Open Access Perspectives

Data Without Dignity? A Critical Perspective on How Educational Assessment Systems Overlook the Financial and Safety Realities of Women Learners

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DOI: 10.35898/ghmj-921306

ABSTRACT

Educational assessment systems worldwide claim objectivity and meritocracy, yet they systematically fail to account for the gendered realities that shape women learners' access, performance, and persistence. This perspective paper critically examines how contemporary assessment frameworks, despite increasing datafication and loud claims of evidence-based practice, overlook the financial precarity and safety vulnerabilities that disproportionately affect women and girls in educational settings. The analysis draws on a critical synthesis of peer-reviewed empirical studies across diverse contexts, including South Asia, Sub-Saharan Africa, Europe, and North America, alongside policy documents from international organizations and recent large-scale quantitative and qualitative research. Assessment systems from primary through higher education are examined here. The paper is delimited to formal educational assessment contexts, standardized examinations, continuous assessment, and digital assessments, and focuses specifically on five categories of gendered barriers: period poverty, financial precarity, transportation and campus safety risks, intimate partner violence, and caregiving responsibilities. The analysis does not extend to informal assessment, workforce credentialing, or barriers arising from disability, though intersections with these are acknowledged where evidence permits. Through the lens of feminist epistemology, capability approach theory, and recent empirical evidence, the central argument holds that assessment systems function as technologies of inequality when they measure learning outcomes without acknowledging the material conditions required for dignified participation. Period poverty, transportation safety concerns, caregiving responsibilities, and economic vulnerability each create assessment disadvantages that are rendered invisible by ostensibly neutral measurement systems. In response, the paper proposes a dignity-centered assessment framework, one that treats safety and financial security as prerequisites for valid educational measurement rather than mere contextual variables. Concrete principles for gender-responsive assessment design are offered as a path toward transforming evaluation systems from instruments of exclusion into tools for genuine equity and empowerment.

Keywords: *Educational assessment; Gender equity; Feminist epistemology; Period poverty; Financial precarity.*

Received: 27 November 2025 **Reviewed:** 28 January 2026 **Revised:** 19 February 2026 **Accepted:** 12 March 2026.

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1. INTRODUCTION

In Bareilly, India, a 16-year-old student sitting a Class 11 exam was denied a sanitary pad by her principal when she menstruated mid-examination, waited outside for over an hour, and was eventually sent home bleeding through her clothes (Sanjay, 2025). In England, a study of nearly 2,700 girls aged 13–16 found that heavy or painful menstrual bleeding correlated with missing 1.7 additional school days per year and roughly a 27% lower chance of achieving five standard GCSE passes (Vennells, 2025). A student named Tilly reportedly leaked onto her chair during a GCSE exam because no sanitary products were available. In Uganda, longitudinal data link poor menstrual health, inadequate materials, stigma, pain, and teasing directly to absenteeism and weaker standardized exam performance (Trinies et al., 2025). These cases are not aberrations. They are symptoms of a structural problem: assessment systems evaluate academic outcomes while systematically disregarding the gendered material conditions, missing menstrual products, stigma, pain, inadequate facilities, and economic barriers that prevent many students from participating fully and with dignity. Large-scale empirical research confirms these patterns extend across contexts. Menstrual health challenges measurably affect assessment participation and performance (Trinies et al., 2025; Vennells, 2025), transportation safety concerns limit examination access (Kutywayo et al., 2024; Porter et al., 2010), and financial precarity compounds these disadvantages (Wodon et al., 2020). What registers as individual misfortune is, on closer inspection, the predictable outcome of frameworks designed without attention to gendered material realities, frameworks that consequently underestimate female learners' capabilities and quietly reproduce educational inequality.

The global education community has made significant progress toward gender parity in enrollment, with most countries approaching balance at the primary level, though disparities widen at secondary and upper-secondary levels (UNESCO Institute for Statistics, 2023; United Nations Statistics Division, 2023). These disparities mask persistent inequities in how educational achievement is assessed and recognized. Assessment systems, the mechanisms through which learning is measured, validated, and credentialed - operate on assumptions of equal access, safety, and material security that do not reflect women learners' lived realities (Fennell & Arnot, 2009). When a university examination assumes students can afford transportation to campus during evening hours, when a standardized test occurs during a time when adolescent girls experience menstrual-related school absence, or when continuous assessment requires technology access that economically marginalized women cannot afford, these systems become technologies of exclusion rather than accurate measures of capability.

Three scholarly traditions inform this paper, each relevant but none yet adequately connected to the others. Assessment validity theory has evolved from purely psychometric conceptions toward consequential frameworks acknowledging assessment's social impacts (Messick, 1989; Kane, 2013), yet mainstream validity scholarship has largely ignored feminist epistemological critiques exposing how neutral-seeming measurement systems encode privileged standpoints (Harding, 2004; D'Ignazio & Klein, 2020). Feminist educational scholarship has documented how schools reproduce gender inequality through curriculum, pedagogy, and institutional practices (Fennell & Arnot, 2009; Unterhalter, 2007), but assessment as a specific mechanism of gendered exclusion remains underexamined within this tradition. The capability approach in education (Walker & Unterhalter, 2007; Nussbaum, 2011) emphasizes substantive freedoms to achieve valued functionings, yet stops short of theorizing how assessment systems themselves constrain those capabilities. Bringing these three traditions into conversation, this paper reconceptualizes assessment validity to position gendered material conditions not as external contextual factors but as internal threats to measurement validity.

A critical gap persists. Despite extensive documentation of barriers to educational access and persistence (UNESCO, 2019; Unterhalter, 2007), gender and education scholarship treats assessment primarily as a dependent variable, something that records gendered outcomes rather than something that generates them. Assessment validity research has developed sophisticated fairness tools, including differential item functioning and prediction bias detection (American Educational Research Association et al., 2014), but without engaging the material conditions that prevent equitable participation. Feminist data scholarship has exposed inequality encoded within neutral-seeming data systems (D'Ignazio & Klein, 2020; Noble, 2018), yet educational assessment remains outside its focus. This paper addresses that gap directly: assessment systems do not merely reflect gender inequality; through systematic inattention to the material conditions dignified participation requires, they produce it.

In this perspective paper, three interrelated arguments are advanced. The first contends that educational assessment systems embody what this paper terms "dignity-less data", a concept that extends beyond mere data gaps to describe measurements that (1) claim technical objectivity and neutrality, (2) systematically disadvantage learners whose participation requires overcoming gendered safety and financial barriers, and (3) render these disadvantages invisible by treating unequal material conditions as external to measurement rather than as fundamental validity threats. Dignity-less data are produced when assessment systems measure outcomes without ensuring the material, physical, and economic conditions necessary for equitable participation, thereby generating results that appear to reflect individual capability but actually reflect structural privilege. The second argument demonstrates that this oversight is not incidental but structural, rooted in assessment philosophies that privilege abstract conceptions of merit over embodied realities of access. The third holds that addressing this requires more than incremental accommodation. What is needed instead is a fundamental reconceptualization of assessment validity, one that centers dignity, safety, and material security as prerequisites for meaningful educational measurement.

2. METHODS

Methodological Approach

This perspective paper employs a critical interpretive synthesis (Dixon-Woods et al., 2005) that integrates theoretical analysis with systematic evidence review to reconceptualize assessment validity through a feminist-capabilities lens. Unlike traditional systematic reviews that privilege particular study designs, critical interpretive synthesis explicitly combines diverse evidence types, quantitative studies, qualitative research, policy documents, and theoretical scholarship to generate new theoretical insights that transcend individual empirical findings (Dixon-Woods et al., 2006). This approach is particularly appropriate for addressing the paper's central question: how do assessment systems function as mechanisms that transform gendered material disadvantages into educational inequality?

Guiding Objectives

Consistent with procedural standards for rigorous perspective papers (Plummer et al., 2017; Sullivan et al, 2022), this synthesis is structured around five specific objectives that guided evidence identification, analysis, and framework development:

1. To examine and critically evaluate how existing educational assessment frameworks conceptualize validity, fairness, and equitable participation, with particular attention to the treatment of gendered material conditions within mainstream assessment theory.
2. To systematically identify and document the specific financial barriers, including direct assessment costs, opportunity costs, technology requirements, and period poverty, that prevent or compromise women learners' full participation in educational assessments across diverse global contexts.
3. To identify and document the specific safety-related barriers, including transportation vulnerability, campus safety threats, intimate partner violence, and caregiving responsibilities, that constitute gendered threats to assessment validity for women learners.
4. To analyze the causal mechanisms through which identified financial and safety barriers translate into assessment invalidity, drawing on feminist epistemology and capability approach theory to specify how material conditions constrain the substantive freedoms necessary for valid educational measurement.
5. To develop and propose a dignity-centered assessment framework that operationalizes safety and material security as prerequisites for valid educational measurement, offering concrete principles and implementation strategies for gender-responsive assessment design.

These objectives sequentially organize the paper's analytical structure**:** Objectives 1 provides the theoretical foundation (addressed in the section on the Illusion of Neutrality); Objectives 2 and 3 ground the analysis in empirical evidence (addressed in the sections on Financial Barriers and Safety as a Prerequisite); Objective 4 drives the synthesis and mechanism specification (addressed in the Discussion); and Objective 5 generates the paper's constructive contribution (addressed in the section on Dignity-Centered Assessment)

Evidence Identification and Selection

Evidence for this synthesis was identified through multiple strategies:

1. Systematic database searches: Web of Science, ERIC, PsycINFO, and Google Scholar were searched using combinations of terms including: ("educational assessment" OR "examination" OR "standardized test") AND ("gender" OR "women" OR "girls") AND ("barriers" OR "access" OR "equity" OR "validity") AND ("menstrual health" OR "period poverty" OR "safety" OR "violence" OR "financial" OR "economic"). Searches covered 2015-2025 to capture recent evidence.
2. Targeted searches for specific barriers: Additional focused searches addressed particular mechanisms (e.g., "menstrual health" + "school attendance" + "academic performance"; "intimate partner violence" + "educational achievement"; "digital divide" + "gender" + "assessment").
3. Policy and organizational documents: Reports from UNESCO, World Bank, OECD, and other international organizations were systematically reviewed for empirical data on gendered educational barriers and assessment practices.
4. Citation chaining: References from key articles were examined to identify additional relevant sources, and forward citation searches identified recent work citing foundational studies.

Inclusion criteria prioritized: (a) empirical studies documenting relationships between gendered barriers (financial, safety-related, health-related, caregiving-related) and educational participation or performance; (b) studies examining assessment systems, practices, or outcomes; (c) theoretical work on feminist epistemology, capability approach, or assessment validity; (d) evidence from diverse global contexts to establish cross-context patterns.

Quality assessment evaluated empirical studies for methodological rigor (sampling, measurement, analysis) and theoretical work for conceptual clarity and scholarly grounding. Preference was given to peer-reviewed sources, though high-quality reports from reputable international organizations were included when they provided unique empirical evidence unavailable in peer-reviewed literature.

Analytical Framework

The synthesis employed a configurative approach (Gough et al., 2012) that seeks to build explanatory theory rather than merely aggregate findings. Analysis proceeded through iterative stages:

1. Evidence mapping: Empirical findings were systematically organized according to the specific barrier type (period poverty, transportation safety, digital access, caregiving, intimate partner violence, financial precarity) and the proposed causal pathway to assessment disadvantage.
2. Theoretical integration: Evidence patterns were interpreted through the integrated lens of feminist epistemology (examining how assessment systems encode privileged standpoints), capability approach (analyzing how barriers constrain substantive freedoms), and validity theory (reconceptualizing what constitutes valid measurement).
3. Mechanism specification: For each barrier type, I identified and articulated the specific mechanisms through which material disadvantages translate into assessment invalidity (e.g., cognitive load from pain and anxiety, time constraints from caregiving, mobility restrictions from safety risks).
4. Framework development: The dignity-centered assessment framework emerged through abductive reasoning, moving iteratively between empirical patterns, theoretical principles, and practical requirements to generate a coherent reconceptualization of assessment validity.

Limitations and Scope

This synthesis faces several limitations. First, empirical evidence linking specific gendered barriers to assessment outcomes varies in quality and quantity across barrier types; menstrual health and safety risks have substantial research bases, while evidence specifically examining assessment accommodations for caregiving remains limited. Second, most available evidence comes from quantitative studies documenting associations; experimental or quasi-experimental research establishing causal effects is scarce. Third, evidence is geographically uneven, with more research from Global North contexts than from regions where barriers may be most severe. Fourth, intersectional

analyses, examining how gender interacts with race, class, disability, and other axes of marginalization, remain underdeveloped in the assessment literature. Despite these limitations, the synthesis provides robust evidence that gendered material barriers systematically affect assessment participation and performance across diverse contexts, supporting the paper's central argument that assessment systems function as technologies of inequality when they fail to account for these realities.

3. THE ILLUSION OF NEUTRALITY: HOW ASSESSMENT SYSTEMS ENCODE GENDER INEQUALITY

Theoretical Foundations of Assessment Bias

Educational assessment theory traditionally distinguishes between construct validity, whether a test measures what it purports to measure, and fairness, whether measurement is equitable across populations. However, this bifurcation itself perpetuates inequality by treating fairness as secondary to technical validity rather than recognizing that measurement cannot be valid when systemic barriers prevent dignified participation. Feminist epistemology offers crucial insights here: knowledge production systems, including assessment, are never neutral but reflect the standpoints and material conditions of those who design them (Collins & Bilge, 2020; D'Ignazio & Klein, 2020). When assessment architects occupy positions of privilege - typically male, economically secure, and physically safe- their instruments inevitably encode these privileged circumstances as the norm against which all learners are measured.

Sen's (1999) capability approach provides complementary theoretical grounding for understanding assessment inequality. Sen distinguishes between functionings - what people can do and be - and capabilities, the substantive freedoms people have to achieve valued functionings. Educational assessment ostensibly measures learning functions, but it systematically fails to account for how capability deprivation constrains women's ability to demonstrate their actual learning (Walker & Unterhalter, 2007). A student who possesses knowledge but cannot safely travel to an examination center, or who cannot afford the materials required for assessment participation, experiences capability deprivation that renders assessment results invalid measures of their learning. Yet assessment systems treat these constraints as external to measurement rather than as fundamental validity threats.

The Gender Data Gap in Assessment Design

Recent scholarship on the gender data gap - the systematic failure to collect and analyze sex-disaggregated data - reveals parallel gaps in assessment design. While many systems now disaggregate results by gender, they fail to collect data on the gendered conditions affecting assessment participation. According to the GPE Results Report 2024, many partner countries are improving their data systems by strengthening Education Management Information System (EMIS), conducting learning assessments, and collecting sex-disaggregated education statistics (Global Partnership for Education, 2024). However, the report does not indicate that GPE is currently tracking more specific gender-related barriers to assessment—such as menstrual-related absences, transportation safety, or the financial costs of taking exams. This produces what feminist data scientists' term "missing data by design" - the systematic exclusion of variables that would reveal gendered disadvantage (D'Ignazio & Klein, 2020).

The consequences extend beyond individual assessment events. When women students experience assessment disadvantages due to period poverty, safety concerns, or economic constraints, their resulting scores underestimate their capabilities. These underestimates then feed into algorithms and decision systems - university admissions, scholarship allocation, employment screening - that compound initial disadvantages through seemingly objective data-driven processes (Noble, 2018). Machine learning systems trained on historical assessment data inherit and amplify these biases, creating what O'Neil (2016) terms "weapons of math destruction" that systematically disadvantage women learners under the guise of meritocracy. Bradbury and Roberts-Holmes (2016) demonstrate how the datafication of education creates new forms of accountability that obscure rather than illuminate structural inequalities.

4. FINANCIAL BARRIERS AS ASSESSMENT INVALIDATORS

The Hidden Costs of Educational Assessment

Contemporary assessment systems impose substantial financial burdens that disproportionately affect women learners globally. These costs extend far beyond explicit examination fees to include transportation, accommodation, technology access, materials, and opportunity costs of time. While there is limited evidence on the direct financial burden of taking high-stakes exams, broader research demonstrates that gender pay gaps and unequal labor market participation can exacerbate economic barriers to educational access. For example, net earnings losses from gender inequality remain substantial (Wodon et al., 2020), which may indirectly affect the ability of low-income and female-headed households to afford exam-related costs.

For women learners specifically, these costs intersect with gender-specific financial vulnerabilities. Adolescent girls and young women are more likely than male peers to experience interrupted education due to family economic stress, to shoulder unpaid care work that constrains paid employment opportunities, and to lack independent financial resources (Ferrant et al., 2014; Addati et al., 2022). When assessment participation requires costs that women learners cannot bear without depending on male family members - fathers, brothers, husbands - the conditions for dignified assessment are fundamentally compromised. In a qualitative study by Milimo et al., (2021), female adolescents reported that economic support was critical for staying in school, but despite that, some still faced pressure and dependency: many relied on relatives or male partners for school fees, which affected their educational decisions. Such financial dependency may also influence their ability to sit for and complete assessments: if exam participation requires extra funds (for fees, travel, or materials), they may face additional pressure or conditionality, undermining their autonomy in high-stakes academic decisions.

Period Poverty and Assessment Access

Period poverty - the inability to afford menstrual hygiene products, represents a particularly pernicious intersection of gender and economic disadvantage affecting assessment participation. Recent estimates suggest that globally, 500 million women and girls lack adequate resources for menstrual hygiene management (World Bank, n.d), with profound implications for educational assessment. Menstruation significantly affects school attendance and academic participation. In a study by Vashisht et al., (2018), nearly 65% of girls reported that menstrual-related pain, anxiety, shame, and fear of leakage or staining forced them to miss classes and class tests, highlighting the direct impact of menstruation on their ability to engage fully in assessments and learning activities.

The assessment implications extend beyond absence. Even when present, students experiencing period poverty often cannot concentrate effectively during examinations, face distraction and discomfort from inadequate menstrual management, and experience anxiety that impairs cognitive performance. A randomized controlled trial by Nyadoi et al. (2022) found that adolescent girls who received a menstrual health management intervention - including gamified education and provision of sanitary products - significantly outperformed a control group on post-test assessments in mathematics, English, integrated science, and social studies. This suggests that addressing period poverty can meaningfully improve academic performance. Yet assessment validity research rarely considers menstrual management as a test accommodation issue, despite evidence that its impact on performance exceeds that of many disabilities for which accommodations are routinely provided. Period poverty, hence, represents not merely a hygiene issue but a fundamental barrier to educational equity that assessment systems must address.

Technology Access and Digital Assessment Inequality

The rapid shift toward digital assessment, accelerated by the COVID-19 pandemic, has introduced new financial barriers that disproportionately affect women learners. The gender digital divide - women's reduced access to internet connectivity, digital devices, and technological literacy - translates directly into assessment disadvantage (UNESCO, 2023). UNESCO data from 2023 indicate that women in low-income countries are 20% less likely than men to own smartphones and 33% less likely to use mobile internet, with even wider gaps in access to computers and stable broadband connections required for online assessments.

These access gaps reflect broader patterns of intra-household resource allocation that systematically disadvantage girls and women. A qualitative work in Myanmar shows that male household members are frequently prioritized for mobile device ownership, in part because they are more likely to work or study outside the home, and women often deprioritize their own digital use even when they manage household finances (UN Women, 2022). According to OECD analyses, the COVID-19 pandemic exposed and deepened digital inequities: many students lacked access to necessary devices and connectivity at home, disproportionately affecting those from disadvantaged backgrounds (OECD, 2023a). There is also concern that gender norms in some contexts restrict girls' access to internet-enabled devices and the space needed for sustained digital learning and assessments (OECD, 2023b). Platform-based infrastructure of digital assessment may create new forms of exclusion that disproportionately affect marginalized learners, including women from economically vulnerable backgrounds.

5. SAFETY AS A PREREQUISITE FOR VALID ASSESSMENT

Transportation Vulnerability and Examination Access

Educational assessment frequently requires travel to designated examination centers, yet transportation safety represents a gendered barrier that assessment systems systematically ignore. Research shows that women and girls face significant risks of sexual harassment, assault, and violence while commuting to and from school, especially in contexts where public transport or long walking distances are the norm (Porter et al., 2010; UNESCO, n.d). These safety risks can disproportionately affect their ability to attend school regularly, potentially including during critical times such as exam-related travel. In a study of South African high school learners, nearly 58% of female participants reported feeling unsafe traveling to and from school, compared to 42% of male students (Kutywayo et al., 2024), which could lead to missed classes or examinations and negatively affect their academic performance.

The assessment implications are profound. When examinations are scheduled without consideration of transportation safety - early morning start times requiring travel during darkness, evening sessions necessitating late return travel, locations accessible only by routes known to be unsafe - women learners may face an impossible choice between their physical safety and educational assessment participation. Those who choose safety and miss assessments are penalized through failed grades, delayed progression, or exclusion from educational opportunities, while those who choose participation risk assault, harassment, and trauma. Feminist and equity-oriented scholars argue that many assessment systems are poorly designed because they ignore the lived realities of marginalized learners, including women. For example, assessment frameworks often fail to account for how gender norms and social risks such as violence and harassment undermine both equity and validity (Vanner, 2019).

Distance compounds these challenges. When examination centers are located far from residential areas, the duration of travel exposure to harassment and assault risk increases. For rural women learners especially, examination center location may require overnight accommodation in unfamiliar areas, introducing additional safety and financial burdens. While there is limited research specifically on violence at or around exam centers, studies do show that long travel distances to school are linked to increased safety risks for girls, including harassment and assault on the way to school (Porter et al., 2011; Duri et al., 2025). These broader mobility-related vulnerabilities suggest that allocating exam centers without regard for students' safety may exacerbate gendered risks.

Campus Safety and Examination Environments

Safety concerns extend beyond transportation to examination environments themselves. Sexual harassment and assault on educational campuses affect women learners' assessment performance through multiple mechanisms: direct trauma effects for survivors, ambient fear and hypervigilance effects for all women students, and time costs of safety behaviors that reduce study and preparation time (Ramos et al., 2025; Molstad, et al., 2023; Makhaye et al., 2023). Research demonstrates that women students on campuses with high rates of gender-based violence show measurably impaired academic performance (Samakao & Manda, 2023), yet assessment systems treat these effects as individual failures rather than environmental validity threats.

Examination conditions can heighten safety risks. Extended campus presence in the evenings, inadequate supervision during breaks and ineffective reporting mechanisms for harassment will compromise students' ability to participate safely and with dignity. Reports from South African universities and UNESCO's global higher education studies show that students, especially women, face increased risks of harassment on campus and during commutes (Nunlall-Hiralal, 2023; UNESCO, 2024). These conditions foster fear, hypervigilance, and stress, which may reduce study time, limit campus participation, and negatively affect assessment performance. Institutional policies often fail to address these risks, underscoring gaps in academic support and the need for safe, supportive learning environments to protect students' rights and ensure fair assessments.

Intimate Partner Violence and Assessment Performance

For women learners in intimate relationships, partner violence represents a largely invisible assessment barrier. Intimate partner violence affects approximately 30% of women globally, with elevated rates among young women in educational settings (World Health Organization, 2024). The temporal dynamics of intimate partner violence often intensify during academic stress periods, including examination seasons, when women's time devoted to study rather than partner attention can trigger abuse (Klencakova et al., 2023). Assessment impacts include physical injuries affecting ability to write or concentrate, psychological trauma impairing cognitive function, restricted mobility limiting examination center access, and economic control limiting resources for assessment-related expenses.

These dynamics are largely overlooked in discussions of assessment validity. Perveen et al. (2022) found that intimate partner violence (IPV) significantly impaired the academic performance of married female students, affecting GPA, attendance, motivation, and engagement. Such effects raise important concerns for the validity of educational assessments, as IPV-related stress and cognitive strain may prevent students from demonstrating their true knowledge and abilities. This oversight reflects a broader trend in assessment research, which often treats learners as autonomous individuals while ignoring how relationship-embedded violence limits women's participation. Consequently, assessment systems risk systematically underestimating the capabilities of women experiencing IPV, attributing to individual deficit what is in fact the measurable impact of gender-based violence.

Caregiving Responsibilities and Assessment Timing

Women and girls globally shoulder disproportionate unpaid care work including childcare, eldercare, household labor, and sibling care that directly constrains time available for assessment preparation and participation. UNESCO (2024) estimates that adolescent girls spend 40% more time on household chores than boys, with this gap widening in contexts of poverty, family illness, or household stress. These responsibilities intensify during assessment periods when family members may assume that school breaks mean students are available for increased household labor, yet assessment systems schedule examinations without considering these caregiving demands.

The temporal rigidity of assessment systems particularly disadvantages women with caregiving responsibilities. Fixed examination schedules that conflict with childcare needs, continuous assessment deadlines that assume unlimited flexible time, and residential examination requirements that presume freedom from care obligations all systematically disadvantage women learners. Analysis of higher education policy suggests that only a small fraction of institutions formally support students with caregiving responsibilities in assessment contexts (Times Higher Education, 2024). Very few universities provide flexibility in deadlines or recognize unpaid caregiving as a legitimate reason for alternative assessment arrangements, despite growing calls to adapt academic policies to the realities of student carers (National Academies of Sciences, Engineering, and Medicine, 2024). The intersection of caregiving responsibilities with economic vulnerability creates compounded assessment disadvantages. Women learners from economically marginalized backgrounds are simultaneously more likely to have substantial caregiving responsibilities and less likely to have resources to purchase care services that would enable assessment participation. This creates a double bind where those who most need educational credentials for economic mobility face the greatest assessment participation barriers.

6. TOWARD DIGNITY-CENTERED ASSESSMENT: A RECONCEPTUALIZATION

The empirical evidence presented reveals five interconnected causal pathways through which gendered material barriers invalidate assessment results: (1) cognitive resource depletion, wherein pain, anxiety, safety hypervigilance, or worry consume working memory capacity required for academic performance (period poverty, intimate partner violence, transportation safety concerns); (2) physical access prevention, wherein barriers physically prevent students from reaching examination venues or participating during scheduled times (transportation safety, caregiving responsibilities, financial constraints on travel); (3) technological exclusion, wherein unequal access to required digital infrastructure prevents participation in technology-mediated assessments (digital divide, financial precarity); (4) time constraint imposition, wherein gendered responsibilities consume time required for preparation and participation (caregiving, economic necessity requiring paid work); and (5) dignity violation and psychological harm, wherein stigma, harassment, or material deprivation creates emotional distress that impairs performance (period poverty, campus safety, intimate partner violence). Importantly, these mechanisms operate cumulatively and intersectionally; students experiencing multiple barriers face compounded disadvantages that assessment systems neither recognize nor accommodate. A validity framework that treats these as external contextual variables rather than as threats to measurement integrity fundamentally misunderstands the nature of educational assessment. Valid measurement requires not merely psychometrically sound instruments but also equitable conditions for participation; when systemic barriers prevent such conditions, assessment results cannot be considered valid indicators of capability. The dignity-centered framework proposed below directly addresses each of these causal pathways by establishing material conditions, safety, and economic accessibility as foundational validity criteria rather than optional accommodations.

Principles of Dignity-Centered Assessment Frameworks

Addressing these failures requires moving beyond incremental accommodations toward dignity-centered assessment frameworks that recognize safety and material security as prerequisites for valid educational measurement. Drawing on Fraser's (2022) framework of participatory parity and Fredman's (2016) substantive equality theory, I propose five foundational principles:

1. Material Conditions as Validity Criteria: Assessment validity must incorporate not only technical measurement properties but also the material conditions required for dignified participation. An assessment cannot be considered valid when systemic barriers prevent equitable access and participation. This aligns with Nussbaum's (2008) capabilities approach, which emphasizes that true equality requires not merely formal opportunities but substantive capabilities to function.
2. Embodied Learner Recognition: Assessment design must acknowledge that learners are embodied beings with material needs - including menstrual hygiene, physical safety, economic resources, and caregiving responsibilities - rather than abstract rational actors in idealized assessment conditions. As Hooks (1994) argues, education must engage the whole person, not merely disembodied intellect, and this principle extends fundamentally to assessment practices.
3. Gendered Impact Accountability: Assessment systems must systematically collect and analyze data on gender-differentiated participation barriers, performance impacts, and opportunity foreclosure resulting from assessment design choices. This addresses the "missing data by design" problem identified by D'Ignazio and Klein (2020) and creates accountability for gender equity outcomes.
4. Safety-First Scheduling: Assessment timing, location, and logistics must prioritize learner safety, with particular attention to transportation safety, campus security, and avoidance of schedules that require unsafe travel or exposure. This principle recognizes that safety is not a luxury but a prerequisite for valid measurement (European Institute for Gender Equality, 2023).
5. Economic Accessibility: Assessment participation costs including direct fees, transportation, accommodation, technology, and materials must not exceed levels that economically marginalized learners can afford without dependency relationships that compromise autonomy. This principle operationalizes Sen's (1999) emphasis on substantive freedoms rather than merely formal opportunities.

Each dignity-centered principle directly addresses specific causal pathways identified in the empirical evidence. The Material Conditions as Validity Criteria principle addresses cognitive resource depletion and physical access prevention by requiring that assessment design ensure conditions for full participation. Embodied Learner Recognition addresses dignity violation and psychological harm by acknowledging that valid measurement must account for learners' physical and emotional realities. Gendered Impact Accountability creates mechanisms to detect when cognitive resource depletion, access prevention, or time constraints differentially affect women learners. Safety-First Scheduling eliminates physical access prevention and safety-related cognitive load by prioritizing secure participation conditions. Economic Accessibility removes financial barriers to access and eliminates economic dependency relationships that compromise autonomy. Together, these principles transform assessment from a system that measures outcomes while ignoring participation conditions into one that recognizes equitable access as prerequisite for valid measurement.

Practical Implementation Strategies

Translating these principles into meaningful transformation requires structural reforms across assessment policies, administration, and support systems. The following strategies outline practical pathways for building assessment environments that are equitable, safe, and accessible for women learners:

1. Financial Support Mechanisms

Assessment systems should integrate robust financial support policies to ensure that economically vulnerable learners can participate fully in high-stakes assessments. Specifically, examination fees need to be either waived or substantially subsidized for disadvantaged students. Additionally, targeted support should be provided for related costs, such as transportation to exam centers, accommodation for students required to travel, and access to technology (e.g., computers or internet) for remote or digital assessments. In Kenya, the government has historically subsidized or fully covered examination registration fees through the Kenya National Examinations Council (KNEC). Recent developments indicate that the universal waiver may be phased out in favor of a means-tested model, in which only learners from financially disadvantaged households will continue to benefit. This shift underscores both the importance and fragility of financial support mechanisms in sustaining equitable exam participation (Kenyan News Agency, 2025; Mwakilishi, 2025). Embedding financial assistance into the core of assessment policy not only reduces immediate barriers but also strengthens fairness and inclusion within evaluation systems.

2. Flexible Assessment Modalities

Assessment systems should adopt flexible modalities that offer multiple pathways for students to demonstrate their learning. This includes offering take-home assessments, non-timed evaluations, hybrid or online formats, and distributed testing windows rather than relying solely on inflexible, high-stakes exams. These flexible designs better accommodate varying life circumstances and help reduce barriers for learners who may be disadvantaged by rigid systems (El Galad, Harvey, & Betts, 2024). In emergency remote education contexts, scholars also highlight how flexibility in assessment format offers critical advantages. When face-to-face exams were not possible, students and instructors reported that non-traditional digital assessment formats provided increased opportunity for fairness and access, particularly for those balancing multiple commitments (Meccawy et al., 2021). However, successful implementation demands careful design: it is vital to ensure that alternative assessment formats are evaluated equitably, that educators are trained in rating diverse types of student work, and that assessment structures align with meaningful and valid evidence of learning.

3. Menstrual Health Integration

Menstrual health must be recognized as a legitimate and systemic component of equitable assessment design. Examination centers should provide free menstrual hygiene products, ensure access to private and hygienic facilities, and incorporate basic training for invigilators on how to support students experiencing menstruation-related challenges. Where possible, examination timetables should avoid known periods that disproportionately burden menstruating students. Integrating menstrual health into assessment planning is not merely a welfare measure; it is an educational equity requirement that directly influences participation and performance.

4. Safety-Centered Logistics

Learners' physical safety must be treated as fundamental to assessment integrity. Examination schedules should avoid very early or late hours that heighten exposure to violence and harassment. Centers should be located to minimize travel distances, especially for students in rural or high-risk areas, and transportation support should be available where necessary. All assessment venues should operate under formal safety protocols, including secure reporting channels for incidents of harassment or intimidation. Evidence consistently shows that when safety is embedded into assessment logistics, female students' participation increases significantly, and assessments more accurately reflect genuine learning.

5. Caregiving-Responsive Policies

Assessment systems must formally acknowledge caregiving responsibilities as valid grounds for alternative arrangements. This includes offering flexible assessment windows, providing childcare services at examination venues, and allowing rescheduling for those with unavoidable caregiving duties. Such measures recognize that caregiving burdens; borne disproportionately by women, are structural, not personal failings. Incorporating caregiving responsiveness into assessment policy therefore represents a commitment to fairness, inclusion, and accurate measurement of learners' academic capabilities.

Measurement and Monitoring

Dignity-centered assessment requires robust measurement of gender-differentiated impacts, supported by systematic data collection and continuous improvement. Assessment systems should routinely gather information on participation rates disaggregated by gender, including reasons for non-participation, the financial costs associated with assessment involvement, safety incidents or concerns occurring during assessment periods, menstrual-related challenges that hinder participation, caregiving responsibilities that limit assessment access, and performance gaps across different assessment modalities by gender. Such data should directly inform ongoing refinement of assessment design, ensuring that systems remain accountable for identifying and reducing gendered disadvantages. Empowerment-oriented approaches must include continuous monitoring and adaptation grounded in the lived experiences of women learners, ensuring that assessment practices evolve in ways that genuinely support dignity, equity, and meaningful participation.

7. POLICY AND RESEARCH IMPLICATIONS

Reforming Assessment Policy

Educational assessment policy at national and institutional levels must be reformed to incorporate dignity-centered principles. UNESCO and other international bodies should revise assessment quality frameworks to explicitly address gender equity not merely as outcome disaggregation but as assessment design imperative. National examination authorities should conduct gender impact assessments of assessment policies and practices, with mandatory remediation of identified disparities. Universities and educational institutions should audit assessment systems for gendered barriers and implement comprehensive accessibility supports.

Regulatory frameworks should require that assessment systems demonstrate not only technical measurement quality but also equitable accessibility across gender. This might parallel disability accommodation frameworks, which recognize that failure to provide reasonable accommodations invalidates assessment results. The same logic should apply to gendered accessibility: assessment results cannot be considered valid measures of capability when systemic gender-based barriers prevented dignified participation. Freire's (2018) pedagogy of liberation reminds us that education either functions as an instrument to integrate individuals into the logic of the present system or becomes the practice of freedom through which people critically engage with reality.

Research Agenda

Addressing the knowledge gaps identified in this paper requires a robust research agenda that centers gender equity in educational assessment. Priority areas include large-scale quantitative studies documenting the prevalence and magnitude of financial and safety barriers affecting women's assessment participation, as evidence remains fragmented across diverse contexts. Causal inference research through experimental and quasi-experimental designs, should establish links between specific barriers and performance. Additional needs include rigorous evaluation of dignity-centered assessment innovations across varied institutional settings. Further priorities involve applying intersectional analysis to understand how gender interacts with race, class, disability, and other social positions to shape assessment disadvantages, extending the framework of Collins and Bilge (2020). Participatory research that positions women learners as co-creators of assessment reform is also essential. Importantly, this research must support policy change and practice improvement, requiring strong partnerships between researchers, policymakers, and practitioners to ensure meaningful system transformation.

8. CONCLUSION

Educational assessment systems hold enormous power in shaping life opportunities, yet they consistently overlook the gendered material realities that determine who can participate with dignity. Period poverty, financial precarity, safety vulnerabilities, and caregiving responsibilities create assessment disadvantages that remain invisible within systems that present themselves as neutral and objective. The result is dignity-less data, measurements that appear to reflect capability but actually reflect privilege, claiming fairness while excluding those facing structural barriers, and reinforcing inequality under the guise of meritocracy. This paper's central theoretical contribution lies in reconceptualizing assessment validity itself: rather than treating validity as primarily a psychometric property of instruments (construct representation, score meaning, consequential basis), dignity-centered assessment positions validity as fundamentally dependent on the material, physical, and economic conditions required for equitable participation. This reconceptualization challenges the field's dominant validity frameworks (Messick, 1989; Kane, 2013) by demonstrating that measurement cannot be valid, and cannot accurately represent learners' capabilities when systemic barriers prevent dignified participation. In this framework, threats to validity are not merely statistical (bias, measurement error) but material and structural (unsafe conditions, financial barriers, health constraints). Assessment systems must therefore be evaluated not only on psychometric criteria but on whether they ensure the substantive freedoms (Sen, 1999) necessary for learners to demonstrate their actual capabilities.

The way forward is challenging, but unmistakably clear. Concretely, this framework implies three immediate imperatives for assessment practice: (1) Validity studies must systematically include analyses of differential participation barriers and their impacts on score meaning, not merely differential item functioning statistics; (2) Assessment system accreditation and quality assurance frameworks must incorporate dignity-centered criteria as core standards, not optional equity considerations; and (3) Research funding priorities must shift to support rigorous evaluation of dignity-centered innovations through experimental and quasi-experimental designs that establish causal effects of barrier-reduction interventions on both participation and performance. Embracing dignity-centered assessment, grounded in safety, financial accessibility, and genuine learner recognition, education systems can transform assessment from a mechanism of exclusion into a tool for empowerment. Equitable education requires not only formal access but conditions that allow learners to participate fully and with dignity. Women continue to experience assessment-related disadvantages that shape their educational trajectories, economic opportunities, and long-term life chances. Immediate action is necessary: auditing existing systems for gendered impacts, implementing reforms that prioritize dignity, collecting stronger evidence on barriers, and holding institutions accountable for equitable outcomes. The era of dignity-less data must end; the time for dignity-centered assessment must begin.

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Cite this article as:

Kpum, M. M., & Gasa, V. (2026). Data Without Dignity? A Critical Perspective on How Educational Assessment Systems Overlook the Financial and Safety Realities of Women Learners. *GHMJ (Global Health Management Journal)*, *9*(2), 59–73. https://doi.org/10.35898/ghmj-921306