# Descriptive and Categorical Delimitation of the Theories of "Didactics"

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**Abstract**

This literature review aims to describe the theoretical approaches to Didactics as they have emerged in modern literature and the classification of these theories to realize their dynamics in the teaching practice. Didactics, either as a macro-theory or a micro-theory and methodology of teaching, constitutes its theoretical background, thus significantly contributing to decisions made about the models, methods, and means employed in the instructional design. In this respect, it refers to the theory and practical applications which underlie instruction. Its wide range of definitions, which are based on different and often conflicting theoretical approaches, have sustained an ongoing reflection and debate on the epistemological entity of Didactics. The present study views Didactics as the framework for the scientific and theoretical documentation of teaching, which it perceives as a complex multifactorial phenomenon.

**Keywords:** Didactics, theories, classification, criteria

## Introduction

The aim of this literature review was to categorize and explain the theories of Didactics that originated in Europe and, thus, serve as a valuable resource for developing curricula and for teachers to enhance their classroom instruction.For this reason, the different notions applied toDidacticsconcerning the relationship between learning and teaching are discussed in detail. The innovation of this review lies in the fact that it attempts to delimit learning and teaching in terms of the Didactic theories developed in Europeand investigate how they could complementarily contribute to the effectiveness of the teaching practice.

Didactics deals with learning as a result of teaching practices, as well as social interactions within the school environment (Vercetis, 2003).Learning entails a permanent change in a student's behaviour, which contributes to the development of mental processes and knowledge acquisition (Kassotakis&Flouris, 2003).The process of learning is a uniquely human endeavor, as only humans have the ability to consciously direct their intellectual growth (Kolb & Kolb, 2009). According to Charalambopoulos (2001), learning also has biological roots that are closely linked to teaching. Learning, in a broader sense, is a multifaceted intellectual process whose factors are constantly changing (Flouris, 2003).

Based on the aforementioned framework, the learning theories provide a comprehensive view of the process through which each person manages to handle both himself and his environment. The educational process, being the framework for achieving learning, is based on learning theories and models influencing the teaching decisions and choices about the content, purpose and process of learning (Fykaris, 2016; Ioakeimidou, 2018; Lawson, Vosniadou, Van Deur, Wyra & Jeffries, 2018; Vosniadou, Lawson, Van Deur, Wyra & Jeffries, 2020; Vosniadou et al., 2021; Zimmerman & Schunk, 2011).

The learning theories are organized into the following four categories:

• The behavioural theories of learning emphasize that learning and the acquisition of knowledge is the result of stimuli processing received by an individual from his environment and his reaction to these stimuli.

• The cognitive theories of learning support that cognition is a function that creates meanings based on the experiences of the individual. Knowledge comes from pre-existing experiences; the mental creations that everyone uses to explain situations or events. One of the principal advocates of the cognitive learning theory, Piaget, argued that learning is a process of building representations and cognitive schemes (Duncan, 1995; Feldman&Fowler, 1997; Feldman, 2004; Glassman, 1995; Fykaris, 2016; Kalovrektis, Kontou, Psycharis & Paraskevopoulou-Kollia, 2020).

• The constructivist theoriesperceive learning as a process of active construction and not simply a process of acquiring knowledge. It is also a process of adaptation to the empirical world which is not independent of the individual knower (Petrie, 1999; Oliver, 2007; Bakoyannis & Kyriazis, 2003; Kalovrektis et al., 2020). According to Vygotsky, man is an active participant in the creation of knowledge and not a passive receiver of it, as he structures

his actions within a cognitive reality (Duncan et al., 1995; Glassman, 1995; Glassersfeld, 2007; Helm, Beneke, & Steinheimer, 2008; De Vries, 2000; Kalovrektis et al., 2020).

• According to the social interdependence theory, individuals achieve their goals through interactions with others (Johnson & Johnson, 2005, 2017; Manitsaris & Mavridis, 2005). This theory suggests that students are motivated to learn from one another because of their investment in the group and its members, as well as the advantages they receive for their self-esteem through this collaboration (Slavin, 2011, 2014, 2015).

## Descriptive and categorical definition of "Didactics"

The term "Didactics" appeared as a science for the first time in the 17th century in Ratichius' "Methodus Didactica" and Comenius's "Didactica Magna" (Raithel, Dollinger, Hörmann, 2009, p. 74). Didactics evolved as a "macro-theory" of teaching and learning, utilized for making teaching decisions about the teaching and learning process (Kron, 2004, p. 43) and a"micro-theory" of teaching and learning a specific school subject (Hasebrock, 2004). Regarding methodology, Didactics is viewed as a normative theory focusing on making decisions abouteducational design (Arnold, 2012).

## Theoretical Approaches to Didactics

Before presenting the theories of Didactics, a clarification of the term "theory", as conceived in this literature review, needs to be made. ¨Theory¨ is understood as a system of ideas and principles (Moser, 2005; Babiniotis, 2010: 563; Roussopoulos, 2018), originating from research and reasoning (Plato, Laws IB, 951c). In this context, Didactics is the scientific field of Pedagogy that studies teaching from both a practical and a theoretical perspective (Fykaris, 2014; Melissinopoulos, 2013).

In its broader sense, Didactics refers to the set of rules and principles that guide teaching but, in practice, it functions as an applied science that utilizes teaching theories to facilitate the educational process through the development of models, techniques, and methods, that support the learning and teaching process (Koutrouba, 2004).

A theory of Didactics as a scientifically structured framework within which teaching can be organized and analyzed should include the following elements: (a) the theoretical background, i.e., the learning theory, the sociological and epistemological perspective, (b) the specific structure based on teaching principles, and (c) the applied processes through which teaching is organized, such as the teaching methods and techniques (Frydaki, 2009; Moser, 2005; Mialaret, 2007).

Consistent with these ideas, at the beginning of the 20th century, Otto Willmann (2015, p. 210) talked about the importance of "didacticformation", which is achieved through the application of the learning and teaching principles in the classroom context. The didactic formation implies the adaptation of a school subject) to the principles of the content of education, b) to the educational value of the respective discipline, and c)to the general principles ofteaching and learning (Willmann, 2015, p. 210).

In the 1930s, Erich Weniger developed the "interpretative didactics" based on the Humanities and, in particular, on the views of Wilhelm Dilthey (Gunden, 2000). According to Weniger, Didactics encompasses more than just the study of teaching and learning. It also involves a wide range of factorsinherent in teaching, making it a complex and multifaceted phenomenon that is both unique and unrepeatable.He concludedthat Didactics is "the theory of the content of education and syllabi" (Weniger, 2000, cited in Arnold, 2012, p. 987).

On the other hand, the evolution of Didactics into a scientific fundament of learning and teaching was highlighted by Wolfgang Klafki and Paul Heimann, who tried to establish the epistemological foundation of Didactics(Zierer & Seel, 2012). Klafki, having been influenced by Weniger, developed the idea of "Categorical Education" (Kategoriale Bildung) (1959) (Kron, 2004, p. 75) in opposition to both "formal education" and "material education" (Arnold, 2012). Klafki distinguishes between "material education", which prioritizes knowledge content and objectivity, and "formal education", which emphasizes human ability development. Categorical Education, however, concentrates on both knowledge content and student skill development, aiming to cultivate self-determination, solidarity, and social engagement (Sjöström, Eilks&Talanquer, 2020). Didactics is responsible for the selection of educational content, its negotiation with teaching practice, and ensuring effective teaching methods.

In 1991, Klafki developed the Exemplar Approach to learning (exemplarischeBedeutung) which emphasizes that knowledge acquisition is facilitated through examples that help connect a concept to the learning material in a specific context. This approach is similar to Bruner's "learning by discovery" theory and highlights that learning is a constructive process where the objectives, content, and methods are constantly interdependent.

Another important advocate of Didactics, Schulz, distinguished four decision-making fields, which he included in his "Structural Analysis" theory (Struktur-analyse): a) the intentions, b) the topic, c) the methods, and d) the media. The use of these four fields follows three instructional design principles: (a) interdependence of the fields, (b) variability of the instructional design, and (c) monitoring the differences between the initial instructional design and the instructional outcome (Arnold, 2012). These principles together with the students'socio-cultural as well as individual characteristics are the prerequisites for a successful instructional design. In this context, Didactics perceives teaching as a complex web of interaction, social learning,and knowledge and skills acquisition directly related to the learning content (Hudson, 2016).

Schulz (1980, cited in Arnold, 2012) also focused on the social dimension of schooling and the interactive nature of teaching and developed "The Hamburg Model of instructional analysis and design", which consists of the following five steps (Gundem, 2000, p. 251-252): 1) design criteria, 2) structure of instructional components, 3) skills and functions of the teaching practice, 4) fundamental deliberation inherent in the design, 5) levels of design, including: a) planning in perspective, related to the entire curriculum or groups of school subjects or a specific school subject (Die Perspektiveplanung), b) planning for teaching units

(Die Umrissplanung), c) process planning at an appropriate point of time during teaching (Die Prozessplanung), and d) correction of the teaching design, when required due to unexpected situations arising during the teaching procedure (Die Planungs korrektur).

Based on the above perspective, Klafki (1991) introduced the term "Didaktische Analyse", pointing out the importance of the individual and socio-cultural characteristics of the learners, as well as the institutional conditions for the selection of the learning content. In this context, Klakfi, influenced by the Critical Theory of the Frankfurt School of Social Research of Horkheimer and Habermas, pointed out that the most effective organization of instructional design requires two levels of analysis (Klafki, 1980, 1994 cited in Seel, Lehmann, Blumschein, & Podolskiy, 2017; Zierer & Seel, 2012):

- the analysis of the learning prerequisites and conditions concerned withthe specific socio-cultural background of the student, the teacher, and the educational institution,

- the didactic analysis, which concerns a) the investigation of the importance of the teaching content for the present and future, b) the thematic structure of the content and the verification and evaluation of its objectives, c) the accessibility to the content with the use of appropriate educational means and, d) the methodological structure of teaching, i.e., the teaching and learning process.

In the second half of the 20th century, the dominant theories of Didactics were:

- the Theory of Goal-oriented Didactics (Zielorientierter Unterricht) was concerned with the optimization of the learning process (Möller, 1999)and viewed the teacher as an experimental psychologist and social worker.

- the Theory of Dialectical Didactics (Dialektische Didaktik) focused on the dynamics of the dialectical teacher-student relationship. In this context, the objectives, learning contents, and teaching methods are interconnected

- the Theory of Critical communicative Didactics (Kritisch-kommunikativeDidaktik)emphasized the value of experiential achievement in learning (Kron, 2004, p. 126)

- the Theory of Curriculawas oriented toward the teaching and learning objectives,

- the theoretical approach of Critical Constructivist Learning (Kritisch-konstruktivistischer Ansatz), developed by Siebert & Moller (1994) and Reich (1996, cited in Kron, 2004, p. 153-154). This theoretical approach was oriented towards the creation of productive learning processes, where learning is perceived as a social process (Petersen, 2004, p. 76) according to the following structural pattern: a) reconstruction of knowledge (Rekonstruktion), through the exploration of reality, b) construction of knowledge (Konstruktion), through individual action and reflection and c) deconstruction of knowledge (Dekonstruktion) through the students' self-reference for the perception of their learning reality.

Jank and Meyer (1994) summarized the most important theories of Didactics in the 20th

century as follows:

Table 1. Theories of Didactics

| Theories of Didactics | |
|---|---|
| *Bildungs theoretische Didaktik (1962-1985)* | Weniger, Klafki, Blankerts, Kramp, Wagenschein |
| *Lehr-lern-theoretische Didaktik (1965-1980)* | Heimann, Schulz, Willmann |
| *DialektischeDidaktik (1972-1987)* | Klingberg, Rausch, Weck |
| *Zielorientierter Unterricht (1965-1970)* | Mager, Bloom, Möller, Lemke |
| *ErfahrungsbezogenerUnterricht (since 1981)* | Rumpf, Scheller |
| *HandlungsorientierterUnterricht (since 1980)* | Gudjons, Bönsch, Jantzen, Mansje, Aeldi |

During the 20th and 21st centuries, Didactics– still considered a scientific branchof Pedagogy- seems to focus on two main trends: the first trend tries to integrate the classic enduring models of Didactics as well as elements of instructionaldesign, while the second one attempts to develop new teaching models, utilizing verified scientific dataprovided by sciences related to learning, such as the Educational Psychology (Zierer & Seel, 2012).

However, the existence of a wide range of definitions of Didactics continues to be found in the relevant literature, which is based on different and often conflicting theoretical approaches, creating, but also maintaining the dispute on the epistemological entity of Didactics (Gundem, 2000). Bearing in mind the aforementioned concerns, it seems that a functional definition of Didactics could be: "Didactics consists of the framework forthe scientific validationofthe facts related to the teaching and learning process so that a coherent correlation of the didactic theory with the didactic practice is achieved".

Didactics as the theory of instructional designis thesupporting fundament of teaching and aims to attain a dynamic functional correlation of theory with the teaching practice (Fykaris, 2015). It is concerned with the aims, methods, and practices of teaching and its organization and practical application for learning to be achieved (Kansanen & Meri, 1999, Koutrouba, 2004).Following this idea, the scientific natureof Didactics lies in the correlation of its theory with the developmentof the instructional design.

In this context, an important issue arises concerning the selection of aclassification criterionfor the theories of Didacticswhich could define their theoretical starting points, their proposed educational field of application (teaching framework), and their structural characteristics. Porsch (2020, p. 207) proposed the following taxonomy of the theories of Didactics: (a) theories that concern the instructional design, (b) theories that focus on the analysis of the teaching stages, and (c) theories that emphasize reflection on teaching. Accordingly, Terhart (2018, p. 83-85) proposed three epistemological paradigms of Didactics: (a) the paradigm of education (Bildungs paradigma), which includes the theories of Didactics focusing on the general term "education", (b) the production/efficacy paradigm (Produktions-/Effektivierungs), which focuses on the instructional design and the

achievement of the objectives, and (c) the interaction paradigm (Interaktions paradigma), which emphasizes the social context and the interaction that govern the teaching practice.

**Classification of the Theories of Didactics**

The theories of Didactics could be classified according to their content which includes their philosophy, structure, and application in the teaching practice, as follows (Fykaris, 2015, p. 92 - 99):

- The Didactic Theory of education,represented byDilthey, Flitner&Klafki, emphasizes man as the creator and creation of his culture. Using Hermeneutics, it seeks the understanding of the essence and the meaning of logical forms rejecting the explanation through experiments and the verification using mathematical formulas. The didactic theory of education could be utilized during the design and organization of the teaching process, where the objectives of the teaching are determined (Why?), as well as in shaping the content of instruction (What?) (Fykaris, 2017; Trilianos, 2013). At the same time, it can be utilized during the implementation of teaching where the teacher as a critical researcher (Dimitriadou, 2016) mediates the selective utilization of knowledge in the teaching practice.

- The Didactic Theory of Learning and Teaching relates to the epistemological ideas of the Berlin School represented byHeimann, Willmann, and Schulz and reflectson the combination of theory and daily teachingpractice. Teachers can incorporate the didactic theory of learning and teaching in their lessons by merging theory with practice. This involves several stages, including testing for students' understanding and readiness, introducing new information, processing new data, and evaluating the students' progress (Fykaris, 2017; Trilianos, 2013).

- The Didactic Theory of Cyberneticsdeveloped by Felix von Cube focuses on how teachers guide learners to achieve their learning objectives. This theory can be applied by teachers during teaching as well as in the evaluation and feedback stages. Cybernetics, which deals with communication and control, can be compared to automatic control systems and is often referred to as feedback in psychology (Dimitriadou, 2016).

- The Didactic Theory of Critical Communicationviews teaching and learning as a social interaction. Its principal representatives are Adorno, Fromm and Markuze. A basic tenet of the theory is that teaching has more to do with the conditions in which learning happens. This theory can be utilized by the teacher in all stages of the teaching process (Dimitriadou, 2016) and aims to develop students' critical thinking creating the conditions necessary for triggering the student's intellectual powers (Matsangouras, 2011a). Finally, it can be used during the evaluation and feedback stage of the teaching process (Matsangouras, 2011a) either a) in the evaluation of learning that concerns both the evaluation of declarative and procedural knowledge and the evaluation of values and attitudes, or b) in the metacognitive evaluation that addresses students' development of knowledge planning, management, and production skills.

- The Didactic Theory of Curriculum focuses on the planning and organization stage of the teaching process. It deals with formulating the teaching aims and objectives and choosingthe

methods, teaching tools, and student assessment techniques. The Didactic theory of the curriculum contributes to a complete teaching guide development (Flouris, 2008).

- The Theory of Instructional Design is a theory of teachingbased on specific goalplanning, e.g., the development of particular skills through a detailed organization of the learning experience (Reigeluth, 1999, p. 5-6). This theory uses elements from psychological theories (i.e., motivational theories) and communication tacticsto develop in a preciseand comprehensible way the instructions the student needs to reach the teaching goal(Christensen, 2008, p. 25). In this context, particular emphasis is placed on instructional design, both in terms of the teaching process itself and in terms of the preparation of print and electronic teaching materials. For this reason, the Theory of Instructional Design is a tool for structuring a more general educational interventionwhile it can also be utilized in the initial planning phase of the teaching process (Petrina, 2004, p. 81-82, Reiser & Dempsey, 2012, pp. 159-167). The theory of Instructional Design includes elements from the cognitive and behavioural theories of learningthat setthe acquisition of knowledge as theiressential goal and support that knowledge is acquired through learning experiences based on communicative stimuli (Yanchar, South, Williams, Allen&Wilson, 2009, pp. 40-42; Schott, 1992, pp. 55-57). During the last decades of the 20th century, the Instructional Design theory incorporated constructivist elements focusing on the learner and utilizing an increasingly developing technology to structure an original and enjoyable learning experience. In this context, Instructional Design models were developed, such as ADDIE (Analyze, Design, Develop, Implement, Evaluate), the Dick & Carey model, the IDLS (Instructional Development Learning System), the Morrison/Ross/Kemp model, the UbD and others (Reiser & Dempsey, 2012; Dick, Carey & Carey, 2005; Morrison, Ross & Kemp, 2001; Esseff&Esseff, 1998).

- The Theory of Teaching as Designpresupposes "the principles of design thinking and design process to the thought processes of teaching" (Dinham, 1988, p. 30). According to this theory, any improvements in the teaching design could be implemented and evaluated in terms of their results. In this context, teaching can be seen as a design project, i.e., an attempt to conceive and implement changes that lead to a positive outcome (Dinham, 1988). The theory in question uses the Portsmouth Design Group's Model, which is based on architecturaldesign in teaching and includes descriptions of what designers and teachers doin parallel.Assuming that teaching can be analyzed and improved like architectural design, it appearsthat examining effective teaching can enhance educational architecture (Dinham, 1988).

- The Theory of the Transfer of Learning is a "complex mental process in which prior knowledge - declarative and procedural - helps the individual to understand and manage a fundamentally new problem situation, different at first sight from the previous ones he has managed in the past" (Politis, 2012, p. 76). This implies that the learner's previous knowledge is used to integrate new knowledge into his existing knowledge set to solve a problematic situation (Herring, 2010, pp. 143-147; Steiner, 2001). Knowledge transfer incorporates elements from cognitive psychology as it concerns the retention of knowledge through the use of memory mechanisms and formative or summative assessment processes (Healy &Woodmann, 2012, pp. 227-230). During this process, an important role is played by the

sensory intake and classification of the stimulus (Zanone&Kelso, 1994, pp. 461-465). The process followed concerns the access to the stimulus knowledge, the coupling of the information with the existing cognitive structures, the matching of the new information with similar information, the adaptation of the information to the existing cognitive structure, the assessment of the importance of the information and its final hierarchical integration into the cognitive structure (Bracke, 1998, pp. 246-252). In general, the Transfer of Learning Theory emphasizes the processes that activate students' memory abilities and, for this reason, can be used (a) in planning specific teaching activities, (b) in defining specific teaching actions, and (c) in selecting the teaching content.

• The Theory of Teaching through Art derives its philosophical background from Gardner's "Theory of Multiple Intelligences" and is based on the view that art can be a starting point for any teaching subject. This particular theory focuses on the view that learning takes place through the understanding of Art by the learners and their motivation to create works of Art, as well as their reflection on their creations (Heme & Page, 2008; Jones, 2007; Gisbson& Ewing, 2020; Besgen, 2015; Topaloglu, 2015).

• The Theory of values teaching focuses on the individual's thinking in the context of a socio-cultural value system (Boyer, 1975; Jelinek, 1975). When using this theory, the teacher serves as the mediator and facilitator in the student's effort to acquire knowledge (Brackenbury, 1975).

• The Practicing Theoryattempts to transform learners from passive receivers of information to active reflective participants in the teaching process (Cahalan & Downing, 1991). The main emphasis is on the practical application of theories during teaching. According to this theory, the teacher uses the learners' previous experience to enable them to respond torelated learning situations and help them solve problems they face in their daily lives (PrandiniBuckler, 1991).

• The Theory of Holistic Mind Development combines the following three theoretical references: Orff's school of work, Montessori's philosophy, and Gardner's theory of Multiple Intelligences, to provide a complete and comprehensive empowerment of mind and body (Calvin-Campbell, 1998). In the context of this theory, there is the belief that when the learner is trained based on the combination of these three theoretical references, he takes the opportunity to develop all his abilities to the maximum possible level (Calvin-Campbell, 1998; Flouris, 2021).

• The Personal Theory refers to a theoretical system of ideas, beliefs, values, and attitudes concerning everything related to the education process, e.g., the students, the school environment, and the curricula (Elliotetal, 2008). The Personal Theory is related to the teacher's perception of how people learn (Elliot, Kratochwill, Littlefield Cook & Travers, 2008). However, it includes views on educational issues that are often contradictory (Suerev, 2012, pp. 162-165).

**Conclusion**

The teaching process is founded on the theoretical conceptualizations of Didactics both as a

"macro-theoretical" framework for making decisions about the teaching and learning process and as a "micro-theoretical" framework for designing a specific school subject. The purpose of this literature review was to gather and categorize the various theories of Didactics that have been developed in Europe, based on phenomenological criteria. However, further analysis is required to fully understand their significance. Nonetheless, these theories are essential in creating pedagogical contexts that enable meaningful learning and knowledge acquisition.

Although some researchers have supported that Didactics have traditionally focusedon philosophical rather than empirical issues (Künzli, 2000),the detailed examination of the theories described in this literature review has shown that Didactics is also concerned with the pedagogical application of these theoretical conceptualizations. In this respect, Didactics as a normative theory consists of the scientific means for making decisions about the instructional design at all stages of the teaching process (Arnold, 2012).

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