prinsloo (2013) on the importance of social learning in digital citizenship development.

The study also illuminates the role of educators in mediating ethical learning. Respondents identified the need for lecturers to remain current with technological developments and ethical challenges, integrate real-life examples, and facilitate interactive discussions. These observations reinforce Dunmade (2022), who emphasises the pivotal role of educators in shaping students' understanding of digital ethics. Furthermore, participants advocated for the development of dedicated resources and institutional support to ensure that cyberethics education remains relevant, reflecting Davis's (2014) call for innovation in digital pedagogies.

Finally, the data indicate a forward-looking perspective among students. Participants envisioned cyberethics becoming a core component of digital literacy curricula, supported by interactive platforms, simulations, and continuous professional

development for educators. This aligns with broader educational goals of preparing Generation Z to navigate digital spaces responsibly, highlighting the interplay between technology, pedagogy, and ethical awareness as essential for contemporary education (Dunmade & Tella, 2023; Prajapati & Kumar, 2022).

The results suggest that while students recognise and value cyberethics, the effective operationalisation of these principles requires robust technological support, interactive pedagogical strategies, and sustained educator engagement. The findings confirm that technology, when leveraged appropriately, can serve as a powerful tool for cultivating ethical behaviour and responsible digital citizenship among university students.

Implications for Theory and Practice

Theoretically, the study underscores the importance of the TPACK framework in understanding how technology can be used to foster cyberethics education. It adds to the body of knowledge on the role of educators in cultivating responsible digital citizens and the need for comprehensive cyberethics curricula aligned with technological advancements.

The study suggests that educational institutions should revise their technology policies to incorporate cyberethics more thoroughly. It also implies that educators must receive adequate professional development to navigate the complexities of teaching cyberethics in an ever-evolving digital world.

Recommendations

Based on the findings of this study, several actionable recommendations emerge to enhance the teaching and learning of cyberethics among undergraduates. These suggestions aim to strengthen pedagogical practices, optimise the use of technology in ethical education, and create an enabling environment that supports responsible digital behaviour, by doing the following:

1. Revise existing technology education policies to include a stronger emphasis on cyberethics.
2. Develop and integrate cyberethics modules within the curriculum at the University of Ilorin and other institutions.

3. Implement professional development programs focused on TPACK to enhance educators' ability to teach cyberethics.
4. Design digital educational platforms with built-in features that promote ethical behaviour among users.
5. Encourage a collaborative approach among policymakers, educators, and technologists to ensure cyberethics education is relevant and practical.

Areas for Future Research

While this study provides valuable insights into cyberethics education and technology use among undergraduates, several gaps remain that warrant further investigation:

1. Longitudinal studies to track the effectiveness of cyberethics integration into curricula and its impact on student behaviour.
2. Comparative studies examining cyberethics education across different cultures and educational systems.
3. Research into the barriers educators face when teaching cyberethics and how to overcome these challenges.
4. Investigation into the specific components of digital platforms that most effectively promote ethical behaviour.
5. Studies on how to personalise cyberethics education to address Gen Z students' diverse needs and understanding levels.

CONCLUSION

The study concludes that Gen Z students at the University of Ilorin's Centre for Open and Distance Learning, despite being well-versed in technology, display a varied understanding and application of cyberethics. The findings indicate that technological tools, particularly digital educational platforms, have a significant impact on shaping the digital behaviours of students. The research reaffirms the potential of technology to enhance cyberethics education, particularly when it is seamlessly integrated into the curriculum and tailored to encourage ethical online conduct. Using the TPACK framework highlights the need for educators to synergise technological knowledge with pedagogical and content knowledge to impart cyberethics effectively.

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