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Reconceptualizing Didactics as a Scientific Discipline: Theoretical Foundations, Conceptual Evolution, and Contemporary Perspectives for Twenty-First Century Education

Didaktiğin Bilimsel Bir Disiplin Olarak Yeniden Kavramsallaştırılması: Yirmi Birinci Yüzyıl Eğitimi İçin Kuramsal Temeller, Kavramsal Evrim ve Çağdaş Yaklaşımlar

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Abstract

Didactics has evolved from being regarded primarily as the art of teaching into a multidisciplinary scientific discipline concerned with the systematic investigation of the relationships among knowledge, teaching, learning, and educational contexts. Despite its growing importance within educational research, conceptual inconsistencies across different academic traditions continue to hinder the establishment of a unified theoretical framework. While Continental European scholarship recognizes didactics as an autonomous scientific discipline, Anglo-American educational literature frequently associates its concepts with pedagogy, curriculum studies, or instructional methodology, resulting in fragmented theoretical interpretations. This study aims to reconceptualize didactics by synthesizing its principal theoretical foundations and proposing an integrated conceptual framework suitable for contemporary educational research and practice. Employing a conceptual research design based on critical literature analysis and theoretical synthesis, the study examines major didactic traditions, including constructivism, sociocultural theory, didactic transposition, the Theory of Didactical Situations, the Anthropological Theory of the Didactic, Joint Action Theory in

Özet

Didaktik, tarihsel süreç içerisinde yalnızca öğretme sanatı olarak görülen bir yaklaşım olmaktan çıkarak; bilgi, öğretim, öğrenme ve eğitim bağlamları arasındaki ilişkileri sistematik biçimde inceleyen çok disiplinli bir bilimsel alan hâline gelmiştir. Eğitim araştırmalarındaki öneminin giderek artmasına rağmen, farklı akademik geleneklerde didaktiğe ilişkin kavramsal yaklaşımların çeşitlilik göstermesi, ortak ve bütüncül bir kuramsal çerçevenin oluşturulmasını güçleştirmektedir. Kıta Avrupası eğitim geleneğinde didaktik, bağimsız bir bilimsel disiplin olarak kabul edilirken; Anglo-Amerikan eğitim literatüründe çoğu zaman pedagoji, program geliştirme (curriculum studies) veya öğretim yöntemleriyle ilişkilendirilmekte, bu durum ise kuramsal yorumların parçalı ve dağınık bir yapıya bürünmesine neden olmaktadır. Bu çalışma, didaktiğin temel kuramsal yaklaşımlarını bütüncül bir biçimde sentezleyerek, çağdaş eğitim araştırmaları ve uygulamaları için uygun, bütünsel bir kavramsal çerçeve geliştirmeyi amaçlamaktadır. Araştırma, eleştirel literatür incelemesi ve kuramsal senteze dayanan kavramsal araştırma deseni kullanılarak yürütülmüştür. Bu kapsamda yapılandırmacılık, sosyokültürel kuram, didaktik dönüşüm (didactic transposition), Didaktik Durumlar Kuramı (Theory of Didactical Situations), Didaktiğin Antropolojik Kuramı (Anthropological Theory

Didactics, and Pedagogical Content Knowledge. These complementary perspectives are analyzed to identify their common principles and contributions to understanding educational processes. Based on this synthesis, the article develops a comprehensive conceptual model consisting of four interdependent dimensions: knowledge transformation, teaching mediation, learning processes, and educational context. The proposed framework demonstrates that didactics should be understood as a scientific discipline integrating cognitive, social, disciplinary, institutional, and technological dimensions of education rather than merely a collection of instructional techniques. The study further discusses the implications of this integrated perspective for curriculum development, teacher professional education, competency-based learning, digital pedagogy, and the educational applications of artificial intelligence. By clarifying the epistemological foundations of didactics and presenting a coherent conceptual framework, the article contributes to strengthening the scientific identity of didactics and provides a theoretical basis for future interdisciplinary research in educational sciences.

Keywords: Didactics; Educational Sciences; Educational Theory; Knowledge Transformation; Curriculum Development; Teacher Education; Learning Theories; Pedagogical Content Knowledge; Digital Education; Artificial Intelligence.

of the Didactic), Didaktikte Ortak Eylem Kuramı (Joint Action Theory in Didactics) ve Pedagojik Alan Bilgisi (Pedagogical Content Knowledge) gibi başlıca didaktik yaklaşımlar incelenmiş; bu kuramların eğitim süreçlerinin anlaşılmasına sağladıkları ortak katkılar ve temel ilkeler karşılaştırmalı olarak değerlendirilmiştir. Bu kuramsal sentez doğrultusunda makalede; bilginin dönüştürülmesi, öğretimin aracılık işlevi, öğrenme süreçleri ve eğitsel bağlam olmak üzere birbirini tamamlayan dört temel boyuttan oluşan kapsamlı bir kavramsal model önerilmektedir. Geliştirilen model, didaktiğin yalnızca öğretim tekniklerinden oluşan uygulamalı bir alan olarak değil; eğitimin bilişsel, sosyal, disiplinler, kurumsal ve teknolojik boyutlarını bütünleştiren bağımsız bir bilimsel disiplin olarak ele alınması gerektiğini ortaya koymaktadır. Çalışmada ayrıca bu bütünleşik yaklaşımın program geliştirme, öğretmen yetiştirme, yeterlilik temelli öğrenme, dijital pedagoji ve yapay zekânın eğitimde kullanımı üzerindeki kuramsal ve uygulamalı yansımaları tartışılmaktadır. Didaktiğin epistemolojik temellerini açıklığa kavuşturan ve tutarlı bir kavramsal çerçeve sunan bu çalışma, didaktiğin bilimsel kimliğinin güçlendirilmesine katkı sağlamanın yanı sıra eğitim bilimleri alanında yürütülecek disiplinlerarası gelecekteki araştırmalar için sağlam bir kuramsal temel sunmaktadır.

Anahtar Kelimeler: Didaktik; Eğitim Bilimleri; Eğitim Kuramı; Bilginin Dönüştürülmesi; Program Geliştirme; Öğretmen Eğitimi; Öğrenme Kuramları; Pedagojik Alan Bilgisi; Dijital Eğitim; Yapay Zekâ.

1. Introduction

Education in the twenty-first century is undergoing profound transformations driven by globalization, rapid technological advancement, digitalization, artificial intelligence (AI), and the growing demand for learner-centered, competency-based education. These developments have fundamentally altered not only educational practice but also the theoretical foundations upon which teaching and learning are understood. As educational systems increasingly emphasize critical thinking, problem-solving, collaboration, creativity, and lifelong learning, traditional conceptions of teaching as the simple transmission of knowledge have become insufficient for explaining the complexity of contemporary educational processes (Biesta, 2015; Deng, 2018). Consequently, renewed attention has been directed toward didactics as a scientific discipline capable of explaining how knowledge is selected, transformed, mediated, and reconstructed within diverse educational contexts.

Historically, didactics has occupied a central position in educational thought. The concept originates from the Greek word *didáskein* ("to teach") and was systematically developed by Johann Amos Comenius, whose *Didactica Magna* established one of the earliest comprehensive theories of education based on universal principles of instruction, learner development, and equal educational opportunity (Comenius, 1967). During the nineteenth century, Johann Friedrich Herbart further strengthened the scientific foundations of didactics by integrating psychology, moral philosophy, and instructional planning into a coherent theory of education (Herbart, 1901). These early contributions established didactics as more than a collection of teaching techniques, presenting it instead as a systematic field concerned with the organization, sequencing, and communication of knowledge.

Despite its rich intellectual history, didactics continues to exhibit considerable conceptual diversity across international educational traditions. Within Continental Europe, particularly in Germany and France, didactics is generally regarded as an autonomous scientific discipline that investigates curriculum, knowledge organization, instructional decision-making, and educational interaction (Hopmann, 2007; Kansanen, 2009). The German tradition of *Didaktik* emphasizes curriculum interpretation, educational aims, and teachers' professional judgment, whereas the French tradition of *didactique* focuses on the transformation of disciplinary knowledge into teachable knowledge through the process of didactic transposition (Chevallard, 1991; Klafki, 2000). By contrast, Anglo-American educational research has traditionally addressed similar issues through curriculum studies, pedagogy, instructional design, and teacher education, often reducing didactics to methodological aspects of classroom instruction rather than recognizing it as an independent scientific discipline (Hudson, 2007).

The increasing complexity of modern educational systems has further expanded the scope of didactics. Contemporary educational environments are characterized by competency-based curricula, inclusive education, multicultural classrooms, digital learning ecosystems, online and hybrid instruction, and the rapid integration of artificial intelligence into educational practice. These developments require teachers to perform roles that extend well beyond knowledge transmission, including curriculum interpretation, instructional adaptation, digital facilitation, assessment design, collaborative learning management, and ethical decision-making. Consequently, didactics has evolved into an interdisciplinary framework capable of integrating cognitive,

pedagogical, social, disciplinary, technological, and institutional perspectives on education (European Commission, 2022; UNESCO, 2023).

This conceptual expansion has been supported by several influential theoretical traditions. Constructivist learning theory conceptualizes learning as an active process through which learners construct knowledge by integrating new experiences with existing cognitive structures (Piaget, 1970; Bruner, 1996). Sociocultural theory emphasizes the importance of language, collaboration, and cultural mediation in cognitive development, particularly through guided participation within the Zone of Proximal Development (Vygotsky, 1978). Discipline-specific didactic theories have further enriched educational research by explaining how scholarly knowledge is transformed into classroom knowledge through curriculum design, teacher mediation, and institutional processes (Brousseau, 1997; Chevallard, 1991; Sensevy, 2011). In parallel, Shulman's (1986, 1987) concept of Pedagogical Content Knowledge (PCK) highlighted the specialized professional knowledge teachers require to transform disciplinary content into meaningful learning experiences for students.

More recently, advances in digital education and artificial intelligence have introduced new dimensions to didactic inquiry. Adaptive learning systems, intelligent tutoring technologies, learning analytics, virtual learning environments, and generative AI have fundamentally altered how educational content is created, delivered, and assessed (Holmes et al., 2022; OECD, 2021). These innovations present significant opportunities for personalized learning while simultaneously raising important questions regarding ethics, teacher professionalism, educational equity, algorithmic transparency, and human agency in education (UNESCO, 2023; Williamson & Eynon, 2020). As a result, contemporary didactics must increasingly address not only pedagogical and disciplinary issues but also technological, ethical, and institutional dimensions of educational practice.

Despite the substantial body of literature examining individual aspects of didactics, significant theoretical fragmentation persists. Existing studies frequently focus on isolated perspectives—including constructivism, sociocultural learning, curriculum theory, didactic transposition, pedagogical content knowledge, or digital pedagogy—without providing a comprehensive synthesis capable of integrating these complementary approaches into a unified scientific framework. Consequently, the epistemological status of didactics remains insufficiently clarified, limiting its theoretical coherence and reducing its explanatory capacity within contemporary educational sciences.

To address this gap, the present study adopts a conceptual research approach based on critical literature analysis and theoretical synthesis to reconceptualize didactics as a multidisciplinary scientific discipline. Specifically, the study pursues three interrelated objectives. First, it examines the historical evolution of didactics from its classical philosophical origins to its contemporary scientific status. Second, it synthesizes the principal theoretical traditions that have shaped modern didactic thought, including constructivism, sociocultural theory, didactic transposition, the Theory of Didactical Situations, the Anthropological Theory of the Didactic, Joint Action Theory in Didactics, and Pedagogical Content Knowledge. Third, it develops an integrated conceptual framework comprising four interrelated dimensions—knowledge, teaching, learning, and educational context—to explain the multidimensional nature of didactics and its relevance for curriculum development, teacher education, digital pedagogy, and artificial intelligence in education.

By providing a coherent theoretical synthesis of diverse educational traditions, this study contributes to strengthening the scientific identity of didactics and offers a comprehensive conceptual foundation for future interdisciplinary research and educational innovation. It argues that didactics should no longer be viewed merely as a theory of instruction but as an integrative scientific discipline that explains the complex interactions among knowledge, teachers, learners, institutions, and technological environments in contemporary education.

2. Literature Review

2.1 The Evolution of Didactics as a Scientific Discipline

Didactics has undergone profound conceptual development since its emergence in classical educational philosophy. Originally understood as the art of teaching, contemporary didactics has evolved into a multidisciplinary scientific discipline concerned with the systematic investigation of how knowledge is selected, transformed, communicated, and reconstructed within educational settings. This evolution reflects broader transformations in educational sciences, where teaching is no longer viewed merely as knowledge transmission but as a dynamic process involving cognitive, social, cultural, institutional, and technological interactions (Biesta, 2015; Deng, 2018).

The intellectual origins of didactics are commonly traced to Johann Amos Comenius, whose *Didactica Magna* established one of the earliest systematic educational theories based on universal principles of instruction, learner development, and equal educational opportunity (Comenius, 1967). Comenius proposed that effective teaching should follow natural developmental principles rather than arbitrary instructional practices, laying the philosophical foundation for modern educational science.

During the nineteenth century, Johann Friedrich Herbart further strengthened the scientific status of didactics by integrating educational psychology with instructional planning. His work emphasized structured lesson organization, systematic curriculum sequencing, and moral education, thereby transforming teaching into a scientifically organized activity rather than an intuitive practice (Herbart, 1901). Although Herbart's approach has often been criticized for its teacher-centered orientation, its influence on curriculum theory and instructional planning remains substantial.

The twentieth century witnessed a paradigm shift in didactic research as advances in psychology, sociology, and philosophy redirected scholarly attention from teaching methods toward learning processes. Constructivist perspectives emphasized learners'

active construction of knowledge rather than passive reception of information (Piaget, 1970; Bruner, 1996), while sociocultural theories highlighted the central role of language, culture, and social interaction in cognitive development (Vygotsky, 1978). Consequently, didactics gradually expanded beyond instructional methodology to become an interdisciplinary framework integrating curriculum studies, educational psychology, subject knowledge, and teacher professional practice.

2.2 Major Traditions of Didactic Thought

One of the principal challenges within contemporary didactic research concerns the existence of multiple theoretical traditions that conceptualize didactics differently. Rather than representing contradictory paradigms, these traditions emphasize complementary dimensions of educational practice.

The German Didaktik tradition considers didactics as a comprehensive theory of education concerned primarily with curriculum interpretation and teachers' professional judgment. According to Klafki (2000), teaching should not simply implement predetermined curricula but involve critical reflection on educational content and its significance for learners. Similarly, Hopmann (2007) argues that didactics fundamentally concerns the educational relationship between knowledge, learners, teachers, and society.

In contrast, the French didactique tradition focuses on the epistemological transformation of disciplinary knowledge. Chevallard (1991) introduced the concept of didactic transposition, explaining how scholarly knowledge is progressively transformed into teachable school knowledge through curriculum design, textbook development, and classroom instruction. This perspective shifted attention from teaching methods toward the nature and transformation of knowledge itself.

Within the Anglo-American educational tradition, similar concerns have historically been addressed through curriculum studies, pedagogy, instructional design, and teacher education rather than through an independent discipline called didactics (Hudson, 2007). Nevertheless, recent scholarship increasingly recognizes the conceptual convergence among these traditions, emphasizing that all seek to explain how educational knowledge is selected, organized, communicated, and learned (Kansanen, 2009).

This convergence demonstrates that contemporary didactics should not be understood as competing national traditions but rather as an integrated scientific field drawing upon multiple educational perspectives.

2.3 Constructivism and Sociocultural Perspectives

Modern didactic theory is strongly influenced by constructivist and sociocultural theories of learning, both of which fundamentally transformed understandings of teaching and knowledge acquisition.

Constructivism views learning as an active process through which learners continuously construct and reconstruct knowledge based on previous experiences and cognitive structures. According to Piaget (1970), conceptual understanding develops through assimilation and accommodation, making learners active participants rather than passive recipients of information. Building upon this perspective, Bruner (1996) introduced the concepts of discovery learning and the spiral curriculum, arguing that complex concepts should be revisited throughout education at progressively higher levels of sophistication.

Sociocultural theory complements constructivism by emphasizing the importance of social interaction, language, and cultural context. Vygotsky (1978) proposed that higher-order cognitive development occurs primarily through collaborative learning within the Zone of Proximal Development (ZPD), where learners achieve conceptual growth with appropriate instructional support. Consequently, teachers become facilitators of knowledge construction rather than simple transmitters of information.

These theoretical perspectives significantly broadened the scope of didactics by recognizing that effective teaching depends on interactions among learners, teachers, educational content, and social context.

2.4 Knowledge Transformation in Didactic Theory

One of the defining characteristics of modern didactics is its emphasis on knowledge transformation rather than simple knowledge transmission. Educational knowledge differs fundamentally from scholarly knowledge because it undergoes continuous reconstruction before entering classroom practice.

Chevallard's (1991) Theory of Didactic Transposition provides one of the most influential explanations of this process. According to this theory, disciplinary knowledge is transformed through multiple institutional stages—including curriculum development, textbook production, educational policy, and teacher interpretation—before becoming classroom knowledge. Consequently, school knowledge should be understood as reconstructed rather than simplified scientific knowledge.

Expanding this perspective, Brousseau (1997) developed the Theory of Didactical Situations, emphasizing that meaningful learning occurs when students engage with carefully designed educational situations that encourage exploration, hypothesis testing, and conceptual discovery. His concepts of the didactic contract and didactical situations explain how teachers gradually transfer responsibility for learning to students while maintaining appropriate pedagogical guidance.

Similarly, Sensevy's (2011) Joint Action Theory in Didactics conceptualizes teaching and learning as collaborative activities in which teachers and students jointly construct educational meaning through continuous interaction. This theory highlights negotiation, communication, and shared responsibility as central components of effective educational practice.

Collectively, these approaches demonstrate that didactics is fundamentally concerned with the transformation and mediation of knowledge rather than with instructional techniques alone.

2.5 Teacher Knowledge and Professional Mediation

Contemporary didactic research increasingly recognizes teachers as active interpreters and mediators of knowledge rather than passive curriculum implementers.

Shulman's (1986, 1987) concept of Pedagogical Content Knowledge (PCK) fundamentally transformed educational research by demonstrating that effective teaching requires more than disciplinary expertise. Teachers must possess specialized knowledge enabling them to transform disciplinary concepts into forms understandable by learners through appropriate representations, examples, analogies, and instructional strategies.

This perspective aligns closely with both German *Didaktik* and French *didactique*, emphasizing that professional teaching requires sophisticated pedagogical decision-making rather than mechanical application of instructional methods. Consequently, teacher education programs increasingly emphasize reflective practice, curriculum interpretation, and professional judgment alongside disciplinary knowledge.

The integration of pedagogical content knowledge into didactic theory strengthens the scientific identity of didactics by linking curriculum studies, educational psychology, and professional teacher expertise within a unified conceptual framework.

2.6 Didactics in Digital Education and Artificial Intelligence

Rapid technological advancement has introduced new challenges and opportunities for didactic theory. Digital learning environments, online education, learning analytics, adaptive technologies, and artificial intelligence have fundamentally transformed traditional conceptions of teaching and learning.

Recent studies emphasize that artificial intelligence should complement rather than replace professional teachers by supporting personalized learning, intelligent assessment, curriculum adaptation, and data-informed instructional decision-making (Holmes et al., 2022; UNESCO, 2023). Likewise, the OECD (2021) and the European Commission (2022) argue that successful digital transformation requires robust ethical frameworks governing transparency, equity, privacy, and algorithmic accountability.

Williamson and Eynon (2020) further caution that technological innovation should be accompanied by critical educational reflection, ensuring that digital technologies enhance rather than undermine human-centered educational values. Similarly, Zawacki-Richter et al. (2019) observe that despite rapid growth in artificial intelligence research, relatively little attention has been devoted to teachers' pedagogical roles within AI-supported educational systems.

These developments significantly broaden the scope of didactics by requiring theoretical frameworks capable of integrating technological innovation with pedagogical, ethical, cognitive, and institutional considerations.

2.7 Research Gap and Conceptual Contribution

Although substantial progress has been made in understanding individual dimensions of didactics, existing literature remains fragmented across multiple theoretical traditions. Constructivism primarily explains learning processes, sociocultural theory emphasizes interaction and cultural mediation, didactic transposition focuses on knowledge transformation, while pedagogical content knowledge addresses teachers' professional expertise. Digital education research, meanwhile, increasingly investigates artificial intelligence, adaptive learning systems, and technology-enhanced instruction.

Despite these important contributions, relatively few studies have attempted to integrate these diverse theoretical perspectives into a comprehensive conceptual model capable of explaining didactics as a unified scientific discipline. Existing research often examines these theories independently, limiting the development of a coherent epistemological foundation for didactics.

Accordingly, this study addresses this theoretical gap by synthesizing the principal traditions of modern didactic research and proposing an integrated conceptual framework comprising four interconnected dimensions: knowledge, teaching, learning, and educational context. By reconceptualizing didactics as an interdisciplinary scientific discipline rather than merely a collection of instructional methods, the study contributes to strengthening its theoretical identity and provides a comprehensive foundation for future research in curriculum studies, teacher education, digital pedagogy, and educational innovation.

3. Discussion

The present study sought to reconceptualize didactics as a scientific discipline by synthesizing its historical development, theoretical foundations, and contemporary educational relevance. The analysis demonstrates that didactics has evolved considerably beyond its traditional understanding as the art or methodology of teaching. Instead, it now represents an interdisciplinary scientific field that investigates the complex interactions among knowledge, teaching, learning, curriculum, institutional structures, and educational contexts. This conceptual shift reflects broader transformations in educational sciences, where teaching is increasingly understood as a multidimensional process requiring cognitive, social, technological, and ethical integration rather than simple knowledge transmission.

One of the principal findings of this study is that the conceptual fragmentation surrounding didactics stems largely from differences among national and disciplinary traditions rather than from genuine theoretical contradictions. The German *Didaktik* tradition emphasizes curriculum interpretation, educational aims, and teachers' professional judgment (Hopmann, 2007; Klafki, 2000), whereas the French *didactique* tradition focuses on the epistemology of knowledge transformation through didactic transposition (Chevallard, 1991). Anglo-American educational research has traditionally addressed similar issues through curriculum theory,

pedagogy, instructional design, and teacher education (Hudson, 2007). Although these traditions employ different conceptual vocabularies, they converge around a common objective: explaining how disciplinary knowledge becomes meaningful learning within particular educational contexts. This convergence supports the argument that didactics should be viewed as an integrative scientific discipline rather than as competing theoretical schools.

The study further demonstrates that modern didactics cannot be adequately explained through a single learning theory. Constructivist perspectives emphasize learners' active construction of knowledge through cognitive development (Piaget, 1970; Bruner, 1996), while sociocultural theory highlights the essential role of language, collaboration, and cultural mediation in learning (Vygotsky, 1978). At the same time, theories of didactic transposition (Chevallard, 1991), didactical situations (Brousseau, 1997), and joint action in didactics (Sensevy, 2011) illustrate that educational knowledge is not merely transmitted but continuously transformed, negotiated, and reconstructed through interactions among teachers, learners, curriculum, and institutions. The integration of these theoretical perspectives provides a more comprehensive understanding of educational processes than any individual theory considered independently.

Another significant contribution of this study concerns the role of teachers within contemporary didactic theory. Traditional instructional models frequently portrayed teachers primarily as transmitters of predetermined knowledge. However, the synthesis presented in this study supports more recent perspectives that conceptualize teachers as professional mediators, curriculum interpreters, instructional designers, and facilitators of knowledge construction. Shulman's (1986, 1987) theory of Pedagogical Content Knowledge (PCK) is particularly relevant in this regard because it demonstrates that effective teaching requires specialized professional knowledge that integrates disciplinary expertise with pedagogical understanding. Consequently, teacher education should move beyond methodological training toward developing reflective professionals capable of making informed pedagogical decisions within diverse educational contexts.

The findings also indicate that rapid technological transformation has fundamentally expanded the scope of didactics. Digital learning environments, adaptive educational technologies, learning analytics, and artificial intelligence increasingly influence curriculum implementation, assessment, classroom interaction, and personalized learning. Rather than replacing teachers, these technologies require new forms of pedagogical mediation that combine technological competence with ethical judgment, critical thinking, and educational responsibility (OECD, 2021; UNESCO, 2023). Recent scholarship argues that artificial intelligence should function as an educational support system enhancing human decision-making rather than substituting professional teaching (Holmes et al., 2022; Williamson & Eynon, 2020). Consequently, contemporary didactics must incorporate digital competence, data literacy, algorithmic transparency, and ethical governance into its theoretical foundations.

The proposed conceptual framework developed in this study addresses these contemporary challenges by integrating four interconnected dimensions: knowledge, teaching, learning, and educational context. Knowledge represents the disciplinary and curricular content undergoing continuous transformation before entering educational practice. Teaching encompasses professional mediation, instructional decision-making, and curriculum interpretation. Learning involves cognitive construction, social participation, and conceptual development, while educational context incorporates institutional structures, cultural environments, technological infrastructures, educational policies, and assessment systems. The interaction among these dimensions demonstrates that educational processes cannot be fully understood by examining isolated variables but instead require systemic and interdisciplinary analysis.

The discussion further suggests important implications for curriculum development and educational policy. Contemporary curricula increasingly emphasize competencies, interdisciplinary learning, digital literacy, creativity, collaboration, and lifelong learning. Such educational priorities require didactic models capable of integrating disciplinary knowledge with broader educational goals while remaining sufficiently flexible to accommodate technological innovation and changing societal demands. The proposed conceptual framework provides a theoretical basis for designing curricula that balance content knowledge, learner development, pedagogical innovation, and contextual responsiveness.

From the perspective of teacher education, the findings highlight the necessity of preparing future educators not only in subject knowledge and instructional methods but also in curriculum theory, educational psychology, digital pedagogy, assessment literacy, and reflective professional practice. Effective teaching in contemporary educational environments requires continuous professional learning and the ability to adapt instructional strategies to diverse learners, technological environments, and institutional contexts. Therefore, didactics should occupy a central position within teacher education programs as the scientific discipline integrating these diverse dimensions of professional competence.

Despite its theoretical contributions, the present study has several limitations. As a conceptual investigation, it does not empirically validate the proposed framework through classroom observations or quantitative analysis. Future research should therefore examine the applicability of the four-dimensional model across different educational systems, subject areas, and cultural contexts using mixed-methods and empirical research designs. Additionally, further studies should investigate how emerging technologies—including generative artificial intelligence, adaptive learning systems, immersive virtual environments, and learning analytics—reshape the relationships among knowledge, teaching, learning, and educational context.

Overall, the findings reinforce the argument that didactics should no longer be regarded merely as a collection of instructional techniques or teaching methods. Instead, it constitutes a comprehensive scientific discipline concerned with understanding the multidimensional processes through which knowledge is selected, transformed, mediated, and reconstructed in educational environments. By integrating historical traditions, contemporary learning theories, curriculum studies, teacher education, and digital

innovation into a coherent conceptual framework, this study contributes to strengthening the epistemological foundations of didactics and provides a theoretical platform for future interdisciplinary research in educational sciences.

4. Methodology

4.1 Research Design

This study adopts a conceptual qualitative research design grounded in systematic theoretical inquiry and critical literature synthesis. Unlike empirical studies that rely on primary data collection, conceptual research seeks to advance scientific knowledge by critically examining existing theories, identifying conceptual inconsistencies, and constructing new theoretical frameworks capable of explaining complex educational phenomena (Jaakkola, 2020). The selection of this methodology is appropriate because the primary objective of the study is not to measure educational outcomes empirically but rather to reconceptualize didactics as an autonomous scientific discipline through the integration of its principal theoretical traditions.

Conceptual research has become increasingly important within educational sciences because it enables researchers to clarify fundamental concepts, redefine disciplinary boundaries, and establish coherent theoretical models capable of guiding future empirical investigations (Gilson & Goldberg, 2015). In this context, the present study examines didactics from historical, philosophical, pedagogical, and epistemological perspectives in order to synthesize its diverse theoretical foundations into a unified conceptual framework.

The research follows an interpretivist epistemological orientation, recognizing that educational theories evolve through continuous dialogue among different scientific traditions rather than through universally fixed definitions. Consequently, the study emphasizes theoretical coherence, conceptual integration, and explanatory power instead of statistical generalization.

4.2 Data Sources

The research is based entirely on secondary academic sources obtained from internationally recognized scholarly publications. The reviewed literature includes classical works that established the foundations of didactics together with contemporary studies reflecting recent developments in educational sciences, curriculum theory, teacher education, digital pedagogy, and educational technology.

The theoretical corpus incorporates major contributions from internationally recognized scholars, including Comenius, Herbart, Piaget, Vygotsky, Bruner, Chevallard, Brousseau, Sensevy, Klafki, Shulman, Hopmann, Deng, Kansanen, and Biesta. These authors represent the principal schools of didactic thought, including German *Didaktik*, French *didactique*, constructivism, sociocultural learning theory, curriculum studies, and pedagogical content knowledge. Their works collectively provide the theoretical foundation upon which the proposed conceptual model is developed.

4.3 Literature Selection Criteria

The literature included in this study was selected according to four principal criteria.

First, the publications had to make a substantial theoretical contribution to the conceptual development of didactics or closely related educational theories.

Second, priority was given to peer-reviewed books and journal articles published by internationally recognized academic publishers and indexed educational databases.

Third, the review intentionally incorporated literature representing different educational traditions, including Continental European, Anglo-American, and international perspectives, thereby ensuring theoretical diversity and reducing disciplinary bias.

Finally, preference was given to studies that remain highly influential within contemporary educational research and continue to shape discussions concerning curriculum development, teacher education, instructional design, and educational innovation.

4.4 Analytical Framework

The study employs critical conceptual analysis combined with theoretical synthesis as its principal analytical strategy. Conceptual analysis involves identifying the underlying assumptions, definitions, relationships, and theoretical propositions that characterize different understandings of didactics. Rather than comparing theories descriptively, the analysis investigates their epistemological foundations and explanatory capacities.

The analytical process consisted of four consecutive stages.

The first stage examined the historical evolution of didactics from classical educational philosophy to contemporary educational sciences.

The second stage analyzed the principal theoretical frameworks underpinning modern didactics, including constructivism, sociocultural theory, didactic transposition, the Theory of Didactical Situations, the Anthropological Theory of the Didactic, Joint Action Theory in Didactics, and Pedagogical Content Knowledge.

The third stage identified common conceptual elements shared across these theoretical traditions, particularly regarding knowledge transformation, teaching mediation, learning processes, and educational context.

Finally, these common elements were synthesized into an integrated conceptual framework capable of explaining didactics as a multidimensional scientific discipline suitable for addressing contemporary educational challenges.

4.5 Conceptual Synthesis Procedure

The conceptual synthesis followed an iterative process of comparison, categorization, integration, and theoretical refinement. Initially, individual theories were examined independently to identify their distinctive assumptions concerning the nature of knowledge, teaching, learning, curriculum, and educational interaction.

Subsequently, conceptual similarities and differences among the theories were systematically compared to identify complementary rather than competing perspectives. Particular attention was devoted to recurring concepts such as knowledge transformation, teacher mediation, learner agency, curriculum interpretation, classroom interaction, institutional influence, and educational context.

The resulting synthesis enabled the construction of an integrated conceptual model consisting of four interconnected dimensions:

- Knowledge (selection, organization, transformation, and disciplinary structure);
- Teaching (professional mediation, instructional decision-making, curriculum interpretation, and pedagogical strategies);
- Learning (cognitive construction, social interaction, conceptual development, and learner participation);
- Educational Context (institutional structures, curriculum policies, technological environments, cultural influences, and assessment systems).

This multidimensional framework represents the principal theoretical contribution of the present study.

4.6 Trustworthiness and Theoretical Rigor

To enhance the scientific credibility of the conceptual analysis, several strategies commonly employed in qualitative theoretical research were adopted.

First, theoretical triangulation was achieved by integrating multiple educational traditions instead of relying on a single theoretical perspective.

Second, conceptual consistency was maintained by comparing definitions, assumptions, and explanatory mechanisms across different theories before synthesizing them into the proposed framework.

Third, the study employed extensive engagement with foundational and contemporary scholarly literature to ensure that the conceptual model accurately reflects current developments within educational sciences.

Finally, the transparency of the analytical procedure enables future researchers to evaluate, refine, or empirically validate the proposed theoretical model.

4.7 Limitations of the Study

Several limitations should be acknowledged.

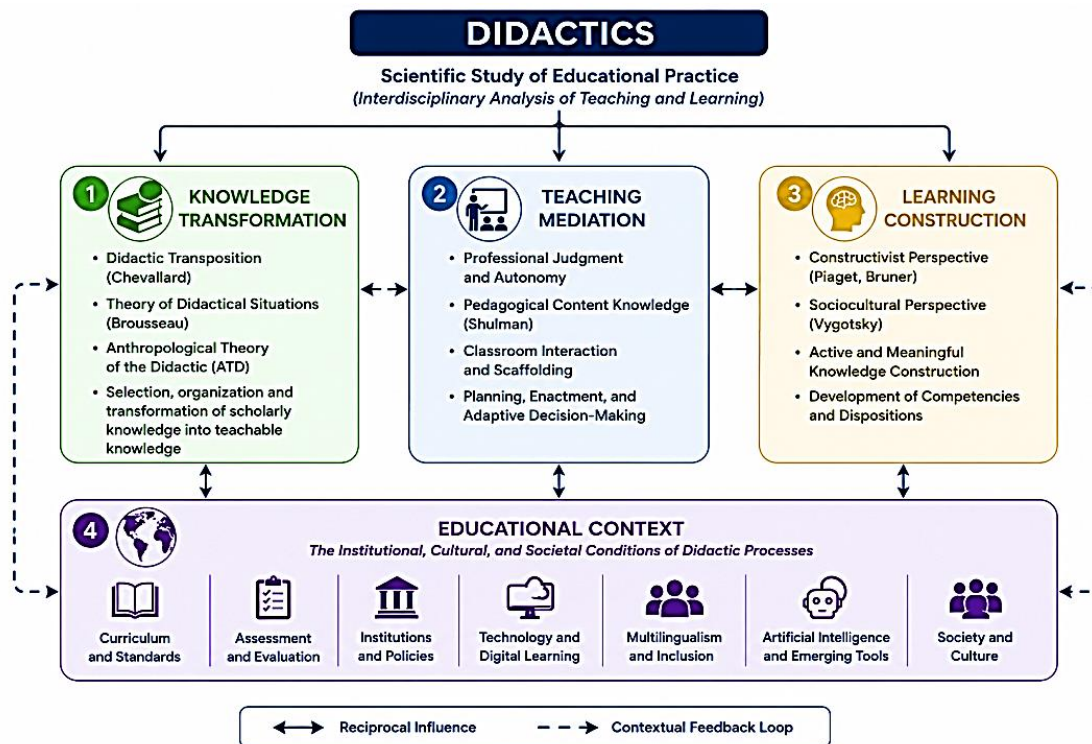
First, the study is conceptual rather than empirical and therefore does not statistically evaluate the effectiveness of the proposed framework in classroom practice.

Second, although the literature review incorporates major international theoretical traditions, additional regional perspectives may further enrich future conceptual developments.

Third, the rapidly evolving fields of educational technology, digital learning environments, and artificial intelligence continue to transform educational practice. Consequently, the proposed conceptual framework should be regarded as theoretically comprehensive yet sufficiently flexible to accommodate future scientific developments.

Despite these limitations, the study provides a coherent theoretical foundation that contributes to strengthening the scientific identity of didactics and establishes a conceptual basis for future empirical investigations examining knowledge transformation, teacher professional practice, curriculum development, digital pedagogy, and educational innovation.

Fig. 1. Integrated Conceptual Framework of Contemporary Didactics



Source: Developed by the author based on Comenius (1967), Piaget (1970), Vygotsky (1978), Bruner (1996), Chevallard (1991), Brousseau (1997), Shulman (1987), Sensevy (2011), Deng (2018), and Biesta (2015).

5. Results

The findings of this conceptual study demonstrate that didactics has evolved into a comprehensive interdisciplinary scientific discipline that extends substantially beyond traditional conceptions of teaching methodology. The systematic synthesis of classical and contemporary educational theories indicates that modern didactics integrates curriculum theory, educational psychology, sociology of education, subject-specific pedagogy, teacher professional knowledge, and digital learning into a coherent framework for explaining how educational knowledge is generated, transformed, mediated, and reconstructed in diverse learning environments (Biesta, 2015; Deng, 2018).

The results presented below summarize the principal theoretical findings that emerged from the comparative analysis of major didactic traditions.

5.1 The Scientific Evolution of Didactics

The first major finding indicates that the historical development of didactics reflects a gradual transition from a theory primarily concerned with instructional methods toward an autonomous scientific discipline addressing the complexity of educational processes. Early educational scholars such as Comenius and Herbart emphasized systematic instruction, curriculum organization, and the logical sequencing of learning activities. Contemporary scholarship, however, positions didactics within a broader interdisciplinary framework that explains the relationships among knowledge, teachers, learners, educational institutions, curriculum, and social context (Comenius, 1967; Herbart, 1901; Hopmann, 2007).

Comparative examination of the German *Didaktik*, French *didactique*, and Anglo-American pedagogical traditions reveals substantial conceptual convergence despite their different historical origins and theoretical terminology. Each tradition ultimately investigates how educational knowledge should be selected, transformed, interpreted, and communicated to facilitate meaningful learning. Consequently, the findings suggest that these perspectives should be regarded as complementary theoretical approaches rather than competing educational paradigms (Chevallard, 1991; Hudson, 2007; Kansanen, 2009).

These observations reinforce the contemporary understanding of didactics as an integrative educational science that synthesizes curriculum studies, educational psychology, pedagogy, and institutional analysis into a unified conceptual framework.

5.2 Learning as an Active and Social Process of Knowledge Construction

The second finding demonstrates that modern didactic theory consistently rejects transmission-based conceptions of teaching in favor of learner-centered models emphasizing active knowledge construction. Across the literature reviewed, learning is conceptualized as a dynamic cognitive and social process through which learners actively construct conceptual understanding rather than passively receive information.

Constructivist theory explains that learners continuously reorganize existing cognitive structures through assimilation and accommodation, making prior knowledge an essential component of effective instruction (Piaget, 1970). Bruner (1996) further

argues that meaningful learning requires repeated engagement with concepts through discovery learning and spiral curriculum design. Complementing these perspectives, sociocultural theory emphasizes that conceptual development is fundamentally mediated through language, dialogue, collaboration, and guided participation within learners' Zone of Proximal Development (Vygotsky, 1978).

Taken together, these theoretical perspectives indicate that effective didactic practice requires learning environments that promote inquiry, collaboration, reflection, and active learner participation rather than memorization and information transfer.

5.3 Knowledge Transformation as the Core Function of Didactics

A third important finding concerns the centrality of knowledge transformation within contemporary didactic theory. The reviewed literature consistently demonstrates that educational knowledge differs fundamentally from disciplinary knowledge because it undergoes systematic transformation before becoming suitable for classroom instruction.

Chevallard's theory of didactic transposition explains that scholarly knowledge is progressively reconstructed through curriculum development, textbook production, institutional regulations, and teachers' pedagogical interpretation before being introduced into educational settings (Chevallard, 1991). Likewise, Brousseau's Theory of Didactical Situations emphasizes that meaningful learning occurs when transformed knowledge is embedded within authentic educational situations encouraging conceptual exploration, hypothesis testing, and independent reasoning (Brousseau, 1997).

Accordingly, the findings indicate that classroom knowledge should be understood as reconstructed disciplinary knowledge designed to meet learners' developmental needs and educational objectives rather than as simplified scientific information.

5.4 Teachers as Professional Mediators of Educational Knowledge

The conceptual synthesis also demonstrates that contemporary didactics assigns teachers a substantially broader professional role than traditional instructional models. Rather than merely transmitting curriculum content, teachers function as professional mediators responsible for interpreting curricula, adapting disciplinary knowledge, facilitating classroom interaction, and supporting learners' conceptual development.

Joint Action Theory in Didactics conceptualizes teaching as a collaborative process in which teachers and learners jointly construct educational meaning through continuous dialogue and interaction (Sensevy, 2011). Similarly, Shulman's framework of Pedagogical Content Knowledge emphasizes that effective teaching requires integrating disciplinary expertise with pedagogical reasoning, learner understanding, instructional representation, and contextual decision-making (Shulman, 1986, 1987).

The findings therefore suggest that professional teaching requires continuous reflection, curriculum interpretation, instructional adaptation, and evidence-informed decision-making rather than mechanical implementation of standardized teaching methods.

5.5 Development of an Integrated Conceptual Framework

Perhaps the most significant outcome of the present study is the development of an integrated conceptual model synthesizing the principal theoretical traditions of contemporary didactics into a unified explanatory framework.

The proposed model consists of four interconnected dimensions:

- Knowledge, representing disciplinary content and its transformation into educational knowledge;
- Teaching, encompassing professional mediation, curriculum interpretation, and instructional decision-making;
- Learning, referring to cognitive development, social interaction, and conceptual construction;
- Educational Context, including curriculum policies, institutional structures, technological environments, cultural influences, and assessment practices.

Rather than functioning independently, these dimensions continuously interact throughout the educational process, illustrating that teaching and learning emerge from complex relationships among knowledge, teachers, learners, and educational environments. This systems-oriented perspective provides a comprehensive theoretical explanation for the multidimensional character of contemporary education.

5.6 Implications for Contemporary Educational Systems

The findings also generate several important implications for educational practice and policy.

First, curriculum development should be conceptualized as an ongoing process of knowledge transformation rather than a static selection of educational content. Teachers therefore become curriculum interpreters who continuously adapt disciplinary knowledge to learners' developmental characteristics and contextual needs (Chevallard, 1991; Deng, 2018).

Second, teacher education programs should extend beyond disciplinary expertise by emphasizing pedagogical reasoning, reflective practice, curriculum theory, and professional decision-making. Such preparation enables teachers to respond effectively to increasingly complex educational environments characterized by learner diversity and technological innovation (Shulman, 1987).

Third, the integration of digital technologies and artificial intelligence creates significant opportunities for personalized learning, adaptive assessment, and intelligent instructional support. Nevertheless, the findings indicate that technological innovation should

remain subordinate to pedagogical objectives, ensuring that AI complements rather than replaces teachers' professional expertise. Ethical considerations—including academic integrity, data privacy, transparency, digital equity, and learner autonomy—must therefore become central components of contemporary didactic theory (Holmes et al., 2022; OECD, 2021; UNESCO, 2023; Williamson & Eynon, 2020).

Finally, the increasing cultural, linguistic, and social diversity of contemporary classrooms requires didactic frameworks capable of supporting multilingual, inclusive, and learner-centered educational environments. Future educational practice should therefore adopt flexible instructional approaches that recognize diversity as a fundamental characteristic of modern education rather than as an exception requiring separate pedagogical strategies.

Overall, these findings demonstrate that didactics has evolved into a mature interdisciplinary scientific discipline capable of explaining the interdependent relationships among knowledge transformation, professional teaching, active learning, and educational context. The integrated conceptual framework proposed in this study provides a robust theoretical foundation for future research in curriculum development, teacher education, digital pedagogy, educational policy, and artificial intelligence in education.

6. Conclusion

This study has reconceptualized didactics as a comprehensive interdisciplinary scientific discipline that extends far beyond its traditional interpretation as a theory of instruction or a collection of teaching methods. Through a systematic synthesis of classical educational philosophy and contemporary theoretical perspectives, the study demonstrates that didactics provides an integrative framework for understanding the complex relationships among knowledge, teaching, learning, and educational context. Rather than focusing exclusively on instructional techniques, modern didactics explains how disciplinary knowledge is selected, transformed, mediated, interpreted, and reconstructed through interactions among learners, teachers, curricula, institutions, and broader social and technological environments.

The findings reveal that contemporary didactics is founded upon multiple complementary theoretical traditions that collectively strengthen its scientific identity. Constructivism and sociocultural theory explain the cognitive and social mechanisms through which learning occurs, whereas theories such as Didactic Transposition, the Theory of Didactical Situations, Joint Action Theory in Didactics, and Pedagogical Content Knowledge provide sophisticated explanations of knowledge transformation, teacher mediation, and classroom interaction. Although these theoretical perspectives emerged from different educational traditions, they converge toward a common objective: explaining how meaningful learning is created through the dynamic interaction between educational content, professional teaching, learner engagement, and contextual conditions. Consequently, didactics should be understood not as a fragmented collection of pedagogical theories but as a coherent scientific field integrating insights from educational psychology, curriculum studies, sociology of education, subject-specific pedagogy, and teacher professional development.

One of the principal contributions of this study is the development of an integrated conceptual framework comprising four mutually dependent dimensions: knowledge, teaching, learning, and educational context. This framework provides a holistic explanation of educational processes by recognizing that effective teaching cannot be understood through isolated variables but rather through the continuous interaction among disciplinary knowledge, pedagogical mediation, learner cognition, institutional structures, technological environments, and cultural influences. By synthesizing these dimensions into a unified model, the study contributes to strengthening the epistemological foundations of didactics and offers a theoretically robust basis for future conceptual and empirical investigations.

The proposed framework also has important practical implications for contemporary education. It supports curriculum development that emphasizes knowledge transformation rather than content transmission, promotes teacher education focused on reflective professional competence and pedagogical reasoning, and reinforces learner-centered instructional approaches grounded in active knowledge construction. Furthermore, the framework provides a theoretical foundation for addressing emerging educational challenges associated with digital transformation, artificial intelligence, multilingual education, inclusive classrooms, and rapidly changing societal expectations. As educational systems continue to evolve, didactics offers an essential scientific perspective capable of balancing technological innovation with pedagogical integrity, educational equity, and human-centered learning.

Despite these contributions, the study is conceptual in nature and therefore does not empirically validate the proposed framework across specific educational contexts. Future research should examine the applicability of the four-dimensional model using qualitative, quantitative, and mixed-methods approaches across different educational systems, subject disciplines, and cultural settings. Particular attention should be devoted to investigating how artificial intelligence, adaptive learning technologies, learning analytics, and digitally mediated environments reshape the relationships among knowledge, teaching, learning, and educational context while preserving the ethical and humanistic purposes of education.

In conclusion, this study argues that didactics has matured into a scientifically grounded interdisciplinary discipline that occupies a central position within contemporary educational research. Its theoretical capacity to integrate diverse educational traditions, explain knowledge transformation, guide professional teaching, and respond to technological and societal change makes didactics an indispensable framework for advancing curriculum theory, teacher education, educational policy, and pedagogical innovation. Continued interdisciplinary dialogue and empirical investigation will further strengthen the scientific foundations of didactics and enhance its contribution to the development of sustainable, inclusive, and future-oriented educational systems.

Declarations

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Institutional Review Board Statement

Not applicable. This study is a conceptual and theoretical investigation based exclusively on published scholarly literature and does not involve human participants, animals, clinical data, or experimental procedures.

Data Availability Statement

No new datasets were generated or analyzed during this study. All information supporting the findings is derived from publicly available academic literature cited in the reference list.

Conflict of Interest

The authors declare that they have no known competing financial interests, personal relationships, or institutional affiliations that could have appeared to influence the work reported in this paper.

Author Contributions

Conceptualization: Abdelkader Makhlouf, Sabah Dali;
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Formal Analysis: Abdelkader Makhlouf, Sabah Dali;
Investigation: Abdelkader Makhlouf;
Literature Review: Abdelkader Makhlouf, Sabah Dali;
Writing—Original Draft Preparation: Abdelkader Makhlouf;
Writing—Review and Editing: Sabah Dali;
Visualization: Abdelkader Makhlouf;
Supervision: Sabah Dali.

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Ethical Approval

Ethical approval was not required for this study because it is based exclusively on theoretical analysis and published academic sources and does not involve human participants or personal data.

Consent for Publication

All authors have reviewed the manuscript and consent to its publication.

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Geniştirilmiş Özet

Giriş

Yirmi birinci yüzyılda eğitim sistemleri; küreselleşme, dijital dönüşüm, yapay zekâ teknolojilerindeki hızlı gelişmeler, bilgi toplumunun gereksinimleri ve yaşam boyu öğrenme anlayışının yaygınlaşmasıyla birlikte köklü bir değişim sürecinden geçmektedir. Bu dönüşüm, yalnızca öğretim uygulamalarını değil, aynı zamanda eğitim bilimlerinin temel kavramlarını ve kuramsal yapılarını da yeniden değerlendirmeyi gerekli kılmaktadır. Bu bağlamda didaktik, geleneksel anlamda yalnızca öğretim yöntemlerini inceleyen bir alan olmaktan çıkarak; bilgi, öğretim, öğrenme ve eğitim bağlamları arasındaki çok yönlü ilişkileri açıklayan disiplinlerarası bilimsel bir araştırma alanı hâline gelmiştir. Bununla birlikte didaktiğin farklı akademik geleneklerde farklı biçimlerde yorumlanması, ortak bir kuramsal çerçevenin oluşturulmasını güçleştirmektedir. Kıta Avrupası eğitim anlayışında didaktik bağımsız bir bilim dalı olarak değerlendirilirken, Anglo-Amerikan eğitim literatüründe daha çok pedagoji, öğretim tasarımı veya program geliştirme kapsamında ele alınmaktadır. Bu durum, didaktiğin bilimsel kimliği konusunda kavramsal parçalanmalara yol açmaktadır. Modern eğitim sistemlerinde öğrenen merkezli yaklaşımlar, yeterlilik temelli eğitim, dijital öğrenme ortamları ve yapay zekâ destekli öğretim uygulamalarının yaygınlaşması, didaktiğin yeniden tanımlanmasını zorunlu hâle getirmiştir. Bu çalışma, didaktiğin tarihsel gelişimini ve temel kuramsal yaklaşımlarını bütüncül biçimde inceleyerek, çağdaş eğitim bilimine uygun yeni bir kavramsal çerçeve geliştirmeyi amaçlamaktadır. Böylece didaktiğin yalnızca öğretim tekniklerinden oluşan uygulamalı bir alan değil; bilgi dönüşümü, öğretim süreçleri, öğrenme dinamikleri ve eğitim bağlamını bütünleştiren bilimsel bir disiplin olduğu ortaya konulmaktadır.

Yöntem

Araştırmada kavramsal nitel araştırma deseni benimsenmiş ve sistematik literatür incelemesine dayalı kuramsal sentez yöntemi kullanılmıştır. Çalışmanın temel amacı, didaktiğin tarihsel gelişimini, kuramsal temellerini ve çağdaş eğitimdeki rolünü yeniden değerlendirerek bütünlük bir bilimsel model ortaya koymaktır. Araştırma herhangi bir deneysel uygulama veya alan çalışmasına dayanmamakta; uluslararası eğitim literatüründe yer alan temel kuramlar eleştirel bakış açısıyla analiz edilmektedir. Veri kaynaklarını Johann Amos Comenius, Johann Friedrich Herbart, Jean Piaget, Lev Vygotsky, Jerome Bruner, Yves Chevallard, Guy Brousseau, Gérard Sensevy, Lee Shulman, Wolfgang Klafki, Stefan Hopmann ve diğer çağdaş eğitim kuramcılarının çalışmaları oluşturmaktadır. Literatür seçiminde, didaktiğin kuramsal gelişimine doğrudan katkı sağlayan hakemli kitaplar ve bilimsel makaleler öncelikli olarak değerlendirilmiştir. Analiz sürecinde yapılandırmacılık, sosyokültürel öğrenme kuramı, didaktik dönüşüm kuramı, Didaktik Durumlar Kuramı, Didaktiğin Antropolojik Kuramı, Didaktikte Ortak Eylem Kuramı ve Pedagojik Alan Bilgisi gibi temel yaklaşımlar karşılaştırmalı olarak incelenmiştir. Ardından bu kuramların ortak kavramları belirlenmiş ve bilgi, öğretim, öğrenme ile eğitim bağlamı arasındaki ilişkileri açıklayan dört boyutlu bütünlük kavramsal model geliştirilmiştir. Araştırmanın güvenilirliğini artırmak amacıyla kuramsal üçgenleme yöntemi uygulanmış; farklı eğitim geleneklerinden elde edilen bulgular karşılaştırılarak ortak noktalar belirlenmiştir. Böylece çalışma, didaktiğin bilimsel kimliğini güçlendiren sistematik ve disiplinlerarası bir kuramsal sentez ortaya koymaktadır.

Bulgular

Araştırma bulguları, didaktiğin günümüzde yalnızca öğretim yöntemlerini açıklayan bir alan olmaktan çıkarak bilgi, öğretim, öğrenme ve eğitim ortamlarını birlikte ele alan disiplinlerarası bir bilim dalına dönüştüğünü göstermektedir. İncelenen kuramlar, farklı tarihsel ve ulusal geleneklerden gelmelerine rağmen ortak bir amacı paylaşmaktadır: Bilginin eğitim ortamlarında nasıl seçildiğini, dönüştürüldüğünü, aktarıldığını ve yeniden yapılandırıldığını açıklamak. Yapılandırmacı yaklaşım öğrenmenin bireyin aktif bilgi inşası yoluyla gerçekleştiğini vurgularken, sosyokültürel kuram sosyal etkileşim, dil ve kültürel bağlamın öğrenme üzerindeki belirleyici rolünü ortaya koymaktadır. Didaktik dönüşüm kuramı ise bilimsel bilginin doğrudan sınıfa aktarılmadığını; program geliştirme, öğretmen yorumları ve öğretim süreçleri aracılığıyla yeniden yapılandırıldığını göstermektedir. Ayrıca Pedagojik Alan Bilgisi yaklaşımı, etkili öğretimin yalnızca alan bilgisine değil, öğretmenin bu bilgiyi öğrenci düzeyine uygun biçimde dönüştürebilme yeterliliğine bağlı olduğunu ortaya koymaktadır. Çalışmanın en önemli bulgularından biri, didaktiğin dört temel boyut üzerine inşa edilen bütünlük bir kavramsal modelle açıklanabileceğidir. Bu model; bilgi dönüşümü, öğretim süreçleri, öğrenme dinamikleri ve eğitim bağlamını birbirine bağımlı unsurlar olarak ele almaktadır. Araştırma ayrıca dijital eğitim, çevrim içi öğrenme, öğrenme analitikleri ve yapay zekâ uygulamalarının didaktiğin kapsamını genişlettiğini ve öğretmenlerin artık yalnızca bilgi aktaran kişiler değil; öğrenmeyi yönlendiren, teknolojiyi pedagojik amaçlarla kullanan profesyonel rehberler hâline geldiğini göstermektedir.

Sonuç

Araştırma sonuçları, didaktiğin çağdaş eğitim bilimleri içerisinde bağımsız ve disiplinlerarası bir bilimsel disiplin olarak yeniden tanımlanması gerektiğini ortaya koymaktadır. Çalışma, didaktiğin yalnızca öğretim tekniklerini açıklayan uygulamalı bir alan olmadığı; bilgi dönüşümü, öğretim tasarımı, öğrenme süreçleri ve eğitim bağlamı arasındaki karmaşık ilişkileri açıklayan kapsamlı bir kuramsal yapı sunduğunu göstermektedir. Geliştirilen dört boyutlu kavramsal model, eğitim süreçlerinin yalnızca öğretmen veya öğrenci merkezli yaklaşımlarla açıklanamayacağını; bilgi, öğretmen, öğrenen ve eğitim ortamı arasındaki sürekli etkileşimlerin birlikte değerlendirilmesi gerektiğini ortaya koymaktadır. Araştırma ayrıca öğretmen eğitimi programlarının yalnızca alan bilgisi ve öğretim yöntemlerine odaklanmasının yeterli olmadığını; program geliştirme, dijital pedagoji, değerlendirme okuryazarlığı, etik sorumluluk ve yansıtıcı mesleki uygulamaların da öğretmen yeterliklerinin temel bileşenleri olması gerektiğini vurgulamaktadır. Yapay zekâ ve dijital teknolojilerin eğitim sistemlerinde giderek daha fazla kullanılacağı öngörülmekle birlikte, bu teknolojilerin öğretmenin yerini almak yerine öğretim süreçlerini destekleyen araçlar olarak değerlendirilmesi gerektiği sonucuna ulaşılmıştır. Sonuç olarak çalışma, didaktiğin gelecekte program geliştirme, öğretmen yetiştirme, dijital eğitim, eğitim politikaları ve yapay zekâ destekli öğrenme alanlarında yürütülecek disiplinlerarası araştırmalar için güçlü bir kuramsal temel sunduğunu ortaya koymaktadır. Bu yaklaşım, hem eğitim bilimlerinin kuramsal gelişimine katkı sağlamakta hem de hızla değişen çağdaş eğitim ortamlarının daha bilimsel, kapsayıcı ve sürdürülebilir biçimde yeniden yapılandırılmasına önemli katkılar sunmaktadır.