Journal of Education and Learning Technology (JELT)
ISSN 2720-7730 Volume 7 Issue 3 2026 pp 311 - 328
Available online at: https://noyam.org/journals/jelt/
DOI: https://doi.org/10.38159/jelt.2026738

Developing a triangulated model for effective Digital Safety Education in the early years

Dominique Cook[1], Joyce West[1] & Kayla Willemse[1]

[1] Department of Early Childhood Education, Faculty of Education, University of Pretoria, South Africa.

ABSTRACT

As young children increasingly interact with information and communication technologies, they face significant digital safety risks, including exposure to explicit content, online grooming, and the creation of self-generated child sexual abuse material. Despite these growing threats, South Africa lacks a structured digital safety framework within its national early childhood education curriculum, despite the possibility of integration within existing subjects. This study aims to develop a model for effective digital safety education in early childhood. Guided by the digital phallic development framework, which integrates Freud's psychosexual development theory (specifically the phallic stage) with the CO:RE 3 C's model of digital safety risks, this study offers a comprehensive lens for understanding sexual digital safety risks in young children. It is further underpinned by the digital safety education collaboration (DSEC) model, highlighting the essential intersectoral partnerships needed for effective digital safety education. Employing a qualitative, constructivist methodology, data were gathered through semi-structured interviews with six stakeholders representing the sectors identified in the DSEC model. Additionally, four authentic South African policy and guidance documents referencing digital safety were analysed. Thematic analysis, supported by Atlas.ti and ChatGPT, revealed a critical need for developmentally appropriate, holistic digital safety education and identified gaps in policy, training, and intersectoral communication. The findings underscore the urgency of coordinated action among the education, community, and legal sectors to empower and protect young children from sexual digital risks in an increasingly digital world. This study contributes to scholarship by creating a theoretical and practical framework for digital safety education in early childhood.

Keywords: Digital Phallic Development Framework, Digital Safety Risks, DSEC, Early Childhood Education, Triangulated Communication.

INTRODUCTION

Globally, information communication technologies (ICTs) are being used by a growing number of young children,[1] with many becoming ICT users before they enter formal schooling.[2] This rapid rise in

[1] Susan Edwards et al., "Young Children's Everyday Concepts of the Internet: A Platform for Cyber-safety Education in the Early Years," *British Journal of Educational Technology* 49, no. 1 (2018): 45–55.

[2] Hyoung Yoon Chang et al., "Electronic Media Exposure and Use among Toddlers," *Psychiatry Investigation* 15, no. 6 (June 25, 2018): 568–73, https://doi.org/10.30773/pi.2017.11.30.2; Gorica Popovska Nalevska and Filip Popovski, "Parental Attitudes and Mediation in Children's Use of Digital Media," *International Journal of Research Studies in Education* 12, no. 7 (August 25, 2023), https://doi.org/10.5861/ijrse.2023.57.

CORRESPONDENCE – Dominique Cook Email: u19258063@tuks.co.za
PUBLICATION HISTORY - Received : 4th September, 2025 | Accepted: 6th March, 2026 | Published: 23rd April, 2026.
TO CITE THIS ARTICLE – Cook, Dominique, Joyce West, and Kayla Willemse. "Developing a triangulated model for effective Digital Safety Education in the early years." *Journal of Education and Learning Technology* 7, no.3 (2026): 311 - 328. https://doi.org/10.38159/jelt.2026738

usage is primarily attributable to the convenience that touchscreen internet-enabled ICTs provide. Although children can access ICTs at a young age, they often lack the skills to navigate them safely.[3] This deficiency in skills is caused by a lack of understanding and awareness of the risks associated with ICT use, leaving children vulnerable to digital safety risks.[4] As such, there is an increased need for a developmentally appropriate model of effective digital safety education in the early years.[5] Despite increasing awareness of the risks associated with ICT usage, digital safety education remains relatively understudied within the fields of child development and early childhood education.[6] This highlights the urgent need for a holistically appropriate model to guide effective digital safety education in the early years.

Despite the notable risks involved, children are introduced to ICTs from infancy, shaping their interaction with ICT from a very young age.[7] This reliance on ICT extends to early childhood education, where both teachers and learners increasingly use ICT for teaching and learning.[8] The increased reliance on ICT was particularly evident during the transition to remote teaching at the onset of the COVID-19 pandemic.

As ICT becomes intertwined with various aspects of daily life, it is crucial to ensure that children possess the knowledge and skills to navigate the digital landscape safely.[9] However, the South African Curriculum Assessment Policy Statement (CAPS) on coding and robotics in the foundation phase currently lacks content on digital safety.[10] While some countries incorporate digital safety education into their educational frameworks, South Africa's curriculum falls short in providing comprehensive coverage on this essential topic.[11]

Consequently, with the widespread use of ICT among young children, digital safety has become a significant public concern. Notably, access to ICTs alone is insufficient; limiting usage is not a suitable solution for a generation that relies heavily on ICT.[12] Therefore, learners require skills to navigate the digital landscape safely, evaluate information critically, and protect their "digital identities" self-perception and external perception, shaped by an individual's digital interactions and activities.[13] However, there remains a lack of comprehensive models on digital safety education beyond basic ICT usage, failing to address the evolving challenges in the digital culture.[14]

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[3] Julie Bacak et al., "Elementary Educator Perceptions of Student Digital Safety Based on Technology Use in the Classroom," *Computers in the Schools* 39, no. 2 (2022): 186–202; Florence Martin et al., "Teacher and School Concerns and Actions on Elementary School Children Digital Safety," *TechTrends* 67, no. 3 (2023): 561–71.

[4] Elizabeth Ujarura Kamutuezu, Heike Winschiers-Theophilus, and Anicia Peters, "An Exploration of Factors Influencing the Adoption of ICT Enabled Entrepreneurship Applications in Namibian Rural Communities," *ArXiv Preprint ArXiv:2108.09789*, 2021.

[5] Bacak et al., "Elementary Educator Perceptions of Student Digital Safety Based on Technology Use in the Classroom"; Abdul Wajid Fazil et al., "Enhancing Internet Safety and Cybersecurity Awareness among Secondary and High School Students in Afghanistan: A Case Study of Badakhshan Province," *American Journal of Education and Technology* 2, no. 4 (2023): 50–61.

[6] Yujin Jang and Bomin Ko, "Online Safety for Children and Youth under the 4Cs Framework—A Focus on Digital Policies in Australia, Canada, and the UK," *Children* 10, no. 8 (2023): 1415.

[7] Jan Grobbelaar and Chris Jones, *Childhood Vulnerabilities in South Africa: Some Ethical Perspectives* (African Sun Media, 2021); Kristiina Kumpulainen, Heidi Sairanen, and Alexandra Nordström, "Young Children's Digital Literacy Practices in the Sociocultural Contexts of Their Homes," *Journal of Early Childhood Literacy* 20, no. 3 (2020): 472–99; Martin et al., "Teacher and School Concerns and Actions on Elementary School Children Digital Safety."

[8] Naume Sonhera, Elmarie Kritzinger, and Marianne Loock, "Cyber Incident Handling and the Perceptions of Learners on Cyber Incidents in South African Schools," *Advances in Science, Technology and Engineering Systems Journal* 6, no. 5 (September 2021): 23–31, https://doi.org/10.25046/aj060504.

[9] Fazil et al., "Enhancing Internet Safety and Cybersecurity Awareness among Secondary and High School Students in Afghanistan: A Case Study of Badakhshan Province."

[10] Liezel Cilliers and Willie Chinyamurindi, "Perceptions of Cyber Bullying in Primary and Secondary Schools among Student Teachers in the Eastern Cape Province of South Africa," *The Electronic Journal of Information Systems in Developing Countries* 86, no. 4 (2020): e12131.

[11] Sonhera, Kritzinger, and Loock, "Cyber Incident Handling and the Perceptions of Learners on Cyber Incidents in South African Schools."

[12] Popovska Nalevska and Popovski, "Parental Attitudes and Mediation in Children's Use of Digital Media."

[13] Kumpulainen, Sairanen, and Nordström, "Young Children's Digital Literacy Practices in the Sociocultural Contexts of Their Homes."

[14] Grobbelaar and Jones, *Childhood Vulnerabilities in South Africa: Some Ethical Perspectives*; Elmarie Kritzinger, "Growing a Cyber-Safety Culture amongst School Learners in South Africa through Gaming," *South African Computer Journal* 29, no. 2 (2017): 16–35; Kumpulainen, Sairanen, and Nordström, "Young Children's Digital Literacy Practices in the Sociocultural Contexts of Their Homes."

Additionally, there is a significant gap in research concerning digital safety education in the early years. Specifically, there is no studies on the roles and collaboration of digital safety education stakeholders, as well as the challenges associated with its implementation. This gap is particularly concerning given that young children have limited critical judgment in the digital landscape, making it difficult for them to identify digital safety risks.[15] These concerns underscore the urgent need for a comprehensive and collaborative model to guide effective digital safety education during early childhood.

This study aims to develop a model for effective digital safety education in the early years by exploring how digital safety education can be enhanced. The objectives are to explore how key stakeholders, including educators, parents, policymakers, and digital content developers, can collaborate effectively to strengthen digital safety initiatives for young children. Furthermore, the study aims to identify the challenges these stakeholders encounter in implementing digital safety education, intending to develop strategies to overcome these barriers and ensure a more cohesive, informed, and protective approach to digital engagement in early childhood.

LITERATURE REVIEW

Factors Informing Digital Safety Education

According to the , children aged 0 to 10 are increasingly exposed to digital safety risks due to the widespread accessibility of ICTs and the internet in both educational and home environments. The report found that 67% of South African children under the age of 10 had access to ICT in their household, often unsupervised.[16] Alarmingly, the same report notes that one in three children within this age group had viewed inappropriate content online, with many parents being unaware of these incidents.

In the foundation phase (Grades R to 3), teachers and learners have an increased reliance on ICT for teaching and learning; therefore, emphasise the need for digital safety education in the early years. According to , children in their early years are vulnerable to digital safety risks due to their naivety; therefore, it is imperative to provide them with education on the responsible and safe use of ICT in order to minimise digital safety risks. support these motions by stating that the integration of ICT into children's daily lives necessitates the need to teach young children to safely and securely use ICT.

Digital safety education has been incorporated into the school curricula of several countries, such as Australia, New Zealand, Canada, the United States of America (USA), and the United Kingdom (UK).[17] According to , 24 European countries had already implemented digital safety education into their curriculum by 2009.

The exponential expansion of ICT on a global scale has prompted several African countries, including Mauritius, Tunisia, Kenya, Ghana, Mozambique, Cameroon, Egypt, and Rwanda, to integrate digital safety education into their school curricula.[18] Nevertheless, countries such as Uganda, Sudan, Morocco, and South Africa (SA) continue to encounter difficulties in this area. According to the study, "Cyber Safety Education in Developing Countries" by , a study was conducted with primary schools in the region of the Port Elizabeth (Gqeberha) University. Teachers were asked to participate in a digital safety workshop intending to gather data for a digital safety curriculum.

> *"Although the cyber-safety curriculum will only be finalised and extensively made available at a later stage, it can definitely be classified as filling a huge gap in the educational programme in junior or primary schools – and that it will prove to be very helpful to schools and teachers that want to educate their learners on the risks and controls relating to cyberspace"* .

[15] Bacak et al., "Elementary Educator Perceptions of Student Digital Safety Based on Technology Use in the Classroom"; Anna Fleck, "Online Child Pornography Skyrockets," *Statista*, 2023; Internet Watch Foundation, *Annual Report 2021*, 2021.
[16] National Centre for Child Protection., "1st Annual Statistics Report. " (South Africa, , 2024).
[17] Lynn Futcher et al., "Key Elements for Cybersafety Education of Primary School Learners in South Africa," in *International Symposium on Human Aspects of Information Security and Assurance* (Springer, 2023), 116–28.
[18] Futcher et al., "Key Elements for Cybersafety Education of Primary School Learners in South Africa."

Given that this study was conducted in 2015 and received favourable responses, the primary inquiry is why, a decade later, we still do not have a digital safety curriculum?

Digital Safety Awareness

Digital safety is a complex idea that encompasses a broad spectrum of concerns that are directly or indirectly related to the physical and mental well-being of individuals who use ICT.[19] Rahman et al. highlight the importance of teaching digital safety in schools with the study title *"The importance of cybersecurity education in school."* However, according to Walsh et al. emphasis is placed on teaching digital literacy, highlighting that education focuses more on competency and lacks focus on prevention methods and well-being promotion. Kritzinger supports this motion stating that schools are not are not establishing digital safety among school learners, leaving these learners vulnerable and open to digital safety risks.

Furthermore, Aphane asserts that the primary obstacle encountered by children in SA is the lack of adequate education on safe and secure navigation of ICT. Rahman et al. conclude that those who are uninformed about the significance and consequences of digital safety exhibit a lack of digital safety awareness. Insufficient awareness of digital safety can lead to numerous digital safety risks that can have substantial and enduring adverse effects on children.[20]

Consequently, digital safety awareness a method of educating ICT users about the diverse digital safety risks and the susceptibility of mobile devices to such threats.[21] Furthermore, it encompasses users' understanding of the significance of keeping their information secure and their duties in implementing sufficient information control to protect themselves. According to these descriptions, digital safety awareness has dual objectives: informing ICT users about digital safety risks and enriching their understanding of these risks to promote a steadfast commitment to employing security measures while using ICT.

Several sources emphasise the critical need to raise digital safety awareness to safeguard young learners.[22]However, they also point out a significant lack of awareness not only among learners in the early years but also among parents and teachers. Furthermore, data from the National Centre for Child Protection (2024) reveals that among reported digital safety risk cases involving children, 45% were within the 0 - 10 age bracket. Children in this age group were also excessively affected by SG-CSAM, particularly those unaware of the implications of sharing photos or engaging with strangers online. These findings reinforce the critical need to improve awareness and preventative education during the early years.

Stakeholder Collaboration

While it is important to assess children's understanding of ethical ICT use, it is equally critical to examine the roles and responsibilities of the adults who provide and regulate their access to ICT's.[23] Digital safety education must therefore be a collaborative effort involving parents, teachers,

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[19] Siti Fatimah Mardiah Hamzah et al., "The Relationship between Digital Communication, Digital Literacy, and Digital Safety on Online Behaviour," *International Journal of Academic Research in Business and Social Sciences* 13, no. 12 (2023): 788; Lies De Kimpe et al., "Internet Safety," *The International Encyclopedia of Media Literacy* (Singapore: Wiley Blackwell, 2019).

[20] Mmabatho Portia Aphane, "Cybersecurity Awareness on Cybercrime Among the Youth in Gauteng Province," *International Journal of Social Science Research and Review* 6, no. 8 (August 6, 2023): 23–32, https://doi.org/10.47814/ijssrr.v6i8.1414.

[21] Farzana Quayyum, Daniela S Cruzes, and Letizia Jaccheri, "Cybersecurity Awareness for Children: A Systematic Literature Review," *International Journal of Child-Computer Interaction* 30 (2021): 100343.

[22] De Kimpe et al., "Internet Safety"; Quayyum, Cruzes, and Jaccheri, "Cybersecurity Awareness for Children: A Systematic Literature Review"; Fazil et al., "Enhancing Internet Safety and Cybersecurity Awareness among Secondary and High School Students in Afghanistan: A Case Study of Badakhshan Province"; Virgilio G Medina and Ross J Todd, "Building a Wall of Digital Safety: A Passport for Learning without Borders," in *IASL Annual Conference Proceedings*, 2017; Martin et al., "Teacher and School Concerns and Actions on Elementary School Children Digital Safety"; Sonia Livingstone and Mariya Stoilova, "The 4Cs: Classifying Online Risk to Children," 2021; Cilliers and Chinyamurindi, "Perceptions of Cyber Bullying in Primary and Secondary Schools among Student Teachers in the Eastern Cape Province of South Africa"; Carrie James, Emily Weinstein, and Kelly Mendoza, "Teaching Digital Citizens in Today's World: Research and Insights behind the Common Sense K–12 Digital Citizenship Curriculum," *Common Sense Media* 2021 (2019).

[23] Lauren Mark and Thanh Trúc T. Nguyễn, "An Invitation to Internet Safety and Ethics: School and Family Collaboration," *Journal of Invitational Theory and Practice* 23 (December 6, 2021): 62–75, https://doi.org/10.26522/jitp.v23i.3497.

communities, government, NGOs, and law enforcement. [24] Nevertheless, existing research overwhelmingly focuses on the education sector, with limited attention to collaboration across sectors.

To address the lack of intersectoral collaboration, the digital safety education collaboration (DSEC) model proposes a multisectoral approach integrating the law, education, and community sectors. Each sector contains key stakeholders whose expertise must inform and support digital safety education (Figure 1).

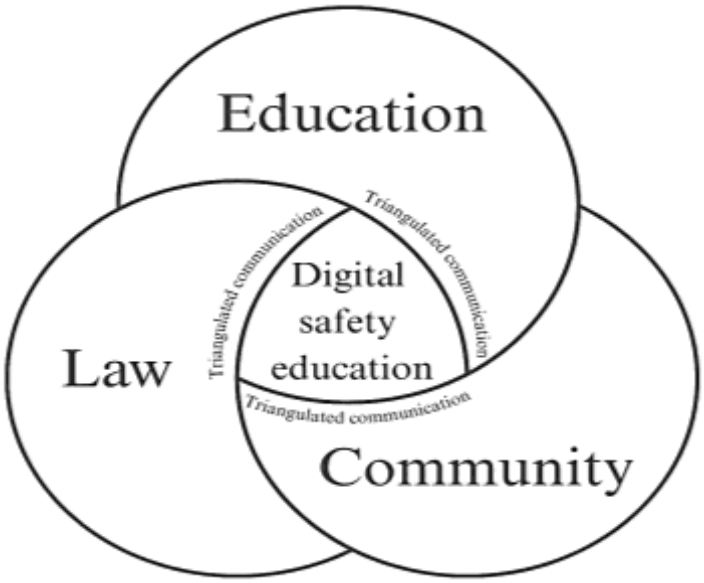

Figure 1: Digital Safety Collaboration Model (DSEC)

The law sector includes legal advocates and South Africa's Serial Electronic Crimes Investigation Unit (SECI). Advocates are essential for shaping child protection laws responsive to digital threats, [25] while SECI provides critical expertise in investigating cybercrimes involving children.[26] Despite their importance, collaboration between the law and education sectors remains underdeveloped. As the Law Reform Commission (2021) recommended, the Department of Education should be actively involved in intersectoral legal committees to integrate digital safety into national curricula.

The community sector includes NGOs, parents, guardians, and social workers. NGOs such as the Internet Watch Foundation play a vital role in identifying and removing harmful online content.[27] However, NGOs face challenges such as limited funding, unclear mandates, and difficulties engaging parents.[28] Social workers, although positioned to support vulnerable children across sectors, often lack digital safety training. [29] This limits their ability to identify online risks such as grooming or cyberbullying. Addressing this gap requires targeted training and integration of ICT tools in social work practices.[30]

Parents are also central to digital safety efforts, offering insight into children's online habits at home. Yet, many face barriers, including technical knowledge gaps, unclear guidance, and low

[24] Grobbelaar and Jones, *Childhood Vulnerabilities in South Africa: Some Ethical Perspectives*; Kritzinger, "Growing a Cyber-Safety Culture amongst School Learners in South Africa through Gaming."
[25] Shanaaz Mathews and Chandré Gould, "Preventing Violence: From Evidence to Implementation," *ChildGauge* 2017 (2017): 61–67.
[26] South African Police Service., ""Sergeant Molwantoa Rapakgadi Has Secured 57 Life Term Sentences and an Additional 3074 Years' Imprisonment for 17 Serial Rapists to Date."" (SAPS Newsroom, 2023).
[27] Internet Watch Foundation, *Annual Report 2021*.
[28] Shafa Azahra Siregar and Mirwan Surya Perdhana, "Literature Review on Organizational Performance and Sustainability of Educational NGOs for Obtaining Funding," *Diponegoro Journal of Management* 13, no. 2 (2024).;Sonia Livingstone, Eva Lievens, and John Carr, "Handbook for Policy Makers on the Rights of the Child in the Digital Environment," 2020.
[29] Aiman El-Asam et al., "Children's Services for the Digital Age: A Qualitative Study into Current Procedures and Online Risks among Service Users," *Children and Youth Services Review* 122 (2021): 105872.
[30] Josh Behan-Devlin, "Digital Technology in Children's Safeguarding Social Work Practice in the 21st Century: A Scoping Review," *The British Journal of Social Work* 54, no. 7 (October 1, 2024): 2957–76, https://doi.org/10.1093/bjsw/bcae071.

engagement.[31] The National Centre for Child Protection (2024) found that 78% of caregivers could not activate parental controls, highlighting the need for outreach and support in early childhood settings.

The education sector includes the Department of Basic Education (DBE), school governing bodies (SGBs), and teachers. Despite the implementation of the Coding and Robotics CAPS curriculum, South Africa still lacks a comprehensive digital safety framework.[32] Criticism has been directed at the DBE for insufficient commitment,[33] and the outdated National Cybersecurity Policy Framework[34] has not been revised to reflect current threats.

SGBs, described as the nerve centres of schools,[35] often lack clear responsibilities around digital safety.[36] Similarly, schools lack the leadership, resources, and training necessary to build a digital safety culture.[37] Teachers' attitudes toward technology significantly affect their digital safety knowledge.[38] Negative perceptions often driven by fear or lack of exposure reduce ICT engagement and hinder implementation efforts, as explained by the theory of planned behaviour.[39]

While schools remain crucial to digital safety education, an overemphasis on the education sector neglects the roles of legal and community actors. The DSEC model addresses this by promoting intersectoral collaboration. Future efforts must expand training, clarify roles, and build inclusive digital safety strategies that reach beyond classrooms and into homes, communities, and legal systems.

CONCEPTUAL FRAMEWORK

A conceptual framework is a comprehensive explanation of a researcher's understanding of the factors that are pertinent to a study, as well as their interrelationships.[40] The conceptual framework used in this study, known as the digital phallic development framework, was developed by incorporating an adapted version of the CO:RE (Children Online: Research and Evidence) 3 C's model of digital safety risks with Sigmund Freud's psychosexual development theory.

The 3 C's risks include content, contact, and conduct.[41] Content risk refers to exposure to illegal, age-inappropriate, or harmful online material, including pornography.[42] Pornography, generally defined as sexually explicit content designed to provoke arousal,[43] is increasingly accessible to children. Although precise numbers are hard to determine, research acknowledges that children encounter such content regularly.[44] Children also use ICT's to escape daily life, which can exacerbate mental health challenges when coupled with exposure to harmful content.[45] This exposure can

[31] Florence Martin et al., "Examining Parents Perception on Elementary School Children Digital Safety," *Educational Media International* 58, no. 1 (January 2, 2021): 60–77, https://doi.org/10.1080/09523987.2021.1908500.
[32] Futcher et al., "Key Elements for Cybersafety Education of Primary School Learners in South Africa."
[33] Cilliers and Chinyamurindi, "Perceptions of Cyber Bullying in Primary and Secondary Schools among Student Teachers in the Eastern Cape Province of South Africa."
[34] Department of State Security., *National Cybersecurity Policy Framework for South Africa* (Republic of South Africa: Government Gazette No. 39475, 2015).
[35] Noma Pakade and Thokozani Chilenga-Butao, "The Role of School Governing Bodies in School Academic Performance: An Exploratory Study in Two Districts in KwaZulu Natal," *Education Governance Programme, Public Affairs Research Institute*, 2021.
[36] Naume Sonhera, Elmarie Kritzinger, and Marianne Loock, "Roles And Responsibilities For School Role Players In Addressing Cyber Incidents In South Africa," *Eurasian Journal Of Social Sciences* 9, no. 3 (2021): 123–37, https://doi.org/10.15604/ejss.2021.09.03.001.
[37] Elmarie Kritzinger, "Improving Cybersafety Maturity of South African Schools," *Information* 11, no. 10 (2020): 471.
[38] Łukasz Tomczyk, "Skills in the Area of Digital Safety as a Key Component of Digital Literacy among Teachers," *Education and Information Technologies* 25, no. 1 (2020): 471–86.
[39] Icek Ajzen, "The Theory of Planned Behavior," in *Handbook of Theories of Social Psychology: Volume 1* (1 Oliver's Yard, 55 City Road, London EC1Y 1SP United Kingdom : SAGE Publications Ltd, 2012), 438–59, https://doi.org/10.4135/9781446249215.n22.
[40] Julie A Luft et al., "Literature Reviews, Theoretical Frameworks, and Conceptual Frameworks: An Introduction for New Biology Education Researchers," *CBE—Life Sciences Education* 21, no. 3 (2022): rm33.
[41] Livingstone, Lievens, and Carr, "Handbook for Policy Makers on the Rights of the Child in the Digital Environment."
[42] Mahyuddin Daud and J Abdul Jalil, "Protecting Children against Exposure to Content Risks Online in Malaysia: Lessons from Australia," *Jurnal Komunikasi, Malaysian Journal of Communication* 33, no. 1 (2017): 115–26.
[43] Alan McKee et al., "An Interdisciplinary Definition of Pornography: Results from a Global Delphi Panel," *Archives of Sexual Behavior* 49, no. 3 (2020): 1085–91.
[44] Kristina Massey, Jan Burns, and Anke Franz, "Young People, Sexuality and the Age of Pornography: K. Massey et Al.," *Sexuality & Culture* 25, no. 1 (2021): 318–36.
[45] Grobbelaar and Jones, *Childhood Vulnerabilities in South Africa: Some Ethical Perspectives*.Martin et al., "Examining Parents Perception on Elementary School Children Digital Safety."

negatively affect their development and well-being,[46] highlighting the importance of vigilant oversight and education.[47]

Contact risk, distinct from content risk, involves direct interactions between children and potentially harmful adults online.[48] Examples include harassment, cyberbullying, and grooming.[49] As ICT use becomes more interactive, children may inadvertently share personal information, not understanding the repercussions.[50] Online grooming is a particularly concerning form of contact risk, where adults build trust with children to exploit them sexually.[51] Cases of self-generated child sexual abuse material (SG-CSAM) often originate from such grooming. Exact figures are difficult to obtain due to underreporting and privacy concerns.

Conduct risks involve children as either perpetrators or victims of harmful online interactions, such as spreading misinformation or sharing personal details.[52] A growing concern is the dramatic increase in SG-CSAM, explicit images produced by children themselves.[53] For example, the reported 63,057 SG-CSAM cases involving children aged 7-10 in 2022, a significant rise from previous years, and partly attributed to increased online activity during the COVID-19 pandemic.

Young children often lack awareness of the dangers of sharing personal or explicit content, leading to blurred boundaries between private and public lives and increased vulnerability to exploitation. Raising awareness at all levels, children, families, communities, ICT sectors, and governments, is seen as vital for prevention. [54]

Psychosexual Development Theory

Freud's psychoanalytic theory is foundational for understanding children's psychological and sexual development.[55] Freud outlined five psychosexual stages: oral, anal, phallic, latency, and genital, each defined by the focus of pleasure-seeking impulses.[56]

- Oral stage (birth - 1 year): Pleasure centres on the mouth.
- Anal stage (1 - 3 years): Pleasure focuses on controlling bladder and bowel movements.
- Phallic stage (3 - 6 years): Children become aware of their bodies and gender differences, focusing on genitalia.
- Latency stage (6 - puberty): Sexual impulses are repressed while social and intellectual skills develop.
- Genital stage (puberty - adulthood): Sexual desires re-emerge and mature relationships develop.

The Digital Phallic Development Framework

Combining the 3 C's model (content, contact, conduct) with Freud's psychosexual theory provides a valuable framework for understanding digital safety risks for young children, especially those in the phallic stage (ages 3 - 6). During this period, children naturally explore their bodies, and digital technologies can facilitate or exacerbate risky behaviours.

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[46] Jang and Ko, "Online Safety for Children and Youth under the 4Cs Framework—A Focus on Digital Policies in Australia, Canada, and the UK."

[47] Livingstone and Stoilova, "The 4Cs: Classifying Online Risk to Children"; Martin et al., "Teacher and School Concerns and Actions on Elementary School Children Digital Safety."

[48] De Kimpe et al., "Internet Safety."

[49] Jang and Ko, "Online Safety for Children and Youth under the 4Cs Framework—A Focus on Digital Policies in Australia, Canada, and the UK."

[50] Sana Ali, Hiba Abou Haykal, and Enaam Youssef Mohammed Youssef, "Child Sexual Abuse and the Internet—A Systematic Review," *Human Arenas* 6, no. 2 (June 4, 2023): 404–21, https://doi.org/10.1007/s42087-021-00228-9.

[51] Parisa Rezaee Borj, Kiran Raja, and Patrick Bours, "Online Grooming Detection: A Comprehensive Survey of Child Exploitation in Chat Logs," *Knowledge-Based Systems* 259 (January 2023): 110039, https://doi.org/10.1016/j.knosys.2022.110039.

[52] Julie Hooft. Graafland, "'New Technologies and Twenty-First Century Children: Recent Trends and Outcomes.,'" 2018; Livingstone and Stoilova, "The 4Cs: Classifying Online Risk to Children."

[53] Thorn., " Self-Generated Child Sexual Abuse Material: Attitudes and Experiences. ," 2022.

[54] Grobbelaar and Jones, *Childhood Vulnerabilities in South Africa: Some Ethical Perspectives*; South African Law Reform Commission, "Guidelines for Judicial Review of Coalition Governance," *Project 143, Annexure B.*, 2023.

[55] Douglas C Youvan, "From Freud's Oedipus to Jung's Archetypes: Tracing the Evolution of Psychoanalytic Theory," 2024.

[56] Jessica Traylor, Laura Overstreet, and Diana Lang, "Psychodynamic Theory: Freud," *Individual and Family Development, Health, and Well-Being*, 2022.

Although curiosity about their bodies is natural, children must be educated about safe behaviours and the risks of inappropriate sharing.[57] Integrating the 3 C's model with psychosexual development theory, the digital phallic development framework offers a comprehensive lens for studying and responding to these risks.

Children face complex, overlapping digital safety risks rooted in their developmental stage and amplified by the accessibility and anonymity of ICT. Addressing these challenges requires heightened awareness, coordinated prevention, and integrated educational strategies tailored to children's psychological development and digital engagement. The digital phallic development framework is a useful tool for understanding and mitigating the unique risks faced by children aged 3 to 6 in the digital era.

METHODOLOGY

Design

A research design is a blueprint or plan that researchers use to generate answers to research questions.[58] This study used an exploratory research design. Exploratory research is typically characterised by an inductive and qualitative approach. This type of research usually occurs when a researcher explores a new area of interest or when the subject matter itself is relatively novel. It involves engaging with stakeholders to gain preliminary insights into the topic.[59] This research study employed an exploratory research design, primarily because there is a limited understanding of digital safety education in the early years. The exploratory approach was well-suited for this study as it enables a thorough investigation of diverse or unforeseen findings, thus contributing to a more comprehensive understanding of the intricate dynamics surrounding digital safety education. By delving into these factors, valuable insights were obtained on how to develop an effective digital safety education model.

Participants

A purposive sampling method was used to select 10 participants involved in digital safety education. Purposive sampling involves selecting participants who are most likely to provide relevant and valuable information. The rationale for implementing a purposive strategy stems from the premise that, considering , certain individuals may possess distinct and significant perspectives about the concepts and issues at hand based on the aims and objectives of the study, thus necessitating their inclusion in the sample. The 10 participants met the following criteria: they were citizens of South Africa, had specific knowledge of digital safety; related to their occupation, knew the South African education system, had at least 3 years of experience in their current occupation and had to work in one of the sectors identified in the digital safety education collaboration (DSEC) model. 4 Documents were analysed for document analysis of which the inclusion criteria included the authenticity and the type of documents.The documents had to be authentic South African documents and included digital security.

Data gathering

Data gathering involved semi-structured interviews and document analysis to explore digital safety education in the early years. The interviews were conducted online using Microsoft TEAMS in 2024, providing a platform for in-depth discussions with each session lasting approximately 60 minutes. Each interview was meticulously transcribed to facilitate thorough analysis. Member checking of the transcribed interviews also took place to increase the transparency, accuracy and trustworthiness of the study's findings. Document analysis was done with the Cybercrimes Act 19 of 2020, Digital safety policy, Coding and Robotics foundation phase curriculum and the 1st Annual Statistics Report 2024 of child protection services.

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[57] South African Law Reform Commission, "Guidelines for Judicial Review of Coalition Governance."

[58] Brighton Kumatongo and Kenneth Kapalu Muzata, "Research Paradigms and Designs with Their Application in Education," *Journal of Lexicography and Terminology (Online ISSN 2664-0899. Print ISSN 2517-9306).* 5, no. 1 (2021): 16–32.

[59] Neha Jain, "Survey versus Interviews: Comparing Data Collection Tools for Exploratory Research," *The Qualitative Report* 26, no. 2 (2021): 541–54.

Data analysis

For data analysis, thematic analysis was employed using open coding techniques. This approach involved systematically identifying recurring codes within the data and organising them into categories. Coding reliability was achieved by developing a handwritten codebook, in which codes were cross-referenced and clearly interpreted. Audit trails were maintained to document coding decisions and changes, ensuring transparency throughout the process. Additionally, member checking was conducted to ensure consistency of coding across researchers. Thereafter, the themes emerged based on the categories and associated codes. Through this process, a comprehensive understanding of the data was achieved. Theme validation was accomplished through triangulation, using both interviews and document analysis to gather and compare data, thereby strengthening the validity of the identified themes. Member checking was employed to ensure consistency and accuracy across themes, allowing participants to review and confirm that the themes accurately reflected their perspectives and experiences. Additionally, peer debriefing and the use of thick description were incorporated to further enhance the trustworthiness and depth of the analysis.

Limitations

While data saturation was reached with 10 participants, a key limitation of the study is the relatively small sample size for interviews. Although triangulation was employed using interviews and document analysis for data gathering, the qualitative focus of the study means that findings are primarily based on participants' perceptions and experiences. Incorporating quantitative data in future research could add an objective dimension to the analysis and further strengthen the overall findings of the study.

Ethical considerations

In this study, the researchers followed a rigorous ethical protocol and obtained clearance from the University of Pretoria's ethics committee with ethical clearance number EDU064/24. As all participants were of legal age, they were issued with informed consent forms outlining the research objectives and the research team's credentials. Participation was voluntary, and participants were informed of their right to withdraw at any time without explanation or to request the removal of their contact information. Anonymity and confidentiality were maintained through the use of pseudonyms, and no identifying information was collected. Only the research team had access to the data, which was gathered transparently and respectfully. Participants were informed about the data used, and no data was manipulated to achieve favourable outcomes. The researchers remained aware of potential bias during thematic analysis and aimed for objective, ethical interpretation.

PRESENTATION OF FINDINGS AND DISCUSSION

After analysing the data, 6 themes emerged based on the categories and codes identified. These themes shed light on various aspects of digital safety education in the early years.

Theme 1: Owing to the complexity of digital safety, a holistic approach in early childhood is required

Digital safety is a complex idea that encompasses a broad spectrum of concerns related to the physical and mental well-being of individuals who use ICT.[60] Participants stressed that *"kids don't just wake up digitally responsible, they need to be guided"* (AE), and that educational focus *"is more on what children can do online rather than what they should do safely"* (BE). The literature and interviews concur that there is an *"assumption that young people 'just know' digital safety, but they don't"* (CE), leaving them vulnerable.[61] The absence of awareness among *"children, parents, and teachers"* (DE) points to the need for a structured approach to digital awareness that includes children, parents, and teachers.[62]

[60] De Kimpe et al., "Internet Safety"; Hamzah et al., "The Relationship between Digital Communication, Digital Literacy, and Digital Safety on Online Behaviour."
[61] Aphane, "Cybersecurity Awareness on Cybercrime Among the Youth in Gauteng Province."
[62] Livingstone and Stoilova, "The 4Cs: Classifying Online Risk to Children."

Theme 2: Intersectoral collaboration and stakeholder integration is crucial to enhance digital safety in early childhood

Safeguarding digital safety entails collaboration among parents, teachers, communities, government, NGOs, and law enforcement.[63] As one participant noted, *"It can't just be either parents or the school… it's a relationship"* (BE). The proposed DSEC model encourages structured collaboration, which participants confirmed: *"More structured efforts are needed between the government and schools"* (DE). The need for *"workshops and training…for everyone, not just kids"* (AE) demonstrates the importance of shared learning, communication, and responsibility.[64]

Theme 3: Systemic deficiencies in digital safety education infrastructure

Key barriers include the government's absence of commitment, insufficient digital knowledge, and inadequate school infrastructure.[65] Participants emphasised the lack of resources: *"We just don't have the resources… overseas police do talks at schools, but here, that's unlikely"* (DL), and that *"there's no material…no structure, and we don't even have time"* (AC). Lack of teacher training is a recurring issue: *"Teachers aren't getting the training they need. It's just assumed that they'll figure it out"* (AC), resulting in *"many teachers who don't feel confident talking about digital risks"* (BE). These findings echo concerns in the literature about implementation shortfalls.[66]

Theme 4: A pedagogically integrated framework for interactive and developmentally appropriate digital safety education

Participants advocated for *"age-appropriate teaching"* (AE), warning that *"if kids get too much information too soon, it backfires"* (AE). Integration into daily routines was emphasised: *"Everyday integration into lessons makes safety second nature"* (DE), and *"it should be part of how we talk about tech"* (BE). Interactive, creative methods such as *"gamification"* and *"stories"* (DL; AE) were seen as highly effective, while *"training both parents and children makes a real difference"* (CE), necessitating ongoing, inclusive efforts.[67]

Theme 5: Heightened vulnerability of children to online risks due to insufficient preparation, monitoring, and protection

Children are exposed to content, contact, and conduct risks , with participants noting *"even young kids are exposed to harmful online content"* (AC), and *"they can get messages from anyone, and parents have no idea it's happening"* (DL). Lack of parental monitoring is critical: *"Many parents don't check their children's online activities"* (DL). Cyberbullying is also a concern, as *"kids are being bullied in WhatsApp groups before they even reach Grade 4"* (BE). These issues highlight the urgent need for a comprehensive digital safety strategy involving all stakeholders.[68]

Theme 6: A Comprehensive and coordinated legal and policy framework for child digital safety

Findings highlighted fragmented and inconsistent approaches to digital safety education. Participants stated, *"Our cybersecurity laws don't fully protect children"* (DE) and *"there's no real enforcement of digital safety laws"* (DE; DL). Teachers are left without guidance: *"There's nothing really guiding us on how to respond to digital threats in schools"* (BE), and *"different provinces are doing their own thing. There's no shared understanding"* (DE). Calls for a *"structured national approach"* (AC) and the introduction of a development framework highlight the need for child-specific digital legislation, as echoed by and the .

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[63] Grobbelaar and Jones, *Childhood Vulnerabilities in South Africa: Some Ethical Perspectives*.

[64] Maria Kambouri et al., "Making Partnerships Work: Proposing a Model to Support Parent-Practitioner Partnerships in the Early Years," *Early Childhood Education Journal* 50, no. 4 (2022): 639–61.

[65] Kritzinger, "Growing a Cyber-Safety Culture amongst School Learners in South Africa through Gaming."

[66] Futcher et al., "Key Elements for Cybersafety Education of Primary School Learners in South Africa."

[67] Amukelani Lisa Nkuna and Elmarie Kritzinger, "Language as a Moderating Factor in Cyber-Safety Awareness Among School Learners in South Africa: Systematic Literature Review (SLR)," in *International Conference on Advanced Research in Technologies, Information, Innovation and Sustainability* (Springer, 2023), 444–56.

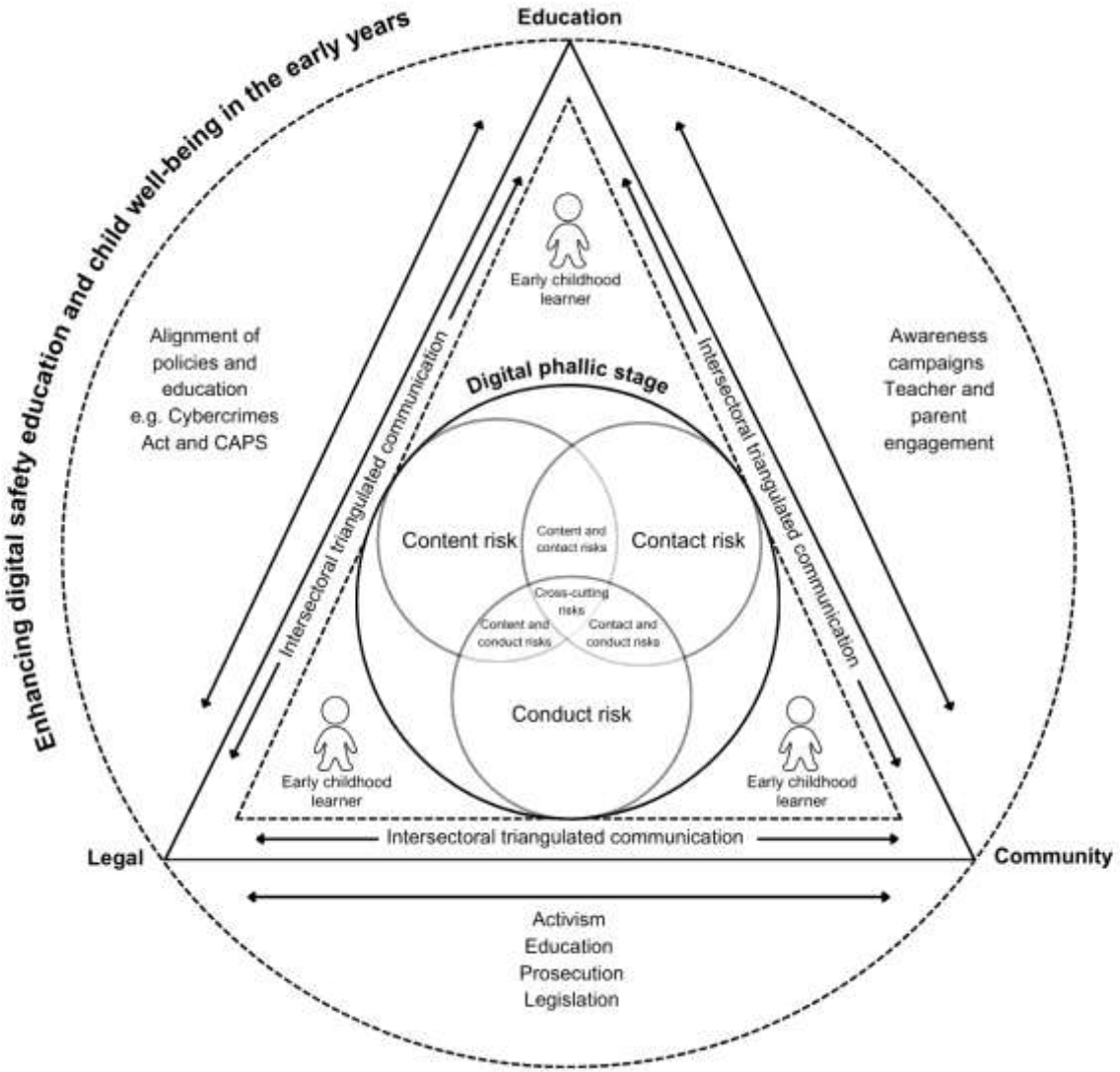
[68] Martin et al., "Teacher and School Concerns and Actions on Elementary School Children Digital Safety."

Overall, the findings demonstrate an urgent need for a holistic, collaborative, and well-resourced digital safety education framework that is developmentally appropriate, supported by robust policy, and underpinned by active stakeholder engagement at all levels.

Study Contribution: Model For Enhancing Digital Safety Education And Child Well-Being In The Early Years

This study makes a significant and original contribution to the field of early childhood digital safety education by addressing a critical gap in both literature and practice, namely, the absence of developmentally and contextually informed approaches to digital safety for young children in South Africa. While global discourse has increasingly prioritised digital safety, much of the existing literature and intervention models have been concentrated in Western countries and primarily focused on older children and adolescents. This study addresses the pressing need to explore digital safety education, particularly within the early childhood years (ages 0-10), where children are developmentally vulnerable and often overlooked in national policy frameworks and educational programming.

As evidenced in this dissertation, the digital landscape is no longer an optional terrain for children; it has become an integral dimension of early life experiences, increasingly shaping how young children play, communicate, learn, and express themselves. In response to the complex challenges arising in this rapidly evolving digital landscape, this study draws upon and advances the model, enhancing digital safety education and child well-being in the early years (see figure 2). This model provides a coherent and multidimensional framework that addresses the multifaceted risks children face in the digital landscape, while simultaneously offering a roadmap for systemic, intersectoral responses grounded in education, law, and community collaboration.


Enhancing digital safety education and child well-being in the early years
Education
Early childhood learner
Alignment of policies and education e.g. Cybercrimes Act and CAPS
Awareness campaigns Teacher and parent engagement
Digital phallic stage
Intersectoral triangulated communication
Intersectoral triangulated communication
Content risk
Content and contact risks
Contact risk
Cross-cutting risks
Content and conduct risks
Contact and conduct risks
Conduct risk
Early childhood learner
Early childhood learner
Intersectoral triangulated communication
Legal
Community
Activism
Education
Prosecution
Legislation

In Figure 2, the early childhood learner is placed at the cornerstones of its design, based on the premise that digital safety must be integrated from the early phases of development. This model acknowledges that young children are interacting with digital landscapes while simultaneously progressing through the essential stages of their social, cognitive, and moral development, frequently lacking the critical ability to assess or respond to digital safety risks appropriately.

This model outlines three primary categories of digital safety risks, as recognised by the CO:RE 3 C's model: content, contact, and conduct. These categories are interconnected and exhibit complicated overlaps. Consequently, the digital safety risks children encounter online are numerous, necessitating the implementation of several strategies to ensure their safety.

A theoretically rich component of the model is the inclusion of the digital phallic stage, a concept inspired by Freud's psychosexual development theory. This element highlights the psychological and identity-forming implications of young children's initial digital engagements. It pushes the conversation beyond the technical to suggest that early digital interactions influence children's emerging understandings of gender, privacy, and interpersonal boundaries. In this context, exposure to digital landscapes is framed not merely as a matter of access but as a critical developmental fragment requiring intentional scaffolding and support.

In the model, a triangular structure links education, law, and community, each positioned as equally responsible for safeguarding children's digital well-being, indicating that these sectors cannot operate in silos. Instead, the concept of intersectoral triangulated communication is introduced, which delineates the active, reciprocal coordination among education systems, legal frameworks, and community stakeholders. In education, alignment between national policy documents such as CAPS and legislation such as the Cybercrimes Act is essential. Schools must prepare children not only for academic success but also for safe, ethical engagement with ICTs. The legal sector, in turn, must move beyond punitive responses and begin crafting proactive, child-centred protections. The community, particularly parents, caregivers, and NGOs, must remain actively involved, as they represent the immediate environments in which children's digital behaviours are nurtured and observed.

This model contributes both theoretically and practically to the study. Theoretically, it offers a multidisciplinary framework that intersects developmental psychology, digital education, legal policy, and community engagement. It challenges narrow interpretations of digital safety as solely technological or regulatory and reframes it as a deeply relational, developmental issue. Practically, it serves as a blueprint for designing targeted interventions across sectors, informing curriculum design, legal reform, teacher training, and community education. It not only supports efforts to shield children from digital safety risks but also foregrounds the importance of empowering young learners to become confident, capable digital citizens.

The enhancing digital safety education and child well-being in the early years model stands as a timely and essential contribution to the field of early childhood digital engagement. Its integration into this dissertation strengthens the central premise: that digital safety is not a supplementary concern, but rather a core element of child development and well-being in a digitally saturated world. By adopting a triangulated, intersectoral approach, the model offers a vision for embedding digital safety across all levels of society, ensuring our youngest digital citizens are not only protected but also prepared to participate with awareness.

This study contributes rich, qualitative insights from multiple stakeholder perspectives, drawing from semi-structured interviews and document analysis. The findings underscore the disconnect between policy intention and implementation, as evidenced in documents such as the Cybercrimes Act 19 of 2020, the NCCP Report (2024), and school ICT policies. Despite the presence of legal instruments, the lack of structured follow-through, training, and curriculum integration remains a major barrier.

Finally, this study answers call for locally grounded research into digital safety implementation in the Global South by offering context-sensitive, developmentally appropriate, and theoretically informed responses to the pressing challenge of digital harm in early childhood. The research thereby

extends both the theoretical discourse and practical strategies in the field of child protection, education, and digital safety policy.

CONCLUSION

This study affirms that digital safety education in early childhood is both urgent and indispensable in today's interconnected world. As young children begin to navigate digital landscapes during critical phases of their cognitive, emotional, and psychosexual development, they become increasingly vulnerable to a range of digital safety risks, particularly of a sexual nature. These include inappropriate content exposure, online grooming, and SG-CSAM. The findings of this study strongly support the argument that current educational practices, legal frameworks, and parental involvement remain inadequate in addressing these risks effectively.

This study was guided by the digital phallic development framework, which integrates Freud's psychosexual development theory, specifically the phallic stage (ages 3 to 6), with the CO:RE 3 C's model of digital safety risks (content, contact, and conduct). This innovative conceptual framework allows for a more precise understanding of how young children's natural curiosity, emerging identities, and limited cognitive regulation intersect with digital vulnerabilities. The framework acknowledges the complexity of children's digital experiences and underscores the need for educational responses that are developmentally appropriate, emotionally sensitive, and ethically grounded.

The study's data component, based on semi-structured interviews with key stakeholders from the education, law, and community sectors, alongside document analysis of policy and curriculum materials, generated six core themes that map the landscape of digital safety education in South Africa. These include the need for a holistic approach, the importance of intersectoral collaboration, the presence of systemic deficiencies, the demand for interactive and age-appropriate teaching, the heightened vulnerability of children, and the absence of comprehensive legal and policy frameworks. Collectively, these themes offer a compelling critique of the current state of digital safety education and point toward practical and policy-oriented interventions.

One of the study's cornerstones is the introduction of the DSEC model, which calls for coordinated action between the education, community, and law sectors. The findings clearly demonstrate that no single sector can effectively shoulder the responsibility of digital safety education alone. Instead, triangulated communication, mutual accountability, and integrated practices are required to build robust and sustainable protective systems around young learners. Teachers, parents, social workers, legal professionals, NGOs, and policymakers must all contribute to a shared vision of digital safety through intersectoral triangulated communication.

Furthermore, the research highlights the pressing need for leadership from government in establishing a national digital safety curriculum. Such a curriculum should be integrated into the early years, supported by targeted teacher training, and complemented by parental education. This holistic, ecosystemic approach to digital safety is essential not only to prevent harm but also to foster digital resilience, emotional intelligence, and ethical digital citizenship from an early age.

This study's key contribution presents a model for enhancing digital safety education and child well-being in early years, positioning the early childhood learner at its core. It is founded on the premise that digital safety should be integrated from the initial stages of development. The model acknowledges that young children interact with digital landscapes while developing essential social, cognitive, and moral skills. It delineates three interconnected categories of digital safety risk content, contact, and conduct based on the CO:RE 3 C's model and emphasises their intricate interrelations.

This theoretical contribution integrates the digital phallic stage, using Freud's psychosexual theory to highlight the influence of early digital interactions on identity formation, privacy awareness, and interpersonal boundaries. The model presents a triangulated structure encompassing education, law, and community, positing that the protection of children's digital well-being necessitates coordinated intersectoral communication rather than fragmented initiatives. The alignment of curriculum policies, such as CAPS, with legislation such as the Cybercrimes Act is essential, alongside proactive child-centred legal protections and active community engagement.

The enhancing digital safety education and child well-being in early years model is theoretical, integrating developmental psychology, digital literacy, and legal policy, while also being practical by providing a framework for creating cross-sector interventions that enable children to become competent and resilient digital citizens. The model asserts that digital safety is a fundamental aspect of holistic child development in the 21st century, rather than a peripheral concern in early education.

In conclusion, this study offers a theoretically grounded and analytically supported blueprint for enhancing digital safety education in the early years. The enhancing digital safety education and child well-being in early years model represents a significant step forward in reimagining how to protect and empower young learners in digital landscapes. As ICTs continue to evolve, so too must the educational, legal, and social systems. This research provides the conceptual clarity, practical direction, and interdisciplinary foundation needed to support meaningful change, ensuring that children not only access the digital world but do so safely, confidently, and with the guidance they deserve.

COMPETING INTERESTS

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

FUNDING INFORMATION

The research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

DATA AVAILABILITY

The authors confirm that the data supporting the findings of this study are available within the article.

DISCLAIMER

The views and opinions expressed in this article are those of the authors and do not necessarily reflect the official policy or position of any affiliated agency of the authors.

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ABOUT AUTHORS

Dominique Cook is an English teacher for Grades 5 to 7. Her professional and research interests lie at the intersection of language education, early childhood development, and digital safety. She is particularly focused on how young children engage with digital environments and how educators can support safe and developmentally appropriate digital practices. She is currently affiliated with the University of Pretoria, where her research centers on enhancing digital safety education in the early years. Her work draws on interdisciplinary perspectives, including coding, robotics, language, and play-based learning, to develop practical and contextually relevant approaches for educators. Her research aims to contribute to the development of conceptually grounded and classroom-applicable strategies that support safe, ethical, and meaningful digital engagement among young learners.

Dr Joyce West, is an early childhood education scholar at the University of Pretoria, whose work sits at the intersection of language, literacy, teacher education, and educational technology. Her research focuses on how young children learn to read and write in multilingual contexts, with particular attention to African language literacy development, orthographic features, readability, and the implications of linguistic complexity for equitable early-grade instruction. She works across mixed-methods and design-oriented approaches to generate evidence that is both theoretically robust and usable for classroom practice, including tools and resources that support teacher decision-making and inclusive learning. A central thread in her scholarship is the question of how pedagogical innovation, especially technology-mediated learning, can expand access to high-quality early literacy experiences while remaining ethically grounded and context-responsive. This includes interests in learning analytics, human–machine teaching, and the careful integration of generative AI into teacher education and curriculum design. Dr West collaborates with practitioners and partners to translate research into professional learning and classroom-ready materials, with a strong emphasis on multilingual pedagogy, translanguaging-informed practices, and equity-driven assessment.

Dr. Kayla Willemse is a lecturer in the Department of Early Childhood Education at the University of Pretoria, with research interests that span educational technology, coding and robotics, and broader digital innovation. Her work sits at the intersection of early childhood development, human-centred design, and educational technology. A central thread in her scholarship is how emerging technologies can be used in ethical, playful, and context-sensitive ways to strengthen learning, creativity, and meaningful participation in everyday life. She also engages with digital design and examines how artificial intelligence can influence the quality, efficiency, and ethics of work across continent.