

Effectiveness of Gender Education Campaigns for Girls in Mountainous Regions

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ABSTRACT: This paper examines how accessibility of educational campaigns, cultural sensitivity of content, and teacher involvement affect the effectiveness of gender education campaigns for girls in mountainous regions, as well as the moderating role of digital and traditional media platforms. A quantitative research design was applied, with survey data from 312 adolescent girls across mountainous areas in Vietnam, Nepal, India, and Indonesia. The study employed SPSS software for descriptive statistics, Cronbach's alpha, exploratory factor analysis, multiple regression, and moderation analysis. Findings indicate that cultural sensitivity ($\beta = 0.78$), teacher involvement ($\beta = 0.73$), and accessibility ($\beta = 0.68$) significantly influence campaign effectiveness. Moreover, digital and traditional media platforms demonstrate a strong moderating role ($\beta = 0.75$), amplifying the impact of culturally tailored content on outcomes. By moving beyond descriptive accounts, this paper contributes to the literature on gender education in marginalized contexts by integrating structural, cultural, and pedagogical factors with delivery mechanisms. It also proposes practical insights for policymakers, NGOs, and educators to design campaigns that are not only accessible but also contextually resonant, ensuring that girls in geographically constrained regions gain real opportunities and expanded freedoms.

KEYWORDS: Gender Education Campaigns; Cultural Sensitivity; Teacher Involvement; Accessibility; Digital and Traditional Media Platforms.

1. INTRODUCTION

Defining the effectiveness of gender education campaigns is more complex than it first appears. Success can be measured on increased knowledge, shifts in attitudes, or changes in long-term behavior, yet these outcomes rarely evolve in the same way. Evidence shows that well-designed programs consistently strengthen knowledge and self-confidence among girls, but the translation into sustained behavioral change remains uneven and highly context-specific (Barriuso-Ortega et al., 2024). A central concern is that interventions often focus on individuals while overlooking community norms that strongly shape girls' choices; without tackling these social pressures directly, gains in awareness may quickly erode (Levy et al., 2020). Studies in low-middle income contexts also consistently show that physical isolation like steep terrain, poor roads, and long travel distances severely limits both access to programs and regular attendance (Byrne et al., 2024). Moreover, gender education programs that import "global best practices" without adapting to local languages, cultural norms, or the daily responsibilities of girls in rural communities often struggle to gain traction, leading not only to limited engagement but, in some cases, active resistance from families or communities (Chandra-Mouli et al., 2015). These intertwined geographical, cultural, and logistical obstacles not only dilute effectiveness, they also challenge the very idea of one-size-fits-all measure of success.

The prior research offers valuable glimpses into how gender-sensitive educational efforts shape girls' lives in remote mountain communities, but notable gaps still remain. Voigt & Spies (2020), for instance, document how increased schooling in Northern Pakistan shifted perceptions of women's roles such as delaying marriage, expanding mobility, and encouraging self-determination, yet they stop short of examining how campaign design or media reach catalyzed those changes in the first place. Similarly, Ali et al. (2025) empirically identify socio-economic barriers to higher education for girls in Gilgit-Baltistan such as parental education and household income, but do not explore how culturally attuned content might interact with those constraints. Teachers, meanwhile, are critical actors who translate campaign materials into lived opportunities, with evidence showing that gender-responsive pedagogy and classroom practices can significantly enhance girls' participation and confidence (Chea et al., 2023). What remains underexplored is how cultural sensitivity of educational content, teacher support, and spatial barriers such as school distance jointly shape campaign effectiveness in remote mountainous regions. This study will bridge this gap by exploring how

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accessibility, cultural sensitivity, and teacher involvement predict campaign effectiveness, and how disparities in digital competence moderate culture-effectiveness relationship. By employing quantitative measures of reach, participation, and outcomes, this study will systematically test how accessibility, cultural sensitivity and media platforms shape campaign effectiveness, therefore offering more evidence-based guidance for the design of future interventions in similarly remote contexts. Guided by two central research questions, the study first answers: “To what extent do accessibility of educational campaign, cultural sensitivity of educational content, and teacher involvement influence the effectiveness of gender education campaigns for girls in mountainous regions?” Followed by “To what extent does media platform moderate the relationship between cultural sensitivity of educational content and the effectiveness of gender education campaigns?” The objectives of this research are not simply to test associations but to critically evaluate how accessibility, cultural sensitivity and teacher engagement each influence campaign effectiveness, and how media platform alter the strength of the cultural sensitivity-effectiveness relationship in geographically and socially constrained contexts. While prior research highlights the importance of access, cultural fit and the central role of teachers (Ali et al., 2025), few have systematically examined their simultaneous influence within a quantitative framework. Moreover, research rarely isolates the moderating role media platforms, despite their growing relevance in bridging information gaps in marginalized regions. Addressing these shortcomings, it is the purpose of this study to generate robust, evidence-based insights by linking accessibility and cultural sensitivity directly to effectiveness while clarifying how media delivery mechanisms shape the strength of cultural sensitivity-effectiveness relationship. In doing so, it intends to move beyond descriptive accounts and offer a more integrated explanation that can guide policy and practice.

2. LITERATURE REVIEW

2.1. Effectiveness of Gender Education Campaigns

Gender education campaigns are structured initiatives aimed at increasing awareness of gender equity, challenging prevailing stereotypes, and promoting equitable behaviors through targeted educational content, community engagement, or media outreach; as evidence indicates that such campaigns can yield measurable improvements in gender-related knowledge and attitudes, through their influence on deeper behavioral shifts varies significantly depending on local cultural alignment and delivery fidelity (Guthridge et al., 2022). The significance behind these campaigns lies in its capacity to challenge and reshape unequal power relations, particularly by empowering adolescent girls in marginalized settings, so that they can foster long-term improvements in equity, health outcomes, and social participation (Levy et al., 2020). In the region of Southeast Asia, innovative school-based programs like Cambodia’s TIGER and LSLAG initiatives have shown that embedding gender-responsive pedagogy within curricula can reduce emotional, physical, and sexual abuse while enhancing teachers’ gender-awareness and students’ safety (Chea et al., 2023). Nonetheless, despite promising pilot results, evidence on sustained behavioral change remains limited in mountainous or remote contexts due to challenges in monitoring, cultural misalignment of content, and logistical barriers (Ali et al., 2025). As a result, current campaign effectiveness often hinges on short-term gains and urban-focused designs, highlighting the need for research tailored to remote, culturally distinct environments.

Social Cognitive Theory suggests that learning occurs not only through personal experience but also through the observation of others, with self-efficacy functioning as the pivotal determinant of whether individuals internalize and reproduce modeled behaviors (Bandura, 1986). The effectiveness of gender education campaigns can be translated through this lens as their capacity to heighten girls’ confidence and agency by presenting credible, empowering role models whose actions challenge traditional constraints and provide tangible pathways toward equity. Social Role Theory, by contrast, emphasizes that gender differences in behavior and aspiration are primarily shaped by the social division of labor and the expectations societies attach to men’s and women’s roles (Eagly, & Wood, 2012); suggesting that campaign effectiveness entails the capacity to challenge deep rooted cultural prescriptions of femininity that limit girl’s educational opportunities, reframing roles in ways that expand agency and legitimate broader participation in public life. Human Capital Theory conceptualizes education as an investment in individuals that yields cumulative returns in productivity, social mobility, and empowerment (Holden & Biddle, 2017); applied to the context of this paper, effectiveness is measured not only in attitudinal shifts but in the demonstrable accumulation of knowledge, skills, and confidence that enable girls to contribute more fully to both their personal development and broader societal advancement. Through these psychological, normative, and economic perspectives, they illuminate the multilayered ways in which gender education campaigns can generate transformative outcomes and provide a robust analytical foundation for later anchoring the study within two overarching theoretical frameworks.

2.2. Anchoring theoretical frameworks

2.2.1. Capability Approach

The Capability Approach, originally developed by Amartya Sen and further refined by Martha Nussbaum, reorients evaluation from resources or utilities to the substantive freedoms people possess to pursue lives they value, distinguishing realized functionings from the capabilities that make them possible (Robeyns, 2006; Sen, 1999). This reframing is particularly pivotal for education as effectiveness cannot be read off inputs or test scores alone but from whether learners gain agency, voice, and the genuine option to convert learning into valued life paths (Tikly & Barrett, 2011). Capability Approach's distinctive strength is its attention to conversion factors such as personal, social, and environmental conditions that mediate the translation of resources into freedoms, thereby explaining why the same provision yields unequal outcomes across contexts (Robeyns, 2005). By placing agency and justice at the center, Capability Approach supplies a rigorous normative basis for judging gender education campaigns against the expansion of girls' real opportunities rather than surface-level participation.

The framework in mountainous settings can clarify how key factors operate as conversion levers that mediate whether access to resources results in genuine freedoms. Accessibility determines how schools or campaign sites can be physically reached despite the constraints of steep terrain, high level costs, and sparse infrastructure, conditions that significantly reduce girls' participation and restrict their capability sets (Ali et al., 2020). Whereas cultural sensitivity shapes whether messages resonate with prevailing norms around girlhood, family duty, and honor; when this resonance is absent, informational resources often fail to translate into agency and choice (Ali et al., 2021). The role of teachers adds a vital human layer, as they interpret campaign content, set expectations, and shape classroom climates that influence whether girls' capabilities are expanded or constrained (Desimone, 2009); by modeling gender-equitable practices and fostering supportive learning, teachers act as conversion agents who turn campaign messages into real opportunities for participation and self-confidence. The choice of media platforms also matters, since digital channels can extend reach and interaction, but often falter without adequate connectivity and local adaptation, while traditional platforms like radio or community meetings remain trusted and accessible in remote regions where digital divides persist (Wang, 2022). Borrowing the lens of Capability Approach, the effectiveness of campaigns is evidenced not simply exposure to messages or informational content, but by the tangible enlargement of feasible options for girls, such as the ability to remain in school, delay marriage, and participate in community decision-making.

The empirical applications of the Capability Approach in Asian settings deepen its practical relevance by showing how schooling and related interventions expand girls' real freedoms only when conversion factors are addressed. In Bangladesh, DeJaeghere & Lee (2011) used a capabilities lens to show that marginalized girls' educational well-being is best signaled by agency, meaningful participation, and strengthened aspirations – outcomes that enrollment statistics alone fail to capture. In rural China, Seeberg (2014) documents how schooling created identifiable "empowerment capabilities" for excluded village girls (improved confidence, alternative life plans, and reduced early-marriage trajectories), illustrating how local schooling can reconfigure social expectations when it alters girls' opportunity sets. Hannum et al. (2009) further complements these cases by demonstrating that household decision-making, parental perceptions, and economic calculations are powerful family-level conversion factors that mediate whether resources actually become capabilities for girls; their work explains why identical inputs yield divergent outcomes across households and locales. Building on this, Tikly & Barrett (2011) underscore teachers as essential conversion agents whose pedagogy, expectations, and responsiveness directly influence whether resources provided through curricular or campaigns translate into genuine freedoms. Regional reviews of technology-enabled learning, specifically information and communication technologies (ICT), highlight a key Capability Approach principle that digital interventions widen educational freedoms only when design elements such as local language use, equitable access, and pedagogical alignment enable resources to convert into genuine capabilities (Liang et al., 2023), indicating that media function as enablers of capability expansion only when campaigns address these contextual conversion factors, rather than treating delivery as sufficient. Combining these studies, this evidence foregrounds three practical imperatives for evaluating gender education campaigns through Capability Approach: measure agency and aspiration (not just attendance), identify and target family- and teacher-level conversion factors, and ensure delivery modes, including media are context-matched so that informational inputs reliably expand girls' real freedoms.

This application draws on the Capability Approach, which shifts evaluation from inputs or scores to the real freedoms that learners gain to shape valued lives. Through this lens, the effectiveness of gender education is not judged by enrollment or scores alone, but by whether girls acquire agency, aspiration, and the real possibility of pursuing alternative futures. Such outcomes depend on conversion factors like terrain, cultural expectations, family decision-making, teacher practices, and the type of media platform that mediates access to information. Regional evidence also shows that when these conditions are addressed, education can transform expectations and expand girls' opportunities in meaningful and lasting ways.

2.2.2. Intersectionality Theory

First articulated by Kimberlé Crenshaw, Intersectionality Theory emphasizes that social identities such as gender, race, class, and geographic location intersect to create distinctive configurations of privilege and marginalization (Collins, 2015; Crenshaw, 1989). Rather than treating inequalities as separate or additive, it explains how overlapping structures of power such as patriarchy, poverty, ethnicity, and institutional neglect converge to shape experiences that cannot be reduced to a single dimension (Cho et al., 2013). This multidimensional lens is particularly valuable in education, where the barriers faced by girls in rural or disadvantaged settings often stem not from gender alone but from the compounded effects of social expectations, economic precarity, and cultural or ethnic marginalization (Hannum & Wang, 2022). The theory's key advantage is its capacity to expose both limitations and potentials as it underlines the multiple, overlapping barriers that hinder access to education while simultaneously acknowledging how resilience and personal agency can develop within these intersecting constraints. By attending to the complexity of lived realities, Intersectionality provides a rigorous framework for evaluating whether gender education campaigns are merely gender-sensitive in name or genuinely responsive to the intertwined conditions that shape opportunity.

Particularly useful for examining gender education campaigns in mountainous regions, as Intersectionality theory shows how overlapping disadvantages shape both opportunities and barriers to learning. A key factor is accessibility of educational campaigns such as long travel distances, seasonal isolation, and safety concerns limit girls' participation, while reforms like school consolidation, framed as efficiency measures, have disproportionately reduced opportunities for ethnic minority and remote households (Hannum & Wang, 2022). Yet targeted interventions such as community boarding schemes demonstrate that accessibility is not only a logistical issue but a determinant of whether families see participation as feasible and worthwhile (Xiao et al., 2023). Equally crucial is the cultural sensitivity of educational content. Even well-funded campaigns can falter when messages clash with local norms around gender, duty, and household economics. Parental decisions about resource allocation often dictate whether girls benefit from campaigns, making resonance with community values essential for shifting attitudes (Hannum & Wang, 2022). In this way, cultural sensitivity functions less as a complement than as a mechanism that determines whether resources translate into real empowerment. Teachers also play a vital role at the intersection of identity and support; where educators fail to mediate or openly challenge gendered and cultural biases in instructional materials, layered inequities persist in how girls experience campaigns (Vu & Pham, 2022). Digital and traditional media platforms now function as moderators, shaping how culturally sensitive content is delivered and absorbed; as digital media broaden reach and diversify engagement when accessibility, language, and design reflect local realities, whereas traditional platforms remain more trusted and accessible in remote mountainous regions, especially where digital devices persist (Chikwe et al., 2024). The interplay of accessibility, cultural sensitivity, teacher engagement, and media platforms ultimately determines whether campaigns genuinely expand girls' choices or merely replicate symbolic inclusion.

The existing literature applying Intersectionality Theory to marginalized education contexts can further expand the understanding how gender, ethnicity, household resources, and geography intersect in shaping girls' educational experiences. In China, school network consolidation has lengthened children's travel distance, with remote and economically disadvantaged communities most severely affected; for girls, this often translates into higher dropout risks as families weigh safety, cost, and cultural expectations around mobility (Zhao & Barakat, 2015). At family level, Shu (2004) shows that both individual and community education levels influence gender norms and support for girls' schooling, families with higher educational status are more likely to reject traditional gendered expectations. Spatial factors also compound on this as many mountainous regions in China, difficult terrain, poor transport networks, and dispersed school locations restrict girls' access to education, making interventions such as satellite schools or mobile classrooms essential to bridging opportunity gaps (Yao et al., 2022). Teachers' own negotiations of gender identity and professional responsibilities shape how gender education campaigns are enacted; as Wang & Feng (2025) show, even within exam-driven systems, teachers can challenge stereotypes and foster equitable participation, though often through subtle and constrained forms of practice. Technology also intersects with inequality as girls often show lower digital competence even when access is available, as cultural norms and reduced confidence limit their ability to use technology effectively; evidence suggests these gaps are shaped less by access itself than by differences in self-efficacy and cultural capital, which place marginalized girls at a disadvantage (Hatlevik et al., 2015). A broader cross-national analysis confirms that digital knowledge, confidence, and attitudes are critical mediators of learning, with girls lagging often not due to lack of resources but due to persistent disparities in technology attitudes and self-efficacy (Campos & Scherer, 2024). These studies together illustrate that effective gender education campaigns must diagnose overlapping barriers like structural, cultural, pedagogical, and technological and craft interventions that connect infrastructure, culturally attuned messaging, family engagement, and accessible media to truly expand girls' capabilities, rather than rely on one-size-fits-all models.

Intersectionality Theory assumes that experiences of inequality are never shaped by gender in isolation but emerge from the convergence of multiple dimensions such as class, ethnicity, geography, culture, and the role of teachers. It presumes these

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identities interact in ways that are inseparable, producing distinct forms of disadvantage or resilience that cannot be captured by single-category analysis. The theory further assumes that effective evaluation of girls' education must account for these intersecting structures, rather than treating barriers as isolated or additive.

2.3. Accessibility of Educational Campaigns

Accessibility of educational campaigns refers to the degree to which learners can realistically reach, attend, and benefit from initiatives despite constraints of geography, infrastructure, and social context (Byrne et al., 2014). It is not limited to physical distance but also encompasses affordability, safety, and institutional support that together determine whether opportunities translate into actual participations (Yao et al., 2022). Ecological Systems Theory explains how human development is shaped by multiple layers of environmental influence, ranging from immediate settings like family and school (microsystem) to broader social, institutional, and policy context (exosystem and macrosystem) (Bronfenbrenner, 1979). Through this scope, accessibility can be viewed as functioning as a core exosystemic condition, where the wider physical and institutional environment either facilitates or obstructs girls' educational engagement by shaping the immediate contexts in which they live; highlighting that without enabling environments such as nearby schools, safe travel routes, or locally adapted campaign venues, even the most relevant gender-education material (e.g., lessons on equity, rights, and health) remain under-utilized, as seen when maternal health programs in Vietnam's mountainous Cao Bang province failed to improve facility-based childbirth rates despite deploying education materials through home visits and village sessions (Hoang et al., 2024). Also in southwest China, the spatial accessibility of schools in mountainous areas remains uneven, with travel times frequently exceeding policy standards, particularly in remote countries, stressing how geographic barriers continue to block even foundational campaign access (Yang et al., 2025). Thus, these findings make clear that accessibility is not a peripheral factor but a structural determinant of whether gender education campaigns in mountainous regions achieve genuine reach and lasting effectiveness.

Accessibility exerts a decisive effect on campaign effectiveness because it determines girls can realistically take up, sustain, and benefit from offered learning opportunity. Large-scale review of girls' education show that programs that directly remove or reduce access barriers such as subsidized transport, proximate provision, or elimination of user fees consistently produce larger gains in participation, retention, and learning than interventions that focus on content alone (Evans et al., 2024). Interpreting these results through Ecological Systems Theory (Bronfenbrenner, 1979) clarifies the mechanism of children's educational participation is embedded within nested systems (household, school, community, policy). When macro-level conditions (infrastructure, school-network design) undermine meso- and micro-level supports (household decisions, safe travel), even high-quality programming cannot convert into outcomes; conversely, improving physical and institutional access repairs the systemic links that enable uptake and sustained impact. The transformative effect of such interventions is clearly evident in Muralidharan & Prakash's (2017) study of a bicycle distribution scheme in Bihar, which lifted girls' secondary school enrollment by nearly a third. By reducing the physical burden of distance, the program translated existing aspirations into sustained attendance and progression. Filmer & Schady's (2008) research in Cambodia, likewise, demonstrated that scholarships significantly boosted female enrollment and curbed dropout, as lowering both direct and hidden costs shifted household choices toward investing in daughters' education. Interpreting these outcomes through Spatial Justice, which emphasizes the fair and equitable distribution of resources and opportunities across geographic space (Soja, 2010), shows that distance and affordability are not only simply logistical barriers but manifestations of uneven social and geographic arrangements that systematically disadvantage girls. Policies that alter these spatial inequities through subsidized transport, nearby provision, or cost removal reconfigure how families weigh risks, responsibilities, and future returns. In doing so, they convert educational campaigns from symbolic promises into mechanisms that tangibly expand girls' participation and long-term opportunities.

Evidence from mountainous regions indicates that simply building new infrastructure or expanding the number of educational facilities rarely produces rapid or transformative gains in outreach. In many cases, progress unfolds at a sluggish pace, or in some districts, does not materialize at all, leaving gaps between policy intentions and lived realities. Recent spatial analyses of Southwest China illustrate that despite government initiatives to expand school coverage, mountainous countries often remain underserved as new facilities are concentrated in more accessible valleys, while highland villages continue to face long travel times, sparse institutional presence, and geographic isolation that systematically constrain participation (Yang et al., 2025; Yao et al., 2022). Through Critical Realism, a philosophy that distinguishes between surface-level events and deeper structures that generate them (Bhaskar, 2013), helps interpret this outcome as unless structural issues like chronic underinvestment, rural poverty, or ecological constraints are addressed, new facilities alone cannot break entrenched patterns of exclusion. Structuration Theory, developed by Giddens (1984), adds another layer by emphasizing the interplay between structure and human agency. Even when schools or transport networks exist, their impact depends on whether local factors such as families, educators, and campaign organizers are empowered to use and adapt them. Without community involvement, context-sensitive strategies, and alignment, with household

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priorities, accessibility gains risk being superficial; with these insights show that improving access is necessary but rarely sufficient, enduring effectiveness requires reform and agency at the local level.

With the current body of literature, and while some studies point out uneven outcomes, the broader evidence indicates that improved accessibility tends to enhance girls' participation and learning opportunities. Therefore, the following hypothesis is proposed:

H1: Accessibility of Educational Campaigns positively impacts the Effectiveness of Gender Education Campaigns.

2.4. Cultural Sensitivity of Educational Content

Cultural sensitivity is the extent to which educators recognize, respect, and actively use learners' cultural repertoires as assets; it entails aligning language, examples, symbols, and norms in instruction with community meanings so that content feels legitimate and usable to students (Aronson & Laughter, 2016). As in educational content, cultural sensitivity means materials name local realities, counter harmful gender scripts, and invite students to see themselves as knowers, not just recipients. Its significance can be clarified with Cultural-Historical Activity Theory which suggests that curricular artifacts mediate learning within an "activity system" of tools, rules, community, and roles (Engeström, 2001); meaning when content resonates with local norms and labor divisions, uptake accelerates, but when it contradicts these structures, contradictions emerge and learning stalls, requiring redesign through expensive learning and formative interventions (Sannino et al., 2016). Recent evidence in Asia suggests uneven progress, for instance, analyses of Chinese English textbooks find persistent gender stereotyping in depictions of competence and leadership, signaling weak alignment between official goals and classroom texts (Huang & Liu, 2024), while a cross-country study of Malaysia, Indonesia, Pakistan, and Bangladesh documents systemic male-favoring representation and traditional role casting in schoolbooks, conditions that blunt the transformative aims of gender education (Islam & Asadullah, 2018). This evidence, therefore, indicates that cultural sensitivity must be operationalized in concrete textual choices, not just policy rhetoric.

Culturally attuned educational content has proven to enhance the effectiveness of gender educational campaigns as it increases perceived relevance, builds efficacy, and shifts the local norm climate in ways that sustain behavior change. The Social Norms Theory (Cialdini et al., 1991) explains why culturally sensitive content yields enduring campaign effects as it reframes both descriptive norms (what others are seen doing) and injunctive norms (what others approve of) in a way that reduces social penalties for girls' participation in education. Evidence through a large-scale intervention in India supports this view (Dhar et al., 2022), showing that when curricula openly challenged restrictive gender norms in locally resonant terms, adolescents reported more progressive attitudes and higher aspirations. In line with this, Amin et al. (2018) carried out a study of rural Bangladesh demonstrated that a life-skills and rights program tailored to community marriage practices reduced child marriage and extended schooling. In both cases, gender-sensitive framing acted not as bordering messaging but as a norm-shaping force, legitimizing new options for girls that families previously regarded as risky or inappropriate. Social Cognitive Theory (Bandura, 1986) further complements this, highlighting how modeling, self-efficacy, and reinforcement determine whether new behaviors take hold. When content resonates with learners' cultural realities, it fosters identification with role models and strengthens confidence in applying knowledge. Beattie et al.'s (2015) Samata trial in Karnataka exemplifies this process as gender-focused modules embedded within caste and poverty-sensitive frameworks improved school retention by providing adolescents with practical models of resistance to early marriage. Levy et al.'s (2020) global review, likewise, finds that programs achieving the most consistent impact are not only gender-transformative but also carefully adapted to local contexts, ensuring that girls can visualize themselves as capable actors within familiar social scripts. These insights confirm that cultural sensitivity is not a surface-level feature but a mechanism that amplifies campaigns credibility, resonance, and ultimately their effectiveness in expanding girls' educational opportunities.

Evidence from recent program evaluations also suggests that culturally sensitive content, on its own, often yields only modest or uneven effects because it does not reliably trigger the cognitive and motivational pathways required for durable change. In Jakarta, the cluster-randomized evaluation of the Journey4Life program reported small gains in girls' gender-equality attitudes and disclosure of sexual violence but no significant movement on intentions around child marriage or broader socio-emotional learning (Todesco et al., 2023), a pattern consistent with the Elaboration Likelihood Model: messaging was likely processed via peripheral cues rather than the central route, lacking the depth of issue involvement, argument strength, and sustained rehearsal needed to consolidate attitudes into intentions and behavior (Petty & Cacioppo, 2012). A parallel dynamic appears in India's high-visibility Bet Bachao Beti Padhao campaign, where culturally resonant slogans and community-facing activities did not translate into measurable increases in girls' enrollment or household education spending (Saraswathy, 2021). Read through the Theory of Planned Behavior (Ajzen, 1991), this indicates that culturally aligned appeals did not sufficiently shift the full set of antecedents like attitudes, perceived social norms, and, crucially, perceived behavioral control, in contexts where poverty, safety risks, and domestic labor demands continue to depress families' sense of feasible action. The previous findings together underscore a critical nuance that

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cultural tailoring can enhance receptivity, but without structures that deepen elaboration and strength control beliefs, its net impact on campaign effectiveness remains weak to neutral.

Although certain studies highlight that the impact of cultural tailoring may differ by context, the broader literature indicates that culturally sensitive educational content generally enhances the effectiveness of gender education campaigns by improving girl's engagement and learning outcomes. Hence the following hypothesis is proposed:

H2: Cultural Sensitivity of Educational Campaigns positively impacts the Effectiveness of Gender Education Campaigns.

2.5. The role of Teachers

Teachers are the proximate implementation agents of gender-education campaigns, exerting a direct influence on outcomes by translating campaign materials into daily interactions, setting expectations that signal what girls can become, and shaping whether messages translate into participation, persistence, and self-efficacy. Recent conceptual work positions "teacher performance" as an integrative construct such as content knowledge, pedagogical repertoire, assessment practice, and classroom climate that directly channels policy and program inputs into learner outcomes (Wongmahesak et al., 2025). Expectancy-Value Theory explains why this gatekeeping role is decisive as teachers' communicated expectations and task values they cultivate (utility, interest, attainment) steer effort, choice, and persistence, especially for students navigating stereotype-laden domains (Wigfield & Eccles, 2000). Evidence from resource-constrained educational settings underscores the point. In Cambodia, initiatives to strengthen gender-responsive pedagogy through teacher training, encouraging equitable questioning, counter-stereotypical examples, and sensitivity to girls' safety, have demonstrably expanded girls' participation and confidence, underscoring teachers' role as the mechanism through which "gender-sensitive" content becomes lived opportunity (Chea et al., 2023). An umbrella review of digitalization in education shows that technology boosts learning only when teachers adapt it through clear expectations, formative feedback, and culturally relevant framing; absent this mediation, tools tend to widen rather than narrow participation gaps (Wohlfart & Wagner, 2023). The literature affirms that teachers are not bordering facilitators but the pivotal actors who convert gender-education campaigns into meaningful gains, ultimately determining whether such initiatives in mountainous regions achieve equity in both access and outcomes.

Teachers exert a decisive and multifaceted influence on the effectiveness of gender-education campaigns, with evidence consistently showing that their role is not merely facilitative but transformative. At a broad level, Kraft et al.'s (2018) meta-analysis demonstrates that structured teacher coaching interventions significantly improve instructional quality and student outcomes, underscoring that even well-designed campaigns depend on teachers' capacity to translate policy inputs into meaningful practice; which in line with Expectancy-Value Theory, highlighting how teachers' communication of competence and task value directly shapes student's motivation, persistence, and academic choices (Eccles & Wigfield, 2000). In gender-focused campaigns specifically, Dhar et al. (2022) provide casual evidence from India that teachers delivering attitude-shaping curricula produced durable shifts in adolescents' gender norms and aspirations, illustrating that teachers' authority and daily interaction amplify curricular content into broader social change. The Samata trial in India further reinforces this point, arguing school retention and gender-norm interventions only reduced dropout and early marriage risks when teachers consistently enacted the program in classrooms (Beattie et al., 2015). Yet teacher influence is not neutral; Xu & Li (2018) show that in Chinese middle schools, teachers' gender and expectations significantly mediated girls' achievement, revealing that the teachers' own identity and biases can intensify campaign effectiveness when channeled toward high expectations and equitable treatment. This comes together with Jussim and Harber's (2005) framework on teacher expectancy effects, which explains how high expectations can foster self-fulfilling cycles of achievement while low expectations risk reproducing inequities. Overall, the evidence converges to show that teachers are the central mechanism through which gender-education campaigns gain real traction, since their pedagogical expertise, expectations, and interactional style determine whether campaigns remain abstract ideas or become lived opportunities that transform participation, persistence and empowerment for girls.

Although often positioned as decisive actors in gender-education campaigns, evidence suggests that teachers' influence is not always strong or uniform. A large-scale analysis in China using randomly assigned student-teacher data finds no statistically significant effect of student-teacher gender match on overall academic performance, largely because of structural factors such as curriculum design and socioeconomic disparities outweighed any influence of teacher gender, suggesting that teacher characteristics alone may not reliably shape campaign outcomes (Xu & Li, 2018). Chudgar & Sankar's (2008) study across five Indian states showed mixed results; in some subjects, teacher gender aligned with modest gains, while in others the effect was negligible, indicating that structural, curricular, and socio-cultural conditions can overshadow individual teacher influence. Even where teacher performance is targeted directly, results can be disappointing, Loyalka et al. (2019) evaluated a major Chinese teacher training initiative and reported null effects on both teacher practice and student outcomes after a full year, highlighting the gap between professional development inputs and measurable changes in classroom realities. Interpreting these patterns with Self-

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Determination Theory (Ryan & Deci, 2000) by emphasizing that improvements depend on whether teachers can foster autonomy, competence, and relatedness; without these motivational conditions, training or identity variables exert little impact on learner engagement. The Theory of Planned Behavior (Ajzen, 1991), likewise, views teacher's attitudes or knowledge alone are insufficient unless supported by perceived control and social norms that enable them to consistently translate intentions into practice. These findings together caution against assuming that teachers, in isolation, can guarantee the success of gender education campaigns, since their influence is mediated by broader institutional contexts, entrenched cultural norms, and the motivational climate they are or are not able to create.

With some research suggests that the influence of teachers may vary across contexts, the wider body of evidence emphasizes that teachers still play a decisive role in shaping the effectiveness of gender education campaigns by mediating how messages are delivered, interpreted, and internalized by students. Accordingly, the following hypothesis is proposed:

H3: The role of teachers positively impacts the Effectiveness of Gender Education Campaigns.

2.6. The moderating role of Digital and Traditional Media Platforms

Digital and traditional media platforms shape whether culturally sensitive educational content actually changes attitudes and behavior by altering how messages are framed, received, and reinforced. Media Richness Theory (Daft & Lengel, 1986) explains this mechanism by suggesting richer media that support multiple cues, immediate feedback, and interactivity make it easier to convey nuanced, contextually adapted messages and to sustain dialogue; learner channels struggle to transmit complexity and may blunt cultural nuance. In practice, digital platforms can amplify culturally tailored content because they enable multimodal storytelling, peer discussion, and adaptive pacing, but only when design addresses language, access, and pedagogic fit; otherwise, digital delivery risks entrenching exclusion through uneven connectivity and misaligned interfaces (Liang et al., 2023). By contrast, traditional mass media retain advantages in reach, community trust, and norm-shaping capacity in low-connectivity settings, and well-crafted radio or broadcast campaigns have produced measurable behavior change at scale when coupled with trusted local messaging (Naugle & Hornik, 2014). Defining platforms broadly as channels that host and mediate content clarifies that platform choice is not neutral; strategic selection and hybrid deployment are required to ensure cultural sensitivity converts into real educational gains (Kaplan & Haenlein, 2010).

A strong body of evidence suggests that digital and traditional media platforms do not merely serve as neutral conduits for gender education campaigns but actively magnify the influence of culturally sensitive content on effectiveness. Kreuter & McClure (2004) emphasized that culturally grounded messages resonate more deeply when shared through trusted and familiar channels such as community radio, local newspaper, and neighborhood health networks, showing that platform alignment with cultural expectations is as critical as the messages itself. This argument is reinforced in the systematic review by Naugle & Hornik (2014), which demonstrated that mass media interventions in low- and middle-income countries achieved substantial behavioral change only when campaigns were transmitted via channels embedded in local contexts, such as radio or television, suggesting that platform choice amplifies cultural resonance. From the digital perspective, Lustria et al. (2009) highlighted how web-based interventions were most effective when interactivity and personalization features allowed tailoring to be fully experienced by users, thereby intensifying the educational impact. Liang et al. (2023) extended this evidence to Asian contexts, showing that ICT-enabled programs for schoolgirls generated measurable improvements in engagement and learning precisely when technological platforms addressed local linguistic and cultural needs. These findings can be understood through Media Richness Theory, which argues that channels offering multiple cues, immediacy of feedback, and personalization such as interactive digital platforms or locally embedded radio discussions are especially effective for delivering culturally adapted messages, while learner media like printed flyers often fail to capture the subtleties required for community resonance. The Elaboration Likelihood Model (Petty & Cacioppo, 1986) further complements this, explaining these platforms increase the likelihood of central information processing because culturally resonant content delivered through interactive or trusted media is perceived as relevant, which promoted sustained attention and deeper cognitive elaboration. Altogether, the literature indicated that when cultural sensitivity is combined with the affordances of well-chosen media platforms, the result is a powerful synergy that significantly enhances the effectiveness of gender education campaigns in marginalized regions.

Research examining the influence of digital and traditional media platforms on the effectiveness of culturally sensitive educational content for girls reveals that platform characteristics alone do not guarantee improved outcomes. Studies indicate that while media have the potential to extend reach and engagement, their structural and social limitations can constrain impact. For instance, analyses of YouTube educational videos in STEM contexts reveal persistent gender bias in narrator representation and algorithmic content promotion, undermining the translation of culturally adapted messages into meaningful learning outcomes (Gezici & Saygin, 2022). Similarly, global evidence indicates that social media can reinforce gender stereotypes and present girls with content that is either harmful, misleading, or demotivating, demonstrating that culturally tailored educational messages may not achieve

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their intended impact when delivered through platforms that lack supportive moderation, context-sensitive design, or mechanisms for safe and equitable engagement (Park et al., 2023; UNESCO, 2024). Muted Group Theory explains these patterns by emphasizing that communication systems often marginalize less dominant voices, resulting in the underrepresentation or misalignment of girls' needs in digital spaces (Littlejohn & Foss, 2010). Complementarily, Uses and Gratifications Theory (Katz et al., 1973) suggests that users selectively engage with media that satisfy their own perceived needs; when content is not perceived as relevant or trustworthy, even high-quality culturally sensitive messages may be ignored, limiting their practical influence. This evidence, therefore, underscores that media platforms are not inherently amplifiers of culturally sensitive content; their effectiveness depends critically on structural design, content curation, and alignment with girls' perceptions and engagement patterns, which if neglected, can result in weak, neutral, or even negligible impacts on campaign success.

While acknowledging research that indicates the impact of digital and traditional media platforms may differ depending on context, the broader evidence underscores that these platforms critically shape how culturally sensitive educational content translates into campaign effectiveness by influencing the reception, interpretation, and engagement of learners. Consequently, the following hypothesis is proposed:

H4: Digital and Traditional Media Platforms positively moderate the relationship between Cultural Sensitivity of Educational Content and the Effectiveness of Gender Education Campaigns.

Building upon robust theoretical underpinnings, this study enhances existing scholarship by proposing the following conceptual framework:

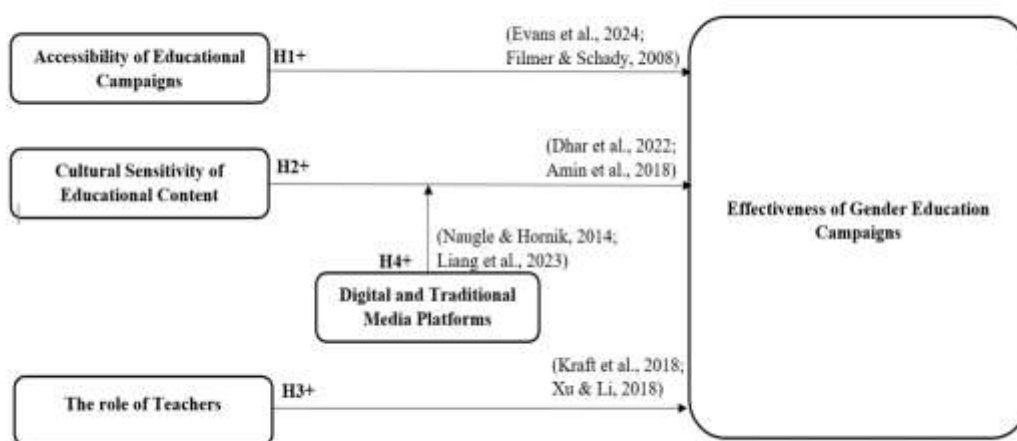


Figure 1: The paper's conceptual framework

3. METHODOLOGY

3.1. Research approach and strategy

This research employs a quantitative, cross-sectional survey design to explore the effectiveness of gender education campaigns for girls in Asian mountainous regions during the period of 2020-2025. A quantitative framework was selected for its ability to translate complex relationships into measurable data and test hypotheses with empirical evidence rather than assumption (Babbie, 2010; Creswell & Creswell, 2017). Guided by deductive reasoning, the research begins with predefined hypotheses and evaluates them against collected responses, allowing both the confirmation of correlations and insight into how accessibility, cultural sensitivity, and teacher involvement shape campaign outcomes

3.2. Sampling technique and procedure

To ensure both empirical rigor and contextual depth, the study employed a purposive stratified sampling strategy targeting adolescent girls in Asian mountainous regions where gender education initiatives were active between 2020 and 2025. The focus was on girls aged 12 to 18 who had direct exposure to campaign activities, with stratification used to capture variation across geography, ethnicity, and school level. Four countries were selected to reflect diverse cultural and policy environments: Vietnam, Nepal, India, and Indonesia, each representing distinct linguistic, social, and infrastructural challenges to education in upland communities. Within these contexts, schools and community centers served as the primary entry points for recruitment, while teachers and parents assisted in confirming eligibility to strengthen reliability.

Eligibility criteria required participants to have attended or been directly involved in at least one structured gender education activity within the past two years, whether delivered through schools, community sessions, or media-based outreach. This ensured

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that responses reflected first-hand interaction rather than second-hand accounts. Additional screening considered schooling level, frequency of participation, and household backgrounds, enabling the study to capture both commonalities and differences in campaign exposure.

In total, 640 questionnaires were distributed, of which 385 were validated after excluding incomplete or inconsistent responses. The final pool was reasonably balanced, with approximately one-third of participants from Vietnam's northern highlands, slightly more than a quarter from Nepal's Himalayan foothills, just under a quarter from India hill states such as Himachal Pradesh, and Uttarakhand, and the remainder from upland districts of Indonesia, particularly Sumatra. The distribution equated to about 34% Vietnamese, 27% Nepali, 23% Indian, and 16% Indonesian. This composition not only provided adequate statistical power for regression analyses but also ensured that findings reflected the lived realities of girls across multiple cultural and geographical contexts.

By structuring the sample in this way, the study generated a participant base that was both diverse and grounded in local campaign experiences. The combination of targeted eligibility, regional variation, and proportional representation allowed the research to investigate how accessibility, cultural sensitivity, and teacher involvement shaped effectiveness across different Asian mountainous settings, offering insights that are both contextually nuanced and analytically robust.

Survey link:

https://docs.google.com/forms/d/e/1FAIpQLScTprnX1Ff4lgdXgvTBcDx1bX5JyTir1oH3YI3Z_nk8TWvgNw/viewform?usp=header

3.3. Data analysis description

The analysis began in SPSS with descriptive statistics to provide an overview of participant characteristics and response patterns. To evaluate the internal consistency of the constructs, Cronbach's alpha was computed. An Exploratory Factor Analysis (EFA) was then conducted to identify latent structures within the survey items, ensuring that indicators aligned with the broader variables of interest. To examine the proposed hypotheses, multiple linear regression analysis was applied, testing how accessibility of campaigns, cultural sensitivity of content, and teacher involvement influenced the overall effectiveness of gender education initiatives. In addition, hierarchical regression using the SPSS Process Macro was employed to assess the moderating effect of media platforms, focusing on how digital and traditional channels shaped the strength of the relationship between cultural sensitivity and campaign effectiveness. This approach underscored the pivotal role of diversity mechanisms in determining whether culturally attuned content translated into meaningful outcomes for girls in mountainous regions.

4. RESULTS

4.1. Reliability analysis

Table 1: Reliability analysis of "Effectiveness of Gender Education Campaigns".

Reliability Statistics				
Cronbach's Alpha	N of Items			
.786	4			

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
EGEC1	9.339	8.615	.614	.637
EGEC2	9.068	8.950	.670	.685
EGEC3	8.767	8.321	.735	.748
EGEC4	8.235	8.000	.608	.629

Where EGEC1 to EGEC4 were coded to represent survey questions 1 through 4 addressing effectiveness of gender education campaigns.

As indicated in Table 1, all observed variables within the dependent construct yielded adjusted item-total correlation coefficients of 0.3 or above. The composite Cronbach's alpha was 0.755, surpassing the widely recognized reliability benchmark of 0.7 and higher than the alpha values that would have resulted if any single item had been removed. Moreover, the Cronbach's alpha for each observed variable remained above its corresponding adjusted item-total correlation, even under hypothetical item

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deletions. Therefore, all items were retained for further analysis. Comparable patterns of internal consistency were also observed across the other constructs.

4.2. Exploratory factor analysis (EFA)

Table 2: Rotated Component Matrix.

Rotated Component Matrix ^a					
Component with loading factors					
1	2	3	4	5	
EGEC1 .595	AEC1 .690	CSEC1 .641	RT1 .655	DTMP1 .630	
EGEC2 .584	AEC2 .630	CSEC2 .541	RT2 .620	DTMP2 .697	
EGEC3 .507	AEC3 .633	CSEC3 .642	RT3 .654	DTMP3 .678	
EGEC4 .640	AEC4 .656	CSEC4 .589	RT4 .558	DTMP4 .640	
Extraction Method: Principal Component Analysis.					
Rotation Method: Varimax with Kaiser Normalization.					

a. Rotation converged in 8 iterations.

Where survey items AEC1 to AEC4, CSEC to CSEC4, RT1 to RT4, and DTMP1 to DTMP4 were designed to capture the three independent variables and the moderator, with each set corresponding to questions 1 through 4. As presented in Table 2, the rotated component matrix successfully clustered the 20 observed variables into five distinct factors, each corresponding to the dependent variable, the three independent variables, and the moderator. All items recorded factor loadings above 0.5, and no items were excluded during the factor analysis process.

4.1. Multiple linear regression model

Table 3: Coefficients^a.

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error				Tolerance	VIF
1 (Constant)	3.281	.207		20.734	.000		
AEC	.690	.336	.680	11.967	.000	.192	1.533
CSEC	.785	.559	.780	15.365	.000	.220	1.723
RT	.746	.867	.730	9.918	.000	.186	1.009

a. Dependent Variable: EGEC

Where **EGEC**: Mean of EGEC1 to EGEC4; **AEC**: Mean of AEC1 to AEC4; **CSEC**: Mean of CSEC1 to CSEC4; **RT**: Mean of RT1 to RT4.

The results indicate that all three variables produced significance values (Sig.) of 0.000, which are below the conventional threshold of $\alpha = 0.05$. This confirms that each independent variable exerts a statistically significant effect on the dependent variable. Thus, all three hypotheses are supported and none is rejected.

4.4. Moderator analysis

Table 4: Results analysis of "Digital and Traditional Media Platforms".

Model : 1
Y : EGEC
X : CSEC
W : DTMP
Sample Size: 385

OUTCOME VARIABLE:

EGEC

Model Summary

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R	R-sq	MSE	F	dl1	dl2	p
.812	.659	.437	5.151	3.000	381.000	.000

Model

	coeff	se	t	p	LLCI	ULCI
constant	7.805	.965	61.544	.000	6.771	6.666
CSEC	.682	.559	5.600	.000	.622	.611
DTMP	.686	.802	4.343	.000	.624	.610
Int_1	.750	.797	5.647	.000	.596	.571

Where **DTMP**: mean of DTMP1 to DTMP4

Table 4 shows that the p-value for the interaction term (Int_1) is 0.000, well below the 0.05 threshold, indicating a statistically significant moderating effect. This result suggests that digital and traditional media platforms significantly moderate the relationship between cultural sensitivity of educational content and effectiveness of gender education campaigns. The positive interaction coefficient of 0.750 demonstrates that greater digital and traditional media platforms strengthen the positive influence of cultural sensitivity of educational content on effectiveness of gender education campaigns. Consequently, hypothesis H4 is supported.

5. DISCUSSION

5.1. Result summary

Regression analysis shows that cultural sensitivity of educational content (CSEC) exerts the strongest influence on the effectiveness of gender education campaigns (EGEC), with a coefficient of 0.78. The role of teachers (RT) also demonstrates a significant effect, though slightly lower, with a coefficient of 0.73, underscoring their importance in reinforcing and contextualizing campaign messages. Accessibility of educational campaigns (AEC) contributes positively as well, though to a lesser extent, with a coefficient of 0.68, suggesting that while access matters, its impact depends on how well content and delivery resonate with learners. The moderating factor, digital and traditional media platforms (DTMP), recorded a coefficient of 0.75, highlighting its capacity to strengthen the link between cultural sensitivity and campaign outcomes by broadening reach and reinforcing content relevance.

5.2. Theoretical implications

The findings confirm that accessibility exerts a meaningful yet comparatively modest influence on the effectiveness of gender campaigns with the coefficient of 0.68, supporting Byrne et al. (2014) and Yao et al. (2022), who conceptualized access as not only physical distance but also affordability and safety. This outcome resonates with Bronfenbrenner's (1979) Ecological Systems Theory, which emphasizes that exosystemic conditions, such as infrastructure and institutional support, determine the feasibility of educational engagement. By showing that girls in mountainous areas benefit most when campaigns reduce barriers of travel and cost, the results align with Evans et al. (2024), whose review demonstrated that access-focused interventions yield more sustained participation than content-only reforms. Likewise, Muralidharan & Prakash's (2017) bicycle program in Bihar and Filmer & Schady's (2008) scholarship initiative in Cambodia mirror the present study's emphasis on accessibility as a structural determinant of educational opportunity. At the same time, the results challenge overly optimistic claims, such as those implied in Yang et al. (2025), that infrastructure expansion alone can equalize outcomes. Instead, they underscore Critical Realism's (Bhaskar, 2013) reminder that deeper socio-economic and spatial inequalities persist, requiring not just physical provision but systemic reform to achieve genuine effectiveness.

The strong coefficient for cultural sensitivity (0.78) demonstrates that adapting educational content to local traditions and norms decisively enhances the effectiveness of gender education campaigns, reinforcing the view that norm alignment is central to sustainable change. Concurring with Social Norms Theory (Cialdini et al., 1991), which holds that shifts in descriptive and injunctive norms are critical for legitimizing new behaviors, a mechanism borne out in Dhar et al.'s (2022) large-scale intervention in India where contextually resonant curricula led to more progressive attitudes and aspirations. Similarly, evidence from Amin et al. (2018) and Beattie et al. (2015) supports the conclusion that norm-sensitive framing not only increases engagement but also builds self-efficacy and resilience, consistent with Bandura's (1986) Social Cognitive Theory. However, the findings diverge from studies such as Todesco et al. (2023) and Saraswathy (2021), which emphasized the limited or neutral effects of cultural tailoring when cognitive elaboration and perceived behavioral control remained weak. The present results therefore align more strongly with the first strand of literature, indicating that in mountainous Asian contexts, culturally attuned campaigns can overcome skepticism and yield significant, durable effects.

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The statistical evidence indicating that the role of teachers exerts a strong effect on the effectiveness of gender education campaigns, coefficient of 0.73, underscores that teachers function as more than simple conduits of policy; they actively shape how young learners receive, interpret, and sustain new understandings. This resonates with Dhar et al. (2022), whose work in India highlighted that teachers delivering gender-sensitive curricula were able to catalyze durable changes in adolescent aspirations, pointing to the irreplaceable authority teachers hold in classroom spaces. The Samata trial (Beattie et al., 2015), likewise, illustrates that interventions aimed at reducing dropout and early marriage achieved real traction only when teachers consistently enacted them, confirming the transformative nature of everyday instructional practices. These results, however, diverge from studies such as Loyalka et al. (2019), which suggested training initiatives often yield limited classroom change, and partially from Xu & Li (2018), who downplayed the significance of teacher characteristics. By contrast, this study supports expectancy-value theory (Eccles & Wigfield, 2000), showing that teachers' communication of competence and value is decisive in translating campaign goals into lived empowerment for girls.

The results indicate that digital and traditional media platforms play a significant moderating role in shaping how cultural sensitivity of educational content translates into overall campaign effectiveness, as evidenced by a coefficient of 0.75. This result strongly concurs with Kreuter & McClure's (2004) claim that culturally embedded messages resonate more when communicated through familiar channels such as community radio or local newspapers, affirming the value of platform alignment with cultural norms. It also aligns with Naugle & Hornik's (2014) conclusion that mass media interventions in developing contexts succeed only when embedded in trusted local systems, underscoring that platform choice is not secondary but integral to effectiveness. Similarly, the study corroborates Liang et al. (2023), who observed that ICT-based education in Asian regions became effective precisely when media were linguistically and culturally adapted. The findings partially concur with Lustria et al. (2009), supporting the value of interactivity and personalization in digital campaigns, but diverge from perspectives such as Gezici & Saygin (2022) and Park et al. (2023), which highlight the risks of bias and stereotyping. In line with Media Richness theory and the Elaboration Likelihood Model, the results emphasize that platforms providing interactive, trusted, and context-sensitive cues amplify cultural sensitivity, confirming that delivery channels are not neutral but decisive in shaping campaign outcomes.

5.3. Practical implications

The coefficient of 0.68 for accessibility of educational campaigns highlights that practical interventions must directly address geographic, financial, and infrastructural barriers to ensure campaigns reach girls in mountainous regions. Muralidharan & Prakash's (2017) bicycle distribution program in Bihar demonstrates that removing distance constraints can immediately translate into higher school attendance, suggesting that similar mobility schemes could be incorporated into gender education campaigns. Financial interventions are equally critical; Filmer & Schady's (2008) work in Cambodia shows that scholarships reduce dropout by shifting household decisions toward sustained education, indicating that subsidies or fee waivers for campaign activities would increase uptake in poor rural households. From a spatial justice perspective (Soja, 2010), ensuring equitable distribution of campaign venues in highland areas can counter the concentration of facilities in more accessible valleys, as noted by Yang et al. (2025). Prioritizing safe travel routes, cost reduction, and localized provision is therefore essential for converting campaign availability into effective participation and lasting outcomes.

The strong coefficient of cultural sensitivity of educational content (0.78) demonstrates that tailoring campaign materials to local realities must be a central strategy for policymakers, curriculum developers, and NGOs designing interventions in mountainous regions. Evidence from India confirms that when messages directly challenge restrictive gender norms in locally meaningful ways, adolescents adopt more progressive aspirations (Dhar et al., 2022), while programs in rural Bangladesh show that life-skills modules rooted in community marriage practices effectively reduce child marriage (Amin et al., 2018). To operationalize these findings, gender education campaigns should embed local languages, stories, and role models into lesson plans so that students recognize themselves in the material. Incorporating approaches like the Samata trial in Karnataka, which aligned content with caste and poverty dynamics to improve retentions (Beattie et al., 2015), can guide adaptation in other upland settings. These practices ensure campaigns resonate authentically, enhance girls' agency, and deliver outcomes that are both credible and sustainable.

The coefficient of 0.73 for the role of teachers highlights the urgent need for gender education campaigns in mountainous regions to prioritize investments in teacher capacity-building as a central implementation strategy. Evidence from Cambodia shows that teacher training in gender-responsive pedagogy through equitable questioning, counter-stereotypical examples, and enhanced classroom safety significantly broadened girls' participation and confidence (Chea et al., 2023), suggesting that policymakers and program designers should embed structured professional development into campaign planning ensuring that teachers possess both the pedagogical repertoire and sensitivity to deliver content effectively. Kraft et al.'s (2018) meta-analysis further demonstrates that ongoing coaching models rather than one-off workshops yield sustained gains in instructional quality, underscoring the importance of continuous support. Integrating Expectancy-Value Theory, campaigns should also equip teachers

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to actively communicate competence, utility, and value to girls, thereby strengthening persistence and motivation (Wigfield & Eccles, 2000). In short, gender education campaigns would benefit from positioning teacher-focused interventions as the primary mechanism for turning content into lasting educational and social transformation.

The strong moderating effect of digital and traditional media platforms on culturally sensitive educational content indicates that campaign planners must deliberately design hybrid communication strategies that exploit the comparative advantages of each medium. Kreuter & McClure (2004) show that trusted community radio and local print outlets can serve as reliable anchors in remote regions, so policymakers should allocate resources to strengthen local broadcasting capacity and ensure consistent airtime for culturally tailored programming. At the same time, Lustria et al. (2009) and Liang et al. (2023) demonstrate that digital platforms yield greater engagement when they incorporate interactive features, local languages options, and culturally familiar narratives; hence, NGOs and education ministries should collaborate with mobile providers to subsidize data packages for girls in upland communities and adapt campaign content into multilingual apps or moderated social media groups. By integrating both low-tech and digital solutions, practitioners can maximize reach, strengthen cultural resonance, and secure measurable shifts in knowledge and behavior among adolescent girls.

5.4. Limitations

The study also faces several limitations that should be acknowledged when interpreting the findings. The cross-sectional design restricts the analysis to correlations observed within the study period, making it impossible to capture long-term dynamics or shifts in campaign influence over time. Reliance on self-reported responses also raises concerns about accuracy, as participants may have overstated positive outcomes or understated challenges due to social desirability pressures. Sampling constraints further limit generalizability; while stratification enhanced diversity, the purposive approach means that the voices of girls outside the selected communities remain underrepresented. Language barriers and the need for translation in minority regions may have also affected the precision of responses, as subtle meanings in culturally sensitive questions could have been lost or simplified. Finally, the study's operationalization of digital and traditional media platforms treated them as broad categories, which may have obscured important variations in how specific channels functioned within different local contexts.

5.5. Direction for future research

While this study sheds light on the effectiveness of gender education campaigns in mountainous regions, several areas remain open for deeper inquiry. Future research could investigate the long-term impacts of such interventions, especially whether shifts in awareness translate into enduring behavioral and social change. It would also be valuable to compare outcomes across diverse geographical and cultural contexts, as the unique traditions and economic conditions of mountain communities may not be easily generalized to other settings. Moreover, future studies might benefit from mixed-method approaches that combine quantitative measurements with ethnographic insights, allowing for a richer understanding of how local values, kinship structures, and informal learning environments shape girls' participation. Incorporating digital platforms and mobile-based campaigns as a variable could also provide new knowledge about how technology mediates access to gender education in remote areas. Finally, closer examination of the roles played by parents, teachers, and local leaders could clarify the social dynamics that either strengthen or hinder the success of educational initiatives.

6. CONCLUSION

The effectiveness of gender education campaigns in mountainous regions rests not on access or content in isolation, but on the interplay of accessibility, cultural sensitivity, teacher engagement, and the mediating role of media platforms. By framing these factors within the Capability Approach and Intersectionality Theory, the analysis moves beyond narrow outcome measures and instead underscores how structural, cultural, and pedagogical conditions together shape whether campaigns expand girls' real freedoms. The findings challenge assumptions that awareness alone produces transformation, showing instead that educational gains are sustained only when messages resonate with local norms, teachers act as consistent advocates, and delivery channels align with community trust and digital realities. In doing so, the study contributes an integrated model that highlights where policy and practice can intervene most effectively. Ultimately, the evidence positions gender education not simply as an intervention to inform, but as a lever to reconfigure opportunity structures in marginalized regions. For policymakers, educators, and NGOs, campaigns designed with cultural depth, social anchoring, and sustained institutional investment hold the power to move beyond symbolic inclusion and toward genuine transformation in girls' lives.

REFERENCES

- 1) Ajzen, I. (1991). The theory of planned behavior. *Organizational behavior and human decision processes*, 50(2), 179-211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)

Effectiveness of Gender Education Campaigns for Girls in Mountainous Regions

- 2) Amin, S., Saha, J. S., & Ahmed, J. (2018). Skills-building programs to reduce child marriage in Bangladesh: a randomized controlled trial. *Journal of Adolescent Health*, 63(3), 293-300. <https://doi.org/10.1016/j.jadohealth.2018.05.013>
- 3) Ali, I., Alam, A., Ali, Z., & Ali, Y. (2020). Physical and geographical impediments to female higher education in high. *North American Academic Research*, 3(02), 439-449. <https://doi.org/10.5281/zenodo.3690260>
- 4) Ali, I., Khan, M., & Alam, A. (2021). What restraints are there on female education in high mountainous rural areas of Gilgit-Baltistan, Pakistan. *Development in Practice*, 31(8), 1040-1050. <https://doi.org/10.1080/09614524.2021.1907539>
- 5) Ali, I., Khan, M., & Ali, A. (2025). Socio-economic determinants of girls' higher education: empirical insights from the high-mountain Nagar District, Gilgit-Baltistan, Pakistan. *Development in Practice*, 35(3), 359-373. <https://doi.org/10.1080/09614524.2024.2434635>
- 6) Aronson, B., & Laughter, J. (2016). The theory and practice of culturally relevant education: A synthesis of research across content areas. *Review of educational research*, 86(1), 163-206. <https://doi.org/10.3102/0034654315582066>
- 7) Babbie, E. (2010). *The practice of social research*. 12th ed. Belmont, CA: Wadsworth Cengage.
- 8) Bandura, A. (1986). Social foundations of thought and action. *Englewood Cliffs, NJ*, 1986(23-28), 2.
- 9) Barriuso-Ortega, S., Fernández-Hawrylak, M., & Heras-Sevilla, D. (2024). Sex education in adolescence: A systematic review of programmes and meta-analysis. *Children and Youth Services Review*, 166, 107926. <https://doi.org/10.1016/j.childyouth.2024.107926>
- 10) Beattie, T. S., Bhattacharjee, P., Isac, S., Davey, C., Javalkar, P., Nair, S., ... & Heise, L. (2015). Supporting adolescent girls to stay in school, reduce child marriage and reduce entry into sex work as HIV risk prevention in north Karnataka, India: protocol for a cluster randomised controlled trial. *BMC Public Health*, 15(1), 292. <https://doi.org/10.1186/s12889-015-1623-7>
- 11) Bhaskar, R. (2013). *A realist theory of science*. Routledge.
- 12) Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Harvard university press.
- 13) Byrne, A., Hodge, A., Jimenez-Soto, E., & Morgan, A. (2014). What works? Strategies to increase reproductive, maternal and child health in difficult to access mountainous locations: a systematic literature review. *PloS one*, 9(2), e87683. <https://doi.org/10.1371/journal.pone.0087683>
- 14) Campos, D. G., & Scherer, R. (2024). Digital gender gaps in Students' knowledge, attitudes and skills: an integrative data analysis across 32 Countries. *Education and Information Technologies*, 29(1), 655-693. <https://doi.org/10.1007/s10639-023-12272-9>
- 15) Chandra-Mouli, V., Lane, C., & Wong, S. (2015). What does not work in adolescent sexual and reproductive health: a review of evidence on interventions commonly accepted as best practices. *Global Health: Science and Practice*, 3(3), 333-340. <https://doi.org/10.9745/GHSP-D-15-00126>
- 16) Chea, P., Tek, M., & Nok, S. (2023). *Gender gap reversal in learning and gender-responsive teaching in Cambodia* (Working Paper Series No. 141). Cambodia Development Resource Institute. <https://doi.org/10.64202/wp.141.202307>
- 17) Chikwe, C. F., Dagunduro, A. O., Ajuwon, O. A., & Ediae, A. A. (2024). Sociological barriers to equitable digital learning: A data-driven approach. *Comprehensive Research and Reviews in Multidisciplinary Studies*, 2(1), 027-034.
- 18) Cho, S., Crenshaw, K. W., & McCall, L. (2013). Toward a field of intersectionality studies: Theory, applications, and praxis. *Signs: Journal of women in culture and society*, 38(4), 785-810. <https://doi.org/10.1086/669608>
- 19) Chudgar, A., & Sankar, V. (2008). The relationship between teacher gender and student achievement: evidence from five Indian states. *Compare: A Journal of Comparative and International Education*, 38(5), 627-642. <https://doi.org/10.1080/03057920802351465>
- 20) Cialdini, R. B., Kallgren, C. A., & Reno, R. R. (1991). A focus theory of normative conduct. *Advances in Experimental Social Psychology*, 24, 201-234. [https://doi.org/10.1016/S0065-2601\(08\)60330-5](https://doi.org/10.1016/S0065-2601(08)60330-5)
- 21) Collins, P. H. (2015). Intersectionality's definitional dilemmas. *Annual review of sociology*, 41(1), 1-20. <https://doi.org/10.1146/annurev-soc-073014-112142>
- 22) Crenshaw, K. (1989). Demarginalizing the intersection of race and sex. *University of Chicago Legal Forum*, 1989(1), 139-167.
- 23) Creswell, J.W. & Creswell, J.D., (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.
- 24) Daft, R. L., & Lengel, R. H. (1986). Organizational information requirements, media richness and structural design. *Management science*, 32(5), 554-571. <https://doi.org/10.1287/mnsc.32.5.554>

Effectiveness of Gender Education Campaigns for Girls in Mountainous Regions

- 25) DeJaeghere, J., & Lee, S. K. (2011). What matters for marginalized girls and boys in Bangladesh: A capabilities approach for understanding educational well-being and empowerment. *Research in Comparative and International Education*, 6(1), 27-42. <https://doi.org/10.2304/rcie.2011.6.1.27>
- 26) Desimone, L. M. (2009). Improving impact studies of teachers' professional development: Toward better conceptualizations and measures. *Educational researcher*, 38(3), 181-199. <https://doi.org/10.3102/0013189X08331140>
- 27) Dhar, D., Jain, T., & Jayachandran, S. (2022). Reshaping adolescents' gender attitudes: Evidence from a school-based experiment in India. *American economic review*, 112(3), 899-927. <https://doi.org/10.1257/aer.20201112>
- 28) Eagly, A. H., & Wood, W. (2012). Social role theory. *Handbook of theories of social psychology*, 2(9), 458-476.
- 29) Engeström, Y. (2001). Expansive learning at work: Toward an activity theoretical reconceptualization. *Journal of education and work*, 14(1), 133-156. <https://doi.org/10.1080/13639080020028747>
- 30) Evans, D. K., Mendez Acosta, A., & Yuan, F. (2024). Girls' education at scale. *The World Bank Research Observer*, 39(1), 47-74. <https://doi.org/10.1093/wbro/lkad002>
- 31) Filmer, D., & Schady, N. (2008). Getting girls into school: Evidence from a scholarship program in Cambodia. *Economic development and cultural change*, 56(3), 581-617. <http://dx.doi.org/10.1086/533548>
- 32) Gezici, G., & Saygin, Y. (2022). Measuring gender bias in educational videos: A case study on youtube. *arXiv preprint arXiv:2206.09987*. <https://doi.org/10.48550/arXiv.2206.09987>
- 33) Giddens, A. (1984). *The constitution of society: Outline of the theory of structuration*. Polity.
- 34) Guthridge, M., Kirkman, M., Penovic, T., & Giummarra, M. J. (2022). Promoting gender equality: A systematic review of interventions. *Social Justice Research*, 35(3), 318-343. <https://doi.org/10.1007/s11211-022-00398-z>
- 35) Hannum, E., Kong, P., & Zhang, Y. (2009). Family sources of educational gender inequality in rural China: A critical assessment. *International journal of educational development*, 29(5), 474-486. <https://doi.org/10.1016/j.ijedudev.2009.04.007>
- 36) Hannum, E., & Wang, F. (2022). Fewer, better pathways for all? Intersectional impacts of rural school consolidation in China's minority regions. *World Development*, 151, 105734. <https://doi.org/10.1016/j.worlddev.2021.105734>
- 37) Hatlevik, O. E., Guðmundsdóttir, G. B., & Loi, M. (2015). Digital diversity among upper secondary students: A multilevel analysis of the relationship between cultural capital, self-efficacy, strategic use of information and digital competence. *Computers & Education*, 81, 345-353. <https://doi.org/10.1016/j.compedu.2014.10.019>
- 38) Hoang, P. A., Nguyen, T. T. H., Nguyen, T. H. H., Tran, N. T., & Mai, T. T. H. (2024). Barriers in providing maternal health care services in a mountainous area. *Sexual & Reproductive Healthcare*, 41, 100998. <https://doi.org/10.1016/j.srhc.2024.100998>
- 39) Holden, L., & Biddle, J. (2017). The introduction of human capital theory into education policy in the United States. *History of Political Economy*, 49(4), 537-574. <https://doi.org/10.1215/00182702-4296305>
- 40) Huang, P., & Liu, X. (2024). Challenging gender stereotypes: representations of gender through social interactions in English learning textbooks. *Humanities and Social Sciences Communications*, 11(1), 1-14. <https://doi.org/10.1057/s41599-024-03293-x>
- 41) Islam, K. M. M., & Asadullah, M. N. (2018). Gender stereotypes and education: A comparative content analysis of Malaysian, Indonesian, Pakistani and Bangladeshi school textbooks. *PloS one*, 13(1), e0190807. <https://doi.org/10.1371/journal.pone.0190807>
- 42) Jussim, L., & Harber, K. D. (2005). Teacher expectations and self-fulfilling prophecies: Knowns and unknowns, resolved and unresolved controversies. *Personality and social psychology review*, 9(2), 131-155. https://doi.org/10.1207/s15327957pspr0902_3
- 43) Kaplan, A. M., & Haenlein, M. (2010). Users of the world, unite! The challenges and opportunities of Social Media. *Business horizons*, 53(1), 59-68. <https://doi.org/10.1016/j.bushor.2009.09.003>
- 44) Katz, E., Blumler, J. G., & Gurevitch, M. (1973). Uses and gratifications research. *The public opinion quarterly*, 37(4), 509-523.
- 45) Kraft, M. A., Blazar, D., & Hogan, D. (2018). The effect of teacher coaching on instruction and achievement: A meta-analysis of the causal evidence. *Review of educational research*, 88(4), 547-588. <https://doi.org/10.3102/0034654318759268>
- 46) Kreuter, M. W., & McClure, S. M. (2004). The role of culture in health communication. *Annu. Rev. Public Health*, 25(1), 439-455. <https://doi.org/10.1146/annurev.publhealth.25.101802.123000>
- 47) Muralidharan, K., & Prakash, N. (2017). Cycling to school: Increasing secondary school enrollment for girls in India. *American Economic Journal: Applied Economics*, 9(3), 321-350. <https://doi.org/10.1257/app.20160004>

Effectiveness of Gender Education Campaigns for Girls in Mountainous Regions

- 48) Naugle, D. A., & Hornik, R. C. (2014). Systematic review of the effectiveness of mass media interventions for child survival in low-and middle-income countries. *Journal of health communication*, 19(sup1), 190-215.
<https://doi.org/10.1080/10810730.2014.918217>
- 49) Levy, J. K., Darmstadt, G. L., Ashby, C., Quandt, M., Halsey, E., Nagar, A., & Greene, M. E. (2020). Characteristics of successful programmes targeting gender inequality and restrictive gender norms for the health and wellbeing of children, adolescents, and young adults: a systematic review. *The Lancet Global Health*, 8(2), e225-e236.
[https://doi.org/10.1016/S2214-109X\(19\)30495-4](https://doi.org/10.1016/S2214-109X(19)30495-4)
- 50) Liang, M., Lim, C. P., Park, J., & Mendoza, N. B. (2023). A review of ICT-enabled learning for schoolgirls in Asia and its impacts on education equity. *Educational technology research and development*, 71(2), 267-293.
<https://doi.org/10.1007/s11423-022-10178-w>
- 51) Littlejohn, S. W., & Foss, K. A. (2010). *Theories of human communication*. Waveland press.
- 52) Loyalka, P., Popova, A., Li, G., & Shi, Z. (2019). Does teacher training actually work? Evidence from a large-scale randomized evaluation of a national teacher training program. *American Economic Journal: Applied Economics*, 11(3), 128-154.
<https://doi.org/10.1257/app.20170226>
- 53) Lustria, M. L. A., Cortese, J., Noar, S. M., & Glueckauf, R. L. (2009). Computer-tailored health interventions delivered over the Web: review and analysis of key components. *Patient education and counseling*, 74(2), 156-173.
<https://doi.org/10.1016/j.pec.2008.08.023>
- 54) Park, K., Ging, D., Murphy, S., & McGrath, C. (2023). *The impact of the use of social media on women and girls* (Study No. 743.341). Policy Department for Citizens' Rights and Constitutional Affairs, European Parliament. Retrieved from: [https://www.europarl.europa.eu/RegData/etudes/STUD/2023/743341/IPOL_STU\(2023\)743341_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2023/743341/IPOL_STU(2023)743341_EN.pdf)
- 55) Petty, R. E., & Cacioppo, J. T. (2012). *Communication and persuasion: Central and peripheral routes to attitude change*. Springer Science & Business Media.
- 56) Robeyns, I. (2005). The capability approach: a theoretical survey. *Journal of human development*, 6(1), 93-117.
<https://doi.org/10.1080/146498805200034266>
- 57) Robeyns, I. (2006). The capability approach in practice. *Journal of political philosophy*, 14(3).
- 58) Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American psychologist*, 55(1), 68.
- 59) Sannino, A., Engeström, Y., & Lemos, M. (2016). Formative interventions for expansive learning and transformative agency. *Journal of the Learning Sciences*, 25(4), 599-633.
- 60) Saraswathy, S. Y. I. (2021). Global Health Security: Addressing social determinants of health through programmes and other initiatives. *Global Security: Health, Science and Policy*, 6(1), 38-48.
<https://doi.org/10.1080/00220388.2024.2383428>
- 61) Seeberg, V. (2014). Girls' schooling empowerment in rural China: Identifying capabilities and social change in the village. *Comparative Education Review*, 58(4), 678-707. <http://dx.doi.org/10.1086/677774>
- 62) Sen, A. (1999). *Development as Freedom*. New York: Knopf.
- 63) Soja, E.W. (2010) *Seeking Spatial Justice*. Minneapolis, MN: University of Minnesota Press.
- 64) Tikly, L., & Barrett, A. M. (2011). Social justice, capabilities and the quality of education in low income countries. *International journal of educational development*, 31(1), 3-14. <https://doi.org/10.1016/j.ijedudev.2010.06.001>
- 65) Todesco, M., Breman, J., Haryanto, N. N., Kok, G., & Massar, K. (2023). Effect evaluation of a comprehensive sexuality education intervention based on socio-emotional learning among adolescents in Jakarta, Indonesia. *Frontiers in Public Health*, 11, 1254717. <https://doi.org/10.3389/fpubh.2023.1254717>
- 66) UNESCO. (2024). *New UNESCO report warns social media affects girls' well-being, learning and career choices* [Press release]. Global Education Monitoring Report. Retrieved from: <https://www.unesco.org/gem-report/en/articles/new-unesco-report-warns-social-media-affects-girls-well-being-learning-and-career-choices>
- 67) Voigt, K., & Spies, M. (2020). Female education and social change: Changing perceptions of women's roles in society in the high mountains of northern Pakistan. *Mountain Research and Development*, 40(4), R9-R16.
<https://doi.org/10.1659/MRD-JOURNAL-D-20-00028.1>
- 68) Vu, M. T., & Pham, T. T. T. (2022). Gender, critical pedagogy, and textbooks: Understanding teachers' (lack of) mediation of the hidden curriculum in the EFL classroom. *Language Teaching Research*, 0(0).
<https://doi.org/10.1177/13621688221136937>
- 69) Wang, Q. (2022). How Media Defend Schooling Opportunities for the Yi Girls in Liangshan Minority Area of Southwest China. *Education Journal*, 11(5), 208-213. <https://doi.org/10.11648/j.edu.20221105.11>

Effectiveness of Gender Education Campaigns for Girls in Mountainous Regions

- 70) Wang, W., & Feng, R. (2025). Quietly practicing gender-friendly education: A middle school teacher's negotiation of feminist identity and gender equity in China. *Teaching and Teacher Education*, 165, 105154. <https://doi.org/10.1016/j.tate.2025.105154>
- 71) Wigfield, A., & Eccles, J. S. (2000). Expectancy–value theory of achievement motivation. *Contemporary educational psychology*, 25(1), 68-81. <https://doi.org/10.1006/ceps.1999.1015>
- 72) Wohlfart, O., & Wagner, I. (2023). Teachers' role in digitalizing education: An umbrella review. *Educational technology research and development*, 71(2), 339-365. <https://doi.org/10.1007/s11423-022-10166-0>
- 73) Wongmahesak, K., Dalwinder, K. A. U. R., & Cardoso, L. M. (2025). Teacher performance: What is it, how important is it, and how can we make it happen sustainably?. *Asian Education and Learning Review*, 3(1), 2-2. https://doi.nrct.go.th/ListDoi/listDetail?Resolve_DOI=10.14456/aclr.2025.2
- 74) Xiao, N., Chen, J., Justice, L. M., & Zhang, X. (2023). Children's learning experiences in rural boarding preschools: Classroom quality and associations with developmental outcomes. *Early Education and Development*, 34(7), 1612-1630. <https://doi.org/10.1080/10409289.2022.2139545>
- 75) Xu, D., & Li, Q. (2018). Gender achievement gaps among Chinese middle school students and the role of teachers' gender. *Economics of Education Review*, 67, 82-93. <https://doi.org/10.1016/j.econedurev.2018.10.002>
- 76) Yang, D., Sun, J., Xie, S., Luo, J., & Yang, F. (2025). Spatial Accessibility Characteristics and Optimization of Multi-Stage Schools in Rural Mountainous Areas in China: A Case Study of Qixingguan District. *Sustainability*, 17(9), 3862. <https://doi.org/10.3390/su17093862>
- 77) Yao, L., Lv, M., Li, T., Wang, D., & Cao, X. (2022). Exploring the Evolution of the Accessibility of Educational Facilities and Its Influencing Factors in Mountainous Areas: A Case Study of the Rocky Desertification Area in Yunnan, Guangxi, and Guizhou. *ISPRS International Journal of Geo-Information*, 11(5), 296. <https://doi.org/10.3390/ijgi11050296>
- 78) Zhao, D., & Barakat, B. (2015). The increasingly long road to school in rural China: the impacts of education network consolidation on broadly defined schooling distance in Xinfeng County of rural China. *Asia Pacific Education Review*, 16(3), 413-431. <https://doi.org/10.1007/s12564-015-9380-y>



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