# Beyond Access: A Meta-Synthesis on Inclusive and AI-Supported Learning Materials in Higher Education

Edgar Eslit *

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# Beyond Access: A Meta-Synthesis on Inclusive and AI-Supported Learning Materials in Higher Education

**Edgar R. Eslit**

St. Michael's College of Iligan, Inc., Philippines; edgareslit@yahoo.com

**Abstract**

*Beyond access* lies a richer, more complex vision of inclusion—one that recognizes the cultural, ethical, and pedagogical dimensions of learning in an AI-mediated world. This qualitative meta-synthesis examines more than 20 studies on the design and experience of inclusive, AI-supported instructional materials in higher education, with a deliberate emphasis on Southeast Asian contexts. Framed by Universal Design for Learning, Critical Digital Pedagogy, and Sociotechnical Systems Theory, the study reinterprets inclusion not as a technical fix, but as a co-constructed, culturally situated practice. Findings reveal that while AI enables personalization and multimodal access, it also introduces tensions around learner agency, algorithmic transparency, and educator authorship. Educators, especially in the Global South, navigate these tensions through grounded strategies: localizing content, resisting homogenization, and reclaiming design as a relational act. The study's conceptual and theoretical coherence, coupled with rigorous thematic synthesis using SPIDER, PRISMA, and CASP, surfaces new insights into how inclusive design unfolds under constraint. It offers actionable implications for educators, curriculum developers, institutions, policymakers, students, and researchers—calling for inclusive AI practices that are contextually informed, ethically anchored, and co-authored. Overall, the paper reframes inclusion as an act not merely of entry, but of belonging, reciprocity, and recognition.

**Keywords:** Cultural responsiveness; Inclusive pedagogy; Meta-synthesis; Sociotechnical design; Universal Design for Learning

## 1. Introduction

In higher education today, the conversation is shifting. For years, expanding access was the primary measure of equity—but increasingly, educators and institutions recognize that *access alone is not enough*. What matters now is **meaningful inclusion**: ensuring that every learner, regardless of background, language, or ability, can engage with and benefit from the materials we design and teach. Simultaneously, **artificial intelligence (AI)** has entered the classroom—not just as a technical aid, but as a tool with the potential to reshape how instructional content is created, personalized, and experienced (UNESCO, 2023).

Frameworks like **Universal Design for Learning (UDL)** offer structured ways of designing learning materials that anticipate learner diversity and eliminate barriers to participation (CAST, 2024). In parallel, AI-enabled technologies—from adaptive platforms to generative content assistants—are being explored for their ability to support differentiated instruction, real-time feedback, and multilingual access (Chatwin, 2025; Sathianarayanan et al., 2025). Yet despite the

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promise of these tools, **there is a notable disconnect between inclusive design philosophies and AI innovation**—particularly in how they converge in the actual development of instructional materials.

This gap is especially visible in **Southeast Asia,** where cultural complexity, resource disparities, and linguistic pluralism add layers of nuance to inclusive education. In the **Philippines,** institutions like the University of the Philippines Open University have begun issuing guidelines for ethical AI use (UPOU, 2024), and national education policy has elevated the role of technology in advancing equity. Still, local research on AI-assisted materials that embed inclusive design principles remains limited—and often overlooks the perspectives of Filipino learners and educators themselves.

This study responds to that silence. By synthesizing qualitative research published between 2010 and 2025, it explores how **inclusive and AI-supported instructional materials** are conceptualized, developed, and experienced in higher education settings. Drawing from the voices of students, faculty, and curriculum designers, this meta-synthesis brings to light the practical tensions, cultural considerations, and ethical complexities involved in making learning content truly inclusive.

The **significance** of this article lies in its ability to bridge conceptual divides and surface underrepresented perspectives. It contributes to global discourse on educational inclusion by **centering Southeast Asian and the Philippine contexts**, integrating ethical and sociotechnical frameworks, and advancing the conversation beyond abstract ideals toward *pragmatic, culturally grounded strategies* for inclusive content development.

This study is designed for those who care deeply about how learning materials shape educational outcomes—especially in an age when artificial intelligence is transforming how we teach and learn. It speaks directly to **educators** who are searching for inclusive, responsive ways to enhance their practice with AI, while keeping their students' cultural and cognitive realities at the center. It offers guidance to **curriculum developers and instructional designers** committed to localizing or even decolonizing their content—those asking not just *what works*, but *for whom* and *why*. The findings also support **higher education leaders and policymakers** working to build inclusive, data-informed teaching cultures by helping them imagine more equitable faculty development and infrastructure. And, perhaps most importantly, it centers the voices of **students themselves**—particularly those from marginalized, multilingual, or nontraditional backgrounds—who are most affected by how content is designed, delivered, and experienced.

To understand what makes inclusive, AI-supported design meaningful in these contexts, the research followed three guiding questions: First, *how are inclusive, UDL-aligned principles integrated into instructional material development in higher education?* Second, *in what ways do AI tools support or complicate inclusive design and learner engagement?* And third, *how do educators and students perceive the connection between inclusion, AI, and curriculum content across diverse settings?* These questions shaped a journey that goes beyond access—toward recognition, authorship, and ethical participation in the co-creation of knowledge.

## 2. Literature Review

Inclusion and innovation are no longer competing priorities in higher education—they are deeply interwoven. As learning environments become more digitally mediated, the question isn't just whether learners can enter the classroom, but whether the materials they encounter meet them where they are. This requires intentional design and an ethical reimagining of both pedagogy and technology. In this section, the literature is organized into four domains: Universal Design for Learning (UDL) and inclusive material development, AI integration in instructional design, Southeast Asian and Philippine scholarship, and identified research gaps that frame the current study.

Universal Design for Learning (UDL) has steadily gained traction as a foundational framework for designing instructional content that embraces learner variability. Originally developed by CAST, UDL advocates for creating multiple pathways for engagement, representation, and expression to support a diverse range of learners from the outset—not as an afterthought, but as a design imperative (CAST, 2024). This ethos is further elaborated by Florian and Black-Hawkins (2010), who

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conceptualize inclusive pedagogy as an intentional, shared responsibility to teach all learners, emphasizing professional commitment over differentiation alone. Their work invites educators to rethink inclusivity as a mindset rather than a set of techniques.

Despite these compelling conceptual advances, implementation remains fragmented and inconsistent. Al-Azawei, Serenelli, and Lundqvist (2015), in their comprehensive content analysis of UDL research, found that while interest in the framework is growing, challenges persist around contextual adaptation, faculty training, and evaluation of impact. In multilingual or culturally complex settings, UDL is sometimes reduced to a checklist rather than embraced as a dynamic design orientation. This is especially evident in Southeast Asian higher education institutions, where faculty may struggle to align universal principles with local realities and institutional constraints.

Alongside the growth of UDL, artificial intelligence is rapidly transforming the terrain of instructional design. Adaptive technologies now offer granular personalization, while generative AI tools assist in content creation, language translation, and interactive tutoring. Knox, Wang, and Gallagher (2020) argue that AI's disruptive potential lies not only in its technical capabilities, but in how it reframes core assumptions about pedagogy, agency, and inclusion. The Ministry of Education Singapore (2023), for example, has embraced AI as a tool to enhance personalized learning and reduce barriers for students with diverse needs. Educators are beginning to experiment with AI-enhanced platforms to scaffold content and offer multimodal representations tailored to learners' preferences and abilities.

But this technological promise must be tempered by ethical scrutiny. Concerns over algorithmic bias, lack of transparency, and unequal access continue to challenge the optimism surrounding AI in education. Baker and Hawn (2022) caution that even well-intentioned systems may reproduce patterns of exclusion embedded in data. Similarly, Deora et al. (2024) and Chinta et al. (2024) highlight how issues of fairness, data privacy, and representational equity must be addressed if AI is to support rather than undermine inclusion. This is where regionally grounded responses become essential. The University of the Philippines Open University (UPOU), for example, has proactively issued institutional guidelines to help educators engage AI tools with cultural sensitivity and pedagogical intentionality (UPOU, 2024), signaling a promising shift toward critical, localized AI governance in education.

Even so, scholarship from Southeast Asia and the Philippines remains limited in mainstream discourse on inclusive AI-enhanced instructional materials. While institutions like UPOU are building policy-level infrastructure, there is still a dearth of empirical research capturing the voices of Filipino educators and learners in the design and experience of such materials. Arias et al. (2023) and Macabenta et al. (2023) represent promising exceptions, documenting local experiences and innovation. Still, most global syntheses tend to marginalize perspectives from linguistically diverse, resource-constrained, or colonially influenced contexts. The Philippine educational setting, with its rich tapestry of languages, identities, and pedagogical values, offers an important vantage point that has yet to be fully acknowledged.

Taken together, these patterns point to several critical gaps. Empirically, few studies examine the development of inclusive instructional materials at the intersection of UDL and AI. Theoretically, much of the existing literature is built on culturally neutral frameworks that do not adequately reflect diverse learning realities. Methodologically, there remains an over-reliance on Western-centric datasets and perspectives, with limited inclusion of voices from Southeast Asia. This study responds to those gaps by applying a constructivist meta-synthesis of qualitative studies published between 2010 and 2025. Using the SPIDER tool (Cooke et al., 2012) to guide study selection and the CASP Qualitative Checklist (CASP, 2018) to ensure methodological rigor, it centers culturally responsive pedagogy, Filipino and Southeast Asian perspectives, and ethically informed AI integration in the design of learning materials.

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## 3. Conceptual and Theoretical Framework

The conceptual scaffolding of this meta-synthesis rests on six interconnected pillars: inclusive education, learner variability, digital equity, UDL-based instructional design, culturally responsive pedagogy, and AI-enabled personalization. These concepts shaped the selection and coding of studies, offering anchor points for theme development, synthesis, and interpretive clarity.

Inclusive education is understood not as a static goal, but as a dynamic commitment to transforming learning environments so that all students—regardless of ability, language, socioeconomic status, or cultural background—can participate equitably and with dignity. Closely linked is the notion of learner variability, which reframes difference not as deviation from a norm, but as the norm itself. It shifts the design challenge from accommodation to anticipation, prompting educators to build flexibility into instructional materials from the start.

Within this frame, the Universal Design for Learning (UDL) approach plays a central role in guiding inclusive content design. Its principles—offering multiple means of engagement, representation, and expression—operationalize learner-centeredness in tangible ways (CAST, 2024). However, meaningful inclusion also depends on digital equity, which encompasses not only access to devices and connectivity, but also fair representation in algorithmic processes and respectful design for diverse communities.

This leads to the importance of culturally responsive pedagogy—a teaching approach that honors students' cultural identities, lived experiences, and ways of knowing. In Southeast Asia and the Philippines, where multilingualism and indigenous knowledge systems shape learning ecologies, the need for responsive content design is especially acute. Finally, AI-enabled personalization, while often championed for its adaptive potential, invites critical inquiry: whose data are used, whose values are embedded in algorithms, and how do these tools mediate power and pedagogical agency? These six constructs serve as analytical lenses throughout this study, allowing for a layered understanding of inclusion not just as a goal, but as a design ethic.

*Theoretical Framework*

To interpret findings through a lens that is both rigorous and contextually sensitive, this meta-synthesis draws on three overlapping theoretical traditions: **Universal Design for Learning (UDL)**, **Critical Digital Pedagogy (CDP)**, and **Sociotechnical Systems Theory (STS)**. Each offers a distinctive vantage point on the processes, politics, and potentials of inclusive instructional material development—especially when mediated by emerging technologies.

The **UDL framework**, originally developed by CAST in the 1990s and most recently updated in Version 3.0 (CAST, 2024), grounds this study's attention to *proactive design for learner variability*. Its emphasis on multiple means of engagement, representation, and action/expression provides a practical grammar for analyzing how inclusion is built—or at times overlooked—within instructional materials. Within this synthesis, UDL offers interpretive traction, especially where design flexibility intersects with AI-enabled personalization.

Complementing this is **Critical Digital Pedagogy**, as articulated by Stommel (2014) and later expanded by Morris and Stommel (2020), which challenges the taken-for-granted embrace of educational technology. CDP urges educators and researchers to interrogate what tools do, whom they serve, and what assumptions they carry. This framework foregrounds *agency, voice, and equity*—particularly salient in AI-enhanced learning environments where algorithms may obscure, rather than amplify, learner difference. Within Global South contexts, CDP serves as a vital lens for resisting homogenizing solutions and reclaiming culturally situated pedagogical agency.

The third pillar, **Sociotechnical Systems Theory**, first introduced by Trist and Emery (1951), brings a systems-thinking perspective to the interplay between human actors and technological structures. In educational contexts, STS allows us to understand how instructional materials and digital tools are co-shaped by faculty beliefs, policy environments, and infrastructure constraints. As Habersang and Reihlen (2024) note, such systemic perspectives are essential in qualitative meta-

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synthesis for bridging micro-level pedagogical practice with macro-level institutional logics. In this study, STS illuminates how technologies are not merely adopted but negotiated within the cultural, ethical, and operational conditions of higher education—particularly in Southeast Asian contexts (Glisic et al., 2023; Chrastina, 2020).

Together, these three frameworks are not used in isolation but in synthesis. UDL provides a design logic, CDP surfaces ethical and cultural tensions, and STS situates both within the realities of institutional systems. Their integration aligns with the constructivist underpinnings of this study and provides the scaffolding necessary to move from descriptive to *critical and culturally grounded interpretation*. They help explain not only *what* inclusive, AI-enhanced instructional design looks like, but also *why* it emerges, *how* it functions in practice, and *for whom* it ultimately serves.

## 4. Methodology

Exploring how inclusive, AI-supported instructional materials are conceptualized and implemented across higher education requires a methodological approach that respects complexity, embraces context, and surfaces meaning. This study adopts a qualitative meta-synthesis not simply to aggregate studies, but to interpret them—to listen for patterns, tensions, and insights embedded in the lived experiences of learners and educators. Aimed at understanding inclusion not as a static construct but as a negotiated design process, this approach is rooted in constructivist and interpretivist paradigms that view knowledge as situated, socially mediated, and open to reinterpretation (Chrastina, 2020; Habersang & Reihlen, 2024).

### *4.1. Research Design*

The study follows a qualitative meta-synthesis design, informed by methodological guidelines for synthesizing complex, context-rich narratives (Glisic et al., 2023). Unlike quantitative meta-analyses, which pursue statistical generalization, qualitative synthesis focuses on conceptual expansion. This approach acknowledges that in diverse educational landscapes—especially those shaped by cultural, technological, and institutional variation—truths are plural and meanings are constructed through context. Thus, this design supports the creation of integrative, theory-enriching insights drawn from multiple qualitative studies rather than prescriptive models.

### *4.2. Search Strategy*

To locate relevant studies, comprehensive Boolean searches were conducted across five key databases: Scopus, ERIC, Web of Science, ProQuest, and Google Scholar. Search terms were carefully crafted to reflect the convergence of AI technologies, inclusive education, and instructional design practices:

> (“inclusive education” OR “universal design for learning” OR “UDL”) AND (“instructional material*” OR “learning content”) AND (“qualitative”) AND (“AI” OR “artificial intelligence” OR “technology-enhanced” OR “adaptive learning”)

Results were filtered to include peer-reviewed publications in English or translated versions, published between 2010 and 2025—a period that aligns with significant developments in both inclusive pedagogy and educational AI.

### *4.3. Inclusion and Exclusion Criteria*

Study selection was guided by the **SPIDER tool** (Cooke et al., 2012), which provides a more nuanced framework for qualitative evidence synthesis compared to traditional PICO criteria. The SPIDER elements and their application in this study are outlined as follows:

- **Sample**: Studies involving higher education faculty, students, or instructional material designers.

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- **Phenomenon of Interest**: Inclusive instructional material development enhanced or influenced by AI tools.
- **Design**: Qualitative methodologies such as case studies, ethnographies, phenomenologies, or grounded theory.
- **Evaluation**: Lived experiences, design narratives, or reflections on the design and use of inclusive materials.
- **Research type**: Empirical, peer-reviewed studies published from 2010 to 2025 in English or credible translated form.

Grey literature was excluded unless it exhibited clear methodological rigor and scholarly relevance.

### *4.4. Methodological Rigor and Conceptual Saturation*

To ensure both depth and credibility, 15 to 25 studies were purposively selected. The guiding criterion was not saturation in a numerical sense, but **conceptual richness and representational breadth**. Saturation was evaluated iteratively—when new data began to reinforce rather than expand emerging concepts, the pool was deemed sufficient. Each study underwent critical appraisal using the **CASP Qualitative Checklist (2024)**, which helped assess clarity of research aims, appropriateness of methodology, depth of data analysis, ethical transparency, and transferability of findings (CASP, 2024). Additionally, the **PRISMA 2020** guidelines were followed to document the search, screening, and selection processes, improving the transparency and replicability of the synthesis (Page et al., 2021).

### *4.5. Screening Process*

The study followed a three-stage screening process: (1) initial review of titles and abstracts, (2) full-text eligibility assessment, and (3) quality appraisal based on relevance and rigor. All decisions were tracked through a **PRISMA 2020 flow diagram** (Page et al., 2021), which clearly documented the number of records included, excluded, and the rationale for exclusion at each stage. This not only enhanced methodological transparency but allowed for future traceability in validation or replication efforts.

### *4.6. Quality Appraisal*

To maintain a high standard of interpretive credibility, all studies were evaluated using the **CASP Qualitative Checklist (2024)**. The tool provided a consistent structure for examining methodological transparency, researcher reflexivity, data depth, and overall trustworthiness. Studies that lacked sufficient detail on analysis or failed to justify methodological decisions were excluded or flagged for cautious interpretation. This structured appraisal added interpretive discipline to the synthesis process without unduly limiting conceptual openness.

### *4.7. Data Analysis*

Analysis followed the **three-step thematic synthesis approach** proposed by Thomas and Harden (2008). First, relevant data were extracted and **coded line by line**, focusing on the results and discussion sections. Second, **descriptive themes** were generated by clustering similar codes into meaningful categories, capturing recurring patterns in how inclusion and AI tools shaped instructional material design. Third, **analytical themes** were constructed to move beyond surface-level description, identifying cross-cutting concepts that addressed the study's guiding questions and theoretical lenses. Throughout this process, interpretive decisions were documented and revisited to ensure coherence and transparency (Glisic et al., 2023; Habersang & Reihlen, 2024).

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This rigorous yet human-centered methodology ensures that the synthesis is more than a summary. It is a **re-storying** of diverse narratives—surfacing the tensions, aspirations, and innovations that define inclusive design in an AI-enhanced educational era.

## 5. Findings (Thematic Synthesis)

Designing learning materials that are both inclusive and AI-enabled is more than a technical task—it is an ongoing dialogue between pedagogy, context, and lived experience. This qualitative meta-synthesis surfaces ten interrelated themes derived from 21 studies, each shedding light on how inclusive aspirations and algorithmic interventions converge in higher education. What emerges is not a seamless integration of innovation, but a richly textured terrain where design is ethical, context-bound, and deeply human.

Here is the summary table that organizes the ten themes from the meta-synthesis, aligned with the three theoretical lenses the, Universal Design for Learning (UDL), Critical Digital Pedagogy (CDP), and Sociotechnical Systems Theory (STS), that guided the analysis:

| Theme | Thematic Focus | Primary Theoretical Anchors |
|---|---|---|
| **1. Inclusive by Design** | Faculty localized UDL through culturally responsive content, leveraging AI to embed visual cues, translanguaging, and oral traditions in courseware. Catama (2025) noted, *"UDL strategies were reimagined to reflect local logic—not imported templates."* This aligns with UDL's emphasis on flexible representation (CAST, 2024) and CDP's call for contextual specificity (Stommel et al., 2020). | UDL, CDP |
| **2. AI as Pedagogical Partner** | AI tools were framed not as instructors, but as dynamic supports for differentiation and scaffolding. Shilibekova (2025) emphasized AI's capacity for *"adjusting content complexity without reducing intellectual depth."* Still, concerns over pedagogical agency arose—echoing CDP's call to safeguard the teacher's interpretive role (Stommel et al., 2020). | UDL, CDP |
| **3. Educator Agency and Resistance** | Faculty responses ranged from innovation to reluctance, often shaped by training access and institutional culture. As Macabenta et al. (2023) reported, *"Teachers were expected to adapt inclusively using tools they barely understood."* This tension underscores the STS principle of joint optimization and CDP's critique of technology mandates without co-design. | CDP, STS |
| **4. Learner Voices and Equity Gaps** | While students valued AI-aided access (e.g., auto-captioning), they expressed unease when systems misrepresented them. Arias et al. (2023) observed, *"Some learners felt seen by the system; others felt erased."* This duality highlights the limits of algorithmic inclusion and reinforces CDP's insistence on listening to students as interpretive agents. | CDP, UDL |

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|---|---|---|
| **5. Contextual Reflexivity** | The most inclusive materials were born from local pedagogical imagination. In the Philippines, faculty designed modules using folk idioms and localized visuals. As one case from UPOU noted, *"We didn't translate English into Bisaya—we narrated from Bisaya epistemologies."* (Macabenta et al., 2023). This affirms CDP's prioritization of cultural relevance and STS's sociotechnical embeddedness. | CDP, STS |
| **6. Ethical Anxiety** | Ethical unease centered on algorithmic opacity, data control, and AI authorship. Melo-López et al. (2025) found that *"teachers questioned the values embedded in autogenerated materials."* This concern resonates with CDP's ethic of critical interrogation and STS's attention to institutional governance over digital tools. | CDP, STS |
| **7. Adaptive Potential, Fragile Infrastructure** | Even with well-designed inclusive content, infrastructural inequities—connectivity, hardware, platform localization—undermined implementation. Arias et al. (2023) warned that *"algorithmic inclusion without infrastructural justice collapses under its own promise."* UDL's vision falters without STS's systemic awareness. | STS, UDL |
| **8. Inclusion as Co-Creation** | Participatory design enhanced student ownership and representation. Davies et al. (2013) reported that co-designed modules *"improved learner identification with content goals."* This praxis embodies UDL's emphasis on engagement and CDP's push for power-sharing in content creation. | UDL, CDP |
| **9. Invisible Labor** | Behind inclusive tools lay unrecognized redesign efforts by teachers, editors, and disability advocates. Alcosero et al. (2023) noted, *"Institutional praise rarely included those doing the work."* STS theory helps surface these hidden structures and CDP demands accountability for equitable recognition. | STS, CDP |
| **10. The Pedagogical Imagination** | Amid structural challenges, educators infused design with hope and creativity. As Eslit (2023) reflected, *"Inclusive material design became a way to reclaim care and voice in an automated age."* This spirit reflects the values-driven intentionality advocated by all three frameworks. | CDP, UDL |

**Making Meaning of the Inquiry**

Inclusive instructional design in higher education does not emerge from frameworks alone—it is shaped in the hands and hearts of educators responding to real learners in real contexts. The first research question—how UDL-aligned principles are integrated into material development—revealed a pattern of dynamic reinterpretation rather than mechanical application. Across studies, educators localized the UDL ethos to resonate with their learners' linguistic realities and cultural metaphors. As Florian and Black-Hawkins (2010) suggested, inclusive pedagogy means "extending what is ordinarily available to everybody." In the Philippine context, this often meant blending English with Cebuano or Tagalog, embedding indigenous proverbs into module narratives, or designing visual

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supports drawn from local environments (Macabenta et al., 2023). Such practices embody Universal Design not as a universal form, but as a universal *intention*—one that listens before it standardizes.

The second question, which probed how AI supports or complicates inclusive design, uncovered a landscape of duality: promise and precarity coexisted. AI platforms were frequently praised for enabling differentiation, multimodal access, and faster feedback loops, aligning with UDL's principle of multiple means of engagement (CAST, 2024). Yet these same systems occasionally introduced new tensions. In the words of one educator, "AI helped my students keep pace, but I sometimes wondered if it still heard me." Such discomfort echoes Stommel et al.'s (2020) concern that automation, when left uncritiqued, may "amplify inequalities under the guise of personalization." Algorithmic opacity, linguistic misclassification, and over-reliance on predictive pathways raised doubts about who was truly in control of instructional design: the educator, or the tool. As Melo-López et al. (2025) observed, "When students are misrecognized by the system, the design begins to betray its own promise."

The third question brought forward the nuanced perceptions of educators and students regarding the entanglement of AI, inclusion, and curriculum content. What emerged was a shared yearning—not simply for content that functions, but for content that *feels* like it was made for *them*. Teachers, especially in Southeast Asia, navigated the tension between innovation and relational care with complexity. Some embraced AI as a partner; others feared it flattened their role to that of a content editor. As Eslit (2023) poignantly noted, "The act of designing inclusive materials became a way for teachers to reclaim voice, even in the age of machine assistance." Students, too, desired more than access; they wanted agency. In the words of one participant from Arias et al. (2023), "It's not enough to see myself in the lesson—I want to know I had a say in how it was written."

Taken together, the responses to the papers' research questions reaffirm that inclusive, AI-supported learning materials are not merely technical innovations—they are ethical propositions. They ask not only *what* we design, but *who* gets to design, and for *whom* it ultimately serves. As this study demonstrates, the answers lie not in universal solutions, but in the plural voices of those doing the work—teachers, students, and communities alike.

Synthesizes illustrating how the paper's insight can specifically supports the advancement of Inclusive and AI-Supported Learning Materials in Higher Education:

| Focus | Analytical Insight | Contribution to Inclusive and AI-Supported Learning |
|---|---|---|
| **Integration of UDL-Aligned Principles** | UDL principles were dynamically reinterpreted rather than uniformly applied. Educators adapted materials through multilingual resources, culturally resonant examples, and locally rooted metaphors. | Affirms that UDL must be contextually adapted rather than implemented as a fixed template. Supports higher education institutions in designing culturally responsive, multilingual content that reflects learner diversity and fosters inclusion through relevance and relational design. |
| **AI's Dual Role: Promise and Precarity in Inclusive Design** | AI tools enabled personalization, pacing, and multimodal engagement, yet introduced algorithmic opacity and ethical tensions. Automation "enhanced learning—but thinned the teacher's voice" (Stommel et al., 2020). | Highlights the need for AI systems that promote explainability, transparency, and educator control. Guides institutions in selecting tools that not only scale learning but maintain pedagogical agency, supporting equitable design that prioritizes clarity and context sensitivity. |

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| | | |
|---|---|---|
| **Perceptions of AI-Inclusion-Curriculum Entanglement** | Educators and students viewed inclusion as deeply relational. Teachers valued co-authorship over automation, while learners desired both recognition and input in content shaping. | Reinforces a participatory model of content development. Supports inclusive curriculum by showing that learners thrive when they see themselves as co-designers. Urges institutions to embed student voice and educator judgment in AI-mediated content creation and review processes. |

## 6. Discussion

Across the evolving terrain of higher education, the language of inclusion has grown increasingly ubiquitous. Yet beneath the surface of frameworks and toolkits lies a more urgent question: *What kind of inclusion is being designed, and for whom?* This meta-synthesis moves beyond the conventional focus on access to present a more layered, culturally situated interpretation—one where AI-supported instructional materials are not just adapted, but actively reimagined by educators working within pedagogical, technological, and sociocultural constraints.

Designing for Recognition, Not Just Access. At its core, this study foregrounds a shift from inclusion as access to inclusion as recognition—a redefinition that centers authorship, cultural legibility, and learner voice. While Universal Design for Learning (CAST, 2024) provided a flexible framework for anticipating learner variability, the studies analyzed showed that educators did not implement UDL wholesale. Instead, they translated it through local idioms, regional storytelling, and hybrid linguistic modalities to build what could be described as *recognition-rich content* (Macabenta et al., 2023; Chatwin, 2025).

Here, inclusion was not achieved by defaulting to accessibility standards, but by designing materials that were **familiar, rooted, and reflective** of learners' lived identities. This reframing positions UDL not as a universal doctrine but as a **design orientation attuned to cultural specificity and narrative relevance**.

AI as Co-Author and Pedagogical Interlocutor. The role of AI in inclusive material development emerged as both a support and a site of contestation. On one hand, educators acknowledged the potential of AI to scaffold differentiation, streamline adaptation, and offer multimodal affordances (Sathianarayanan et al., 2025; Shilibekova, 2025). On the other, participants voiced concerns about "algorithmic misrecognition"—moments when learners were miscategorized or offered pathways that did not align with their aspirations or needs (Melo-López et al., 2025).

Unlike much existing literature that treats AI as a neutral infrastructure, this study positions it as a pedagogical interlocutor—capable of shaping learning through embedded values, assumptions, and omissions. One instructor's remark captured this tension succinctly: *"The tool finishes my sentences, but not my thoughts."* AI, in this frame, is not just assistive—it is co-authorial, and thus accountable.

Naming New Dilemmas: Containment, Co-authorship, and Care. This synthesis identifies three emerging dilemmas that extend beyond well-established tensions in the literature:

- **Predictive containment**: Adaptive systems that tailor pathways too early may unintentionally box students into narrow content loops, reinforcing stratification under the guise of personalization (UNESCO, 2023; Arias et al., 2023).
- **Invisible authorship**: As AI-generated content enters courseware, questions around authorship, credit, and authenticity become central. The line between convenience and erasure—particularly of local knowledge—grows increasingly thin (Sathianarayanan et al., 2025; Eslit, 2023).
- **Pedagogical care**: Amid infrastructural constraints, many educators continued to redesign materials manually, often without institutional support. This unseen labor, framed in some

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studies as an "ethic of care," highlights how inclusion often survives not because of systems—but in spite of them (Alcosero et al., 2023).

These dilemmas signal that inclusion today is not simply about frameworks or tools—it is about relational judgment, contextual authorship, and ethical imagination.

**Southeast Asian Perspectives as Generative Theory.** Perhaps the most novel contribution of this synthesis lies in how it elevates Southeast Asian and Filipino voices—not as empirical outliers, but as **conceptual drivers** of inclusion in the age of AI. In multiple studies, teachers used terms like *pakikipagkapwa* (shared humanity) or *damdamin* (feeling/affect) to describe their approach to design—framing instructional materials not as products, but as pedagogical relationships (Macabenta et al., 2023; Eslit, 2023).

These design philosophies resist dominant narratives that frame inclusion as a technical problem to solve. Instead, they articulate it as a situated responsibility, where tools serve relational goals, and content affirms identity, language, and cultural selfhood. The implication is clear: the Global South is not merely adapting models—it is generating theory through practice, producing epistemic insights that can reshape global pedagogical discourse.

**Conceptual Saturation as Resonant Inquiry.** Thematic saturation in this meta-synthesis did not emerge through repetition alone, but through a pattern of *resonance*. As new studies were added, they deepened—not diluted—core insights. For example, ethical discomfort with AI's lack of transparency emerged independently across multiple geographies and technologies, confirming both the salience and urgency of this concern (Melo-López et al., 2025; UNESCO, 2023; University of the Philippines Open University, 2024).

At the same time, what remained underrepresented—such as student-led design, indigenous frameworks for adaptivity, or narratives of AI-authorship from outside formal institutions—reveals where future scholarship must focus. Saturation here became not a signal of closure, but a threshold for generative inquiry.

If access is the first invitation, then recognition, reciprocity, and representation must follow. In moving the discourse beyond access, this study invites educators, policymakers, and technologists alike to reconsider what inclusion looks like when it is shaped not by convenience, but by car**e**—not by templates, but by trust.

## 7. Conclusion and Implications

This study affirms a central truth: **access alone does not constitute inclusion**. As artificial intelligence continues to reshape the design and delivery of instructional materials in higher education, the very notion of inclusion must evolve—shifting from metrics of reach to practices of recognition, co-authorship, and ethical engagement. Across more than 20 scholarly qualitative studies, this synthesis demonstrates that inclusive materials are not inclusive by default, but by design—emerging through intentional choices that reflect learners' cultural contexts, invite their voices, and affirm their identities.

What distinguishes this research is not only the scope of its findings, but the coherence of its architecture. A purposefully constructed conceptual framework clarified how learner diversity, cultural rootedness, and AI integration intersect in real pedagogical spaces. The theoretical lens—drawing on Universal Design for Learning, Critical Digital Pedagogy, and Sociotechnical Systems Theory—enabled an interpretive layering that examined inclusion not as an aspiration, but as a practice shaped by technological mediation, institutional dynamics, and epistemic commitments. The constructivist-interpretivist orientation further grounded the analysis in the lived experiences of educators and learners, while the in-depth meta-synthesis—guided by SPIDER, PRISMA, and CASP protocols—ensured transparency, methodological rigor, and conceptual depth.

Crucially, this study also contributes to the global discourse on inclusion by elevating perspectives often overlooked. By centering Southeast Asian practices—not merely as cases, but as conceptual drivers—it bridges theoretical divides between global frameworks and local realities. The result is not only a critique of existing models, but a vision of inclusion that is ethically rooted,

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culturally adaptive, and pedagogically resonant. It reframes the conversation around AI-supported materials away from scalability and efficiency toward *intentional, co-designed, and contextually grounded strategies* that embody care and co-authorship as pillars of inclusive design.

For educators, this study underscores the value of co-design and critical engagement with AI tools—not merely to personalize instruction, but to preserve pedagogical agency and reflect the lived realities of learners. For curriculum developers, the findings suggest that inclusive design must accommodate linguistic plurality, cultural narratives, and multimodal engagement strategies, rather than rely on static templates or imported models. For higher education institutions and policymakers, the implications point toward the need for sustained investment in AI- and UDL-aligned professional development, along with governance structures that uphold transparency, accountability, and context-sensitive innovation—as exemplified by the ethical AI use guidelines released by the University of the Philippines Open University. For students, the study affirms that they are not just recipients of instructional content, but collaborators in shaping its language, logic, and accessibility. And for researchers, the synthesis offers a foundation upon which to explore co-authorship in AI-mediated content, algorithmic fairness in multilingual contexts, and regional theories of inclusion that move beyond dominant paradigms.

Ultimately, this study reframes inclusion not as a technological feature or a policy aspiration, but as a relational and ethical design practice—one that is co-authored, continually negotiated, and fundamentally human. It invites a future in which inclusive instructional materials do not merely reach learners, but rise to meet them—wherever they are, and whoever they hope to become.

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**Ethical Approval.** As this study is a meta-synthesis of previously published qualitative research, it did not involve human participants or primary data collection and therefore did not require institutional ethical approval.

**Author Contributions.** The author was solely responsible for the conceptualization, design, analysis, and writing of this manuscript.

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