

Epistemological Perspectives in Inclusive Education: A Systematic Review of Differentiated Instruction Practices across Contexts

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ABSTRACT

This study situates inclusive education within broader epistemological debates, emphasizing how differing conceptions of knowledge shape differentiated instruction practices across diverse educational contexts. The purpose of this systematic review is to examine how empiricist, constructivist, and hybrid epistemological orientations influence the design and implementation of differentiated instruction in inclusive settings, and to identify contextual factors mediating this relationship. Employing PRISMA 2020 guidelines, a systematic search of the Scopus database (2019–2024) yielded 43 peer-reviewed studies, which were analyzed through thematic synthesis and comparative frameworks. The findings reveal three dominant orientations: constructivist approaches (44%) emphasize student-centered, flexible, and experiential learning; empiricist approaches (30%) prioritize data-driven, structured, and assessment-based practices; while hybrid approaches (26%) integrate both perspectives pragmatically. The review further identifies teacher preparation, policy frameworks, and governance structures as key mediating factors influencing how epistemological beliefs translate into classroom practice. Notably, only 28% of studies reported explicit teacher reflection on epistemological foundations, indicating a gap between theory and practice. The study concludes that epistemological orientations fundamentally shape differentiated instruction and inclusive education outcomes. It proposes the Epistemology-Practice-Context (EPC) model to conceptualize the dynamic interaction between beliefs, contextual conditions, and pedagogical practices. These findings highlight the need for enhancing teachers' epistemological literacy and aligning policy frameworks with diverse educational contexts to improve the effectiveness of inclusive education.

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1. INTRODUCTION

Inclusive education represents a fundamental paradigm shift in contemporary educational philosophy, moving from segregated provisions toward accommodating diverse learner needs within mainstream educational settings. This transformation acknowledges that students construct

knowledge differently based on their cognitive profiles, cultural backgrounds, and lived experiences. Central to understanding these differences is epistemology—the philosophical study of knowledge, its nature, sources, and acquisition processes—which provides a theoretical foundation for informing pedagogical approaches in diverse classrooms (Gonzales, 2018). Despite its significance, the explicit integration of epistemological perspectives into differentiated instruction practices remains insufficiently explored in educational research, creating a notable gap in our understanding of how teachers' beliefs about knowledge influence their inclusive practices.

The concept of differentiated instruction, as systematically conceptualized by Tomlinson (2001), involves the deliberate adaptation of content, process, and product to meet the diverse needs of learners within heterogeneous classroom environments. This pedagogical approach fundamentally aligns with constructivist epistemology, which posits that knowledge is actively constructed through meaningful interaction with the environment rather than passively received from external sources (Strogilos, 2018). Constructivist perspectives emphasize the learner's active role in meaning-making, suggesting that effective instruction must account for individual differences in how students interpret and internalize new information. Conversely, empiricist perspectives emphasize observable, measurable learning outcomes and standardized assessment procedures, viewing knowledge as accumulated through sensory experience and systematic observation (Souza & Martins, 2023). The tension between these epistemological orientations manifests significantly in classroom practices, curriculum design, policy frameworks, and teacher preparation programs, ultimately shaping the nature and quality of inclusive education provision.

Recent scholarship has increasingly demonstrated that teachers' epistemological beliefs significantly influence their pedagogical decisions and instructional practices. Sheehy et al. (2019) found that Indonesian teachers holding constructivist beliefs demonstrated more flexible, student-centered approaches to inclusion, while those with empiricist orientations favored structured, assessment-driven methodologies. Similarly, Stavroussi et al. (2021) established connections between teachers' democratic classroom beliefs and their perceptions of inclusive education feasibility. These findings suggest that epistemological orientations function as implicit frameworks guiding teachers' instructional choices, yet systematic examination of how these philosophical foundations specifically shape differentiated instruction in inclusive contexts remains remarkably limited in the literature (Gibbs, 2023).

The implementation of differentiated instruction in inclusive settings presents unique challenges that intersect with epistemological considerations. Teachers must navigate between standardized curriculum requirements and individualized learning needs, between assessment accountability and authentic learning experiences, and between efficient classroom management and responsive pedagogy. How teachers conceptualize knowledge—as fixed or constructed, as transmitted or discovered, as individual or social—fundamentally influences how they approach these pedagogical tensions (Griful-Freixenet et al., 2021). Understanding these epistemological underpinnings is therefore essential for developing more effective teacher preparation programs and supportive policy frameworks that can address the complex realities of inclusive classrooms.

Previous systematic reviews on differentiated instruction have predominantly focused on implementation strategies (Pozas et al., 2021), contextual barriers and facilitators (Gheysens et al., 2020), or outcome effectiveness for specific student populations (Strogilos et al., 2020), without explicitly examining the epistemological foundations underlying these practices. Similarly, reviews addressing inclusive education have concentrated on policy frameworks, teacher attitudes, or practical adaptations (Alkin & Anılan, 2024), leaving the philosophical dimensions largely unexplored. This represents a significant theoretical gap, as understanding why teachers conceptualize and implement differentiated instruction in particular ways requires attention to their underlying beliefs about the nature of knowledge and learning processes.

This systematic literature review addresses this identified gap by comprehensively examining the relationship between epistemological perspectives and differentiated instruction practices in inclusive

education across diverse international contexts. The review is guided by three interconnected research questions: (1) How do different epistemological approaches—specifically empiricism, constructivism, and hybrid orientations—influence the conceptualization and practical implementation of differentiated instruction in inclusive educational settings? (2) What contextual factors mediate the relationship between epistemological orientations and actual instructional practices in classrooms? (3) What implications emerge from these relationships for teacher preparation programs and educational policy development?

The significance of this systematic review lies in its explicit epistemological framing, which distinguishes it from previous reviews in the field. By examining the theoretical foundations underlying differentiated practices, this review contributes to a more nuanced understanding of why certain approaches succeed in specific contexts while others encounter persistent implementation challenges. Furthermore, by proposing a conceptual framework linking epistemology to practice through contextual mediators, this review offers both theoretical advancement and practical guidance for educators and policymakers seeking to enhance inclusive education quality across diverse educational systems.

2. METHODS

This systematic literature review employed a rigorous methodological approach following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines to ensure transparency, replicability, and methodological rigor (Page et al., 2021). A comprehensive review protocol was developed prior to initiating the search process, specifying research questions, search strategy, eligibility criteria, quality assessment procedures, and data synthesis methods. This section details each methodological component to enable replication and critical evaluation of the review process.

2.1 Eligibility Criteria

The review employed carefully defined inclusion and exclusion criteria to ensure relevance and quality of included studies. Inclusion criteria encompassed: (a) empirical studies employing quantitative, qualitative, or mixed-methods designs, as well as theoretical or conceptual articles addressing epistemology in relation to inclusive education and/or differentiated instruction; (b) publication in peer-reviewed journals between 2019 and 2024 to ensure currency and relevance to contemporary educational contexts; (c) publication in English language; and (d) focus on K-12 educational contexts or higher education teacher preparation programs. Exclusion criteria included: (a) conference abstracts, editorials, commentaries, or book reviews without substantial empirical or theoretical content; (b) studies not addressing epistemological dimensions either explicitly through stated theoretical frameworks or implicitly through identifiable philosophical orientations; and (c) articles focused exclusively on special education segregated settings rather than inclusive mainstream environments.

2.2 Information Sources and Search Strategy

The Scopus database was selected as the primary information source due to its comprehensive coverage of peer-reviewed education research, rigorous indexing standards, and broad international scope encompassing journals from diverse geographical regions. The systematic search was conducted in January 2024 using the following Boolean search string: ("epistemological" OR "inclusive education") AND "differentiated instruction". The search was strategically limited to articles published between 2019 and 2024 within the subject areas of Social Sciences and Psychology to ensure topical relevance while maintaining manageable scope for comprehensive analysis.

2.3 Selection Process

The initial database search yielded 87 potentially relevant records. Following PRISMA 2020 procedures, the selection process proceeded through systematic stages as illustrated in Figure 1. First, duplicate removal was conducted both automatically through reference management software (Mendeley) and manually through title verification, resulting in 17 duplicates being removed and leaving 70 unique records for screening. Second, title and abstract screening against the predetermined eligibility criteria was performed independently by two reviewers, resulting in 17 records being excluded due to irrelevance to the review scope (primarily studies addressing general pedagogy without epistemological or differentiation focus), leaving 53 records proceeding to full-text assessment. Third, full-text articles were retrieved and assessed for eligibility by both reviewers, resulting in 10 additional exclusions with documented reasons: six articles were excluded due to insufficient epistemological content (lacking identifiable theoretical frameworks or philosophical orientations despite relevant keywords), and four articles were excluded due to methodological concerns (inadequate reporting of methods, unsupported conclusions, or significant quality issues). The final sample comprised 43 articles meeting all inclusion criteria and proceeding to qualitative synthesis. Throughout the selection process, two reviewers independently conducted screening at each stage, with inter-rater agreement calculated (Cohen's $\kappa = 0.89$) and disagreements resolved through structured discussion until consensus was achieved.

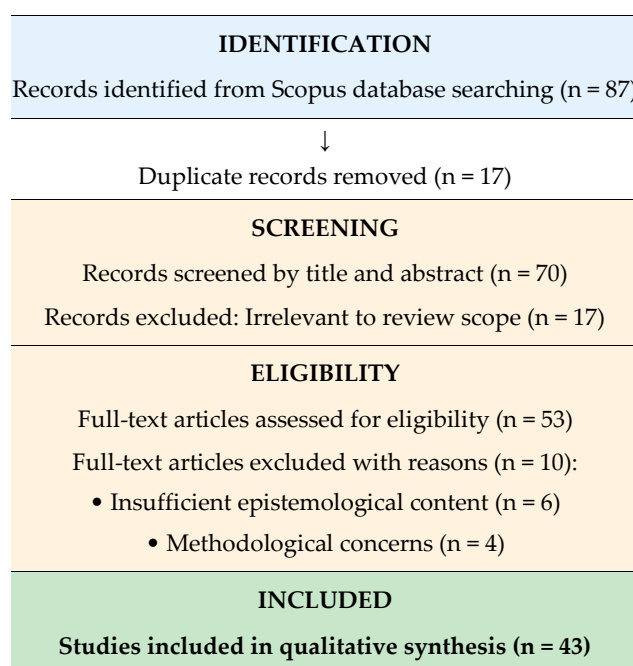


Figure 1. PRISMA 2020 Flow Diagram

2.4 Quality Assessment

Methodological quality of included studies was systematically assessed using established critical appraisal tools appropriate to study design. The Critical Appraisal Skills Programme (CASP) Qualitative Checklist was employed for qualitative studies, evaluating clarity of research aims, appropriateness of qualitative methodology, adequacy of recruitment strategy, rigor of data collection and analysis, and consideration of researcher-participant relationships. The Mixed Methods Appraisal Tool (MMAT) was utilized for mixed-methods research, assessing integration of qualitative and quantitative components and appropriateness of mixed design. For quantitative studies, we assessed sampling procedures, measurement validity, and analytical appropriateness. Quality assessment

focused on four primary domains: clarity of research objectives, appropriateness of methodology to research questions, rigor of data collection and analysis procedures, and adequate consideration of ethical issues. Two reviewers independently assessed each article, with disagreements resolved through discussion. Studies were not excluded based on quality assessment; rather, quality ratings informed the weight given to findings during synthesis and were considered when interpreting contradictory results. Table 1 presents the quality assessment summary.

Table 1. Quality Assessment Summary of Included Studies (N = 43)

Quality Domain	High (n)	Moderate (n)	Low (n)	Assessment Tool
Research objectives clarity	31	10	2	CASP/MMAT
Methodological appropriateness	28	12	3	CASP/MMAT
Data analysis rigor	26	14	3	CASP/MMAT
Ethical considerations	35	6	2	CASP/MMAT

2.5 Data Extraction and Synthesis

Data extraction employed a standardized extraction form developed specifically for this review, capturing: bibliographic information (author(s), publication year, country of study, journal); study characteristics (research design, sample size and characteristics, educational level addressed); epistemological orientation (coded as empiricist, constructivist, or hybrid based on stated theoretical frameworks or identifiable philosophical assumptions); differentiated instruction practices described or examined; contextual factors identified as influential; and key findings relevant to the research questions. Thematic synthesis followed the established framework of Braun and Clarke (2006), proceeding through systematic stages of familiarization with extracted data, generation of initial codes, development of descriptive themes, construction of analytical themes, and refinement through iterative review and discussion between researchers. Cross-national comparisons utilized the comparative education framework of Bray and Thomas (1995), considering levels of analysis, aspects compared, and geographical units to contextualize findings across diverse educational systems and cultural contexts.

3. FINDINGS AND DISCUSSION

3.1 Study Characteristics

The 43 included studies represented considerable geographical and methodological diversity, providing a comprehensive foundation for cross-contextual analysis. Geographically, studies originated from Europe (n = 18, including Belgium, Netherlands, Germany, Finland, Sweden, Austria, Portugal, and Greece), Asia (n = 10, including China, Indonesia, Turkey, Thailand, Singapore, and Bhutan), Africa (n = 7, including South Africa, Kenya, Lesotho, Ghana, and Eritrea), North America (n = 5, including United States and Canada), and Oceania (n = 3, representing Australia). This distribution reflects the global scope of inclusive education research while also indicating notable concentration in Western and European contexts, a limitation addressed in subsequent discussion. Methodologically, qualitative designs predominated (n = 19. 44%), followed by mixed-methods approaches (n = 14. 33%) and quantitative studies (n = 10. 23%). Educational levels addressed included primary education (n = 22), secondary education (n = 15), and higher education or teacher preparation contexts (n = 6). The temporal distribution showed increasing research attention to the topic, with publication frequency rising from 2019 (n = 5) through 2024 (n = 12), suggesting growing scholarly interest in the epistemology-practice relationship in inclusive settings.

3.2 Thematic Analysis: Epistemological Orientations

The thematic synthesis identified three primary epistemological orientations underlying differentiated instruction practices in inclusive education: constructivism, empiricism, and hybrid

approaches. Each orientation demonstrated distinct philosophical assumptions about the nature of knowledge and corresponding implications for pedagogical practice, as summarized in Table 2.

3.3 Constructivist Orientation

Constructivism represented the predominant epistemological framework, evident in 19 studies (44%) across the review sample. Studies grounded in constructivist epistemology conceptualized knowledge as actively constructed through learner-environment interactions rather than passively transmitted from teacher to student. Within this orientation, differentiated instruction prioritized experiential learning opportunities, collaborative activities enabling social knowledge construction, and student agency in determining learning pathways and demonstration methods. Teachers operating from constructivist perspectives tended to implement flexible grouping strategies responsive to evolving student needs, provide meaningful choices in how students engage with and demonstrate learning, and employ formative assessment practices to continuously guide instructional adjustments (Griful-Freixenet et al., 2021; Strogilos et al., 2020).

Constructivist approaches were particularly prevalent in educational systems characterized by decentralized governance structures and established traditions of teacher professional autonomy, such as those in Finland, Sweden, and Australia. These contexts typically featured comprehensive pre-service teacher preparation programs of extended duration (often 4-5 years), emphasizing pedagogical content knowledge, reflective practice, and inquiry-based approaches to teaching and learning (Gibbs, 2023). The apparent alignment between systemic structures valuing teacher judgment and constructivist epistemology appeared to facilitate more coherent implementation of responsive differentiated instruction. Studies from these contexts described teachers who confidently adapted curricula to student interests, created learning environments supporting exploration and discovery, and viewed diversity as a pedagogical resource rather than a challenge to be managed (Nepal et al., 2024).

3.4 Empiricist Orientation

Empiricist perspectives characterized 13 studies (30%), predominantly from centralized educational systems with established standardized assessment frameworks and accountability mechanisms. Within this orientation, knowledge was conceptualized as observable and objectively measurable, with differentiated instruction practices focused on data-driven decision-making, evidence-based intervention selection, and systematic progress monitoring. Teachers emphasized diagnostic assessment to identify student learning gaps, employed structured intervention protocols with fidelity, and adjusted instruction based on measurable outcome indicators (Souza & Martins, 2023; Bayram & Öztürk, 2021).

Empiricist approaches demonstrated notable strengths in providing procedural clarity, consistency of implementation, and accountability mechanisms aligning with systemic demands. These orientations supported teachers in systematically identifying students requiring additional support and monitoring intervention effectiveness over time. However, studies also noted significant limitations in responsiveness to individual learner needs that resist straightforward quantification, such as socio-emotional development, creative expression, and culturally-specific learning preferences. Implementation challenges were particularly evident in resource-constrained contexts where assessment tools, data management systems, and intervention materials were inadequate to support the data-intensive requirements of empiricist approaches (Onyishi & Sefotho, 2020).

3.5 Hybrid Orientation

Hybrid approaches, strategically combining elements of both constructivism and empiricism, were identified in 11 studies (26%). These orientations were particularly prevalent in transitional educational systems actively undergoing curriculum reform, including Indonesia, Brazil, and South Africa. Hybrid approaches reflected pragmatic responses to systemic tensions between accountability

demands emphasizing measurable outcomes and learner-centered pedagogies valuing student agency and experiential learning (Leballo et al., 2021).

Studies reporting hybrid orientations described teachers who navigated between philosophical positions, employing formal assessment while simultaneously valuing experiential learning and student voice. These practitioners demonstrated contextual sensitivity, adapting strategies to local resources, cultural values, and student characteristics. Teachers in hybrid contexts often utilized structured assessment to identify starting points while implementing constructivist learning experiences, or embedded student choice within assessment-aligned curriculum frameworks (Onyishi & Sefotho, 2020). The flexibility of hybrid approaches appeared advantageous in contexts of rapid educational change, though studies also noted potential for philosophical incoherence when integration lacked intentional design and reflective consideration.

Table 2. Epistemological Orientations and Differentiated Instruction Characteristics

Orientation	Knowledge Conception	DI Practice Characteristics	Studies n (%)
Constructivist	Actively constructed through learner-environment interaction; socially negotiated meaning	Experiential learning, flexible grouping, student choice, collaborative activities, formative assessment	19 (44%)
Empiricist	Observable, measurable through systematic assessment; objectively verifiable outcomes	Data-driven decisions, diagnostic assessment, progress monitoring, structured interventions	13 (30%)
Hybrid	Pragmatic integration of perspectives; context-dependent epistemology	Context-adapted strategies, balanced assessment approaches, structured flexibility	11 (26%)

3.6 Contextual Mediating Factors

The synthesis identified three primary contextual factors that mediate the relationship between epistemological orientations and the actual implementation of differentiated instruction practices: teacher preparation quality, policy frameworks, and systemic governance structures. These factors operate interactively to enable or constrain the translation of teachers' epistemological beliefs into classroom practice.

a. Teacher preparation emerged as the most consistently cited and influential mediating factor across the reviewed studies. Research from educational contexts featuring comprehensive, extended teacher education programs (typically 4-5 years of university-based preparation with substantial practicum components) reported more sophisticated understanding and implementation of differentiated instruction, regardless of the predominant epistemological orientation in the broader system (D'Intino & Wang, 2021; Nketsia et al., 2024). Well-prepared teachers demonstrated greater confidence in adapting instruction, stronger repertoires of differentiation strategies, and more nuanced understanding of how to respond to diverse learning needs. Critically, the review revealed that only 28% of studies (n = 12) reported teachers explicitly reflecting on epistemological foundations in their planning and instructional practice. This finding suggests a significant gap between the theoretical frameworks informing educational research and policy and the conscious philosophical awareness guiding practitioners' daily decisions.

b. Policy frameworks significantly shaped how epistemological orientations translated into classroom practice. Studies from contexts with flexible curriculum frameworks, supportive inclusive education mandates, and teacher-empowering policies reported more adaptive, responsive implementation of differentiated instruction (Pozas & Letzel-Alt, 2023). These policy environments created space for teachers to exercise professional judgment in tailoring instruction to student needs. Conversely, high-stakes accountability policies emphasizing standardized assessment outcomes tended to constrain

pedagogical flexibility, effectively pushing classroom practices toward empiricist orientations even in systems where constructivist educational philosophies were officially espoused (Gaitas et al., 2024). This policy-practice tension emerged as a significant theme across multiple contexts.

c. **Systemic governance structures** influenced epistemological alignment and implementation coherence. Decentralized systems with local or regional curriculum authority demonstrated greater diversity in epistemological approaches and more context-responsive differentiated instruction practices. Teachers in these systems reported greater autonomy to adapt curricula and instructional methods to local student populations and community values. Centralized systems, while providing procedural consistency and quality assurance mechanisms, tended toward epistemological homogeneity that limited adaptive responses to local learner needs (Wang & Tian, 2023).

3.7 Proposed Conceptual Framework: The EPC Model

Based on the thematic synthesis, we propose the Epistemology-Practice-Context (EPC) Model as a conceptual framework explicating the relationships between epistemological orientations, differentiated instruction practices, and contextual mediating factors. The framework, illustrated in Figure 2, identifies three interconnected layers of influence operating dynamically to shape inclusive education practices.

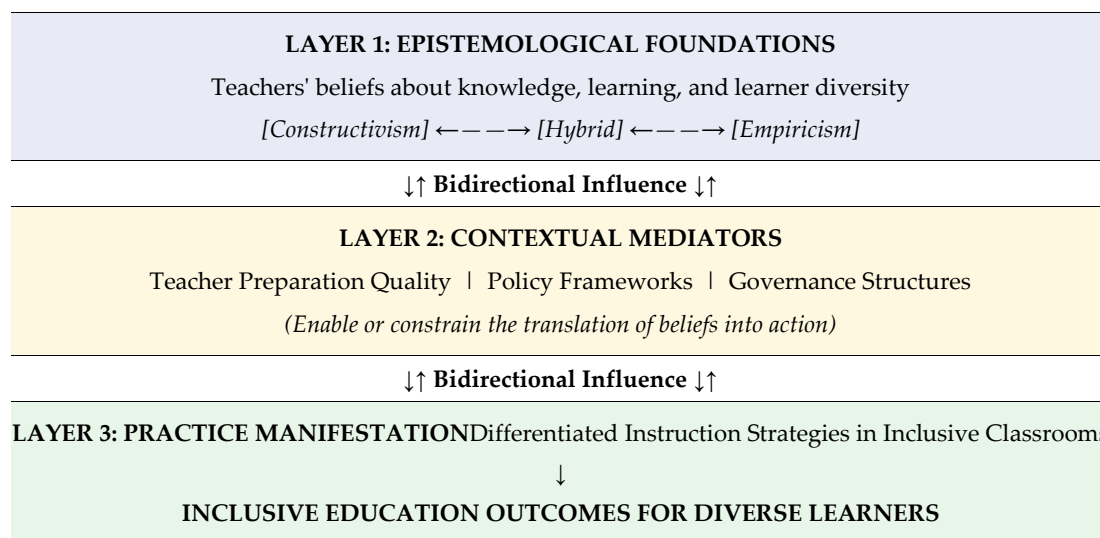


Figure 2. The Epistemology-Practice-Context (EPC) Model

The EPC Model posits that teachers' epistemological beliefs, initially shaped through pre-service preparation and subsequently refined through professional experiences, interact dynamically with systemic contextual factors to produce particular patterns of differentiated practice. These practices, in turn, influence inclusive education outcomes for diverse learners. The framework emphasizes bidirectional relationships, acknowledging that practice experiences may reshape epistemological beliefs over time, and that contextual factors both enable and constrain the translation of beliefs into action. This framework extends existing models by explicitly positioning epistemology as a foundational—though often implicit—influence on pedagogical decision-making in inclusive educational contexts.

Discussion

The findings of this systematic review confirm that epistemological orientations fundamentally shape differentiated instruction practices in inclusive education, directly addressing the first research question. The predominance of constructivism (44%) aligns with contemporary inclusive education

philosophy emphasizing learner agency, social knowledge construction, and responsiveness to diversity (Strogilos, 2018). However, the substantial presence of empiricist (30%) and hybrid (26%) orientations indicates that epistemological pluralism characterizes the field, reflecting diverse educational traditions, accountability imperatives, and systemic constraints operating across international contexts.

This review makes a distinct theoretical contribution that clearly differentiates it from previous systematic syntheses in the field. While Pozas et al. (2021) comprehensively examined differentiated instruction implementation strategies, Gheysens et al. (2020) focused on contextual barriers and professional development needs, and Strogilos et al. (2020) investigated outcome effectiveness for students with disabilities, none of these reviews explicitly examined the epistemological foundations underlying differentiated practices. Similarly, Alkın and Anılan's (2024) extensive review of differentiated instruction in global contexts concentrated on practical applications and national policy comparisons without interrogating the philosophical assumptions guiding teacher decision-making. The present review addresses this theoretical gap by foregrounding epistemology as an analytical lens, offering deeper insight into why certain approaches align with particular contexts while others encounter persistent implementation challenges despite similar policy mandates or resource allocations.

The finding that explicit epistemological reflection remains rare among practitioners—observed in only 28% of studies—has significant practical implications. This theory-practice gap suggests that while epistemological frameworks inform research design and policy discourse, teachers themselves may operate with implicit rather than articulated philosophical orientations guiding their daily instructional decisions. Addressing this gap requires that teacher education programs explicitly develop epistemological literacy, enabling prospective teachers to recognize, critically evaluate, and intentionally apply theoretical frameworks underlying their pedagogical choices. Policy frameworks should similarly acknowledge epistemological diversity rather than imposing singular approaches that may conflict with local contexts, established teacher beliefs, or diverse student needs.

4. CONCLUSION

This systematic literature review synthesized findings from 43 studies across diverse international contexts to examine the relationship between epistemological perspectives and differentiated instruction in inclusive education. Three dominant orientations—constructivist, empiricist, and hybrid—were identified; each associated with distinct pedagogical practices and situated within particular systemic conditions. Constructivist approaches, prevalent in decentralized systems with strong teacher education traditions, emphasize experiential, student-centered strategies that prioritize learner agency and responsiveness to diversity. In contrast, empiricist orientations, commonly found in centralized, accountability-driven systems, favor structured, data-informed interventions that offer procedural clarity but may constrain responsiveness to complex, non-quantifiable learner needs. Hybrid orientations, typical of transitional systems, reflect pragmatic adaptations that integrate multiple epistemological positions in response to contextual demands. The review further highlights the mediating role of contextual factors—especially teacher preparation, policy frameworks, and governance structures—in shaping the translation of epistemological beliefs into classroom practice. Notably, only 28% of studies reported explicit teacher epistemological reflection, indicating a significant gap between theoretical constructs and practitioners' conscious awareness, and underscoring an important area for teacher education reform. The study's primary theoretical contribution lies in foregrounding epistemology as a critical lens for understanding differentiated instruction, operationalized through the proposed Epistemology-Practice-Context (EPC) Model, which conceptualizes how teachers' knowledge beliefs, filtered through systemic influences, shape pedagogical decisions affecting diverse learners. This perspective extends prior

research by explicitly linking philosophical assumptions to instructional practices. However, the review is subject to limitations, including its restriction to English-language, Scopus-indexed sources, the predominance of Western educational contexts, the non-quantitative nature of the synthesis, and the challenges inherent in retrospectively inferring epistemological orientations. Future research should therefore prioritize in-depth qualitative investigations of teachers' epistemic cognition, incorporate cross-cultural perspectives that include non-Western epistemologies, develop and evaluate interventions to enhance teachers' epistemological literacy, and expand the evidence base to include grey literature and underrepresented regions, thereby advancing both the theoretical and practical foundations of differentiated instruction in inclusive education. **Conflict of Interest:** The author declares no conflict of interest. The funding sponsors had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript; or in the decision to publish the results.

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