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Reimagining teacher education for technology-facilitated gender-based violence: An ecological and intersectional framework for South African digital learning environments

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***Abstract*—** The rapid integration of digital technologies into educational settings has impacted both teaching and learning practices, even as it gives rise to new instances of gender-based violence. It has been recognised that technology-facilitated gender-based violence (TFGBV) is a phenomenon growing within digital learning-oriented settings, particularly targeting women and learners from marginalised communities. Notwithstanding the growing scale of TFGBV, teacher education programmes are generally inadequate in preparing teachers to address emerging digital risks. Hence, teachers need to acquire the knowledge and skills to address them. This systematic work aims to reconceptualise teacher education as an intervention site for tackling TFGBV in South African educational contexts. Building on ecological and intersectional approaches, we utilise a PRISMA-guided systematic review to integrate the literature on TFGBV, digital inequality, and teacher education transformation. The results show that gender-based violence fuelled by technology functions at multiple individual, interpersonal, institutional, and societal levels. Other factors, including socio-economic status, geographic location, and intersectional aspects, also contribute to learners' susceptibility to digital learning environments. Although previous teacher education programmes have trained them in technology-related skills and competencies, they have been less focused on teaching digital safety, gender-responsive pedagogy, and inclusive teaching practices. Hence, teachers might not be able to respond adequately to TFGBV. This study proposes a conceptual framework that positions teacher education as a transformative site for mitigating and countering digital violence, grounded in curriculum reform, policy alignment, and professional development. Restructuring teacher education using the lenses of ecology and intersectionality will lead to safer digital spaces, inclusive pedagogical practices, and more equitable learning.

Keywords: Digital inequality, Ecological framework, Intersectionality, Teacher education, Technology-facilitated gender-based violence

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I. INTRODUCTION

THE rapid expansion of digital technologies has significantly transformed educational environments, reshaping how teaching, learning, and communication occur within contemporary societies. Despite new technology revolutionising the tools used for educational collaboration and innovation, new violence and other forms of discrimination may still occur, and disproportionately affect vulnerable populations, such as women and girls. More than any other aspect, technology-facilitated gender-based violence (TFGBV) has grown into a critical issue in education, where digital spaces created for learning are increasingly weaponised as means of harassment, intimidation, exclusion, and surveillance (Hartmann et al., 2025). Such development raises key questions about the preparedness of education systems, especially teacher education programmes, to respond to new forms of digital violence and inequality emerging from increasingly technology-sophisticated learning environments. Worldwide, academics such as Ferreira and Silva (2025) assert that digital spaces are not neutral but reflect and reproduce existing social inequalities, including gendered power relations and systemic discrimination.

Historically thought of as an inclusive and democratic stage, the online is now an arena of social reproduction and exaggeration of misogyny, racism, sexism, and harassment when one enters digital interactions (Power & Khumalo, 2024). Technology-facilitated violence, including cyberbullying, digital harassment, online stalking, image-based abuse, and sharing of non-consensual content, is encountered everywhere by learners and educators in educational settings. A clear example of how technological innovation intersects with social inequality is seen in the study, compelling proactive considerations into teacher training and educational policy frameworks. Within African contexts, the rapid transformation of education has occurred alongside entrenched gender inequalities that shape learners' access to technology, their presence in digital spaces, and their experiences of online safety. Even with national targets for gender equality, constraints and pitfalls persist in digital learning environments due to structural and institutional inequities (George et al., 2025). According to Nyoni and Tabe (2026), these disparities are augmented by unequal access to digital infrastructure, socio-economic disparities, and institutional barriers for both students and teachers.

The occurrence of TFGBV is associated with digital inequality, particularly in rural and under-resourced areas, where sharing devices, limited connectivity, and a lack of institutional safeguards increase exposure. It has been referred to as a digital double bind in which technology fosters both inclusion and new varieties of exclusion and

risk (Seleke, 2025). As a result, teacher education is essential in preparing teachers to address these current challenges and respond to the risks posed by digital technologies. Notwithstanding, this study proposes that TFGBV be conceptualised within ecological and intersectional frameworks rather than as isolated events. These perspectives emphasise that digital violence exists at all levels, including individual, interpersonal, institutional, and societal, hence it cuts across gender, socio-economic status, and geography (Pietersen & Langeveldt, 2025). As such, this systematic review reframes teacher education as a transformative intervention site for addressing TFGBV in South African educational contexts.

Despite growing scholarship on TFGBV and digital transformation in education, research rarely treats teacher education as a targeted, systematic intervention. The extant studies, however, typically only single out uneven digital access or gender-based violence, and their pedagogical training does not take enough ecological and intersectional perspectives into account. This gap is crucial when considering how teachers can prepare themselves to tackle TFGBV in contextually complex environments such as South Africa.

The infusion of digital technology into education can open doors for teaching and learning, but also create new risks, specifically TFGBV. Places of learning, social media, and digital communication instruments have increasingly become arenas for harassment, cyberbullying, and gendered violence, which affect women and girls the most (Power & Khumalo, 2024). In South Africa, such constraints are exacerbated by socio-economic disparities, limited connectivity, and weak institutional safeguards, which together foster unsafe digital learning environments and deepen existing disparities (Seleke, 2025). Teacher training programmes can play an important role in addressing these issues; however, the existing technology-enabled curricula emphasise technological competence, often at the expense of concerns about digital safety, gender equity, and ethical participation. Consequently, teachers attend digital learning sessions without adequate training to recognise and address TFGBV (Power & Khumalo, 2024; Seleke, 2025; Nyoni & Tabe, 2026). This discrepancy suggests that it is essential to adopt a more holistic, ecological, and intersectional perspective to consider teacher education as a major area of intervention.

II. RATIONALE OF THE STUDY

This systematic review paper analyses teacher education as a space of critical intervention that contributes to resolving TFGBV in the South African context. As the use of technology in teaching and learning continues to expand, educators must also navigate complex digital interactions that extend beyond classroom walls. Teacher education programmes, however, often focus on technical literacy, leaving many educators less well prepared to address the social, ethical, and gendered harms that lurk in the realm of digital learning (Nyoni & Tabe, 2026). This leaves a gap in the role of social inclusion in education. Consequently, the current study aims to develop a theoretical perspective to inform a redesign of teacher education that equips teachers with the means to recognise, mitigate, and respond to TFGBV through a continuous teacher professional development (Tabe, 2024). A school-wide focus on teacher education as a site for transformation puts teachers on a path to become agents who challenge systems of digital learning and negotiate for safe, inclusive, and equitable spaces. The study also aims to show that teachers need to understand the impact of the digitalisation of education by integrating digital safety, gender awareness, and inclusive pedagogical practices into teacher education curricula. Subsequently, the research seeks to yield practical and theoretical implications for teacher training programmes, policymakers, and educational institutions.

III. LITERATURE REVIEW

TFGBV in digital educational contexts

Rapidly introducing digital technologies into education systems has fundamentally impacted how we communicate and learn, and has also opened new opportunities for TFGBV. Digital environments like learning management systems, social media platforms, and online communication tools become sites of harassment, intimidation, and surveillance, thereby reestablishing established power relations in education (Power & Khumalo, 2024). Such digital violence may take forms like cyberbullying, non-consensual image sharing, online harassment, and digital exclusion, all of which have negative implications for learners' psychological state, participation of pupils in the learning, and learning outcomes (Hart & Mitchell, 2015). TFGBV must also take a broader approach to context, including the socio-cultural and institutional contexts. Gender norms, power relations, and gaps in policy within schools help keep digital violence on the ground. The lack of adequate educator training and poor institutional responses limit the ability to design safe digital learning environments that integrate digital safety and gender awareness into teachers' training programmes (Pietersen & Langeveldt, 2025).

Additionally, TFGBV is affected by institutional and policy issues embedded in pedagogic spaces. At the same time, more educational institutions are using digital technologies for communication, teaching, and assessment, thereby enabling greater digital interaction among learners and educators (Alenezi et al., 2023). However, many institutions do not have policies on digital violence and online safety. Unfortunately, such a gap leaves educators and learners without guidance on TFGBV. A limited level of digital literacy, along with educators' lack of training, prevents effective responses to digital violence. These limitations, among others, highlight the need to integrate digital safety and gender awareness into teacher education programmes. Though these studies help identify the forms and prevalence of TFGBV, they often focus on description and ignore teacher actions. This limits their applicability for reform in teacher education.

TFGBV in African contexts

The rapid growth of digital technology has also transformed access to and engagement with education across Africa. Both governments and educational institutions are increasingly promoting digitalisation to enhance educational outcomes and prepare students for the Fourth Industrial Revolution. Nevertheless, this digital transformation has occurred alongside lingering gender inequality, which shapes access to and participation in digital learning contexts. Gender-based oppression is so deeply rooted in African cultures to this day that socio-economic gaps, cultural biases, and institutional frameworks significantly impact the prospects and opportunities of academic progression (Ojong, 2025). Limited digital infrastructure and access to technology resources exacerbate these inequalities. Studies have shown that gender inequality persists among African women and men and continues to shape the access, engagement, and educational quality of education (Walker et al., 2019). Limited access to devices, connection challenges, and sociocultural pressures are among the social determinants that hinder women's and girls' access to digital technologies. These structures discourage access to digital learning spaces and exacerbate exposure to TFGBV. In addition, gender-based violence is seen as a common and serious challenge in African education systems, with learners often facing harassment and intimidation based on gender both on and off the internet. It is possible to create these challenges at the intersection of digital transformation and gender inequality within African educational systems (George et al., 2025).

In the African contexts, digital technologies represent new areas of resistance and empowerment. There are social media platforms and mobile technologies where advocates raise awareness and report instances of gender-based violence. Studies have found that mobile technologies can help victims access support networks and resources (Slakoff et al., 2020). However, these technologies also enable forms of harassment and surveillance, indicating the two sides of the digital coin (Hart & Mitchell, 2015). These complexities call for integrated methodologies to tackle TFGBV. Equally, African educational systems

face difficulties in implementing policies and in building institutional capacity. Some countries have developed gender equality policies, but implementation remains inconsistent. Because of resource scarcity and inadequate training, institutional frameworks continue to hamper the development of effective solutions to TFGBV (Seleke, 2025). Consequently, the existing literature tends to generalise about African contexts, with limited attention to localised institutional realities and to the role of teacher education systems in mediating these risks.

TFGBV in South African educational contexts

South Africa is particularly well-suited to examine how technology facilitates gender-based violence because it has high rates of gender-based violence and faces a rapid digital transformation. The rapid integration of digital technologies into education accelerated during the COVID-19 pandemic when institutions switched to online learning. While in this way a person's experience of educational resources gained better distribution, it also exposed learners and educators to new forms of digital violence. With the rise of online hate, cyberbullying, and digital surveillance, it has taken place in educational environments. Digital inequality is a major constraint in South Africa, especially for rural learners from under-resourced communities. Students in these communities tend to have communal devices and little connectivity, thereby making them more susceptible to digital violence (Nthambeleni & Motadi, 2025). These limitations result in non-uniform learning experiences and compound existing social and economic inequalities. This is called a "digital double bind": digital technologies, on the one hand, foster inclusion while, on the other hand, exposing learners to new vulnerabilities (Seleke, 2025).

In South African educational settings, violence is typically rooted in structural socio-cultural patterns that contribute to gender inequality. A feminist perspective on pedagogy emphasises the need for a process of change that questions gender norms and fosters inclusive learning environments (Pietersen & Langeveldt, 2024). These approaches are rooted in the importance placed on educators in responding to gender-based violence and creating safe learning environments. South African studies also point to a need for teacher education programmes that address digital transformation as well as violence against women. Teachers play a vital role in shaping digital learning environments and promoting diversity and inclusion. Notwithstanding limited training in digital safety and gender awareness, which often impedes effective responses to TFGBV, there is a need to reimagine teacher education.

Teacher education and digital preparedness

Teacher Training is Critical in Preparing Teachers to Address Emerging Challenges in Digital Learning Environments. The existing teacher education frameworks, however, are characterised by a focus on technological competence while failing to provide comprehensive education on specific issues, such as digital safety and gender-based violence. Without adequate training to identify and respond to digital violence, pre-service teachers navigate complex digital environments. Ndebele et al. (2023) find that pre-service teachers face several challenges related to pedagogical preparedness and institutional support during work-integrated learning. They are additionally exacerbated by digital transformation, the need to adapt to new teaching methods, and the threats posed by new technologies. Teachers lack the structures to train themselves in creating safe digital learning environments. This also means that the adoption and adaptation of technology and pedagogical practices and approaches to support learning will not happen smoothly. In addition, teacher education programmes should also focus on holistic approaches, including digital literacy, gender awareness, and culturally safe pedagogy.

Ecological and intersectional frameworks are thus useful for understanding TFGBV, as they offer teacher education programmes a framework for investigating different spheres of influence and driving enduring interventions. Teacher education must be rethought to counteract TFGBV, which is the key in these contexts. When digital safety and gender consciousness are embedded in teacher education curricula, it is time to consider how teachers should be prepared to address emerging issues in digital learning spaces.

IV. THEORETICAL FRAMEWORK

Ecological framework

The problem of gender-based violence enabled by technology in education systems cannot be conceived of as a discrete phenomenon in terms of merely happening at the individual level. Instead, it is influenced by several complex, interacting factors at multiple levels. The ecological paradigm offers a complex understanding of the interactions among individual behaviour, interpersonal relationships, institutional arrangements, and societal patterns of practice that produce experiences of TFGBV (Holtmann et al., 2023). Founded to make sense of violence and explain crime and behaviour, at least in the early 1990s, the ecological model has been applied to educational and social justice issues to explain why violence or inequality occurs (Pietersen & Langeveldt, 2025). This model is particularly useful for understanding TFGBV, as it implies a digital environment in which encounters often occur within intricate social and institutional settings. At the personal level, factors such as digital literacy, access to technology, and individual gender norms affect TFGBV. Learners and teachers without digital literacy skills may be exposed to online abuse and exploitation. Gender stereotypes and cultural expectations also shape how people interact with digital technologies. Women and girls experience greater scrutiny and harassment in digital spaces, reflecting broader societal inequalities.

Moreover, these individual-level vulnerabilities compound to create higher levels of risk when learners lack access to institutional support or protective mechanisms within the educational environment in which they learn. Interpersonal relationships amongst learners and teachers play a crucial role in shaping how technology-mediated gender-based violence comes to be experienced in society. Digital learning environments must deal with an increasing pattern of communicative interaction, especially through the internet. The development of online platforms creates opportunities for abuse and intimidation. Peer relations within digital spaces can reinforce gender stereotypes and power imbalances, thus enabling gender-based violence facilitated by technology (Faith, 2022). Research shows that most cyberbullying and web harassment takes place in peer networks, a fact which brings emphasis on the need to deal with interpersonal dynamics of learners in an educational environment (Hart & Mitchell, 2015). Greater institutional and societal forces frequently influence such interpersonal relations. At the institutional level, TFGBV experiences are influenced by educational practices, teacher readiness, and digital infrastructure. As such, many educational institutions do not have adequate plans or policies to combat digital violence, leaving learners and teachers with inadequate safeguards.

In addition, teacher-education programmes lack any training for educators to confront these digital assaults. The institutionalised absence of these institutions hampers teachers' ability to respond appropriately to TFGBV. Moreover, unequal access to institutional digital infrastructure may worsen vulnerabilities, especially in low-resource areas. In the societal domain, TFGBV is affected by cultural norms, gender inequalities, and socio-economic disparities. Gender norms and stereotypes, for example, influence digital interactions and how individuals navigate online spaces. Socio-economic disparities also affect access to technology and digital safety tools. Studies highlight persistent digital inequality, with socioeconomic differences determining access to and participation in digital learning settings in African settings (George et al., 2025). Societal-level, multi-faceted consideration of these factors is necessary to address technology-enabled gender-based violence. As a result, the ecological framework represents a multi-tiered perspective to understanding technology-enabled gender-based violence at many levels of influence. By focusing on these individual, interpersonal, institutional, and societal aspects, this framework enables holistic analysis and intervention strategies to train teachers on how to address technology-enablers of gender-based

violence.

Intersectionality framework

Intersectionality offers an alternative theoretical lens on how to understand how technology facilitates gender-based violence in educational settings. Intersectionality focuses on how various forms of inequality intersect to shape individuals' experiences. These inequalities can range from gender, socio-economic status, geographic location, and race to access to resources. The experiences of gender-based violence facilitated by technology are therefore not the same for everyone; instead, they are contingent upon an individual's intersecting identities and social positions (Faith, 2022). This lens illustrates the need to analyse how digital violence disproportionately impacts marginalised groups in academic contexts. Intersectionality is particularly relevant in South Africa, where chronic socio-economic inequality and historical disparities in access to education and technology remain significant. Rural and underserved learners have had a range of obstacles that exacerbate their disadvantage, including lack of access to technology, poor connectivity, and, more generally, the risk of being involved in digital violence. Such issues combine and generate unequal learning environments that sustain learning disparities. This dynamic is referred to as the "digital double bind" in intellectual work, in which digital technologies open possibilities for full inclusion while simultaneously placing students from marginalised groups into new vulnerabilities (Seleke, 2025). Moreover, gender intersects with other forms of inequality to inflect TFGBV. Women and girls, especially in marginalised communities, are often more vulnerable to obstacles of limited resources and poor institutions.

Cultural and gender stereotypes may also limit students' engagement in digital learning environments (Chang et al., 2019). This multi-faceted nature of factors emphasises the necessity of teacher education programmes that cater to diverse learning practices and inclusive approaches. Intersectionality also emphasises the analysis of systems of power that may reproduce inequalities. If educational and teacher-training policies do not account for learners' differing needs, they are likely to reinforce structural inequalities unintentionally (Walker et al., 2019). Digital learning initiatives that assume universal access to technology, for instance, can negatively impact learners from under-resourced communities. These difficulties underline the need for intersectional approaches in teacher education. Intersectionality can therefore help teachers implement inclusive pedagogical practices that support many learners in their educational process. Consequently, it could extend the ecological perspective as it provides a more nuanced understanding of how technology facilitated gender-based violence and/or is experienced by specific groups. These frameworks provide a strong foundation for reimagining teacher education to address TFGBV.

V. OBJECTIVES OF THE STUDY

This study conceptualises TFGBV within digital educational environments. It examines how ecological and intersectional frameworks explain TFGBVe in South African educational contexts and explores how teacher education can be reimagined to address TFGBV in digital learning environments.

VI. METHODS

Research design

The study utilised a research approach, informed by a PRISMA-driven systematic literature review, to examine TFGBV and its relevance to teacher education in South Africa (Respati et al., 2025). Conceptual research is particularly suitable if theoretical work or a synthesis of the existing literature is sought to explore emerging phenomena. TFGBV is a relatively new and evolving practice in educational research, particularly in teacher education. To this end, a systematic review can synthesise a range of theoretical, empirical, and policy implications to inform understanding. Systematic research would also help identify gaps in existing knowledge and suggest a theoretical framework to guide future empirical research. Given this, the conceptual lens used here allows us to construct a framework grounded in ecological and intersectional perspectives to unpack further the multi-layered manifestations of TFGBV in digital educational contexts.

The methodological approach of conducting a systematic literature review further contributes to the systematic research design by grounding the study in a transparent, rigorous procedure. More systematic reviews are used in educational research to synthesise published work and to develop conceptual frameworks for future developments and theories to address new issues. This helps keep the literature review from cherry-picking and from being anecdotal; the literature reviewed reflects an overall understanding of the scholars. The PRISMA framework was chosen to guide our approach because it provides a structured method for identifying, screening, and analysing relevant literature. PRISMA has been widely utilised in conceptual and systematic reviews across the social sciences and education research to improve transparency and methodological rigour (Welch et al., 2016). The following review question guided this systematic review: How can teacher education be reimagined to prepare educators to prevent and respond to TFGBV within South African digital learning environments? The review further explored how ecological and intersectional frameworks can explain TFGBV and inform teacher education reform.

PRISMA-guided literature review process

The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework guided the identification, screening, eligibility, and inclusion of relevant literature in this systematic review. PRISMA is a structured, systematic review process designed to improve transparency and replicability in literature reviews (Hallinger, 2013). For the first stage of the review, relevant studies were identified through database searches and manual screening of reference lists. This initial phase sought to capture a wide range of literature on technology-facilitated gender-based violence, teacher education, and digital learning environments. The search strategy used various academic databases, including Scopus, Web of Science, ERIC, and Google Scholar. This provided a comprehensive picture of all-embracing studies. After this stage, with n=198 articles, titles, and abstracts screened, we determined whether they met the inclusion criteria for our study. Twenty-four (n=24) Studies related to technology-enabled gendered violence, digital inequality, teacher education, and gendered violence in education were included for further evaluation. The study selection process followed PRISMA guidelines and included title screening, abstract screening, full-text assessment, and final inclusion. Records that did not satisfy the eligibility criteria were removed at each stage.

Articles that focused on offline gender-based violence only or that involved unrelated educational issues were excluded from this stage (=174). The inclusion phase included full manuscript revisions of selected papers in line with the research aim. It helped identify studies that helped understand how technologies enable the perpetration of gender-based violence and teacher education. The final stage was to gather all the identified literature to identify key themes and content that could facilitate the study. In line with PRISMA guidelines, a systematic literature review was conducted to identify literature across various disciplines (e.g., education, gender studies, sociology, and digital technology research). Given the heterogeneity of TFGBV and its coverage of multiple research areas, this multidisciplinary perspective was crucial. As George et al. (2023) reported, previous PRISMA studies on gender and inequality in Africa have shown that systematic literature reviews can provide a useful framework for highlighting gaps and informing theoretical development. Therefore, this study uses this approach to ensure a comprehensive synthesis of research applicable to it. In a nutshell, studies were included if they: (a) were published between 2010 and 2025; (b) addressed TFGBV, digital inequality, teacher education, digital safety, or related educational issues; (c) were peer-reviewed journal articles, books, conference papers, or policy reports; and (d) were published in English. Studies focusing exclusively on offline gender-based violence or unrelated educational topics were

excluded.

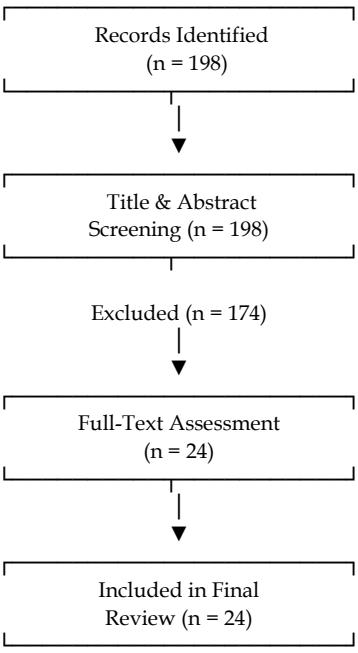

Figure 1. PRISMA-based study selection process

Data sources and search strategy

The literature search targeted peer-reviewed journal articles, academic books, policy reports, and conference papers on TFGBV, teacher education, and digital learning environments. As per the search strategy, keywords and Boolean operators were used to identify relevant literature. Keywords were TFGBV, digital violence in education, online gender-based violence, teacher education and digital safety, digital inequality, and intersectionality in education. The following keywords were combined to ensure comprehensive retrieval of relevant studies. The literature search also involved manually screening the reference lists of selected articles to identify additional relevant literature. To address more recent developments in digital learning environments and TFGBV, the study's search strategy focused on articles published between 2010 and 2025. This period was chosen based on the accelerated adoption of digital technology in education during this timeframe. It also searched for documents from global, African, and South African literatures to ensure contextual appropriateness. The integration of regional literature was particularly critical to comprehend the socio-economic and cultural dimensions of TFGBV in South Africa. The researchers further included the phenomenon of digital inequality and gender-based violence in an African educational setting in the prioritisation to ensure contextual grounding.

Moreover, the literature review focused on publications in the field of teacher education and digital preparedness. For instance, in research on pre-service teachers' perceptions of work-integrated learning, challenges arising from changing learning requirements and technological integration were identified (Ndebele et al., 2023). The findings informed the conceptualisation of teacher education as an important intervention space to alleviate gendered violence facilitated by technology. Further related literature on digital violence, gender inequality, and educational transformation also contributed to a deeper interpretation.

Data analysis and synthesis

The identified literature was analysed thematically to develop themes and gain understanding. Thematic analysis has frequently been employed in systematic research to integrate diverse data sources. Thematic analysis was utilised for comparative data analysis to identify themes related to TFGBV, digital inequality, teacher preparedness, and institutional responses. These themes were then condensed into a conceptual framework grounded in an ecological and intersectional perspective. Thematic analysis identified significant themes across structural digital disparity, teacher preparedness, institutional gaps, and gendered digital experiences. The themes helped to reveal the complexity of TFGBV and contributed to the development of a conceptual framework. The use of ecological and intersectional frameworks enabled us to approach issues of TFGBV at varying scales. This method yielded an in-depth examination of individual, interpersonal, institutional, and societal dimensions of digital violence. The synthesis process enabled the integration of evidence from multiple disciplines and informed the conceptual framework presented in this study.

Conceptual framework development

Drawing on an ecological and intersectional approach, the framework developed in this study conceptualises TFGBV through a multi-layered model in which technology-facilitated violence is viewed as inter-operational across interdependent mechanisms at multiple levels. These theoretical perspectives inform the model's understanding of TFGBV across individual, interpersonal, institutional, and societal contexts that influence the experiences of learners and teachers when interacting with digital learning environments. At the individual level, digital literacy and access to technology, and knowledge of safety and the environment, affect vulnerability to digital violence. Students with limited digital capacity and insufficient resources are often at greater risk of harassment and exclusion in online spaces. Interpersonal relationships among peers, the teacher, and the learner shape digital engagement at the interpersonal level and, thus, could also perpetuate gendered power relations in digital learning environments. Institutional elements such as teacher readiness, institutional policy frameworks, and access to digital infrastructure also affect how TFGBV is handled in educational settings.

At a broader social level, socio-economic, cultural, and gender norms influence who is included and who suffers in digital environments, further demonstrating that TFGBV exists within deeper structural inequalities (George et al., 2025; Seleke, 2025). These levels, when considered together, demonstrate that addressing TFGBV would require systemic, not just local, responses. This framework is reinforced by intersectionality, which considers how TFGBV affects individuals across their intersecting identities, such as gender, socio-economic class, geographic location, and access to technological resources. Rural and under-resourced learners are often uniquely vulnerable due to factors such as digital inequality, weak institutional support, and socio-economic conditions. These interrelated elements lead to inequality in learning spaces and perpetuate inequitable educational conditions.

Teacher education is thus situated as the primary intervention modality for technology-enabled gender-based violence within this setting. New teacher education includes digital literacy, gender-responsive pedagogy, and inclusive teaching practices to prepare teachers with the competency to build safe digital learning spaces. By utilising ecological and intersectional frameworks, teacher education programmes can intervene at multiple levels of power to instigate sustainable responses to technology-mediated gender-based violence. Based on this framework, teachers could be provided with the means to transform teacher education into a transformative space for developing safe, inclusive, and equitable digital learning spaces. The results of the present theoretical investigation imply that TFGBV is becoming more complex in digital educational spaces and call for the recognition of teacher education as a key intervention site. This development of digital technologies has evolved pedagogies, facilitated access, flexibility, and partnership, as well as created additional spaces for gender-based violence and exclusion. The digital platform is perpetuating gender inequality and power dynamics, increasing the likelihood that learners, with emphasis on women and girls, will be vulnerable to harassment, cyberbullying, surveillance, and intimidation in online learning

environments (Power & Khumalo, 2025; Hart & Mitchell, 2015). The transition to online education after the COVID-19 pandemic has fuelled greater dependence on digital technology and heightened exposure to digital risks, while also widening the institutional void in safeguarding learners.

The results suggest that digital transformation does not guarantee inclusive learning environments; rather, it must be complemented by structured, intentional interventions (George et al., 2025; Seleke, 2025) in both teacher education and educational policy to prevent the rise of new forms of violence and inequity. The ecological framework offers an all-round approach to how technology serves as a vector with multiple levels of effect: it creates gender-based violence. To a greater extent, individual-level digital literacy and knowledge of online safety, as well as access to technology resources, influence vulnerability to digital violence for learners. Marginalised learners are often the ones most vulnerable to harassment and exploitation due to limited digital literacy and inequity in access to technology. At a high level, peer relationships and teacher–learner interactions shape students' experiences in virtual learning spaces, as online communication extends far beyond formal educational contexts and provides more opportunities for intimidation and exclusion. The use of technology, driven by digital tools, can reinforce systemic issues that contribute to TFGBV experiences, such as policy gaps, insufficient teacher preparation, and inequitable access to technology infrastructure.

Societally, broader socio-economic deprivation, cultural values, and gender norms shape participation in and vulnerability to digital technologies, further underscoring the need for systemic approaches that target the structural disadvantage entrenched in digital educational settings (Kagola & Notshulwana, 2022; George et al., 2025). The interdisciplinary approach to intersectionality adds additional nuance to this consideration, noting that TFGBV develops when a person's unique identity, specifically gender, socio-economic status, geographical location, and technological access, are intersected. Within South Africa, historical disparities and socio-economic divides deeply impact access to digital learning environments and the risks associated with going online. Learners from rural and under-resourced communities face multiple disadvantages, such as a lack of connectivity, shared devices, and limited access to institutional support, increasing vulnerability to digital violence. These interlocking inequalities establish a "digital double bind," where technology simultaneously builds inclusivity within and exposes learners to alternative forms of vulnerability (Seleke, 2025). Moreover, gender intersects with socio-economic and geographic inequalities to shape experiences of digital violence, suggesting that TFGBV must be addressed in consideration of alternative learner experiences and contextual realities (Patrick et al., 2023; Nyoni & Tabe, 2026).

The results further highlight that teacher education is central to combating technology-facilitated gender-based violence. Teachers have a central role in creating digital learning environments and ensuring inclusive learning and social norms within schools. However, teacher education tends to focus more on technology competencies than on technology safety, gender understanding, and inclusive pedagogy. Studies have shown that pre-service teachers encounter challenges when responding to changing pedagogical needs and integrating technology into pre-service training (Ndebele et al., 2023). The complexity of digital learning environments makes it even more critical for teachers to manage new threats such as online harassment and digital exclusion. Thus, there is an increasing need for institutional preparedness through policy alignment, training, and support to enable teachers to respond adequately to TFGBV. When approached from ecological and intersectional perspectives, rethinking teacher education can equip teachers with the knowledge and skills to create safe, inclusive digital learning environments, thereby helping drive broader education reform and mitigate the digital culture of gender-based violence.

Implications for teacher education

The results of the current study emphasize the pressing need for teacher education programmes to incorporate digital safety and gender-responsive pedagogies into their curricula. In the face of ongoing TFGBV incidents in digital learning settings, teachers will need to be prepared to recognise, prevent, and respond to online harassment. Consequently, teacher training programmes should include curricula with structured modules on TFGBV, digital citizenship, and the ethical use of technology. Such modules should also focus on developing inclusive pedagogical approaches and safe digital learning environments. Empirical evidence indicates that instructors with digital safety skills are better equipped to guide learners and create learning spaces open to all (Power & Khumalo, 2025; Hart & Mitchell, 2015). This type of training, built into teacher education programmes, may then empower teachers to respond with fresh, innovative solutions to new digital situations and to support inclusive learning environments. Moreover, teacher education programmes must incorporate intersectional perspectives that acknowledge learners' varying levels of experience and vulnerability in digital spaces. Due to digital inequality, low connectivity and constraints of socio-economics, marginalised communities are exposed to TFGBV on top. Teacher education programmes should thus help prepare educators to tackle these overlapping issues and educate those involved in digital exclusion. Moreover, evidence suggests that uneven digital access is a major impediment to inclusive education, especially in South African settings, where differences in socio-economic status affect access to technology (Seleke, 2025; George et al., 2025). In this regard, integrating intersectional perspectives would better prepare teacher education programmes to address TFGBV and shape inclusive digital learning contexts.

VII. IMPLICATIONS FOR POLICY AND PRACTICE

These findings further emphasise the importance of policy reform to respond to TFGBV in educational settings. At present, educational policies aim to tackle gender-based violence within offline arenas, and they provide minimal attention to digital spaces. Thus, policymakers need to build robust policy structures targeting online harassment, cyberbullying, and TFGBV. These policies should provide guidelines for teachers and other institutions on reporting systems, prevention strategies, and support for affected learners. Digital literacy and gender-responsive education, on the other hand, should be promoted through institutional policies to create safe learning environments. Policy frameworks are also considered essential for preventing gender-based violence and for the development of equitable educational policies (Patrick et al., 2023; Power & Khumalo, 2024).

Also, partnerships among educational institutions, policymakers, and communities are key to combating TFGBV in the digital age. Local community participation can enhance public awareness and prevention, and institutional partnerships can help design comprehensive digital safety programmes. Policymakers must also invest in professional development programmes that prepare educators for digital safety. These collective approaches can enhance general readiness across institutions in the field and create a context for more sustainable interventions. This research suggests that multi-stakeholder approaches are critical for addressing gender-based violence in education and for ensuring inclusive digital learning (George et al., 2025; Kagola & Notshulwana, 2022).

VIII. RECOMMENDATIONS

Teacher education institutions should address these gaps by embedding digital safety, gender-responsive pedagogy, and inclusive digital literacy into pre-service and in-service teacher development programmes. With TFGBV becoming more common in digitally mediated learning, teachers need to receive training to understand how to identify, prevent, and respond to online harassment and digital abuse. Teacher education schools should therefore have comprehensive

curricula that cover TFGBV, ethical digital engagement, and digital citizenship. Professional development should also be enhanced (Tabe, 2024) to help in-service teachers navigate changing digital worlds and address digital violence. Ongoing training programmes, workshops, and collaborative professional learning communities can help educators share experiences and develop context-specific strategies to mitigate the risks posed by digital environments. These approaches can increase teacher preparedness and foster safe, equitable, and gender-responsive digital learning environments (Power & Khumalo, 2025; Ndebele et al., 2023). Policymakers and educational institutions should also create and implement broader frameworks, specifically those that address TFGBV within technology-enabled academic settings and develop comprehensive policies targeting TFGBV in education. Reporting mechanisms, institutional support structures, forms of support and prevention, and measures to prevent digital harassment and cyberbullying must be among the features of such frameworks. Moreover, institutions need to focus on closer working relationships among educators, policymakers, and community members to promote knowledge and prevention across the institution.

IX. CONCLUSION

The current systematic review focuses on TFGBV in digital learning environments and emphasises the need to reframe teacher education as a key field of intervention. Through an ecological and intersectional lens, the research has revealed that TFGBV is a multifaceted phenomenon, shaped by individual, interpersonal, institutional, and societal factors that together affect learners' and educators' experiences and practices in online learning settings. This rapid growth of digital technologies contributes to wider access to education but can also increase vulnerability, especially for women and disadvantaged learners. The investigation also highlighted that teacher training programmes typically provide little or no detailed training in digital safety, gender-responsive teaching, and inclusive online learning, which limits teachers' ability to learn to overcome TFGBV. A conceptual framework was formulated based on a PRISMA-guided review, which positions teacher education as a transformative space to combat digital violence and promote inclusive educational opportunities. The researchers conclude that reimagining teacher education through ecological and intersectional practices may help create safer online learning spaces, facilitate policy change, and contribute to educational transformation in South Africa and other contexts.

X. AUTHORS' CONTRIBUTIONS

HT conceptualises, identifies the problem, develops the theoretical Framework, constructs the argument, conducts critical analysis, and writes the original draft. VG reviews literature and synthesis, writing, and manuscript refinement and editing.

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XII. CONFLICT OF INTEREST

There are no conflicts of interest in this article.

XIII. DATA AVAILABILITY STATEMENT

Data are available upon request.

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