International Journal of Studies in Psychology
E-ISSN: 2710-2327, P-ISSN: 2710-2319
Special Issue Vol. 1, No. 1, pp. 9-15.
https://doi.org/10.66434/ijspsy.v1i1si.466
GAERPSY Publishing, 2026
Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial-No Derivatives (CC BY-NC-ND 4.0) licence.

History of the article
Submitted 14 March 2026
Revised 24 April 2026
Accepted 29 April 2026
Published 30 June 2026

Digital entrepreneurship education and technology-facilitated gender-based violence: Rethinking safe innovation spaces in schools

[1]Peter Isaac Msughter
[1]Department of Educational Foundations, University of South Africa, South Africa

***Abstract*—** The rapid expansion of digital technologies in education has significantly transformed entrepreneurship education, enabling students to participate in innovation-driven learning through online collaboration platforms, virtual business simulations, digital marketplaces, and technology-mediated project-based activities. While these developments have broadened opportunities for creativity, collaboration, and entrepreneurial skill development, they have also introduced new risks within digital learning environments, including the emergence of technology-facilitated gender-based violence (TFGBV). Existing research on TFGBV has largely focused on cyberbullying, online harassment, and social media interactions among adolescents; however, limited scholarly attention has been directed to how digital entrepreneurship education spaces may inadvertently reproduce gendered harms through technology-mediated collaboration, competition, and public digital engagement. This conceptual paper critically examines the intersection between digital entrepreneurship education and TFGBV in school contexts, arguing that innovation-oriented learning environments can unintentionally create conditions in which gendered exclusion, harassment, reputational harm, and other forms of technology-facilitated abuse may occur. Drawing on intersectionality theory, digital citizenship frameworks, and contemporary perspectives on entrepreneurship education, the paper reconceptualises digital innovation spaces in schools not only as sites of entrepreneurial skill development but also as socio-technological environments shaped by power relations, gender dynamics, and digital behavioural norms. The paper analyses how common pedagogical practices in digital entrepreneurship education, including online pitching platforms, collaborative startup simulations, digital prototyping, and virtual innovation competitions, may expose learners, particularly girls and young women, to forms of TFGBV. In response, the paper proposes a conceptual model for Safe Digital Innovation Ecosystems in entrepreneurship education that integrates gender-sensitive pedagogy, digital ethics, teacher facilitation, and institutional safeguards as key mechanisms to prevent TFGBV within school-based innovation environments.

Keywords: Digital entrepreneurship education, technology-facilitated, gender-based violence, rethinking safe innovation

To cite this article (APA): Msughter, P. I. (2026). Digital entrepreneurship education and technology-facilitated gender-based violence: Rethinking safe innovation spaces in schools. *International Journal of Studies in Psychology, 1*(1si), 9-15. https://doi.org/10.66434/ijspsy.v1i1si.466

I. INTRODUCTION

ENTREPRENEURSHIP education has undergone a profound transformation in the digital age. Once confined to classroom case studies and business plan competitions assessed on paper, entrepreneurship education now routinely immerses school-aged learners in online collaboration platforms, virtual start-up simulations, digital prototype development, social media marketing campaigns, and global virtual innovation competitions (Noptanit & Thadathibesra, 2026). These digital modalities are celebrated in the entrepreneurship education literature for their capacity to develop authentic entrepreneurial competencies, creativity, risk tolerance, collaborative problem-solving, and digital market literacy in ways that traditional pedagogical approaches cannot replicate. International policy frameworks, including the United Nations Educational, Scientific, and Cultural Organisation (UNESCO)'s (2017) framework for entrepreneurship competencies and the Organisation for Economic Co-operation and Development (OECD)'s (2019) recommendations on innovation in education, actively encourage the deepening integration of digital tools into school-based entrepreneurship education, positioning digital innovation skills as foundational competencies for participation in twenty-first-century economies.

According to Peter and Ahon (2020), the enthusiastic embrace of entrepreneurship education enables people to have sufficient attention to the social dynamics of the environments within which entrepreneurial learning takes place. Digital innovation spaces in schools are not neutral technological contexts: they are socio-technical environments shaped by the same power relations, gender dynamics, and cultural assumptions that organise the broader social worlds of young people (Eubanks, 2018). When schools create digital entrepreneurship environments, pitching platforms visible to peer audiences, collaborative start-up simulations requiring sustained digital interaction, virtual competitions with public-facing components, and social media-integrated business projects, they also create conditions within which technology-facilitated gender-based violence (TFGBV) may emerge, proliferate, and cause serious harm to learners, particularly to girls and young women.

TFGBV encompasses the full range of gender-based harms enacted through digital technologies, including online harassment, cyber stalking, image-based sexual abuse, non-consensual sharing of intimate content, gendered trolling, doxing, reputational manipulation, and exclusion from digital networks (Henry & Powell, 2018; Dragiewicz et al., 2018). In educational contexts, TFGBV has been examined principally through the lenses of peer cyberbullying and social media conduct, with responses focused on student-directed digital literacy education and school disciplinary procedures (Alturif & Alsand, 2024). The specific domain of digital entrepreneurship education, with its

distinctive combination of public-facing digital performance, competitive peer dynamics, technology-mediated collaboration, and market-oriented content creation, has received almost no attention as a site of TFGBV risk in schools.

Recent scholarship validates that digital entrepreneurship education has expanded rapidly, driven by the integration of digital technologies that enhance creativity, teamwork, and entrepreneurial capabilities (Jeong-Hyun & Seon-Joo, 2025). However, the literature remains uneven and under-theorised, with limited conceptual consistency and weak appraisal frameworks (Ioannis & Fotis, 2023). Existing studies primarily focus on skill acquisition and entrepreneurial intention, often neglecting the broader socio-cultural and organisational factors that shape digital learning environments (Lopes et al., 2026). While research on developing countries recognises ethical risks associated with digital technologies, these concerns have not been thoroughly examined in entrepreneurship education contexts. Consequently, there remains a critical gap in comprehension of how digital entrepreneurship education environments may produce or amplify gendered forms of harm, including technology-facilitated gender-based violence.

This paper addresses that gap. It argues that digital entrepreneurship education environments are not merely incidentally connected to TFGBV risk but structurally implicated in its production through pedagogical design choices, platform selection, competitive assessment structures, and the gendered norms that organise entrepreneurial culture more broadly. The paper proposes the Safe Digital Innovation Ecosystem (SDIE) model as a conceptual framework for redesigning digital entrepreneurship education environments to prevent TFGBV and promote genuinely inclusive, gender-just innovation learning for all students.

II. METHODS

This paper employs a conceptual research methodology, understood as a form of scholarly inquiry that constructs analytical frameworks and advances theoretical arguments through the critical synthesis of existing literature rather than through the collection of primary empirical data (Sale & Carlin, 2025). Conceptual research is the appropriate methodological choice for the present inquiry because the problem addressed, TFGBV risk in digital entrepreneurship education, is an under-theorised and emergent phenomenon for which the primary intellectual task is conceptual clarification and framework development rather than empirical description. Before empirical research on this intersection can be meaningfully designed, the analytical constructs, theoretical connections, and normative implications must be articulated in the work this paper undertakes.

The methodology proceeds through three structured moves. The first is an interdisciplinary critical literature review, synthesising scholarship from five intersecting fields: TFGBV studies, digital citizenship education, entrepreneurship education, feminist technology studies, and intersectionality theory. The review encompasses peer-reviewed journal articles, scholarly monographs, and authoritative policy documents published between 2017 and 2026, with particular emphasis on literature from 2017 onward, given the rapid evolution of digital entrepreneurship education during this period. The review is critical rather than descriptive, interrogating the assumptions, silences, and framings of existing literature rather than merely cataloging its claims. Attention is paid to the near-total absence of gender and TFGBV analysis from the digital entrepreneurship education literature, which is itself an analytically significant finding.

The second move is theoretical integration. The paper brings three theoretical traditions. Crenshaw's (1989) intersectionality theory, Ribble's (2021) digital citizenship framework, and experience-based entrepreneurship education model are brought into productive dialogue to construct a composite analytical lens through which TFGBV risk in digital entrepreneurship environments can be examined. The integration is not mechanical but dialectical: each theoretical tradition is challenged and enriched by the others, producing an integrated analytical framework that none of the traditions could generate independently.

The third move is framework construction. The SDIE model is developed inductively through theoretical integration and critical literature synthesis, drawing on established approaches to framework development in educational research (Partelow, 2023). The SDIE model is presented as a theoretically warranted conceptual tool grounded in robust scholarly traditions and responsive to identified gaps rather than as an empirically validated intervention. This is consistent with established practice in educational conceptual and theoretical research and with the methodological norms of critical feminist scholarship in education.

III. THEORETICAL FRAMEWORK

Intersectionality theory and gendered digital harm

Crenshaw's (1989) intersectionality theory provides the foundational analytical lens for the present paper's argument. Intersectionality posits that social identities, including gender, race, class, disability, and sexual orientation, do not operate as independent variables but as mutually constitutive dimensions of experience that produce qualitatively distinct forms of privilege and disadvantage at their intersections. Applied to TFGBV in educational contexts, intersectionality insists that the gendered harms of digital environments are not experienced uniformly by all female learners but are intensified, modified, and differentiated by the intersection of gender with other identity dimensions (Powell et al., 2020).

In digital entrepreneurship education specifically, intersectionality illuminates how the TFGBV risks faced by learners are shaped by the convergence of gender with other social positions. A Black girl student participating in a virtual pitch competition faces not merely the generic TFGBV risks that the platform generates but a distinctively intersectional form of harm that compounds gendered harassment with racialised mockery, cultural stereotyping, and the specific hostilities that the entrepreneurship world directs at those who deviate from its dominant imaginary of the young, white, male, tech-sector innovator (Eubanks, 2018). Girls with disabilities face additional layers of vulnerability in digital entrepreneurship environments whose accessibility features are inadequate and whose competitive structures assume able-bodied digital participation. Students from lower socioeconomic backgrounds who lack reliable broadband access, private digital devices, and the cultural capital to navigate entrepreneurial digital spaces on equal terms with more privileged peers face a form of digital exclusion that intersects with gender to produce compound disadvantage.

According to Collins et al. (2019), matrix of domination the interlocking structural, disciplinary, hegemonic, and interpersonal domains through which power operates, provides a useful complement to Crenshaw's analytical intersectionality, directing attention to how TFGBV in digital entrepreneurship education is not merely a product of individual hostile acts but of the structural conditions, hegemonic cultural norms, and institutional arrangements that organise digital entrepreneurial spaces. The matrix of domination framework supports the present paper's argument that addressing TFGBV in digital entrepreneurship education requires intervention at structural, institutional, and pedagogical levels, not merely at the level of individual student behaviour.

Digital citizenship and the ethics of innovation spaces

Ribble's (2015) digital citizenship framework, with its nine elements encompassing digital access, etiquette, law, communication, literacy, commerce, rights and responsibilities, health and welfare, and security, provides the normative vocabulary for conceptualising responsible and ethical participation in digital entrepreneurship environments. For the present paper, three elements are particularly significant. Digital etiquette, the standards of respectful and considerate conduct in digital spaces, establishes the behavioural baseline that digital

entrepreneurship activities should both assume and actively cultivate. Digital law, the ethical and legal parameters governing online conduct, including harassment, image-based abuse, intellectual property violation, and privacy infringement, defines the legal and ethical framework within which digital entrepreneurship activities take place and within which TFGBV constitutes a legal harm as well as an ethical failure. Digital rights and responsibilities, the entitlements and obligations of digital participants ground the argument that students have a right to participate in digital entrepreneurship education free from TFGBV, and that this right creates corresponding obligations for teachers, institutions, and platform providers.

Selwyn's (2019) concept of digital realism is equally important: the insistence that the actual social dynamics of digital educational environments, including their power relations, gender hierarchies, and harm potentials, be examined honestly rather than obscured by the idealised narratives of participatory innovation and collaborative creativity that dominate entrepreneurship education advocacy. A digitally realistic approach to school-based digital entrepreneurship recognises that the same competitive dynamics, peer-judgment pressures, and status hierarchies that generate TFGBV in other digital social contexts also operate within pedagogically structured innovation spaces, and that the pedagogical framing of these spaces as educational does not immunise them from harm.

Entrepreneurship education and the construction of entrepreneurial identity

Lackéus' (2015) experience-based model of entrepreneurship education positions the development of entrepreneurial identity, the student's sense of themselves as a capable, creative, and resilient innovator, as the central educational goal of entrepreneurship learning activities. This identity development occurs through direct engagement with entrepreneurial experiences: pitching ideas to audiences, developing prototypes under competitive conditions, navigating collaborative team dynamics, and engaging with the judgments of peers, teachers, and external evaluators. The entrepreneurial identity that these experiences are designed to cultivate is, as the critical entrepreneurship education literature has extensively documented, deeply gendered in its dominant cultural construction.

Marlow and McAdam (2013) demonstrate that the hegemonic image of the entrepreneur characterised by risk tolerance, competitive assertiveness, technical mastery, and self-promotional confidence reflects masculine cultural norms that render entrepreneurial identity production a gendered project in which female students must navigate the tension between femininity and entrepreneurial identity. Jones and Warhuus (2018) extend this analysis to digital entrepreneurship, arguing that the masculine coding of technological competence in digital innovation cultures creates additional layers of gender-normative pressure for female learners in school-based digital entrepreneurship activities. When these gender dynamics are transplanted into digital environments with the affordances of online harassment, image-based abuse, and public reputational damage, the conditions for TFGBV are substantially enhanced.

According to Lyu et al. (2024), the experiential learning model of entrepreneurship education is a set of cognitive and behavioural practices cultivated through iterative engagement that provides the practical foundation for the paper's argument that pedagogical design choices in digital entrepreneurship education directly shape the social dynamics of innovation spaces and, consequently, their TFGBV risk profiles. This positions teacher pedagogical decisions about platform selection, assessment structure, audience composition, and digital behavioural expectations as primary levers for TFGBV prevention in digital entrepreneurship environments.

TFGBV in digital entrepreneurship education: A critical mapping

Online pitching platforms and gendered public exposure

Online pitching the digital performance of business ideas before peers, teachers, or external audiences is among the most widely used pedagogical activities in digital entrepreneurship education at secondary and post-secondary levels. Platforms such as PitchBook, Canva Presentations shared via institutional LMS portals, and live-streamed pitch sessions conducted via Zoom or Microsoft Teams require students to produce publicly visible or semi-public content that presents their entrepreneurial ideas and, simultaneously, their entrepreneurial identities (Lyu et al., 2024). This combination of idea performance and identity performance in digital spaces creates TFGBV vulnerability through several mechanisms.

The first is the exposure of personal digital presence to peer evaluation in contexts where the norms governing that evaluation are poorly defined and inconsistently enforced. Research on online public performance contexts consistently identifies female performers as targets of disproportionate personal criticism, sexualised commentary, and appearance-focused hostility that deflects evaluation from the quality of the work to the characteristics of the performer (Bates, 2017). When school-based pitching activities create digitally mediated audience relationships, whether through recorded video pitches accessible to the full class, live virtual pitch events open to parent or external audiences, or peer evaluation conducted through online rating systems, they extend the exposure of female students to these forms of gendered digital hostility into formal educational contexts.

The second mechanism is the permanence and shareability of digital pitch content. Unlike an oral classroom presentation that leaves no retrievable trace beyond the memories of those present, a recorded video pitch uploaded to an institutional platform, a shared slide presentation accessible through a class LMS, or a social media business page created as part of a pitching activity generates content that can be downloaded, redistributed, manipulated, and repurposed for harassment purposes (Henry & Powell, 2018). The non-consensual sharing of female students' pitch videos, the superimposition of sexualised commentary on shared presentation slides, and the use of public business profile images for targeted harassment have all been documented in international studies of TFGBV in digital educational contexts, though not yet systematically theorised within the entrepreneurship education literature (Powell et al., 2020).

Collaborative start-up simulations and coercive team dynamics

Collaborative start-up simulation activities in which student teams develop, plan, and virtually enact the establishment and operation of a new business venture through digital platforms represent a second major category of digital entrepreneurship pedagogy with distinctive TFGBV risk profiles. These activities are structured around sustained digital interaction within small teams, typically over extended periods of weeks or months, and commonly involve the allocation of differentiated roles within the team, such as marketing director, financial officer, and technology lead, that carry differential status implications in the context of entrepreneurial culture's gender dynamics.

Women usually exhibit lower rates of entrepreneurship intention than men (Armuña et al., 2020). The highly knowledge-intensive business sectors, and education can play a determinant role in promoting competences that affect the entrepreneurial intentions of both male and female students (Dilli & Westerhuis, 2018). According to Armuña et al. (2020), the competence-intention relationship and the potential effect of gender can shed light on how entrepreneurship education programmes are shaped and adapted to specific needs. In digital collaborative environments, these dynamics are intensified by the reduced visibility of informal power dynamics to teacher oversight, the persistence of digital communications that can record and amplify coercive interactions, and the greater difficulty that students face in exiting or modifying team arrangements when digital platforms are the primary medium of collaboration.

When start-up simulation activities require teams to use external digital communication platforms messaging applications, shared cloud workspaces, or social media group channels the teacher's oversight function is substantially diminished. The private digital spaces of the collaboration become potential sites of gendered harassment, sexual

solicitation, exclusionary conduct, and coercive pressure that are invisible to institutional accountability mechanisms (Woodlock, 2017; Dragiewicz et al., 2018). The widespread use of group WhatsApp channels, Discord servers, or Slack workspaces for collaboration among entrepreneurship teams in school-based entrepreneurship activities, though largely unacknowledged in the pedagogical literature, creates conditions for TFGBV that lie entirely outside the institutional governance structures nominally responsible for student safety.

Virtual innovation competitions and reputational harm

Virtual innovation competitions in which student entrepreneurship teams compete against each other or against teams from other schools through online submission, voting, and evaluation platforms represent a third category of digital entrepreneurship practice with significant TFGBV risk implications. These competitions are increasingly common in school-based entrepreneurship education, promoted by ministries of education, development organisations, and private-sector sponsors as opportunities for authentic entrepreneurial experience and to motivate engagement with innovation challenges (OECD, 2019). Their public-facing digital architecture submission platforms, online voting mechanisms, digital comment systems, and social media promotion requirements create conditions for TFGBV by converging competitive dynamics, public digital exposure, and reduced social constraints in online interaction.

Online public voting mechanisms incorporated into virtual innovation competitions create specific TFGBV risk structures that the pedagogical literature has not engaged. When competition platforms allow or require public voting on student submissions. This design feature mimics the crowd-funding and consumer-validation mechanisms of real entrepreneurial ecosystems; it simultaneously creates opportunities for coordinated hostile voting campaigns, targeted digital ridicule of female student submissions, and the recruitment of external hostile actors to suppress the competitive standing of targeted students (Citron, 2014). The reputational harm that results from publicly visible hostile commentary on a student's innovation submission, or from a coordinated campaign to downvote or ridicule a female student's entrepreneurial idea, constitutes a form of TFGBV whose effects on the targeted student's educational experience, entrepreneurial identity development, and willingness to participate in future innovation activities may be lasting and severe (Bates, 2017).

Digital prototyping and image-based vulnerability

Digital prototyping activities, including the creation of app mockups, website designs, video advertisements, product photography, and social media marketing content as components of entrepreneurship projects introduce a further TFGBV risk dimension through the generation of visual digital content in which students may appear, either intentionally as part of the entrepreneurial performance (video pitches, promotional content featuring student entrepreneurs) or incidentally as the context of prototype development (screenshots, collaborative design sessions, video conferencing recordings). This visual digital content, once generated and shared within digital platforms, becomes susceptible to image-based TFGBV, the manipulation, redistribution, and hostile repurposing of digital images for purposes of sexualisation, ridicule, or harassment (Powell et al., 2020).

The social media-integrated character of much contemporary digital entrepreneurship pedagogy compounds the problem. When entrepreneurship activities require students to create and maintain public social media presences for their venture Instagram business profiles, TikTok marketing channels, YouTube product demonstration videos, or LinkedIn professional profiles they extend students' digital footprint into spaces where the school's protective governance structures do not apply, where platform moderation is designed for general social rather than educational purposes, and where female students' images and personal information are accessible to actors entirely outside the educational community. Selwyn's (2019) principle of digital realism requires educators to confront the fact that public social media business pages created as entrepreneurship assessment tasks are not educationally protected spaces but publicly accessible digital environments in which TFGBV can occur and does occur.

Safe digital innovation ecosystem model

This section presents the paper's central conceptual contribution: the Safe Digital Innovation Ecosystem (SDIE) model, a four-component framework for redesigning digital entrepreneurship education environments to prevent TFGBV and promote gender-just innovation learning. The SDIE model conceptualises school-based digital entrepreneurship education not as a collection of discrete pedagogical activities but as an ecosystem, a structured socio-technical environment whose components interact to produce educational outcomes and to shape the social dynamics within which learning occurs. Ecosystem thinking demands attention to the relational and systemic dimensions of digital entrepreneurship education rather than to individual activities in isolation, and positions TFGBV prevention not as an add-on safety measure but as a design criterion for the ecosystem.

Component one: Gender-sensitive innovation pedagogy

The first component of the SDIE model addresses the pedagogical design of digital entrepreneurship activities. Gender-sensitive innovation pedagogy, drawing on Ladson-Billings' (1995) culturally relevant pedagogy and its development in the context of entrepreneurship education by Jones and Warhuus (2018), requires that the design of entrepreneurship learning activities explicitly attend to the gender dynamics that shape entrepreneurial identity, digital participation, and peer interaction. This involves several specific pedagogical commitments.

The first commitment is to deconstruct hegemonic entrepreneurial masculinity as a component of the entrepreneurship education curriculum. Rather than presenting the competitive, risk-tolerant, assertive, and technically dominant entrepreneurial identity as a universal standard of entrepreneurial competence, gender-sensitive innovation pedagogy critically examines the gendered assumptions embedded in dominant entrepreneurial culture. It creates space for the affirmation of diverse entrepreneurial identities, including those associated with collaborative, relational, and community-oriented approaches to innovation (Marlow & McAdam, 2013). This deconstruction is not merely a matter of gender equity in the abstract but a TFGBV prevention mechanism: it challenges the cultural norms that legitimise the dismissal, ridicule, and exclusion of female entrepreneurial voices in digital innovation spaces.

The second commitment is to design digital entrepreneurship activities that structurally promote equitable participation and minimise TFGBV risk. According to Gallego-Arrufat et al. (2023), practically, this means avoiding assessment designs that require public-facing digital performance without robust conduct governance; structuring collaborative activities with explicit role rotation mechanisms that prevent the gendered consolidation of leadership and technical positions; calibrating the public-private balance of digital entrepreneurship activities to match the protective governance capacity of the institutional environment; and embedding explicit digital conduct expectations, including TFGBV-specific prohibitions, into all digitally-mediated entrepreneurship learning activities.

Component two: Digital ethics integration

The second component of the SDIE model addresses the integration of digital ethics into the substantive curriculum of entrepreneurship education. Rather than treating digital safety and conduct norms as a separate curriculum module delivered before entrepreneurship activities, digital ethics integration embeds ethical digital engagement as a core entrepreneurial competency, central to entrepreneurial education alongside business planning, market analysis, and financial literacy. This positioning reflects the reality of contemporary entrepreneurial practice: ethical failures in digital conduct, including workplace harassment, data privacy violations, and discriminatory platform design, are among the most consequential risks that entrepreneurs face in building and scaling ventures (Eubanks, 2018).

Digital ethics integration in entrepreneurship education would involve curriculum content on the legal frameworks governing digital conduct in entrepreneurial contexts, including data protection law, harassment law, intellectual property law, and platform liability, delivered not as standalone compliance training but as components of authentic entrepreneurial problem-solving activities. It would involve case analysis of entrepreneurial ventures that have failed or faced serious consequences due to digital ethics failures, including ventures where TFGBV among team members or between the venture and its users contributed to organisational breakdown. Moreover, it would involve developing students' capacity for ethical design thinking, their ability to evaluate digital tools, platforms, and business models for their potential to cause gendered harm, and their ability to design technological solutions with equity and dignity as foundational design criteria (Costanza-Chock, 2020).

Component three: Structured teacher facilitation

The third component of the SDIE model addresses teachers' professional role in facilitating safe and equitable digital entrepreneurship environments. Drawing on the AMDE framework developed in this special issue and on the broader literature on teacher professional responsibility for digital safety (OECD, 2023), this component argues that teachers of digital entrepreneurship bear specific professional obligations extending beyond the pedagogical facilitation of innovation activities to encompass the governance of the socio-technical environments within which those activities take place.

Structured teacher facilitation in the SDIE model involves three specific professional practices. The first is proactive platform governance: teachers should assess digital platforms and tools used in entrepreneurship activities for their TFGBV risk architecture before deployment, selecting platforms with robust moderation capabilities, clear conduct standards, accessible reporting mechanisms, and data privacy protections appropriate to the age and vulnerability of the student population (Koch, 2025). The second practice is ongoing monitoring: teachers should maintain regular oversight of digital entrepreneurship platform interactions, not through surveillance of private communications but through structured review of public and semi-public platform activity discussion forums, pitch evaluation comment threads, collaborative workspace activity logs for TFGBV indicators, including systematic exclusion, hostile commentary, and anomalous participation patterns. The third practice is responsive facilitation: teachers should develop the professional competency to recognise TFGBV when it occurs within digital entrepreneurship environments, to respond in ways that prioritise the well-being and academic standing of affected students, and to engage institutional disciplinary and support mechanisms in ways that are accessible, trauma-informed, and not academically penalising to students who disclose harm.

Component four: Institutional safeguards and policy infrastructure

The fourth component of the SDIE model addresses the institutional and policy environment in which digital entrepreneurship education occurs. Individual teacher and pedagogical interventions, however well designed, operate within institutional environments that either support or undermine their effectiveness, and the TFGBV risks of digital entrepreneurship education cannot be adequately addressed without institutional policy infrastructure that creates systemic accountability for safe digital innovation learning.

Institutional safeguards in the SDIE model include developing digital entrepreneurship-specific risk assessment protocols that require schools offering digital entrepreneurship activities to conduct structured TFGBV risk assessments before deploying new platforms, activities, or competition formats (Safety by design, 2025). They include integrating TFGBV risk criteria into the evaluation and procurement of digital entrepreneurship programmes, tools, and external competition partnerships, ensuring that schools do not enter arrangements with technology providers, competition organisers, or external mentors that lack adequate student safety governance. They include the development of clear, accessible, and trauma-informed TFGBV reporting and response procedures specific to digital entrepreneurship contexts, recognising that the competitive, career-oriented, and public-facing dimensions of entrepreneurship activities may create additional barriers to disclosure that generic school-wide TFGBV policies do not address.

At the policy level, the SDIE model calls on education ministries, curriculum authorities, and entrepreneurship education policy bodies to incorporate gender and TFGBV dimensions explicitly into the standards, frameworks, and quality criteria governing school-based digital entrepreneurship education. The absence of these dimensions in current policy frameworks, including the European EntreComp framework, UNESCO's entrepreneurship education guidance, and national curriculum standards across sub-Saharan Africa, represents a significant policy gap that this paper directly addresses (UNESCO, 2017).

Implications and contributions

Implications for entrepreneurship education pedagogy and curriculum

The argument advanced in this paper has direct and substantial implications for how entrepreneurship education is conceptualised and delivered in school contexts. The dominant discourse of entrepreneurship education organised around values of creativity, risk-taking, collaboration, and digital innovation, has been constructed with insufficient attention to the gendered power dynamics that shape entrepreneurial culture and digital social life. This discourse must be reconstructed to incorporate gender justice as a foundational pedagogical value rather than an optional equity supplement. Entrepreneurship educators should approach digital innovation activities with explicit awareness of the TFGBV risks they generate, incorporating gender-sensitive design principles, digital ethics content, and TFGBV-aware facilitation practices into their standard pedagogical repertoire.

Curriculum developers should review existing digital entrepreneurship programmes, including widely used commercial curricula, ministry-endorsed frameworks, and competition-based programmes, against the TFGBV risk criteria developed in this paper, identifying and redesigning elements that create systematic exposure for female students without adequate safeguards. The SDIE model provides a conceptual framework for this review, offering a structured set of criteria against which digital entrepreneurship curriculum components can be evaluated for their gender-safety characteristics.

Implications for teacher education

The professional preparation of entrepreneurship educators must be substantially expanded to address the TFGBV dimensions of digital entrepreneurship environments. Current teacher education programmes in entrepreneurship education focus primarily on pedagogical content knowledge and on how to teach business planning, innovation thinking, and entrepreneurial skills, with minimal attention to the social dynamics of digital entrepreneurship spaces and virtually none to TFGBV risk governance (Nyaaba, 2024). This represents a significant gap in professional preparation that teacher education institutions must address. Pre-service and in-service teacher education in entrepreneurship should incorporate modules developing teachers' capacity to conduct TFGBV risk assessments of digital entrepreneurship platforms and activities; to design gender-sensitive entrepreneurship learning environments; to integrate digital ethics into entrepreneurship curriculum; and to exercise structured oversight of digital innovation spaces in ways that prioritise student safety alongside academic learning outcomes. The SDIE model's four components provide a curriculum framework for organising these developments in teacher education.

Contributions to scholarship

This paper makes three primary scholarly contributions. First, it establishes digital entrepreneurship education as a distinct and hitherto untheorised site of TFGBV risk in schools, thereby filling a significant gap in both the TFGBV and digital entrepreneurship education

literatures. The identification of online pitching, collaborative startup simulation, virtual innovation competition, and digital prototyping as specific TFGBV risk mechanisms advances the empirical and analytical specificity of TFGBV in education. Second, the paper develops the SDIE model as a novel conceptual contribution to both entrepreneurship education theory and digital safety scholarship. The model's four-component architecture, gender-sensitive pedagogy, integration of digital ethics, structured teacher facilitation, and institutional safeguards provide a framework for future empirical research to examine how these components operate in practice, interact with one another, and produce protective outcomes for students across diverse school contexts in sub-Saharan Africa and globally.

Third, the paper extends the application of intersectionality theory to digital entrepreneurship education, demonstrating how compounded disadvantages arising from the intersection of gender with race, class, disability, and geographic location shape TFGBV risk in innovation-oriented digital learning environments. This intersectional extension advances the theoretical sophistication of both the TFGBV and the entrepreneurship education literatures, challenging each to attend more seriously to the social complexity of the learners and learning environments they address.

IV. CONCLUSION

Digital entrepreneurship education is frequently presented as a transformative educational project: a means of equipping the next generation of innovators with the skills, dispositions, and digital competencies necessary to participate in and shape twenty-first-century economies. This paper does not dispute the potential of entrepreneurship education to deliver these outcomes. It argues, rather, that this potential cannot be realised equitably if the digital innovation environments through which entrepreneurship education operates reproduce the gendered harms that constrain girls and young women's participation in digital economic life more broadly. An entrepreneurship education that exposes female learners to online pitching harassment, collaborative startup coercion, virtual competition reputational abuse, and digital prototyping image exploitation is not delivering transformative learning for those learners; it is delivering a digital reproduction of the gendered exclusion that entrepreneurship education claims to challenge.

The Safe Digital Innovation Ecosystem model proposed in this paper offers a conceptual pathway toward digital entrepreneurship education environments that are genuinely safe and equitable, that deliver the creativity, collaboration, and innovation competencies they promise to all students, not only to those whose gender, race, class, and social position already advantage them in the digital entrepreneurial world. The model's four components, gender-sensitive innovation pedagogy, digital ethics integration, structured teacher facilitation, and institutional safeguards, are not supplementary safety features to be added to existing entrepreneurship programmes but foundational design criteria for entrepreneurship education that is serious about its commitments to inclusion, equity, and the flourishing of all learners.

The urgency of this reorientation is amplified by the growth trajectories of both digital entrepreneurship education and TFGBV. As schools deepen their investment in digital innovation platforms, virtual competition infrastructures, and technology-mediated entrepreneurial learning activities, the TFGBV risks embedded in these environments will grow in proportion unless they are actively addressed through pedagogical, institutional, and policy transformation. This paper is offered as a contribution to that transformation, a conceptual foundation for the empirical, pedagogical, and policy work necessary to make digital innovation spaces in schools genuinely safe for every student who enters them.

V. CONFLICT OF INTEREST

There are no conflicts of interest in this article.

VI. DATA AVAILABILITY STATEMENT

Data are available upon request.

REFERENCES

Alturif, G., & Alsand, H. (2024). The repercussions of cyberbullying on students on educational platforms. *Frontier of Psychology,15*, 1426467. https://doi.org/10.3389/fpsyg.2024.1426467

Armuña, C., Ramos, S., Juan, J., Feijóo, C., & Arenal, A. (2020). From stand-up to start-up: exploring entrepreneurship competences and STEM women's intention. *International Entrepreneurship and Management Journal, 16*, 69–92. https://doi.org/10.1007/s11365-019-00627-z

Bates, S. (2017). Revenge porn and mental health: A qualitative analysis of the mental health effects of revenge porn on female survivors. *Feminist Criminology, 12*(1), 22–42. https://doi.org/10.1177/1557085116654565

Collins, P. H., da Silva, E., Ergun, E., Furseth, I., Bond, K. D., & Martínez-Palacios, J. (2019). *Intersectionality as critical social theory: Intersectionality as critical social Theory*. Patricia Hill Collins, Duke University Press.

Costanza-Chock, S. (2020). *Design justice: Community-led practices to build the worlds we need*. MIT Press. https://doi.org/10.7551/mitpress/12255.001.0001

Crenshaw, K. (1989). Demarginalizing the intersection of race and sex: A Black feminist critique of antidiscrimination doctrine, feminist theory, and antiracist politics. *University of Chicago Legal Forum, 1989*(1), 139–167. https://chicagounbound.uchicago.edu/uclf/vol1989/iss1/8

Dilli, S., & Westerhuis, G. (2018). How institutions and gender differences in education shape entrepreneurial activity: A cross-national perspective. *Small Business Economics, (Marques*, 2017), 122. https://doi.org/10.1007/s11187-018-0004-x

Dragiewicz, M., Burgess, J., Matamoros-Fernández, A., Salter, M., Suzor, N. P., Woodlock, D., & Harris, B. (2018). Technology-facilitated coercive control: Domestic violence and the competing roles of digital media platforms. *Feminist Media Studies, 18*(3), 491–508. https://doi.org/10.1080/14680777.2018.1447341

Eubanks, V. (2018). *Automating inequality: How high-tech tools profile, police, and punish the poor*. St. Martin's Press.

Gallego-Arrufat, M., Torres-Hernández, N., García-Martínez, I., & Domene-Martos, S. (2023). An Educational Framework in Digital Rights and Responsibilities for Young Entrepreneurs. *Sage Journals, 3*(4), 21582440231208614. https://doi.org/10.1177/21582440231208614

Henry, N., & Powell, A. (2018). Technology-facilitated sexual violence: A literature review of empirical research. *Trauma, Violence, and Abuse, 19*(2), 195–208. https://doi.org/10.1177/1524838016650189

Ioannis, S., & Fotis, K. (2023). Digital entrepreneurship and entrepreneurship education: a review of the literature. *International Journal of Entrepreneurial Behaviour & Research, 30*(23), 277–304. https://doi.org/10.1108/IJEBR-01-2023-0053

Jeong-Hyun, P., & Seon-Joo, K. (2025). Entrepreneurial competencies in the era of digital transformation: a systematic literature review. *Digital 2025, 5*(4), 46. https://doi.org/10.3390/digital5040046

Jones, S., & Warhuus, J. P. (2018). This class is not for you: An investigation of gendered subject construction in entrepreneurship course descriptions. *Journal of Small Business and Enterprise Development, 25*(2), 182–200. https://doi.org/10.1108/JSBED-07-2017-0220

Koch, L. (2025). *Technology-facilitated gender-based violence as a threat to democracy: Political and psychological impacts on politically active individuals*. Technische Universität München TUM School of Social Sciences and Technology.

Lackéus, M. (2015). *Entrepreneurship in education: What, why, when, how (Entrepreneurship360 Background Paper)*. OECD/European Commission. Retrieved from https://www.oecd.org/cfe/leed/BGP_Entrepreneurship-in-Education.pdf

Ladson-Billings, G. (1995). Toward a theory of culturally relevant pedagogy. *American Educational Research Journal, 32*(3), 465–491. https://doi.org/10.3102/00028312032003465

Lopes, J. M., Gomes, S., Farinha, L., & Carlos, S. (2026). Empowering Digital Entrepreneurship Intention: Unveiling the Role of Education. *Journal of Knowledge Economic*, 1–35. https://doi.org/10.1007/s13132-026-03179-0

Lyu, J., Shepherd, D., & Lee, K. (2024). The impact of entrepreneurship pedagogy on nascent student entrepreneurship: an entrepreneurial process perspective. *Studies in Higher Education*, *49*(1), 62–83. https://doi.org/10.1080/03075079.2023.2220722

Noptanit, N., & Thadathibesra, P. (2026). Reducing gaps in digital entrepreneurship education: A systematic review of innovative learning strategies and their institutional impact. *The International Journal of Management Education, 24*(1), 101283. https://doi.org/10.1016/j.ijme.2025.101283

Nyaaba, M. (2024). Transforming Teacher Education in Developing Countries: The Role of Generative AI in Bridging Theory and Practice. *arxiv logo-cs-arXiv,* 2411.10718. https://doi.org/10.48550/arXiv.2411.10718

Organisation for Economic Co-operation and Development (OECD). (2023). *OECD Digital Education Outlook 2023: Towards an effective digital education ecosystem*. OECD Publishing. Retrieved from https://www.oecd.org/en/publications/oecd-digital-education-outlook-2023_c74f03de-en/full-report.html

Organisation for Economic Co-operation and Development (OECD). (2019). *OECD skills outlook 2019: Thriving in a digital world*. OECD Publishing. https://doi.org/10.1787/df80bc12-en

Partelow, S. (2023). What is a framework? Understanding their purpose, value, development, and use. *Journal of Environmental Studies and Sciences*, *13*(3), 510–519. https://doi.org/10.1007/s13412-023-00833-w

Peter, I. M., & Ahon, I. T. (2020). Managing entrepreneurship education for job creation for university students in North East Nigeria for today and tomorrow. Benue State *University Journal of Educational Management*, *2*(1), 291-299.

Powell, A., Scott, A. J., Flynn, A., & Henry, N. (2020). *Image-based sexual abuse: An international study of victims and perpetrators. A summary report*. RMIT University. https://doi.org/10.13140/RG.2.2.35166.59209

Ribble, M. (2021). Digital Citizenship in the Frame of Global Change. *International Journal of Studies in Education and Science, 2*(2), 74–86. https://ijses.net/index.php/ijses/article/view/2137

Safety by design. (2025). *Safe approaches for ethical technology*. Retrieved from https://www.irex.org/files/nmwso-safety-design-practitioners-guide.pdf

Sale, J. E., & Carlin, L. (2025). The reliance on conceptual frameworks in qualitative research. A way forward. *BMC Medical Research Methodology*, *25*, 36. https://doi.org/10.1186/s12874-025-02461-0

Selwyn, N. (2019). *Should robots replace teachers? AI and the future of education*. Polity Press.

United Nations Educational, Scientific, and Cultural Organisation (UNESCO). (2017). *Education for the Sustainable Development Goals: Learning objectives*. UNESCO Publishing. https://unesdoc.unesco.org/ark:/48223/pf0000247444

Woodlock, D. (2017). The abuse of technology in domestic violence and stalking. *Violence Against Women, 23*(5), 584–602. https://doi.org/10.1177/1077801216646277

Disclaimer/Publisher's Note: The views, statements, opinions, and data expressed in all publications are solely those of the individual author (s) and contributor (s) and do not necessarily reflect those of GAERPSY or the editor (s). GAERPSY and the editor (s) assume no responsibility for any injury to persons or property arising from using any methods, instructions, products, or ideas in the published content.