Breaking the Chalk Ceiling: Challenges and Strategies for Female Teachers during Digital Transformation in Sri Lankan Education

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Abstract*—In an era of rapid technological change, integrating digital technology into education has become essential, enabling innovation and progress. Examples include the use of learning management systems, online teaching platforms, digital curricula, and initiatives such as smart classrooms and teacher ICT training programs. However, this shift highlights the persistent digital gender gap, as women continue to be underrepresented in digital domains across the globe. This paper explores the evolving role of female teachers in Sri Lanka during the country's digital education transformation, focusing on rural school setting. It addresses two objectives: exploring gender-specific challenges faced by female school teachers and identifying strategies they can use to overcome these barriers. The study adopts a qualitative approach grounded in interpretivism and guided by a phenomenological strategy. Semi-structured interviews were conducted with twelve (12) female school teachers from diverse socio-cultural and professional backgrounds in Matale district. The data were analyzed using thematic analysis, to identify key patterns and insights. Findings revealed three main challenges: individual, institutional, and socio-cultural/economic. Individual challenges included lack of awareness, motivation and concerns around self-efficacy and self-esteem due to minimal digital exposure. Institutional issues involved inadequate support, outdated training, and biased decision-making influenced by favoritism and gender discrimination. Socio-cultural and economic factors were linked to traditional gender roles and stereotyping, hindering female teachers' engagement in digital education. To address these challenges, strategies highlighted included promoting female leadership in technology, providing tailored training, fostering support systems, promoting gender equality through schools. The study concludes by stressing the importance of gender-sensitive policies to empower female teachers in Sri Lanka's digital education transformation journey. Further research should explore urban-rural disparities, different stakeholder perception and their impact on female teachers' roles in digital education.

Keywords*—Challenges, digital transformation, education, female teachers, strategies

I. INTRODUCTION

Digital transformation has become a universal imperative, reshaping every sector and industry in response to the unstoppable momentum of technological advancement. Education, as a cornerstone of societal progress, is no exception. It stands at the forefront of this shift, increasingly integrating digital tools and platforms to enhance teaching and learning. As technology continues to redefine how knowledge is delivered and accessed, the education sector must evolve to remain relevant and effective in a rapidly changing world. This aligns with the United Nations' Sustainable Development Goal 4 (SDG 4), which underscores the integration of technology to ensure inclusive, equitable, and quality education while promoting lifelong learning opportunities for all.

In alignment with these global trends, Sri Lanka has initiated its own digital transformation in education. Collaborative efforts between the Information and Communication Technology Agency (ICTA) and the Ministry of Education have resulted in a National Policy for Digital Transformation of Education. This policy targets the digitization of learning, industry alignment, the development of digital ecosystems, and the enhancement of digital skills among students, teachers, administrative staff, and parents [1] Globally, digital transformation in education has not occurred evenly across all social groups. Not all individuals have the same ease of access to digital technologies a phenomenon referred to as the first digital divide [2] Gender has been recognized as a key determinant in these inequalities. Beyond access, the second digital divide refers to disparities in the skills and usage patterns of digital technologies, which also tend to disadvantage women. [2] emphasized that teachers' digital engagement varies significantly based on gender, highlighting persistent asymmetries in both experience and outcomes. The digital gender gap is also linked to segregation in digital fields, where women remain underrepresented, as shown in global studies [3]. Even in countries with progressive gender equality plans, such as Finland, female professionals in digital technology fields continue to face underrepresentation and structural barriers [4]. This suggests that gendered

exclusion in the digital sphere is a pervasive and systemic issue, one that affects not only access to technology but also opportunities for development and leadership.

Despite the policy efforts, Sri Lanka continues to face significant challenges in achieving equitable digital transformation, particularly regarding gender inclusion. National statistics reveal a disparity in digital literacy levels between male and female teachers. While computer literacy among male teachers is reported at 63%, the corresponding figure for female teachers is only 48%. Furthermore, self-reported digital literacy stands at 39% for males and 30% for females [5] This gender gap is concerning given that female teachers make up a majority (76%) of the teaching population.

These disparities may lead to a performance gap in tasks requiring digital competence between males and females, thus undermining the broader goals of inclusive digital transformation. Researchers confirm that digital literacy significantly influences teachers' willingness and ability to adopt online teaching and professional development platforms and when teachers are equipped with digital skills and receive adequate support, they are more likely to adopt new methodologies and integrate digital tools into their teaching. [6]; [7]. Accordingly, this research study aims to bridge the identified gaps by answering the following research questions:

1. What are the key challenges face by female teachers in Sri Lanka during the digital transformation in Sri Lankan education?

2. What are the strategies for overcoming the challenges face by female school teachers during digital transformation?

II. LITERATURE REVIEW

A. Digital Transformation in Education

Digital transformation in education encompasses the adoption of digital tools such as learning management systems, online teaching platforms, and digital content for pedagogical innovation. In Sri Lanka, the Ministry of Education has introduced several initiatives, including smart classrooms, teacher ICT training programs, and digital curriculum development, to support this transformation.

However, scholars argue that digital transformation is not only a technological shift but also a socio-cultural change that demands a rethinking of traditional pedagogical practices [8] Hence, effective transformation requires technological infrastructure, training, motivation, and supportive institutional policies [9].

B. Gender Digital Divide in Education

The Gender Digital Divide (GDD) is a phenomenon that refers to the inequalities and differences between men and women in accessing the digital ecosystem in various environments such as the scenarios of Education 4.0. [10]. It indicates that women, including female educators, are less likely to access, use, and benefit from digital technologies compared to men due to factors such as societal expectations, lack of confidence, time poverty, and unequal access to training [11]

Globally, female teachers face unique challenges in adapting to digital transformation. Although technology is considered a gender-neutral tool, its adoption often reflects existing social inequalities. Research in the Asian context highlights that cultural norms often dictate technology use within households and workplaces, limiting women's autonomy over digital tools [12] Women are more likely to face scrutiny or skepticism regarding their technical competence and may have to work harder to establish credibility in digital domains. Furthermore, digital training programs are often designed without considering gender-sensitive needs such as flexible timings, childcare responsibilities, or women's learning styles.

C. Challenges Faced and Strategies Employed by Female Teachers

Female teachers face significant barriers to adopting digital teaching methodologies due to a combination of interconnected factors. Many educators, particularly those from rural areas or traditional schools, often have limited awareness of how to effectively integrate technology into their lessons. This is compounded by a cited lack of confidence in their technical capabilities [13] and lower self-efficacy, which can deter them from experimenting with new digital tools [14]. Furthermore, personal motivation is often reduced by a fear of failure and the absence of role models (Sang et al., 2010). These internal challenges are exacerbated by external problems, such as a lack of institutional support and mentorship and persistent gender-based stereotypes that view female teachers as less competent in technology, thereby discouraging their participation in digital initiatives [11].

Overcoming the challenges female teachers face in the digital transformation of education requires a multi-pronged approach. A primary strategy involves promoting female leadership in technology initiatives, which serves to dismantle stereotypes and establish visible role models within schools [15]. This should be supported by hands-on, contextually relevant training that enhances digital literacy and strengthens self-efficacy through experiential learning [16]. Furthermore, ensuring equitable access to digital tools and reliable internet is fundamental, as infrastructural barriers often disproportionately impact female educators [15]; [10]. For sustainable, long-term change, these efforts must be combined with the integration of gender-sensitive digital content and pedagogy into the broader educational framework, fostering a culture that actively questions and addresses gender disparities in technology.

III. METHODOLOGY

This study adopts an interpretivist research philosophy grounded in subjectivist ontology, recognizing that reality is socially constructed and shaped by individuals' experiences. Given the study's aim to explore the gender-specific barriers faced by female teachers during the digital transformation of education in Sri Lanka, the interpretivist lens enables the researcher to gain deep insights into participants' perspectives.

A phenomenological research strategy was selected to focus on the lived experiences of participants, making it suitable for understanding the emotional and social implications of digital transformation on female teachers. A mono-method qualitative design was employed to collect and analyze non-numeric data, allowing for rich narrative capture of participants' experiences.

Purposive sampling was used to select twelve (12) female teachers from rural schools in the Matale District, Sri Lanka who are working in government schools. The participants represented a range of subject areas, including Science, Mathematics, Information Technology, Business Studies, English, and Buddhism, ensuring coverage across both STEM and non-STEM disciplines. Their ages ranged from 20 to 60 years, allowing for diversity in both teaching experience and levels of digital exposure. Age emerged as an important factor, as younger teachers often had greater familiarity with digital tools, while older teachers faced more challenges in adapting to new technologies. This sampling approach ensured diversity in teaching experience and digital exposure among participants within the rural context. Sampling continued until data saturation was reached by the 11th interview, indicating that no new themes were emerging.

Semi-structured interviews were conducted to collect primary data, allowing flexibility to probe individual experiences while maintaining consistency across participants. Ethical considerations were carefully observed throughout the study, including obtaining informed consent, ensuring confidentiality, and emphasizing voluntary participation, given the sensitivity surrounding gender-related issues. The research was cross-sectional in its time horizon, providing a snapshot of female teachers' experiences during a specific period of digital shift in education.

Data were analyzed using thematic analysis, following a six-step process: transcription, keyword identification, coding, theme development, conceptualization, and model building [17]. This systematic yet flexible approach enabled the researcher to deeply explore and interpret the gendered challenges experienced by female teachers within Sri Lanka's digital education reform.

IV. RESULTS AND DISCUSSION

As per the findings, female school teachers in Sri Lanka face three main challenges during the digital transformation of education: personal, institutional, and socio-economic and cultural.

A. Personal Challenges

A prominent issue is their lack of awareness and limited familiarity with digital tools, often leading them to underestimate their own capabilities. This contributes to low self-confidence and confusion in selecting the right tools for teaching. Consequently, many show low interest in adopting new technologies, preferring to stick to traditional teaching methods, unlike their male counterparts who are often more proactive. As one respondent noted,

"They (Female) don't try to go out from their comfort zones and always try to stick to traditional teaching methods while males keep growing themselves."

This highlights a significant gendered disparity, where male teachers are often perceived as more proactive in adopting new technologies.

Concerns related to self-efficacy are also evident. Female teachers face discouragement from male colleagues, with comments undermining their confidence and reinforcing gendered perspectives on technology.

"When I once sought assistance to troubleshoot the smart-board, a male colleague's comment implied that I should stick to simpler teaching methods. He said me that women are only good at chalk and talk teaching techniques."

This also manifests as a hesitancy to experiment with new technologies, stemming from negative past experiences and a lack of vicarious experiences.

Furthermore, self-esteem issues arise from a strong reluctance to seek help, especially from male colleagues or male students, due to fear of appearing incompetent or reinforcing gender stereotypes. Public struggles with digital tools, such as failing to operate a smart board, lead to professional embarrassment and self-doubt. A perceived gender disparity in digital skills also contributes to feelings of inferiority and reduced self-esteem.

B. Institutional Challenges

Institutional structures and policies significantly influence teachers' experiences with digital transformation in Sri Lanka's education system. While institutions are expected to provide equitable access, training, and supportive environments, this study reveals that institutional shortcomings disproportionately hinder female teachers, creating gendered barriers within the digitalization process. Female teachers reported experiencing limited autonomy, confidence, and professional growth due to institutional neglect, particularly in three key areas: lack of support, lack of training, and a preference for male teachers in tech-related tasks.

Regarding the lack of support, a significant gender-based disparity in access to digital tools is evident. Male teachers often have autonomous access and control over technological resources, such as laboratory keys, while female teachers must seek permission. This ingrained gatekeeping system, coupled with male

dominance in managing digital infrastructure, marginalizes female teachers, limits their ability to experiment, and reinforces technology as a male domain. Additionally, a general lack of structured and ongoing guidance from the school affects all teachers, but older female teachers find it particularly challenging when integrating digital tools due to minimal institutional support. Furthermore, there's a clear institutional preference for male teachers in tech-related tasks. This is exemplified by the sentiment that,

"The administration of our school doesn't like to give the authority of even the media unit of the school to a female teacher since they believe that they do not have a good knowledge to handle that devices and they may not take any responsibility without knowing the value of those equipment"

This sidelines female teachers, even when qualified, reinforcing gendered stereotypes about digital competence and limiting women's professional advancement in digital education.

Concerning the lack of effective training, many female teachers reported insufficient training focused on digital tools, with their initial education centered on traditional methods, which disadvantages them in modern classrooms. While training is generally available to both male and female teachers, the study highlights that the core issue is not access but the ineffectiveness and lack of contextual relevance of the training provided. Existing workshops tend to be brief, subject-specific (often only for ICT teachers), and exclude general subject teachers. Training programs are also often outdated and irrelevant to current digital demands. This suggests a systemic training gap stemming from institutional failures to update content and provide practical, ongoing support, rather than explicit gender discrimination in training availability.

C. Socio-Cultural and Economic Challenges

Socio-cultural norms and economic limitations also play a crucial role, creating distinct challenges for female teachers. Gender-influenced spending priorities were highlighted as a significant barrier by many respondents. This is exemplified by one respondent's comment.

"Because we (females) are expected to manage household finances compared to males. Personal devices and internet access can be expensive, and it's hard to justify the cost when there are other household expenses to prioritize"

Due to traditional gender roles and societal expectations, married women often prioritize household and family expenses, limiting their ability to invest in personal digital devices or internet access. This economic constraint, coupled with cultural expectations, restricts women's independent access to digital resources.

Further, persistent gender stereotypes lead to doubt about females' digital skills, undermining their confidence and discouraging engagement with technology. This often results in male dominance in tech-related tasks within schools, regardless of female educators' actual capabilities. Furthermore, gendered roles in Sri Lankan society place women in primary roles of managing household responsibilities and childcare, severely limiting their time and energy for professional development in digital literacy.

Finally, a notable generational gap in digital adaptation exists among female teachers. Younger educators demonstrate greater adaptability, while many older female teachers remain hesitant or resistant. This divide is not observed among male teachers, indicating a complex interaction between gender and age in digital participation, further hampering collective progress in digital integration.

D. Strategies to Overcome Challenges Faced by Female Teachers

Female teachers in Sri Lanka propose several strategies to overcome digital transformation barriers, aiming to empower women and create inclusive school environments. A key strategy is to promote female leadership in technology. Encouraging women to lead digital initiatives, like training or tech projects, can break stereotypes and boost confidence. Visible role models and institutional support for female leaders are crucial for digital inclusion. Secondly, targeted, gender-sensitive training programs are vital, especially in rural areas. These should build confidence and skills, offer mentorship, create safe learning spaces, and include joint sessions with male teachers to foster collaboration. Peer-learning groups are also important for ongoing support.

Third, developing support systems that promote gender equality is essential. This involves providing digital devices to female teachers (especially those with financial constraints), ensuring unbiased distribution of resources, and fostering a culture that actively encourages women's technology use and participation in digital decision-making. Finally, the study suggests using school systems to promote gender equality in society. Schools can drive social change through awareness campaigns, community discussions, and student engagement to challenge stereotypes, reshape public perceptions of female teachers' digital capabilities, and promote broader gender equality.

E. Discussion

This study uncovered a range of personal, institutional, socio-cultural, and economic barriers that affect Sri Lankan female teachers during the digital transformation in education. Compared to existing global literature, these findings highlight both unique and shared challenges in a culturally specific context.

On a personal level, female teachers were found to underestimate their digital competencies, aligning with studies by [18] and [7]. However, this underestimation is not simply due to a lack of skills but also due to limited awareness of their existing capabilities. Self-efficacy was found to be low among female teachers, with male teachers consistently perceived as the "technology experts" in school settings. This reinforces the international observations made by Jenson and [19]

where male teachers are more likely to be consulted for technological issues. While Gebhardt et al. (2019) observed higher levels of digital confidence among women in Russia, the Sri Lankan experience reveals a gendered gap in confidence that stems from cultural and institutional reinforcement of male authority in digital tasks. This lack of self-efficacy restricts women's chances to engage meaningfully with technology, reducing their opportunities to build competence through practice. Further, female teachers' self-esteem was also negatively affected by digital transformation. Unlike the findings of [20] who identified no significant gender-based differences in digital challenge perception, this study clearly reveals a deeper psychological burden carried by female teachers in Sri Lanka, rooted in social expectations, lack of institutional recognition, and motivational deficits.

Institutionally, this research diverges from studies such as those by [12], [21], and [22] which indicated gender-balanced support structures. In contrast, Sri Lankan schools reflect unspoken gender biases in task allocation, with institutional practices subtly favoring male teachers for digital engagement and leadership. Although training programs are available for all teachers, a major insight from this study is that their design is fundamentally flawed. Unlike [23], who emphasized the absence of training as a barrier, this study shows that while training exists, it is often theoretical, not subject-specific, and lacks practical follow-up. The ineffective nature of these sessions hinders female teachers, especially those already struggling with low confidence and experience. Importantly, the perception that men are inherently more tech-savvy has led to an observable preference for assigning male teachers to operate smart classrooms, manage ICT equipment, and handle technical troubleshooting. Even when female teachers hold comparable qualifications, their roles are limited due to such stereotypes. This results in unequal access to digital tools, reduced opportunities for hands-on learning, and a reinforcement of existing hierarchical structures. In many instances, female teachers must rely on students or male colleagues to perform basic digital tasks, not because of inability, but due to systemic exclusion. These disparities in access and institutional responsibilities are less emphasized in existing literature and represent a critical contribution of this study to understanding localized gendered inequalities.

Additionally, socio-cultural and economic challenges are deeply embedded in the experiences of female educators. While past studies like [23] noted time limitations due to domestic duties, this study extends those findings by highlighting economic constraints. Female teachers in Sri Lanka often prioritize family needs over their own digital development. They frequently do not own personal digital devices and must prioritize purchasing tools or internet access for their children or spouses. This financial angle of the digital divide rarely addressed in broader global literature emerges as a significant barrier in rural contexts. Furthermore, entrenched gender stereotypes continue to cast male teachers as natural digital leaders, a trend confirmed in earlier research by [19] and [24]. These cultural beliefs inhibit women's digital confidence and professional recognition, reinforcing a cycle of exclusion. A novel insight is the generational variation observed in this study: older female teachers tend to avoid digital tools due to fear, unfamiliarity, or resistance to change, while younger teachers though facing similar structural limitations are more open to adopting technology. Interestingly, this age-based pattern was not observed among male teachers, who appeared to benefit from institutional and cultural support regardless of age. This nuanced interplay of gender and age in digital participation offers a fresh perspective that enhances current understanding of the digital divide in education.

This study builds upon existing literature [10]; [15]; [16] by proposing grounded, practical strategies rooted in the lived experiences of rural Sri Lankan female educators. Rather than offering broad or universal recommendations, the findings emphasize the importance of contextual sensitivity and institutional transformation.

A key recommendation is the promotion of female leadership in school-based technology roles. While [15] suggests leadership as a general strategy to confront stereotypes, this study takes it further by showing how the visibility of female ICT leaders can inspire peers, challenge established norms, and normalize women's participation in technical domains. These female leaders become role models who actively reshape perceptions and create pathways for others to follow.

Training programs, while commonly proposed in literature [16], are reconceptualized in this study as more than technical workshops. Effective digital upskilling requires gender-sensitive, psychologically supportive, and personalized training frameworks. Teachers recommended small-group mentoring, peer-learning models, cross-gender collaboration, and continuous follow-up, all of which contribute to safer and more inclusive learning environments. The focus should be on shifting away from isolated one-time workshops to building ongoing professional ecosystems that foster confidence and community among educators.

This study also highlights the need to reform institutional structures related to resource allocation. [10] discussed equal access to digital tools, but this study emphasizes that equitable distribution must address internal school practices that privilege male teachers. Transparent mechanisms are needed to ensure fair assignment of digital responsibilities, tools, and opportunities, particularly in environments where informal power structures disadvantage women. It is not enough to provide more devices; institutions must actively dismantle the barriers that prevent equal access to those devices.

Lastly, a significant and novel contribution of this study is the proposal to use schools as vehicles for broader societal change. Rather than acting solely as policy

implementers, schools can initiate community-level interventions such as parent workshops, female-led ICT training sessions, and local awareness campaigns. These efforts not only support female teachers but also work to shift entrenched gender norms within the wider community. Such bottom-up strategies, though underexplored in the literature, hold substantial potential for long-term cultural transformation toward gender equality in education and beyond.

V. CONCLUSION

Female teachers in Sri Lanka face unique social, cultural, institutional, and personal challenges limiting their digital engagement in education. A key finding is that gender stereotypes significantly impact their access to and use of digital tools; women are often seen as less tech-competent, affecting their role assignments and self-confidence despite their qualifications. Institutions frequently lack gender-focused policies, often favoring male teachers for technical tasks, while female teachers struggle with financial and household burdens that further restrict their digital involvement.

Overall, Sri Lanka's digital divide goes beyond technology access, rooted in complex socio-cultural barriers. Effective digital transformation requires gender-sensitive approaches. These must prioritize building female teachers' confidence, promoting their visible leadership in ICT roles, ensuring equitable resource distribution, and implementing inclusive policies. Empowering female educators is vital for their growth and for the success of Sri Lanka's digital education goals.

The study recommends fostering female leadership in school ICT, offering gender-sensitive, tailored training, and nurturing inclusive digital cultures that encourage collaboration. It also stresses equitable resource access and engaging schools in challenging gender norms within communities. Integrating gender equity indicators into education policy is crucial for lasting change.

However, the study is limited by its exclusive focus on female teachers, reliance on self-reported data, potential participant bias, and its specific rural context. It also lacks input from institutional stakeholders and a longitudinal view. Future research should compare urban and rural areas, include diverse perspectives, and explore mentorship's role.

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