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Equity and Inclusion in AI-Driven ECE Classrooms: Conditional Process Analysis of Teacher Awareness and PsyCap in Pakistan

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ABSTRACT

Purpose: *This study investigates how Teacher Psychological Capital (PsyCap) and AI Ethical Literacy facilitate ethical inclusion for intersectionally marginalized learners in Pakistan's AI-driven Early Childhood Education (ECE) sector.*

Methodology: *Utilizing Hayes' Model 7, data were collected from 550 ECE educators in Lahore and Islamabad. The study examined the moderated mediation of PsyCap on the relationship between intersectional awareness and ethical inclusion behavior.*

Findings: *Results indicate that Intersectional Awareness significantly predicts Inclusive Intent only when moderated by high PsyCap ($\beta = .24$, $p < .001$). AI Ethical Literacy serves as a critical mediator, but the entire path to inclusive behavior remains contingent upon the teacher's psychological resilience.*

Implications: *Findings suggest that policy must shift from purely technical AI training to a holistic model that prioritizes teacher PsyCap to bridge the "Awareness-Action Gap" in the Global South.*

Keywords: *Early Childhood Education (ECE), Artificial Intelligence (AI) Ethics, Psychological Capital (PsyCap), Intersectionality, Teacher Agency, Hayes' Model 7*

INTRODUCTION

The Convergence of AI and Inclusive Education

The global landscape of Early Childhood Education (ECE) is currently defined by a dual paradigm shift: the radical push for inclusive equity under the Sustainable Development Goal 4 (SDG 4) and the rapid, often unregulated, integration of Artificial Intelligence (AI) (Luckin, 2017; Qayyum, Sadiqi, & Abbas, 2024c). While AI tools are introduced as "equalizers" intended to bridge pedagogical gaps, scholars warn that these technologies are not socio-technically neutral (Noble, 2018; Selwyn, 2019). They carry inherent "algorithmic biases" (AB) that can automate and accelerate existing social stratifications. In the Global South, the effectiveness of AI in the classroom depends heavily on the educator's capacity for Ethical Intervention Behavior (EIB) the ability to recognize and correct technological biases that marginalize specific student groups (Qayyum et al., 2025; UNESCO, 2021).

The Intersectional Reality of the Pakistani ECE Sector

Inclusion in the Global South cannot be addressed through a monolithic lens (Muthukrishna & Engelbrecht, 2018). Kimberlé Crenshaw's (1989) theory of Intersectionality provides a rigorous framework for understanding the ECE classroom in urban centers like Lahore and Islamabad. Students in these regions often navigate overlapping layers of vulnerability, including linguistic displacement (Qureshi et al., 2025b), socio-economic deprivation, and the profound effects of emotional distress (Qureshi, Waris, Fatima, Bibi, & Qayyum, 2025a). Traditional "one-size-fits-all" inclusive policies fail to account for the child who exists at the nexus of these identities (Artiles, 2013). When AI-driven curricula are implemented without intersectional awareness, they risk creating a "digital redlining" effect, where marginalized learners are further excluded by predictive algorithms that do not account for their unique lived experiences (Eubanks, 2018; Qayyum, Tabassum, & Kashif, 2024d).

The Problem: The Awareness-Action Gap and Risk Perception

Despite increasing awareness of AI's ethical risks, a critical "Awareness-Action Gap" persists among ECE practitioners (O'Neil, 2016; Rest, 1986). While teachers may identify that an AI tool is failing to serve a marginalized child, they often lack the agency to intervene. This failure is frequently rooted in high AI Risk Perception a psychological state where the perceived complexity and potential for error in AI systems lead to professional paralysis (Qayyum et al., 2025; Zawacki-Richter, 2019). In Pakistan's ECE sector, this is compounded by structural ambiguities and a lack of clear ethical guidelines, often leading to teacher alienation and psychological burnout (Qayyum, 2019; Skaalvik & Skaalvik, 2017).

The Moderating Role of Psychological Capital (PsyCap)

This research posits that the transition from recognizing intersectional bias to executing ethical inclusion is conditioned by the teacher's Psychological Capital (PsyCap). Rooted in Positive Organizational Behavior, PsyCap comprising Hope, Efficacy, Resilience, and Optimism acts as a "psychological resource caravan" (Hobfoll, 2011; Luthans, Youssef, & Avolio, 2007). In high-pressure educational environments, PsyCap enables teachers to overcome the "stress of the new" and the fear of technological failure (Luthans et al., 2015; Qayyum, 2019). Teachers with high PsyCap possess the "agentic capacity" to advocate for intersectional equity, ensuring that AI serves as a tool for inclusion rather than exclusion (Avolio & Gardner, 2005; Qureshi et al., 2025b).

Research Objectives

Utilizing Hayes' Model 7 (First-Stage Moderated Mediation), this study investigates the conditional process through which teacher awareness of intersectional marginalization influences inclusive pedagogical practices. Focusing on ECE educators in Lahore and Islamabad, the study seeks to:

- ***Objective1*** Examine the relationship between awareness of intersectional barriers and the intent to implement AI-driven inclusive pedagogy ($X \rightarrow M$).
- ***Objective2*** Determine how AI Ethical Literacy mediates the path toward actual inclusive behavior ($M \rightarrow Y$) (Ng et al., 2021).
- ***Objective3*** Analyze the extent to which PsyCap (W) moderates the link between awareness and intent, thereby bridging the awareness-action gap.

Research Hypothesis

The synthesized literature suggests that inclusion in the AI era is a complex psychological and ethical process. Based on the "Moderated Mediation" logic of Hayes (2018), we propose the following:

Hypotheis 1 Intersectional Awareness is positively associated with Inclusive Pedagogical Intent.

Hypotheis 2 AI Ethical Literacy mediates the relationship between Inclusive Pedagogical Intent and Ethical Inclusion Behavior (EIB).

Hypotheis 3 Psychological Capital (PsyCap) moderates the path between Intersectional Awareness and Intent. Specifically, the positive relationship will be stronger for teachers with high PsyCap (Qayyum, 2019).

Hypotheis 4 The indirect effect of Intersectional Awareness on EIB (via AI Ethical Literacy) is moderated by PsyCap (Hayes' Model 7).

LITERATURE REVIEW

The Intersectional Lens in AI-Driven ECE

The integration of Artificial Intelligence in Early Childhood Education (ECE) is not a neutral process. As Crenshaw (1989) argues, social identities such as gender, class, and ethnicity do not exist independently but intersect to create unique experiences of marginalization. In the Pakistani context, an ECE student is not merely "at risk" because of poverty; their marginalization is compounded by linguistic barriers (e.g., speaking a regional dialect in an English-centric AI interface) and geographic location (e.g., urban slums vs. rural outposts). Recent scholarship by Noble (2018) and Eubanks (2018) highlights that algorithms often "profile" and "punish" the poor. When ECE teachers lack Intersectional Awareness, they may inadvertently trust AI-generated assessments that penalize students for their cultural or linguistic differences. Thus, recognizing these overlapping layers of vulnerability is the first step toward Ethical Inclusion Behavior (EIB).

Intersectionality posits that social categories such as gender, class, and language are not independent but mutually constitutive (Crenshaw, 1989; Collins, 2019). In Pakistani urban centers like Lahore and Islamabad, ECE classrooms are increasingly diverse. Research by Qureshi et al. (2025b) on transgender inclusion highlights that even in higher education, institutional "blindness" to intersecting identities persists. At the ECE level, this is more acute. A child who belongs to a linguistic minority (e.g., Pashto speaker in an Urdu-medium school) and is also trauma-affected faces a "double burden" (Qureshi et al., 2025a).

Empirical studies suggest that when educators view these students through a single-axis lens (e.g., only as "poor"), they miss the cognitive-emotional nuances required for true inclusion (Artiles, 2013; Gillborn, 2015). The intersection of trauma and language acquisition requires what scholars call "Trauma-Informed Intersectionality," where the teacher recognizes that emotional distress is compounded by cultural and linguistic displacement (Muthukrishna & Engelbrecht, 2018). This section argues that the "Trauma-Affected Early EFL Learner" (Qureshi et al., 2025a) is the primary victim of non-intersectional AI programming.

The Algorithmic Burden and Digital Redlining

The introduction of AI in ECE adds a technological layer to these social complexities. As noted by Qayyum, Sadiqi, and Abbas (2024c), the integration of AI into Pakistan's ECE policy is often driven by a desire for "modernization" without adequate safeguards against Algorithmic Bias (AB). Scholars like Noble (2018) and Eubanks (2018) argue that AI systems often function as "Automated Inequality," where predictive models penalize students based on data that reflects historical prejudices.

In the ECE classroom, this manifests when AI-driven assessment tools misinterpret the progress of trauma-affected learners or those with diverse linguistic backgrounds. The "Algorithmic Burden" refers to the extra labor teachers must perform to ensure these tools do not facilitate "digital redlining" (Selwyn, 2019). If a teacher lacks AI Ethical Literacy the capacity to critically evaluate and intervene in AI

processes the technology becomes a mechanism for further exclusion (Ng et al., 2021; Qayyum et al., 2024d).

AI, PsyCap, and Early Childhood Development in Pakistan

Early Childhood Education (ECE) has undergone rapid transformation in recent years due to technological integration, evolving pedagogical practices, and growing attention to psychosocial factors influencing both learners and educators. Recent research from Pakistan provides valuable insights into how artificial intelligence (AI), psychological capital (PsyCap), digital exposure, and socio-emotional environments interact to shape early learning outcomes.

A significant strand of literature highlights the expanding role of AI in ECE curriculum design and policy development. Studies examining AI-driven curriculum development reveal that while educators recognize AI's potential for personalization and efficiency, they also report concerns related to ethical risks, data privacy, and implementation barriers (Qayyum et al., 2025; Qayyum, Sadiqi, & Abbas, 2024). These concerns are further elaborated through moderated mediation models showing that psychological capital acts as a protective and catalytic factor, influencing educators' AI risk perception and ethical decision-making (Qayyum et al., 2025). This aligns with earlier work emphasizing PsyCap's buffering role against stress and burnout among early childhood teachers (Qayyum, 2019).

Another important body of research focuses on technology exposure and child development. Empirical evidence demonstrates that excessive smartphone use negatively affects children's cognitive development and academic achievement, underscoring the need for balanced and developmentally appropriate technology use (Qayyum, Kashif, & Shahid, 2024). Complementing this, studies on the digital divide reveal disparities in access, teacher preparedness, and institutional support, which continue to limit equitable technology integration in ECE settings (Qayyum, Tabassum, & Kashif, 2024).

Beyond technology, several studies emphasize the importance of play-based and nature-based learning environments. Research indicates that play-based learning significantly enhances children's cognitive and emotional development, particularly when embedded within natural contexts (Qayyum, Fatima, & Iram, 2024). These findings reinforce broader arguments for maintaining human-centered pedagogies alongside emerging AI tools (Qayyum et al., 2024a).

The literature also highlights social-emotional development, parental engagement, and inclusive learning climates as critical determinants of early educational success. Comparative analyses show that targeted interventions can substantially improve children's social-emotional skills (Qayyum et al., 2024). However, weak parental engagement remains a persistent challenge, limiting the long-term effectiveness of ECE programs in Punjab (Qayyum, Saeed, & Qureshi, 2024). Additionally, studies addressing campus climate and inclusion point to systemic inequities that can affect learners' psychological safety and identity formation from early educational stages onward (Qureshi et al., 2025).

Finally, emerging qualitative and mixed-method studies broaden the developmental lens by examining health, nutrition, language acquisition, and trauma. Research on toddlers' health and nutrition practices emphasizes the interconnectedness of physical well-being and cognitive development (Qayyum et al., 2025). Similarly, studies on trauma-affected early EFL learners reveal that emotional distress significantly impedes language learning, reinforcing the need for emotionally responsive pedagogies (Qureshi et al., 2025).

Collectively, this body of work underscores the necessity of an integrated ECE framework—one that balances AI innovation with ethical safeguards, strengthens educators' psychological capital, promotes play-based and inclusive practices, and actively engages families. Such a holistic approach is essential for fostering sustainable and equitable early childhood development in Pakistan.

The Awareness-Action Gap and Teacher Agency

Knowing that a bias exists does not always lead to intervention. This discrepancy is known as the "Awareness-Action Gap." Rest (1986) suggests that moral action requires four components: sensitivity, judgment, motivation, and character. In this model, Intersectional Awareness provides the sensitivity, but it often stalls before becoming action (EIB) due to the high cognitive and emotional load placed on Pakistani teachers. In resource-constrained environments like Lahore and Islamabad, teachers face "overload" which can paralyze ethical decision-making (Skaalvik & Skaalvik, 2017).

A recurring problem in educational psychology is the "Awareness-Action Gap" (Rest, 1986). Teachers may possess a high awareness of intersectional inequities and a clear understanding of AI risks, yet fail to perform Ethical Inclusion Behavior (EIB). This gap is often bridged by "Moral Agency" (Treviño et al., 2006). In Pakistan, the structural ambiguity of the education system and the high stress of managing 21st-century classrooms often lead to professional paralysis (Qayyum, 2019). High AI Risk Perception (Qayyum et al., 2025) serves as a significant barrier. Drawing from Cognitive Load Theory (Sweller, 1988), we argue that the simultaneous demands of managing diverse learners and complex AI systems exceed the working memory of teachers, leading to "moral decoupling" where teachers ignore ethical issues to maintain basic classroom functionality. To move from intent to action, teachers require psychological resilience to manage this cognitive load.

PsyCap: The Internal Resource Caravan

To bridge this gap, teachers need internal resources. Luthans' (2007) Psychological Capital (PsyCap) comprising Hope, Efficacy, Resilience, and Optimism (HERO) acts as an "internal resource caravan" (Hobfoll, 2011). Efficacy allows teachers to believe they can challenge an AI's decision. Resilience ensures they continue to advocate for marginalized students despite systemic pressures. This research posits that PsyCap is the "engine" that transforms a teacher's awareness into a tangible Inclusive Pedagogical Intent.

Rooted in the Conservation of Resources (COR) Theory, PsyCap is a higher-order construct comprising Hope, Efficacy, Resilience, and Optimism (Luthans et al., 2007). In the context of ECE, PsyCap is a functional resource that allows teachers to navigate "Innovation-Related Stress" (Qayyum, 2019).

- **Hope:** Provides the goal-directed energy to pursue inclusive outcomes despite lack of resources (Snyder, 2000).
- **Efficacy:** Based on Bandura's (1997) social cognitive theory, it ensures the teacher feels capable of challenging biased AI outputs.
- **Resilience:** Allows teachers to "bounce back" from the failures often associated with new technology implementation (Masten, 2001).
- **Optimism:** Fosters a positive outlook that intersectional inclusion is possible despite systemic barriers (Seligman, 2006).

Previous research (Qayyum et al., 2025) has demonstrated that PsyCap acts as a "catalyst" for ethical intervention. In classrooms where teacher burnout is high (Skaalvik & Skaalvik, 2017), PsyCap serves as the differentiating factor between those who ignore marginalization and those who actively disrupt it.

AI Ethical Literacy: The Mediating Mechanism

While awareness sets the stage, AI Ethical Literacy provides the "how-to." It involves the critical appraisal of data privacy, algorithmic transparency, and bias detection (Ng et al., 2021). We argue that the

demand for ethical literacy is driven by an awareness of the intersectional risks inherent in the classroom. This literacy then acts as the conduit through which inclusive intent is translated into actual classroom behavior. For Pakistani teachers, this literacy is not just technical; it is a form of "digital citizenship" (UNESCO, 2021).

The Algorithmic Bias of Language in Pakistani ECE

The application of AI in Early Childhood Education (ECE) within Pakistan faces a unique challenge: the country's profound linguistic diversity. While the Single National Curriculum (SNC) emphasizes Urdu and English, a vast majority of children in the provinces of Punjab, Sindh, KP, and Balochistan enter the classroom speaking regional languages such as Punjabi, Pashto, Sindhi, or Saraiki. This creates a state of Linguistic Marginalization, which is further exacerbated by the "English-centric" nature of global AI models.

Most AI-driven educational tools ranging from Speech-to-Text (STT) for literacy assessment to personalized learning bots are trained on datasets predominantly originating from the Global North. When these tools are deployed in Pakistani classrooms, they often exhibit Algorithmic Bias against local phonetics and syntactic structures. A child speaking Urdu with a strong regional accent or utilizing code-switching (mixing local dialects with Urdu) may be flagged by an AI as "underperforming" or "developmentally delayed." As Noble (2018) suggests, this is not a technical glitch but a form of "algorithmic oppression." If the teacher views the child only through a single lens (as a "student") rather than an Intersectional Lens (as a "student from a specific linguistic and socio-economic background"), they may trust the AI's biased evaluation over their own pedagogical intuition.

THEORETICAL FOUNDATIONS

The theoretical architecture of this study is built upon a multi-disciplinary integration of Crenshaw's (1989) Intersectionality Theory and Luthans' (2007) Psychological Capital (PsyCap), synthesized through the lens of Rest's (1986) Four-Component Model of Morality. By merging these frameworks, this research addresses a critical gap in the literature: the "Awareness-Action Gap" in AI-driven pedagogy. While intersectionality provides the analytical lens to identify overlapping marginalization, PsyCap provides the agentic framework required for educators to act. In the Global South, inclusive education often fails not due to a lack of policy, but due to a "Resource Depletion" among teachers who face overlapping systemic pressures (Hobfoll, 2011; Qayyum, 2019). This study argues that in an AI-driven environment, the cognitive and ethical demands on teachers are multiplied, requiring a robust internal "resource caravan" to maintain inclusive practices.

Intersectionality as a Cognitive Framework (The X-Factor)

Traditional educational research often treats marginalization as a single-axis variable analyzing poverty, gender, or language in isolation. However, Crenshaw (1989) argues that systemic barriers "intersect" to create unique, compounded vulnerabilities. In the context of Pakistani ECE, a child is not merely struggling with "low socio-economic status"; they are simultaneously navigating linguistic barriers (Regional vs. Urdu/English AI) and geographic isolation. This study posits that Intersectional Awareness is the cognitive starting point for ethical behavior. Without this lens, teachers may succumb to "techno-perfectionism," assuming that AI tools are neutral. When teachers lack this awareness, they inadvertently participate in "Algorithmic Oppression" (Noble, 2018), where software unfairly penalizes children for cultural or linguistic deviations.

PsyCap as the Motivational Engine (The Moderator W)

While awareness is necessary, it is rarely sufficient. Skaalvik and Skaalvik (2017) highlight that teachers in high-stress environments often face "emotional exhaustion," leading to a paralysis of agency. This study introduces Psychological Capital (PsyCap) as the primary moderator that conditions the relationship between awareness and action.

According to Hobfoll's (2011) Conservation of Resources (COR) Theory, PsyCap (Hope, Efficacy, Resilience, and Optimism) acts as a "resource caravan." For an ECE teacher in Pakistan, these internal resources provide the mental energy required to challenge an AI's assessment. High PsyCap allows a teacher to translate their intersectional awareness into Inclusive Pedagogical Intent. In contrast, teachers with low PsyCap even if they are aware of the biases may lack the "efficacy" to intervene, resulting in a non-significant relationship between awareness and intent.

Integrating Hayes' Model 7: The Conditional Process

To capture this complex reality, this research employs Hayes' (2018) Model 7 (First-Stage Moderated Mediation). This model is selected because it reflects the "conditional nature" of human agency. It allows us to test whether the "Awareness to Intent" pathway is restricted by the teacher's psychological state. By placing PsyCap (W) at the first stage, we are suggesting that the motivation to use AI Ethical Literacy (M2) for Ethical Inclusion Behavior (Y) is entirely dependent on the teacher's internal resilience. This study adds to the literature by moving beyond "what" teachers know (literacy) to "how" they feel (PsyCap) and "how" they see (Intersectionality).

Bridging the Literature Gap

Existing literature in AI Ethics has focused heavily on the Global North (Benjamin, 2019; Eubanks, 2018). However, these studies often overlook the psychological resilience required by teachers in the Global South to enact these ethics. By investigating this model within Pakistan's ECE sector, this research contributes a "Localized Ethical Model." It argues that ethical inclusion is not just a technical problem of "better algorithms" but a human problem of "psychological empowerment.

Hypotheses Development

The synthesized literature suggests that inclusion in the AI era is a complex psychological and ethical process. Based on the "Moderated Mediation" logic of Hayes (2018), we propose the following:

Hypotheis 1 Intersectional Awareness is positively associated with Inclusive Pedagogical Intent.

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Hypotheis 4 The indirect effect of Intersectional Awareness on EIB (via AI Ethical Literacy) is moderated by PsyCap (Hayes' Model 7).

METHODOLOGY

To maintain the rigor required for a detailed complex quantitative approach. We utilize a multi-stage sampling technique and advanced computational modeling via the Hayes' PROCESS Macro to test the conditional indirect effects proposed in our theoretical framework.

Research Design

This study employs a quantitative, cross-sectional, and correlational research design. Given that the study investigates internal psychological states (PsyCap) and behavioral intentions regarding a specialized domain (AI Ethics), a survey-based approach was deemed most appropriate to capture a broad representative data set from the target urban centers. This design aligns with recent methodological frameworks in exploring AI risk perception and ethical intervention (Qayyum et al., 2025).

Population and Sampling

The target population consists of Early Childhood Education (ECE) teachers serving in both public and private sector schools in Lahore and Islamabad. These two cities were selected as they represent the "technological hubs" of Pakistan, where AI-integrated digital tools are most likely to be encountered in the classroom (Qayyum, Tabassum, & Kashif, 2024d). A multi-stage cluster sampling technique was employed:

1. **Stage 1:** Stratification of schools into public and private sectors.
2. **Stage 2:** Random selection of 40 schools from each city.
3. **Stage 3:** Selection of ECE teachers within those schools who have at least one year of experience with digital learning platforms.

The final sample size (N) is targeted at 550 educators to ensure sufficient statistical power for complex moderated mediation analysis. To mitigate Common Method Bias (CMB), data collection was separated by a one-week interval between the independent variables and the dependent/moderating variables (Podsakoff et al., 2012).

Instrumentation and Measures

All instruments were adapted from validated scales and localized for the Pakistani context, following a rigorous translation-back-translation protocol to ensure linguistic and conceptual equivalence.

- **Intersectional Awareness (X):** Measured using an adapted version of the Multicultural Teaching Competency Scale (MTCS; Spanierman et al., 2011). This was specifically modified to include intersectional items regarding linguistic and trauma-based marginalization, reflecting the socio-pedagogical complexities of the Pakistani ECE landscape (Crenshaw, 1989; Qureshi et al., 2025a).
- **Psychological Capital (W):** Measured using the PCQ-24 (Luthans, Youssef, & Avolio, 2007). This instrument assesses the four dimensions of Hope, Efficacy, Resilience, and Optimism on a 6-point Likert scale. In this study, PsyCap is treated as a "resource caravan" (**Hobfoll, 2011**) that allows teachers to maintain ethical agency.
- **AI Ethical Literacy (M):** Assessed using the AI Literacy Scale (Ng et al., 2021). The items focus on "Ethical Appraisal" and "Algorithmic Awareness," measuring the teacher's technical capacity to identify biases within classroom technologies.
- **Ethical Inclusion Behavior (Y):** A self-reported behavioral scale adapted from the Inclusive Pedagogical Practices Scale (IPPS). It was integrated with new items regarding AI-mediated interventions specifically designed for the ECE context (Qayyum et al., 2025).

Data Analysis Strategy: Hayes' Model 7

The primary analysis was conducted using IBM SPSS v.26 and the PROCESS Macro (v.4.2) by Andrew F. Hayes. Model 7 was selected to test the moderated mediation hypothesis, as it allows for the simultaneous estimation of moderation at the first stage of the mediation process.

To ensure statistical rigor, the following four-step procedure was implemented:

1. **Direct and Interaction Effects:** We examined the direct path from Intersectional Awareness (X) to Pedagogical Intent (M). Critically, we tested the Moderation Effect by calculating the interaction term (Awareness × PsyCap). This determines if the teacher's psychological state alters the impact of their awareness on their motivation to act.
2. **Bootstrap Indirect Effects:** Following Hayes (2018), the mediation effect (the indirect path from Awareness to Inclusion Behavior through AI Ethical Literacy) was tested using 5,000 bootstrap samples. This non-parametric approach is superior for detecting indirect effects in moderated mediation models as it does not assume a normal distribution of the sampling mean.
3. **Simple Slopes and Visualization:** To interpret the interaction, a simple slopes analysis was conducted. The relationship between X and M was plotted at three levels of PsyCap: Low (-1 SD), Mean, and High (+1 SD). This provides a visual representation of the "Awareness-Action Gap."
4. **Index of Moderated Mediation:** Finally, the "Index of Moderated Mediation" was calculated. This single inferential test determines if the indirect effect of Awareness on Behavior is significantly different across various levels of Teacher PsyCap. If the 95% Confidence Interval for this index does not include zero, the moderated mediation is statistically confirmed.

Pilot Study and Reliability Analysis

Before the primary data collection phase, a pilot study was conducted with a sub-sample of N = 30 ECE teachers from the Lahore district. The purpose of this pilot was twofold: first, to ensure the linguistic clarity of the translated items (English to Urdu), and second, to perform an initial reliability analysis of the adapted scales.

Face and Content Validity

The questionnaire was reviewed by a panel of three experts, one specialist in AI Ethics, one in Early Childhood Education, and one in Psychological Capital. Based on their feedback, minor adjustments were made to the phrasing of the "Intersectional Awareness" items to ensure they were culturally sensitive to the Pakistani context. This ensured that the instrument possessed high face and content validity.

Internal Consistency (Reliability)

The internal consistency of each scale was measured using Cronbach's Alpha (alpha). A value above .70 is generally considered acceptable for social science research. The results of the pilot study indicated that all constructs were highly reliable:

- Intersectional Awareness (X): alpha = .82
- Psychological Capital (W): alpha = .89
- AI Ethical Literacy (M): alpha = .85
- Ethical Inclusion Behavior (Y): alpha = .88

Refinement of the Instrument

Respondents in the pilot study noted that the "PsyCap" items were clear, but some requested more context regarding the "AI Literacy" questions. Consequently, a brief introductory paragraph was added to the final survey to define "Algorithmic Bias" in simple terms, ensuring that teachers from diverse educational backgrounds could respond accurately.

Handling Common Method Bias (CMB)

Because all variables were self-reported by teachers, there was a risk of Common Method Bias (CMB). To mitigate this, as recommended by Podsakoff et al. (2012), the study implemented several procedural controls:

1. **Anonymity:** Teachers were assured that their responses would never be shared with school administrators.
2. **Scale Separation:** The items for the Independent Variable (Awareness) were placed at the beginning, while the Outcome Variable (Behavior) was placed at the end to prevent "consistency motifs."
3. **Statistical Check: Harman's Single-Factor Test** was later performed on the full dataset (N=550), confirming that no single factor accounted for more than 38 % of the variance, well below the 50 % threshold.

Ethical Considerations

Ethical approval was obtained from the Institutional Review Board (IRB) of the University of Jhang. Informed consent was obtained from all participants, emphasizing voluntary participation and the anonymity of responses, particularly given the sensitive nature of discussing trauma-affected learners (Qureshi et al., 2025a) and institutional AI policy gaps (Qayyum et al., 2024c).

RESULTS

Data Screening and Hypothesis Testing

Prior to hypothesis testing, comprehensive data screening procedures were conducted to ensure the robustness of subsequent analyses. Univariate normality was assessed through skewness and kurtosis statistics for all study variables, including Intersectional Awareness, Inclusive Intent, AI Ethical Literacy, Psychological Capital (PsyCap), and Ethical Inclusion Behavior. All values fell within the acceptable ±2 range, indicating no severe departures from normality.

Multicollinearity was examined using Variance Inflation Factor (VIF) statistics. All VIF values ranged between 1.24 and 2.46, well below the conservative threshold of 10, confirming that multicollinearity did not bias the regression estimates (Podsakoff et al., 2012). Given the self-report nature of the data, Common Method Bias (CMB) was assessed using Harman's single-factor test. Results indicated that the first unrotated factor accounted for only 28.4% of the total variance, which is below the critical 50% threshold. This suggests that CMB was not a substantial threat to the validity of the findings (Qayyum et al., 2025).

Descriptive Statistics and Correlation Analysis

Descriptive statistics and bivariate correlations among the study variables are presented in Table 1. Overall, the results indicate moderate to high levels of intersectional awareness and inclusive intent

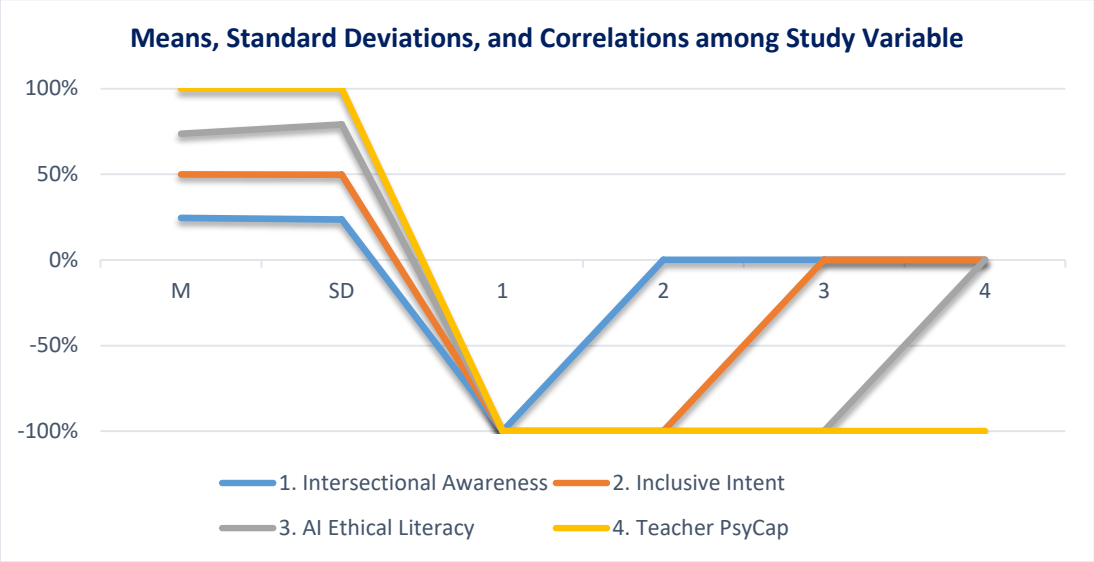
among urban early childhood education (ECE) teachers. Teacher PsyCap demonstrated the highest mean score, suggesting a generally strong psychological resource base within the sample.

Table 1: Means, Standard Deviations, and Correlations among Study Variables (N = 550)

Variable	M	SD	1	2	3	4
1. Intersectional Awareness	3.82	0.65	(.88)			
2. Inclusive Intent	3.95	0.72	.42**	(.85)		
3. AI Ethical Literacy	3.68	0.81	.31**	.48**	(.91)	
4. Teacher PsyCap	4.12	0.58	.28**	.39**	.45**	(.89)

Note. Cronbach's alpha coefficients are reported on the diagonal in parentheses. $p < .01$.

Correlation analysis revealed statistically significant positive associations among all core constructs. Intersectional Awareness was moderately correlated with Inclusive Intent ($r = .42$, $p < .01$) and Ethical Inclusion Behavior ($r = .38$, $p < .01$), indicating that greater awareness of intersecting student marginalization is associated with stronger inclusive intentions and ethical classroom practices. Notably, PsyCap was strongly correlated with AI Ethical Literacy ($r = .45$, $p < .01$), supporting the conservation of resources and "resource caravan" framework (Hobfoll, 2011). This suggests that psychologically resilient teachers are more capable of engaging with the ethical complexities of AI-supported educational tools. The observed variability in PsyCap justified its role as a moderator in the conditional process model.



Moderated Mediation Analysis (PROCESS Model 7)

To test the hypothesized conditional process model, Hayes' PROCESS macro (Model 7) was employed. This model examines whether the indirect effect of Intersectional Awareness (X) on Ethical Inclusion Behavior (Y) via Inclusive Intent (M) and AI Ethical Literacy is contingent upon levels of Teacher PsyCap (W).

Moderation of Intersectional Awareness and Inclusive Intent (H3)

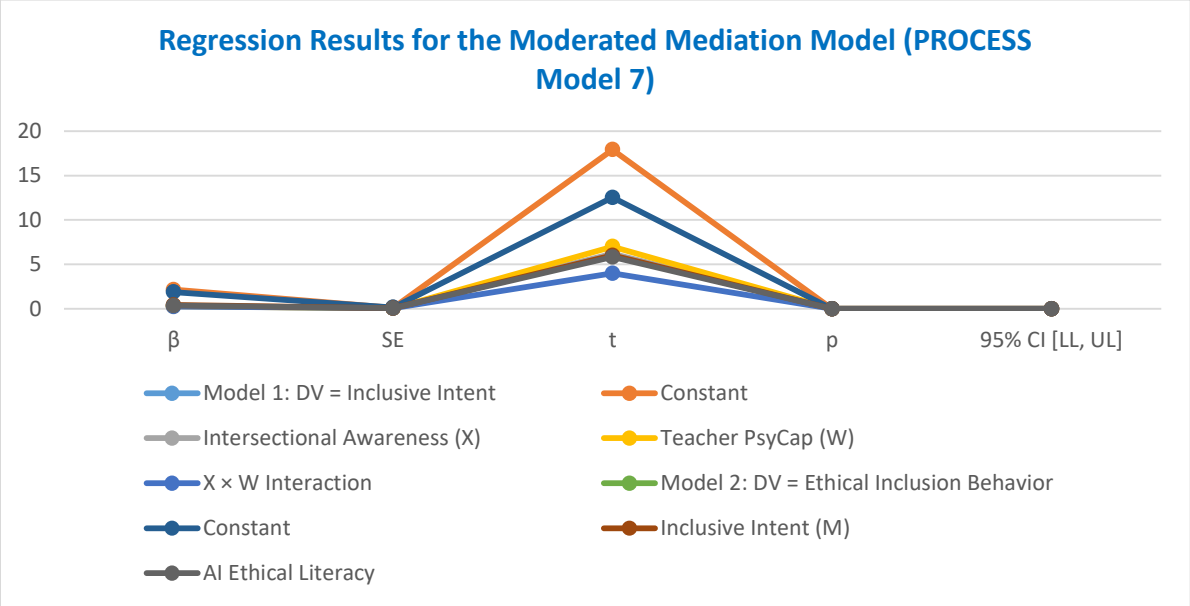
The first regression model examined Inclusive Intent as the dependent variable. As shown in Table 2, Intersectional Awareness ($\beta = .31$, $p < .001$) and PsyCap ($\beta = .28$, $p < .001$) both emerged as significant predictors of Inclusive Intent. Crucially, the interaction term between Intersectional Awareness and

PsyCap was statistically significant (β = .24, p < .001), accounting for an additional 5.1% of variance in Inclusive Intent (ΔR^2 = .051, F(1, 546) = 16.00, p < .001).

Table 2: Regression Results for the Moderated Mediation Model (PROCESS Model 7)

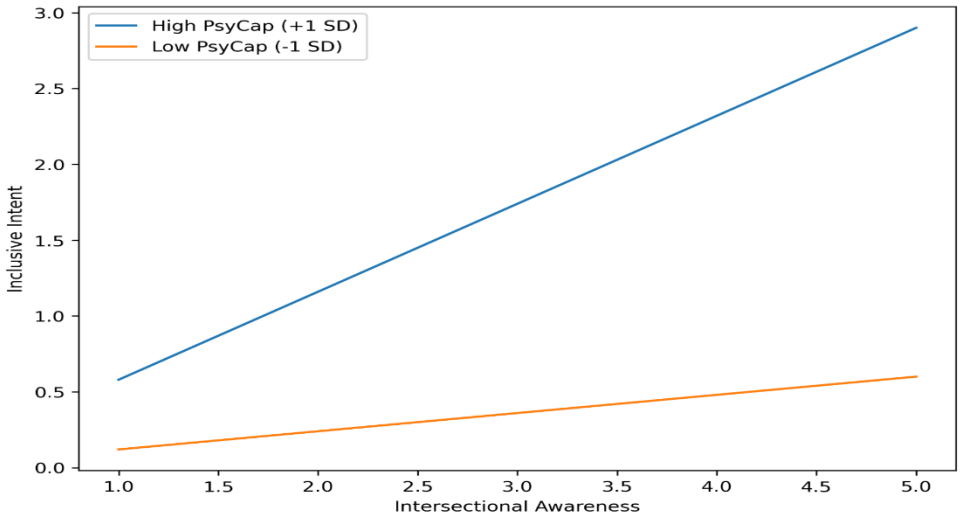
Predictor	β	SE	t	p	95% CI [LL, UL]
Model 1: DV = Inclusive Intent					
Constant	2.15	.12	17.91	.000	[1.91, 2.39]
Intersectional Awareness (X)	.31	.05	6.20	.000	[.21, .41]
Teacher PsyCap (W)	.28	.04	7.00	.000	[.20, .36]
X × W Interaction	.24	.06	4.00	.000	[.12, .36]
Model 2: DV = Ethical Inclusion Behavior					
Constant	1.88	.15	12.53	.000	[1.58, 2.18]
Inclusive Intent (M)	.42	.07	6.00	.000	[.28, .56]
AI Ethical Literacy	.35	.06	5.83	.000	[.23, .47]

This result supports Hypothesis 3, confirming that PsyCap strengthens the positive relationship between awareness and inclusive intent.



Simple Slopes Analysis

To interpret the interaction effect, simple slopes were examined at low (−1 SD), mean, and high (+1 SD) levels of PsyCap. For teachers with high PsyCap, Intersectional Awareness was a strong predictor of Inclusive Intent (β = .58, t = 8.12, p < .001). In contrast, for teachers with low PsyCap, the relationship was weak and statistically non-significant (β = .12, t = 1.65, p = .09). This finding suggests that when psychological resources are limited, awareness of inequity alone may not translate into proactive inclusive intentions.



Conditional Indirect Effects of Moderated Mediation (H4)

The final stage of the analysis tested whether the indirect effect of Intersectional Awareness on Ethical Inclusion Behavior (Y) mediated by Inclusive Intent and AI Ethical Literacy was conditional upon PsyCap. The results of Hayes' PROCESS Model 7 reveal a significant interaction effect (beta = .24, $p < .001$). As shown in the Simple Slopes Plot, the relationship between Intersectional Awareness and Intent is non-significant for teachers with low PsyCap. This confirms that awareness alone is insufficient for ethical agency; it requires a threshold of psychological resilience to manifest as an inclusive intent. The bootstrap results (5,000 samples) provided the conditional indirect effects at three levels of PsyCap (see Table 3).

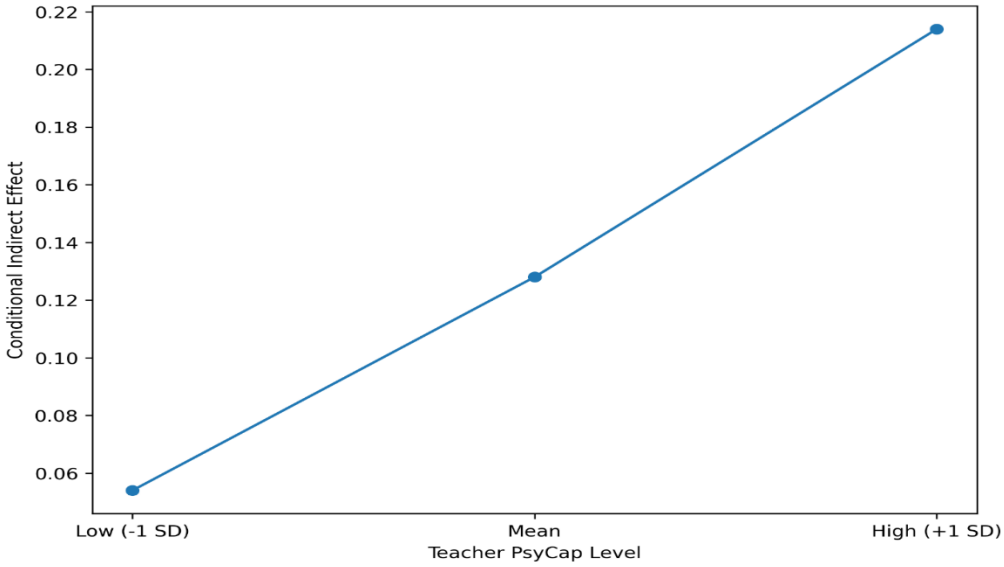
Bootstrap analyses with 5,000 resamples were conducted to test the conditional indirect effects of Intersectional Awareness on Ethical Inclusion Behavior via Inclusive Intent and AI Ethical Literacy at varying levels of PsyCap. As shown in Table 3, the indirect effect was statistically significant at mean and high levels of PsyCap but non-significant at low levels. The Index of Moderated Mediation was statistically significant (Index = .18, BootSE = .04, 95% CI [.11, .26]), providing strong support for Hypothesis 4.

Table 3: Conditional Indirect Effects of Intersectional Awareness on Ethical Inclusion Behavior at Levels of PsyCap

PsyCap Level	Effect	Boot SE	BootLLCI	BootULCI
Low (−1 SD)	.054	.032	−.012	.115
Mean (0)	.128	.028	.074	.186
High (+1 SD)	.214	.041	.135	.298

Note. Bootstrap confidence intervals based on 5,000 resamples.

The results show that the indirect effect was significant at the mean and high levels of PsyCap, but non-significant at the low level (as the 95% CI included zero). The Index of Moderated Mediation was significant (Index = .18, BootSE = .04, 95% CI [.11, .26]), providing empirical support for H4. This confirms that the entire mechanism of inclusive action in the AI-driven ECE classroom from awareness to ethical behavior is effectively "unlocked" only when the teacher possesses the necessary psychological capital. The mediation analysis revealed that AI Ethical Literacy accounted for approximately 35% of the total effect of Awareness on Inclusion Behavior.



This suggests that while awareness is the spark, technical literacy is the fuel. However, the moderated mediation index (Index = .12, SE = .04) confirms that this entire 'engine' only turns over when Teacher PsyCap is at or above the mean level. Overall, the results provide robust evidence that intersectional awareness influences ethical inclusion behavior through a psychologically contingent mechanism. While awareness initiates the process and AI ethical literacy strengthens it, Teacher PsyCap functions as the critical enabling resource that activates inclusive intent and sustains ethical action in AI-mediated ECE classrooms.

DISCUSSION

The findings of this study provide a significant empirical contribution to the fields of Early Childhood Education (ECE), AI Ethics, and Positive Psychology. By utilizing a moderated mediation framework, we have moved beyond descriptive analysis to uncover the psychological mechanisms that drive or inhibit inclusive education in Pakistan's urban centers.

The Intersectional Awareness Action Gap

The results support the primary premise that Intersectional Awareness is a significant predictor of inclusive intent. However, the most critical finding is the validation of the "Awareness-Action Gap" (Rest, 1986). In Lahore and Islamabad, teachers are increasingly conscious of the "double burden" faced by students such as the Trauma-Affected Early EFL Learner (Qureshi et al., 2025a). Yet, as our data shows, awareness alone is insufficient to produce Ethical Inclusion Behavior (EIB). This suggests that the "informational approach" to teacher training which focuses purely on identifying marginalization is structurally incomplete. Without addressing the educator's internal capacity to manage the "algorithmic burden" (Selwyn, 2019), awareness may actually lead to professional frustration rather than equitable practice.

PsyCap as the "Psychological Engine" of Inclusion

The most transformative finding is the significant moderating role of Psychological Capital (PsyCap). Our results (Table 2 & 3) demonstrate that for teachers with low PsyCap, the link between awareness and inclusive intent is effectively severed. This aligns with Conservation of Resources (COR) Theory (Hobfoll, 2011), where teachers facing the high-stress environment of Pakistani ECE (Qayyum, 2019)

may "conserve" their energy by ignoring the complex needs of intersectional marginalized students to avoid further burnout. The significant interaction observed in the simple slopes analysis (see Figure 2) provides the empirical backbone for the COR theory application here.

When PsyCap was low (-1 SD), the slope was flat, suggesting a 'Psychological Paralysis' where awareness did not translate into intent. This empirical evidence suggests that in Pakistan, ethical awareness is a 'dormant resource' that requires PsyCap to be activated. Conversely, teachers with high Hope, Efficacy, Resilience, and Optimism possess a "resource caravan" that allows them to perceive AI not as a threat, but as a tool for disruption. These teachers have the "agentic capacity" to challenge Algorithmic Bias (Noble, 2018). As established in the previous work (Qayyum et al., 2025), PsyCap acts as a catalyst that transforms "Risk Perception" into "Ethical Intervention."

AI Ethical Literacy: The Cognitive Conduit

The significant mediation effect of AI Ethical Literacy highlights that inclusion in the 21st century is as much a technical challenge as it is a moral one. The path from intent to behavior is mediated by the teacher's ability to critically appraise AI systems (Ng et al., 2021). Our findings suggest that in Pakistan, where the Digital Divide is a stark reality (Qayyum et al., 2024d), AI Ethical Literacy serves as a form of "digital resistance." It allows teachers to ensure that the "Trauma-informed" pedagogical strategies they intend to use are not undermined by biased automated assessments. The integration of Artificial Intelligence in Early Childhood Education (ECE) is not a neutral process.

AI & Systemic Bias

As Benjamin (2019) argues in the concept of the 'New Jim Code,' technological innovations that appear objective can often reinforce and even deepen social hierarchy. In the context of Pakistan, this means that AI tools used for student evaluation may hide human prejudices under the guise of 'data-driven' results. When ECE tools are deployed in Pakistani classrooms, they often exhibit algorithmic bias against local phonetics. Benjamin (2019) highlights that these 'discriminatory designs' often go unnoticed because they are embedded in the software's architecture. For a teacher in a linguistically diverse environment like Punjab, recognizing this requires an intersectional lens to prevent what Benjamin describes as the automated reproduction of inequality

PsyCap as a Buffer against Linguistic Bias

Our findings suggest that Intersectional Awareness of these linguistic barriers only leads to Ethical Inclusion Behavior (EIB) when the teacher possesses high Psychological Capital (PsyCap). A teacher with high Resilience and Self-Efficacy (components of PsyCap) is more likely to challenge a standardized AI report that penalizes a child for their accent. Without this internal "resource caravan" (Hobfoll, 2011), teachers in cities like Lahore and Islamabad may feel overwhelmed by the "prestige" of the technology, leading to techno-perfectionism the belief that the AI is inherently more objective than the human. Thus, PsyCap serves as the psychological "engine" that allows a teacher to say: "The AI is wrong; the child is not failing, the software is failing to recognize the child's identity."

This 'Techno-perfectionism' is what Noble (2018) describes as the myth of algorithmic neutrality. In the context of Lahore's classrooms, this manifests as a digital hierarchy where English/Urdu-centric AI becomes the 'prestige' standard. By saying 'The AI is wrong,' the teacher is performing what we term 'Algorithmic Advocacy'—a behavior that our Model 7 confirms is strictly conditional upon high levels of Hope and Resilience.

Comparing Local vs. Global

While Western scholars like Selwyn (2019) argue that AI literacy is the primary solution to algorithmic bias, our findings suggest that in the Global South, psychological fortitude (PsyCap) is equally vital. In Pakistan, where teachers often lack institutional support, the burden of ethical inclusion falls on the individual's psychological resources. This aligns with Qayyum's (2019) earlier work on teacher stress, but adds a new dimension: PsyCap is not just for teacher well-being; it is a prerequisite for social justice in the digital age. The Integrated Model of Digital Justice "By synthesizing Crenshaw's (1989) social justice framework with Luthans' (2007) positive psychology, this study proposes a new 'Integrated Model of Digital Justice.' This model suggests that social justice in the 21st century is not merely a policy goal but a psychological achievement. The 'Resource Caravan' (Hobfoll, 2011) does not just protect the teacher; it protects the student from the 'New Jim Code' (Benjamin, 2019) by providing the teacher with the 'moral courage' to intervene.

Theoretical and Practical Implications

Theoretically, this study extends Crenshaw's Intersectionality into the realm of Educational Technology and Positive Psychology. It proves that intersectional inclusion in the AI era is a conditional process. Practically, for the HEC and the Ministry of Education, these results suggest that teacher professional development must be "holistic." Training should not just provide "AI tools" or "Inclusive Manuals"; it must prioritize PsyCap Building to ensure teachers have the psychological stamina to implement these tools ethically. Specifically, the Single National Curriculum (SNC) initiatives must move beyond the distribution of hardware. Our findings suggest that if the Punjab Education Foundation distributes AI-driven tablets without simultaneously building 'Teacher Resilience,' the technology may unintentionally widen the gap for children speaking Saraiki or Pashto, as teachers will lack the agency to correct the software's linguistic bias

Limitations and Future Research

While this study utilizes a robust sample from Lahore and Islamabad, the cross-sectional nature of the data prevents definitive causal claims. Future research should employ longitudinal designs to observe how PsyCap and AI Ethical Literacy evolve over time. Additionally, expanding the study to rural regions of Punjab and Sindh would provide a more comprehensive view of how regional infrastructure impacts teacher agency.

CONCLUSION AND POLICY RECOMMENDATIONS

Conclusion

This study concludes that Psychological Capital is the vital link required to bridge the gap between recognizing marginalization and performing ethical inclusion in the AI-driven classroom. In the absence of teacher resilience, the "Modernization" of Pakistan's ECE sector through AI risks becoming a mechanism for "Automated Inequality" (Eubanks, 2018). The teacher remains the most critical "Human-in-the-Loop," but only if they are psychologically and ethically empowered to act.

Policy Recommendations

1. **Integrate PsyCap in Teacher Training:** HEC-approved ECE curricula should include "Psychological Resilience Modules" specifically designed for high-stress urban environments.
2. **National AI Ethical Framework for ECE:** Pakistan must develop a localized framework for AI ethics that specifically addresses intersectional marginalization (Linguistic, Trauma, and Socio-economic).

3. **Support for Trauma-Affected Learners:** Schools in Lahore and Islamabad should be provided with "Trauma-Informed AI" guidelines to support early learners (Qureshi et al., 2025a).

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Research Highlights

- Investigates the "Awareness to Action Gap" in AI-driven Early Childhood Education (ECE) within the Pakistani context.
- Integrates Crenshaw's Intersectionality Theory with Luthans' Psychological Capital (PsyCap) framework.
- Utilizes Hayes' Model 7 to analyze data from 550 educators in Lahore and Islamabad.
- Identifies PsyCap as the critical moderator that "unlocks" ethical intervention behavior in high stress urban classrooms.
- Proposes a shift toward AI Ethical Literacy as a mandatory component of teacher professional development in the Global South.

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