





Review

# Models on Teaching Effectiveness in Current Scientific Literature

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**Abstract:** Knowing what defines ‘effective teaching’ contributes significantly to the appropriateness and validity of the instruction provided to pre-service teachers during their initial training. This may help them to perform as expert teachers before finishing their university training. This study aims to reflect upon the most significant models and theoretical contributions of each of the five most common methods for investigating teaching effectiveness in the current scientific literature. To that end, the main scientific sources within this field of study have been obtained on the Internet through the *Web of Science (WoS)*, *Scopus* and *ERIC*. The sources were selected for their relevance to the topic, which was determined by assessing the citations generated by the academic works and the impact of the journals in which they were published. The results show that the key and most central factor salient in teaching quality is related to the teachers themselves and their training. Thus, any educational model that seeks educational excellence must focus foremost on ensuring care and respect for teaching professionals, beyond economic investment, resource availability, or any other factors.

**Keywords:** teaching effectiveness; teacher professional development; theoretical models; ethnographic approach; educational indicators



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## 1. Introduction

The main current theoretical models on teaching effectiveness, such as the Dynamic Model of Educational Effectiveness [1,2] or its predecessor, the Comprehensive Model of Educational Effectiveness [3], share a focus on the complexity of the interrelated factors that affect teaching effectiveness. Multiple factors, such as the characteristics and attitudes of the student and the teacher, the educational context, or educational policies, among others, interrelate with each other and determine the quality of student learning at a specific time and in specific circumstances.

Among all these factors, one of them stands out due to its significance: the teacher’s work. According to the main theoreticians in the field, it is possible to affirm that the effectiveness of the educational process is essentially bound to the teacher’s work [4–6]. In other words, it is related to teacher effectiveness. If the teacher is not effective when guiding student learning, it is difficult to achieve significant progress in students’ learning [7,8]. However, teaching is a profession that is closely linked to the unique contextual characteristics that each teacher experiences (e.g., educational context, student characteristics, teacher personality, social and historical environment). Therefore, it can be complicated and difficult to identify what it is that makes a teacher efficient [9–11].

Usually, teachers learn to develop their work along with their practice through experience, but this is a long and irregular process that can lead them to leave their profession before becoming expert teachers. This often involves unsatisfactory results related to the quality of education that students receive during the time in which the teacher develops her or his teaching skills [12].

Knowing what characterizes an effective teacher is paramount for improving the instruction that is provided to teachers during their initial training [13]. It may help them to perform as experts before finishing their university training. It is therefore understandable that educational research has sought to determine the features that define effective teachers.

In this study, the characteristics of effective teachers have been analyzed from five different approaches. Using distinct methods, several scholars have developed different models defining the qualities of effective teachers. Each approach has an implicit purpose and level of specification, as far as research objectives are concerned, so analyzing previous studies in the context of the approaches used cannot be regarded as a trivial issue.

The first and most common method utilizes empirical research. In this method, the researchers conduct authentic research applied in the classroom. Hypotheses are put forward and then tested in real-world contexts in order to gain a better understanding of the conditions associated with teaching effectiveness. This kind of research tends to be very specific and targeted, providing empirical evidence for aspects of teaching effectiveness that were previously theoretical.

Another common method is based on reviewing the scientific literature, compiling what has been discussed to date on the topic under review, and thereby developing new theoretical models, either through theoretical and conceptual analysis or through a meta-analysis of the combined results of different studies. These models are often developed to define what is considered to be state of the art or in order to compile large amounts of evidence regarding previous theoretical claims.

A third approach is to use the so-called 'Gain Score Methods' or 'Value-added Methods'. These methods consist of isolating the teacher's contribution to student learning from the other factors involved in learning. In other words, the student's learning is usually analyzed with and without the teacher and, on an equal basis, the difference between the two is ascribed to the teaching factor [14]. These methods are often used to quantitatively evaluate the specific effectiveness of a teacher or methodology.

The fourth most widely-used method is classroom observation with effective teachers. This is called the ethnographic approach. This approach consists of applying systematic classroom observation as a scientific method for gathering information and drawing conclusions [15]. This method is often used in order to provide ecological validity to the results, since the context of intervention in this field of study is a crucial factor.

Finally, a very common method in this area of research is macro analysis. This involves the comparison of different education policies in several countries or states in order to determine which of them involve effective teaching practices. This method is often used to illustrate the influence of educational policies on schools, teachers, and, ultimately, on student learning, as shown in the dynamic model of educational effectiveness [1,16].

Authors of the various research models in the field commonly choose from among the five basic methodologies presented above in order to develop their research and draw conclusions based on specific objectives. It is then necessary to review all the perspectives provided by the five methods in order to achieve a global perspective of the current state of teaching effectiveness at present. Thus, this theoretical review aims to reflect upon the most significant models and theoretical contributions of each of the five methodologies in order to draw conclusions about the most relevant learning aspects.

This theoretical review implies a different approach to the reality of teaching effectiveness, as it aims to differentiate the main achievements and trends from each approach used, from the most micro and concrete perspective through empirical research or value-added methods, to the most macro perspective of the scientific literature review or educational policy comparison, going through the ecological perspective provided by ethnographic

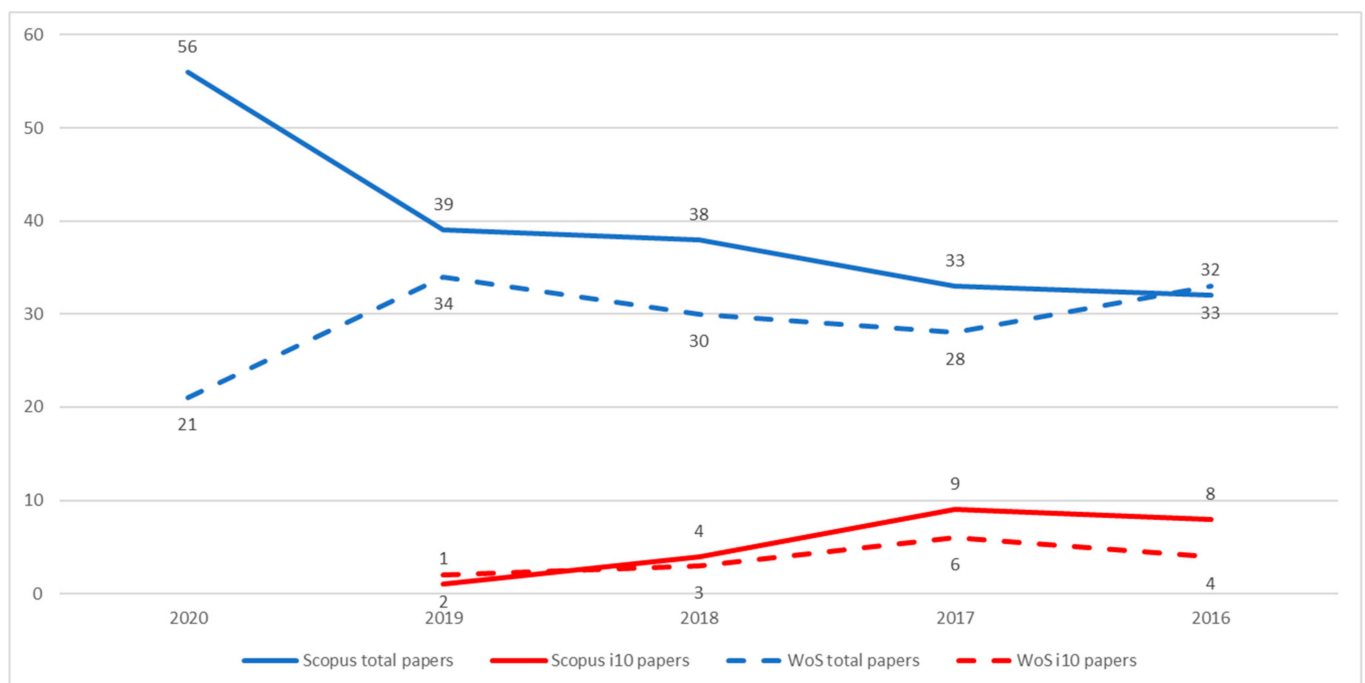
approaches. Other types of theoretical reviews that do not address this distinction may be biased against some of the more minority approaches. Nevertheless, each approach has scientific value, as they are all based on different purposes and methodologies.

## 2. Materials and Methods

For this theoretical review, the main scientific sources on the Internet regarding teaching effectiveness in this field of study have been consulted. *Web of Science (WoS)* and *Scopus* have been the main sources consulted, together with *ERIC* which is a specific database related to education.

A systematic search has been carried out through these servers, initially limiting the selection to studies published in the last five years (from 2016) that have had a very high impact on the scientific field, limiting the initial search to studies with a minimum of *i10* (10 or more citations generated) in the *Scopus* database in the educational area.

The initial selection of works that met all the conditions was 22 academic papers, as seen in Figure 1.



**Figure 1.** Number of *i10* articles on teacher effectiveness in the last five years in relation to total academic articles in the Scopus and WoS databases.

The *i10* studies shown in Figure 1 were thoroughly reviewed in order to narrow down the selection of definitive sources, due to their suitability for the subject and the relevance and currency of the contents discussed. A selection was made using the ‘Snowball sampling technique’ [17] in order to find and select older but still highly relevant sources. In other words, current and high-impact sources were selected, together with older studies that were still relevant due to their great influence on the most significant current research. Throughout this complex process, the theoretical basis for this review study was built.

Finally, this theoretical review includes 75 studies, 7 of which were published in 2020, as seen in Figure 2. Of the selected studies, 77.33% are academic journal articles, as shown in Figure 3. Academic publications in English and Spanish have been included (13.33%), as seen in Figure 4, as these are the languages spoken by the authors and the most relevant within the academic area reviewed.

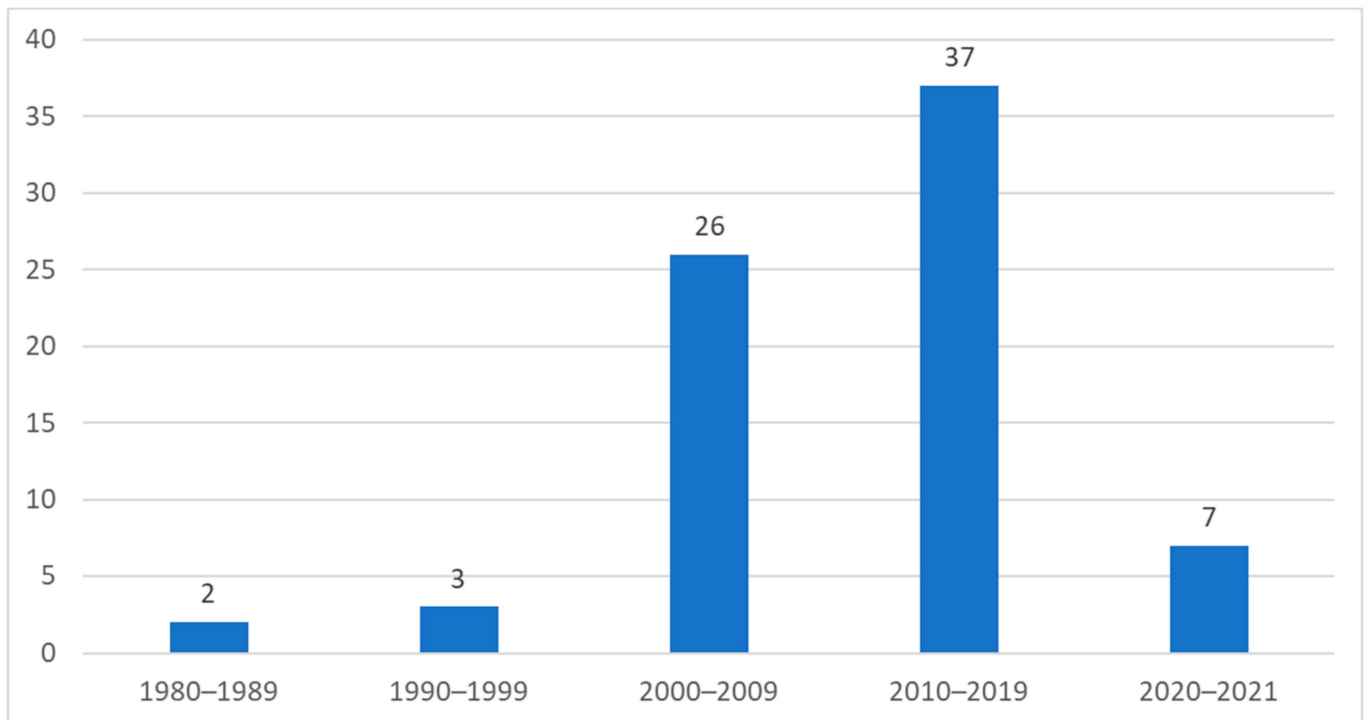


Figure 2. Number of studies included in this work by the decade of publication.

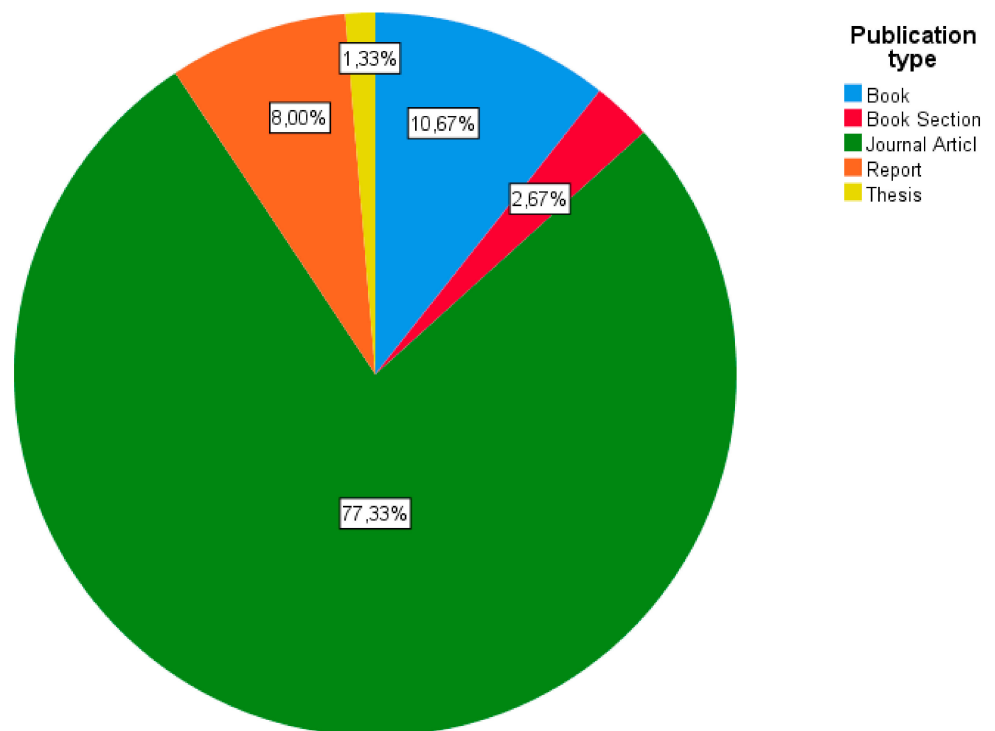
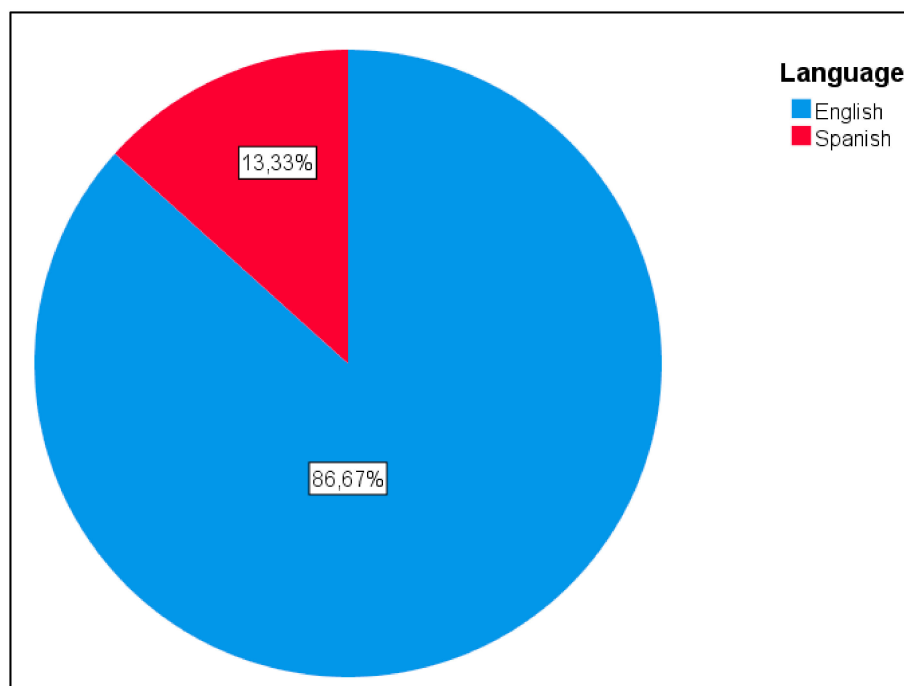
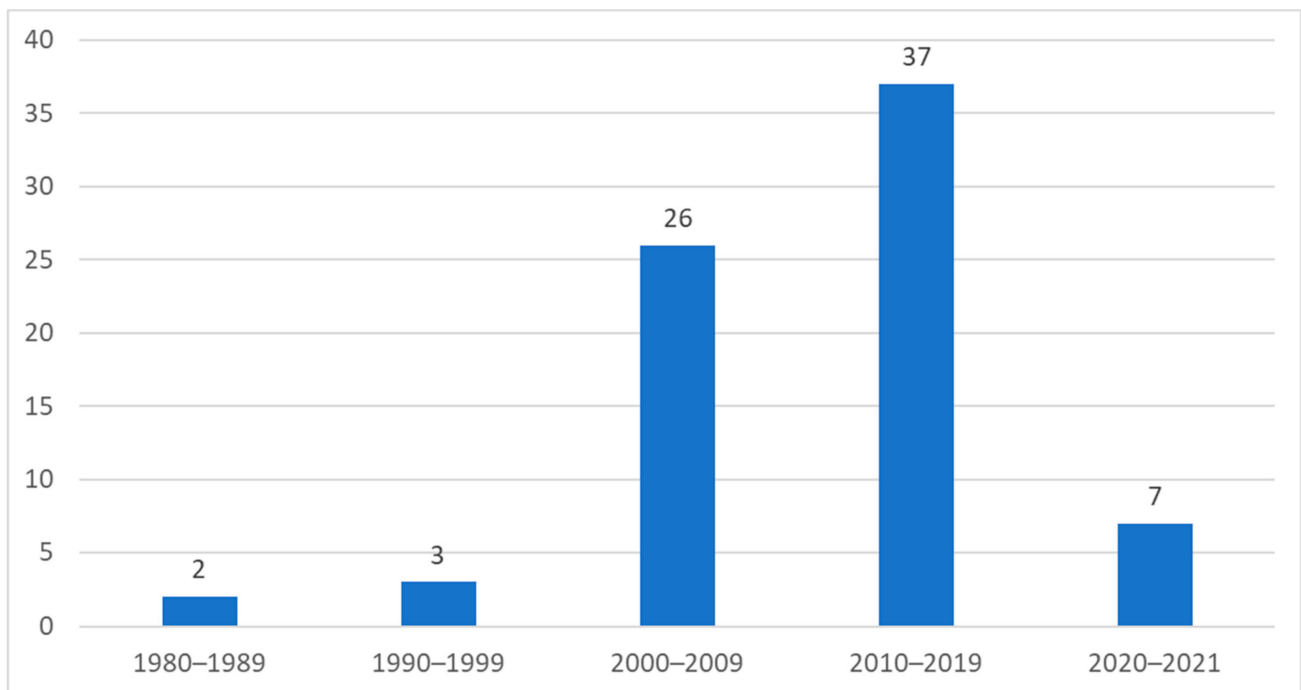


Figure 3. Distribution of the studies included in this work by type of publication.



**Figure 4.** Distribution of the studies included in this work according to language.

The works included in this review have received 32,633 citations in *Google Scholar* (some works were not included in any of the three databases consulted: *WoS*, *Scopus*, and *ERIC*, which made it necessary to collect the number of citations using *Google Scholar* as a source of comparison), with an average number of  $M = 435.11$  citations per study. It must be noted that all studies included in this review have been cited in *Google Scholar*, including those published in 2021, shortly before the completion of this work. The two least cited papers (one *Google Scholar* citation) were published for less than one year at the time that this review article was written. In contrast, the most frequently cited paper has been cited 7511 times in the last fifteen years. Regarding the distribution of citations according to the year of publication, Figure 5 shows the average number of citations per academic paper in each period. It is possible to observe how the decade of the 90s shows an impressive average of  $M = 1006$  citations per paper, and the decade of 2000s shows an impressive average of  $M = 872.42$  citations. However, the works published in the last two years, with much less margin for reviewing by the scientific community, show a magnificent average of  $M = 64.43$  citations per academic paper.



**Figure 5.** Average number of citations per article according to Google Scholar of the studies included in this review.

### 3. Results

The models created by the different authors using the methods presented above will be reviewed in detail. When presenting the collection of selected sources and their findings in this theoretical review of the state-of-the-art methods concerning teaching effectiveness, chronological order will be mainly followed in order to favour a summative presentation of contributions and trends. However, as some research has created trends tangential to the main one, the description of one study may be complemented by more recent contributions from other authors before returning to chronological order. Thus, this is not a strictly chronological review but is combined at specific points, depending on the topic that is being covered.

#### 3.1. Models Developed through Empirical Research

In this method, data collection would be undertaken directly or in a primary fashion, since the authors of the different models obtain their data through applied research in real classroom settings.

One of the first highly relevant contributions to this field was made by Ávalos and Haddad [18]. Through empirical research they identified different characteristics that were proven to have a positive effect on teacher performance, among which five must be highlighted:

1. The training and certification of studies (i.e., teachers who hold a degree or are officially and academically accredited are usually more effective).
2. Training in micro-teaching, simulations, role-playing and case studies as educational tools used in the classroom.
3. The responsibility and emotional stability of the teacher, which always helps to maintain adequate concentration.
4. The use of the 'discover/investigate' method as a regular educational resource in classes with students.
5. The low expectations of teachers towards their students, since these expectations have negative effects on student learning. This factor is known in psychology as the 'self-fulfilling prophecy' or 'Pygmalion effect' [19].

In a much more recent empirical study, Burnett and Meacham [20] proposed to assess teaching effectiveness through the students' point of view. In their study, they attributed more importance to the affective aspects shown by teachers towards learners than to any other characteristic of the teacher. The authors defined effective teachers as warm (instructors that are close and sympathetic towards their students); fair (if the evaluations and treatment they receive correspond to their effort and merits); flexible (if they are capable of varying the way they perform depending on the educational circumstances); and, finally, effective teachers are those who are clear when explaining and teaching. Later, Garduño and Shej [21] corroborated these impressions of Burnett and Meacham [20] in their study on the effectiveness and ineffectiveness of teaching from the students' perspective and they observed how learning outcomes were irrelevant from their point of view. Besides, the affective aspects that were considered as the most important factor by Burnett and Meacham [20] were conversely regarded as relevant for teaching inefficiency, while the aspects more related to didactics and subject knowledge were considered to be more important in the assessment of effectiveness (Garduño and Shej, 2014).

Three years later, Rizvi and Elliot [22] conducted another significant empirical study in Pakistan. Rizvi and Elliot [22] concluded in their research that teacher professionalism is bound to teaching effectiveness, classroom practice, teacher leadership in the classroom, and existing teacher collaborations.

Cheung [23] later added to these conclusions that effectiveness can also be related to whether or not the teacher believes that s/he can positively influence the students' learning. Thus, reference is again made to the concept of the self-fulfilling prophecy [19]. These same conclusions were reaffirmed by Rubie-Davies and Rosenthal [24]. In their research, they conducted a test with experimental and control groups of teachers in which the experimental group participating in professional development workshops were trained in teaching practices that cultivate high expectations for all students. The results showed large differences in teaching effectiveness between the experimental group and the control group, demonstrating that the techniques derived from maintaining high expectations in students are very effective in learning and significantly improve teaching effectiveness.

Another highly significant study was undertaken by Vaillant [25]. This author identified nine characteristics of the basic education teachers who obtained positive results, as follows:

1. Teachers are committed and involved in their work as teachers.
2. They visibly show love for children and adolescents.
3. They have appropriate teaching skills.
4. They apply different teaching methodologies according to their needs and occasions.
5. They collaborate with other teachers and reflect on their work with them.
6. They have intellectual and pedagogical skills.
7. They are familiar with and have sufficient command of the content they teach.
8. They identify themselves as teachers.
9. They perceive correctly and react appropriately to the different stages that students go through in their learning.

The dynamic model of educational effectiveness [1,2] considers four levels of influence on the effectiveness of learning achievement (student, teacher, school, and educational policies), including multiple multilevel interrelationships, and which establishes eight factors that describe teachers' instructional roles and that have been consistently demonstrated to be associated with student outcomes (orientation, structuring, questioning, teaching modelling, application, time management, the teacher's role in making the classroom a learning environment, and classroom assessment). As a result of this model, numerous studies have been developed in order to test the scientific evidence of the model [26–29]. The dynamic model of educational effectiveness showed positive evidence in different countries, academic areas, and circumstances, confirming that it is a robust and appropriate model for addressing teaching effectiveness. Recently, a study undertaken by Kyriakides, Antoniou, and Dimosthenous [16], which was conducted among 56 schools in marginal-



ized settings, revealed that the dynamic model of educational effectiveness can be used to reduce the educational impact of socio-economic status and that the effect is multiplied when the duration of the intervention lasts longer.

Later, Reoyo, Carbonero, and Martín [30] identified eight characteristics directly related to teaching effectiveness: domain knowledge; planning and organization; class management and development; educational innovation; knowledge transmission; interpersonal relationship; personal ethics; and professional commitment. Amongst these characteristics, interpersonal relationships emerges as the most significant skill, while personal ethics and educational innovation are the least relevant [30].

In the same year, Basheer, Hugerat, Kortam, and Hofstein [31] compared student learning and understanding with and without teacher demonstrations in the subject of Chemistry. They observed how teaching effectiveness was much greater when teacher demonstrations were used, confirming that live practical experimentation has a greater impact on learning, making teachers more effective in applying experimental techniques and encouraging student learning.

A year later, Kim, Dar-Nimrod, and MacCann [32] analyzed the relationship of teachers' personality patterns through the Big Five Inventory [33] with students' academic outcomes, in order to assess whether they were related in any way. They concluded that personality patterns may predict teacher support and student self-efficacy, but not academic performance. Hence, although the teacher's work influences the effectiveness of the teaching process, it is not determined by the teacher's personality patterns.

Recently, two studies examined empirically the support for the Dynamic Model [1,2] on mathematics learning. In one study, Dimosthenous, Kyriakides, Kyriakides, and Panayiotou [34] investigated the short- and long-term effects on the home learning environment (HLE), observing how the long-term effect of teachers was stronger than their short-term effect. In the other study, Kyriakides, Anthimou, and Panayiotou [35] investigated the impact of teaching factors on students' cognitive and metacognitive performance in mathematics in a sample of 924 students. They conclude that all teaching factors of the dynamic model of educational effectiveness were associated with mathematics performance, but only four factors (modeling, assessment, questioning, and dealing with misbehavior) were linked to two aspects of metacognition (i.e., prediction and evaluation), extending the evidence in real classrooms and specific areas on the Dynamic Model [1,2] and mathematical learning.

### 3.2. Models Developed through the Review of the Scientific Literature

The models in this method reviewed previous research and scientific articles on teacher effectiveness and drew conclusions and generalizations about the common characteristics of teacher effectiveness, either through theoretical and conceptual analysis or meta-analysis of the combined results of different studies. In other words, data from these models are indirect or secondary, because they are based on research by other authors.

The first model was created by Darling-Hammond and Sykes [36]. In their review of previous studies, these authors attempted to synthesize the determining characteristics of an effective teacher. According to their analysis, these characteristics are verbal ability, subject knowledge, academic ability, professional knowledge, and teaching experience. Moreover, they recognized other very relevant characteristics, such as the enthusiasm, flexibility, and perseverance shown by the teacher in her or his work, and the incidences where the teacher shows actual concern for the learning of her or his students.

In a different vein, in Hunt's [37] literature review, he discovered that in a variety of countries and schools there are five characteristics of teachers that are recurrent as signs of good teacher quality. These would be:

1. Teachers are committed to the students' learning.
2. They master the subject they teach and the content's didactic knowledge.
3. They know how to monitor their students' learning efficiently.
4. They reflect upon teaching practice and learn from their experience.



##### 5. They participate in learning communities.

Four years later, in 2013, Kyriakides, Christoforou, and Charalambous [6,38] conducted a quantitative synthesis of 167 studies searching for the impact of generic teaching skills on students' achievement through a meta-analysis. They found evidence in support of Creemers and Kyriakides' dynamic model of educational effectiveness [1,2], since the factors of teachers linked to student achievement did not stem from a particular educational orientation. Hence, teaching success was not related to any best educational orientation, but rather was related to teachers actively selecting on the basis of the interrelationships between various factors and deciding how to act at any given moment without previous linkages [38].

One year later, Muijs et al. [7] reviewed a number of studies published over a period of 35 years that were focused on teaching effectiveness and its relationship to professional development. They noted how the processes and conditions that promote student learning in these studies are not often used to develop appropriate learning environments in real contexts. Meijs et al. [7] stated that "areas that require further attention and integration in educational effectiveness and improvement are the recent findings of the cognitive sciences, use of ICT in teaching, and research on effective ways of developing professional learning of teachers" (p. 250).

Korpershoek, Harms, de Boer, Van Kuijk, and Doolaard [39] reviewed the scientific literature on teacher effectiveness in the decade 2003–2013 in order to determine which components of classroom management interventions could be attributed to the highest level of teacher effectiveness. The results revealed that interventions focused on students' socio-emotional development were the most effective. They also observed how good classroom management was associated with better student academic performance, behavioral benefits, social-emotional aspects, and motivation in primary school students [39].

Steinert et al. [40] reviewed 111 medical education studies between 2002 and 2012 in order to determine how the professional development of teachers can improve teaching effectiveness. They found that overall satisfaction with teacher professional development programs was high. After participating in teacher professional development, teachers tended to gain confidence, enthusiasm, and knowledge of effective teaching practices. Steinert et al. [40] also noted that behavioral improvements encompassed improved teaching practices, new educational initiatives, improved educational leadership, and higher student academic achievement. Finally, they also highlighted how the study of organizational changes was significantly less frequent.

Relating teaching effectiveness to personality factors, Kim, Jörg, and Klassen (2019) reviewed 25 previous studies. They found that effective teachers also scored high on openness, awareness, extraversion, and emotional stability. In addition, these characteristics were inversely associated with emotional burnout [41].

Finally, Bardach and Klassen [42] carried out a systematic review of 27 studies published since 2000 on the association between cognitive skills and teaching effectiveness. They found little evidence of any consistent relationship as they identified much heterogeneity in the results. Although discrete, the best results of all the cognitive skills and intelligence tests analyzed were obtained employing mathematical skills.

Despite these results, Nuthall [43] highlighted the limitations of the models and conclusions developed from these literature reviews, pointing out that they failed to identify good teaching practices that allow for good learning speed regardless of the situation. Teachers often do not realize when their students are actually learning, and, at times they tend to confuse learning with students' behaviors and motivations. Additionally, teachers often fail to follow students' learning processes closely because they concentrate on efficiently managing the classroom and the pace of their classes.

### 3.3. Models Based on the Gain Score or Value-Added Methods

These models arise from the need to identify what part of a student's performance is the result of the teacher's actions. To that aim, the results obtained by students in one

academic year are compared with those obtained the following year, a process which is known as a 'Gain Score' [44]. These models measure the same students in the same subject with two different teachers in two different years to see the differences, assuming that the most important difference is the change of teacher.

According to this method, students learn more content and learn more effectively with some teachers compared to others. Therefore, comparing the learning with and without these teachers will help to identify and isolate the positive characteristics and effects of these teachers.

These studies may be regarded as complicated and inaccurate because other factors, aside from the students and teacher, can significantly influence learning and cannot be controlled.

There are two types of data collection in value-added methods: Complex Statistical Methods, which are based on elaborating complex formulas in order to isolate the teaching effect, producing a final statistical algorithm to determine teaching effectiveness; and other methods that, in addition to undertaking statistical analysis using complex formulas, add other types of data from other sources in order to not be purely statistical [14].

Regarding the first subgroup of studies which are based on complex purely statistical methods, we can highlight the 'Tennessee Value-Added Assessment System' (TVAAS) by Sanders and Horn [45], originally designed in 1993, but perfected over some years until its final iteration in 2003; and, secondly, an impressive study by Rivkin, Hanushek and Kain [46], carried out with more than one million students.

According to Hunt [37], the results of these studies lead to the following conclusions: there is much variation between teachers in relation to the achievement of students; the quality of the teacher can counteract the negative effect of social or demographic variables; there are many different subtypes of teachers; and, finally, the defining characteristics of teaching effectiveness are still greatly unknown.

Regarding the second subgroup of value-added studies, it is possible to highlight two relevant models in relation to value added combined with other data: the McBer model [47], and the Day et al. [48] model.

Both models link the influence of the statistical results to the personal and psychological processes of teachers and their circumstances. McBer [47] identified three teacher characteristics that significantly influence student progress and that would influence at least 30% of the variation in the formula. These are:

1. Teaching styles and norms of conduct related to the fundamental values, commitments, and attitudes that the teacher must have.
2. Micro-behaviors, or specific teaching skills, which can be identified and learned.
3. The teacher's ability to create an environment in the classroom that motivates their students to learn.

On the other hand, McBer [47] also highlighted four characteristics related to professionalism that allow for predicting teacher effectiveness, namely: commitment to the pursuit of student success; confidence in the ability to overcome challenges; the need to be fair with students; and respect for others.

Other positive traits are related to the style of thinking and the ability to plan and identify expectations. In particular, McBer [47] remarked on five positive traits, as follows: the ability to think logically to find cause and effect; the ability to see connections and associations, the determination to set challenging goals; intellectual curiosity; and finally, the ability to anticipate educational problems.

Finally, McBer [47] considered seven variables related to teacher leadership:

1. The ability to adapt and change strategies.
2. Taking responsibility for student performance.
3. Encouraging and motivating students.
4. Supporting students in their learning.
5. Obtaining positive results and producing a positive image.
6. Working collaboratively on common goals.

## 7. Understanding and knowing other people's behavior.

Day et al. [48], on the other hand, studied more than 300 teachers and concluded that there is no link between effectiveness, age, stage in the career, and gender. However, they perceived differences between primary and secondary teachers. Elementary teachers were more likely to maintain their teaching commitment with students throughout their career (i.e., they were more likely to maintain the bond they had developed).

Finally, they also concluded that, in relation to the task and effectiveness, there were many differences related to the stage of the teacher's professional life and identity, capacities and competences. They determined six different phases of the teacher's professional life, from their first steps as a teaching professional through to retirement.

However, as Sloat, Amrein-Beardsley and Holloway [49] stated, it is necessary to take the results and conclusions obtained under these added value methods with some caution; both those derived from complex statistical methods and those using combined statistical approaches. As they showed in their study, in which they compared the ratings of teachers and their effectiveness derived from six common generalized value-added models, the values in teacher effectiveness showed great variability depending on the methodological approach used. Therefore, making decisions that affect teachers based on any of these methods implies applying a bias to the teacher's evaluation that reduces the reliability and validity of the measurements and decisions taken in this regard.

### 3.4. Models Developed through Classroom Observation and Ethnographic Approaches

The models developed through classroom observation and ethnographic approaches are based mainly on observing teachers who are on the extreme ends of the spectrum—highly effective or not effective—and assessing what characteristics they share. They are carried out through systematic observations and reflection on the observed characteristics for subsequent analysis of shared features. The first highly relevant ethnographic model by Ávalos [50] observed primary school classrooms in Latin America, seeking to better understand the causes of school failure. He concluded that the teacher-student relationship is more important than it first appears and is key to understanding what drives school failure.

Ávalos [50] stated that when a teacher selectively fails to answer questions from some students, regularly answers learners with irony, or shows a degree of intermittent deafness to them, school failure occurs much more frequently.

This author also concluded that another factor of great relevance is the educational strategy that the teacher follows. Thus, if teachers are not clear and concise, focus on form rather than on meaning, or base their teaching on dictation or mindless memorization, they also greatly encourage school failure.

On the other hand, Ávalos [50] also observed that many of these teachers blamed the parents for the children's deficiencies, judging the children as unintelligent or even stigmatizing the social conditions in which they lived.

Focusing on excellent teachers, Allington and Johnston [51], in their systematic observation in the United States, found that these teachers shared a series of common characteristics and behaviors in the classroom, which are the following:

1. They rely on behaviors and responses from their students.
2. They have a greater ability to 'tell a story'.
3. They promote dialogue in the classroom.
4. They stimulate reflection and research.
5. They use a wide variety of meaningful materials for students.

In their ethnographic approach, Carnoy [52] visited classrooms in different Latin American countries and compared them with the high school performance of Cuban children. Regardless of political considerations, it is possible to affirm that the Cuban educational system has six advantages over the rest of Latin American educational systems with which it was compared, as follows:

1. Public policies that favor the education and health system.
2. A considerable 'Social Capital'.
3. Support and supervision of principals and accountability of teachers.
4. Good education of teachers and salaries comparable to those of doctors.
5. Educational tasks centered on the teacher.
6. Easily achievable learning goals.

However, Carnoy [52] was also aware of the disadvantages that the Cuban educational system also has, mainly related to the lack of political freedom. This greatly undermines the student's ability to reason, and, therefore, limits student learning. There is more limitation of individual choice, which represents an important limitation in the possibilities of evolution of the student towards some of their intellectual strengths.

In 2013, Antoniou [53] conducted an impressive and complex longitudinal study in which, among other techniques, 130 teachers were observed over two consecutive school years by three external evaluators. The study aimed to identify the stages of effective teaching by comparing teachers employing the Dynamic Integrated Approach and the Holistic Approach after specific training. Teachers using the Dynamic Integrated Approach achieved better results and were able to advance in their professional development through the five stages considered (novice, advanced beginner, competent, proficient, and expert). Antoniou [53] highlighted among his conclusions the significance of educational policies that promote professional development in a gradual and dynamic way.

More recently, in 2017, Mantzicopoulos et al. [54] investigated whether systematic observation techniques can predict students' learning and motivation in kindergarten. They observed that teachers' instructional supportive practices were positively associated with students' science knowledge, motivation, and perceptions of the learning context, but, surprisingly, classroom organization was negatively related to students learning and motivation. Mantzicopoulos et al. [54] suggested that "highly structured classroom environments may not support students' engagement and interest in science, at least in kindergarten" (p. 227). Barrientos, Pericacho, and Sánchez-Cabrero [55], on the other hand, obtained contrasting results, focusing their study on a positive classroom environment as an essential requirement to generate highly efficient teaching. They concluded in their ethnographic approach that teachers' self-perception of emotional intelligence correlates with a positive classroom climate that generates greater effectiveness. Nonetheless, they also stated that other factors were linked to greater effectiveness and a better classroom climate, such as a low student ratio or higher private funding for the center [55,56].

Finally, another way of observing teaching effectiveness from an ethnographic approach is through the observation and comparison of educational centers, with a special emphasis on their direction to generate good performance. This was the approach of Grissom and Bartanen [57], who paid attention to the rotation of teachers in various schools and observed how the best teachers rotated less and how the least effective teachers rotated more, under the direction of principals with leadership qualifications. This confirmed the fact that effective principals tended to form a team of effective teachers around them, forming more stable teams.

### *3.5. Development of Educational Models Based on the International Comparison of Education Systems*

An important turning point in the models developed based on the comparison between education systems in different countries or regions with different educational models was the comprehensive model of educational effectiveness by Creemers, published in 1994 [3]. To demonstrate empirical evidence for this theoretical model, six studies were conducted in two countries with substantially different educational systems during the years 1999 and 2008 [58]. Three studies were conducted under the Dutch educational model (more centralized) [59–61] and the other three studies were conducted under the Cypriot educational model (less centralized) [62–64]. As Kyriakides [58] stated, the "Creemers' model has a multilevel structure, where schools are nested in contexts, classroom are

nested in schools, and students are nested in classrooms or teachers” (p. 430). Thus, not only was student achievement assessed under this model, but also the dynamic nature of educational processes and effects, which can also be used in improvement policies and practices. Apart from confirming the empirical evidence of Creemers’ comprehensive model of educational effectiveness, the development of these six studies helped to confirm that student achievement is multilevel. Besides, as Kyriakides [58] stated, these studies supported the hypothesis that “classrooms had unique effects on student learning, independently of factors operating at the school and individual levels” (p. 439). This means that the effect of what happens in the classroom is more significant than different educational policies, even though these can exert a great influence on student achievement due to their multilevel characteristics.

The emergence of the Dynamic Model of Educational Effectiveness [1,2] also led to important new comparative studies which worked to test the validity of the model. Panayiotou et al. [65] compared results from six different European countries (Belgium/Flanders, Cyprus, Germany, Greece, Ireland, and Slovenia) across 334 primary schools and more than 10,000 students. Panayiotou et al. [65] concluded that “both across and within country analyses revealed that student ratings are reliable and valid for measuring the functioning of the teacher factors included in the dynamic model” (p. 74).

Currently, the most comprehensive models are the PISA report (Program for International Student Assessment, OECD [66]), which takes its data from the students’ results, and the TALIS report (Teaching and Learning International Survey, OECD [67]), which evaluates and analyzes teachers and educational administrators. The PISA study is repeated every three years and is published the following year, with the latest version published in 2018 [66]. The most recent version of TALIS was published in 2020 and corresponds to its second volume [67]. Another way of comparing educational models is by analyzing the mission statements of different universities [68,69].

According to PISA results, certain countries consistently reoccur in the first places, such as Japan, Finland, Singapore, or South Korea. However, these results should be considered with a some caution, since it is known that certain countries prepare themselves for the PISA report with a view to improving their results. Thus, to a certain extent, we may say that they somehow manipulate the results.

Concerning PISA, the McKinsey report [70] analyzed the results of this report and concluded that the keys to a successful education system are not linked to economic criteria. Singapore, for instance, underinvests in comparison with other Western countries who achieve worse results. Thus, success in this regard is due to these three basic factors: recruitment, training of teachers, and classroom practice support [70]. To these, we should add electronic devices aimed at helping students with learning difficulties.

An essential conclusion drawn by McKinsey [70] is that teacher quality is a factor that decisively influences the academic achievements of students. His report presents a series of common strategies achieved by the countries with the best scores, as follows:

1. Internship during the initial training and the labor insertion period
2. Tutors guiding the beginners
3. Selection and training of mentors and tutors among the teachers of the educational center to help novice teachers.
4. Teacher’s promotion of opportunities for peer learning
5. Joint planning and peer-to-peer training

Following McKinsey’s report [70], teachers are considered to be a key factor in the achievements made by the most successful countries in the PISA. Therefore, we should not mistreat or discredit educators, considering the valuable and essential professionals that they truly are. Both the selection of those who enroll in the degree, as well as the quality of training and support teachers receive when they start their career, are paramount to the success of these countries. Top countries have also developed successful innovations and made a serious effort to improve the educational system and teacher’s welfare, and are now reaping the rewards.



Departing from the PISA 2012, Caro, Lenkeit, and Kyriakides [71] investigated cognitive activation strategies and mathematics performance, taking into consideration the interactions between socioeconomic and instructional contexts. They found that a positive disciplinary climate favors cognitive activation that, along with teacher-directed instruction, is positively related to mathematics performance, but that high levels of direct instruction are negative for students' achievement, showing a curvilinear relationship between the two factors.

Liu and Liao [72] explored the relationship between teacher professional development and teacher effectiveness through the results of the TALIS survey since 2013. These authors found that professional development programs that were practically oriented, focusing on classroom-based and collaborative research, fostered greater teaching effectiveness. For their part, the teachers themselves associated the quality of professional development programs with their own teaching effectiveness, valuing professional development programs as essential in building their capacity to offer quality education.

Another comparative study dealing with educational models was made by the American Educational Research Association (AERA), the result of which was the 'The Widget Effect' [73]. In that report, they analyzed public schools in 24 states in the United States. Based on this study, Kraft and Gilmour [74] made a compilation of teacher performance ratings across the 24 states that adopted major reforms to their teacher evaluation systems. They determined that, in most of these states, the percentage of teachers rated unsatisfactory remains less than 1%. However, there was a wide variation in the educational models of the different states, and a great difference between the evaluation of the evaluators and that of the public education centers.

More recently, Gallegos-Araya and López-Alfaro [75] conducted an interesting study that focused on the unique characteristics of the Chilean educational system. This educational model fosters quality education through various incentives, some of them at the center level, which requires high coordination and collaboration between the teachers and managers of the education center. They concluded that the leadership distributed across all the teachers has a direct effect on the organizational commitment and the collective effectiveness of teachers. Hence, they showed that factors like close coordination and collaboration, apart from offering better group results, have a positive effect on individual teaching effectiveness.

#### 4. Discussion

From the analysis of all these methods and models of teaching effectiveness described above, the following conclusions can be drawn.

Despite the different methodological approaches, a series of common topics can be first observed to show the main concerns of researchers in this area: the significance of the teacher-student relationship, the socioemotional factors involved in teaching, and teacher leadership in the classroom, to name but a few. However, it can be noted that in the models derived from empirical research, interpersonal factors and the generation of expectations in students are particularly relevant [18,20,24], while in the models derived from the review of scientific literature, the cognitive and personality characteristics of teachers are particularly significant [37,41,42]. For their part, the models based on the value-added method emphasize the traits that define effective teachers [47,48], whereas ethnographic approaches focus on the classroom climate and school failure [50,52,55]. Finally, comparisons of educational systems highlight the initial training and professional development of teachers [70,72]. In other words, the analysis of teaching effectiveness involves clear topics, and the methodological research approach implies small specific trends derived from the research objectives.

Concerning the theoretical contributions found in the different studies, the essential role that teachers play in quality education should be highlighted. As has been observed in former studies, such as the one conducted by McKinsey [70] or the study undertaken by Allington and Johnston [51], the difference obtained with quality teachers is extremely

relevant and it may become essential to guarantee that quality education is provided to students.

Secondly, the teacher's management of classroom tasks and climate has great relevance to teaching effectiveness. According to Korpershoek et al. [39] or Barrientos et al. [55], notable differences in teaching effectiveness can be observed, depending on whether the management of classroom tasks and climate is optimal or not.

Thirdly, it should be noted that the affective and emotional components of the teacher play a great part in their own professional performance [12,24,41]. Both students [20,21]b and teachers themselves [48] reflect in their evaluations that these factors make a meaningful difference in the improvement of the student-teacher relationship and result in the achievement of better overall results.

At this point, we should not forget the relevance of self-regulation and focus factors, such as the teacher's commitment to her or his own professional work [30], or their self-reflection on their own work [23,55]. Indeed, committed, and focused teachers are usually more effective in their daily tasks [47,48].

Finally, this discussion is not complete without underlining the relevance of coordination and collaboration between teachers and educational managers. According to several studies [22,25,75], high levels of collaboration and adequate coordination between education professionals are directly related to greater teaching effectiveness and higher quality education.

## 5. Conclusions

This compilation of research on teaching effectiveness shows the most relevant findings of this field of study according to different research approaches. However, as this is not an exhaustive review, but rather a systematic and selected one, this compilation can be regarded as incomplete, since it may be possible to deepen and further specify some of the characteristics of quality teachers which are key in the studies and theoretical models selected. Despite this, the present investigation clearly shows which are the most relevant factors in the field of study, since clarity of presentation has been prioritized over greater comprehensiveness. Additionally, an exhaustive review may tend to excessively blur the most influential models and authors, giving them a relative weight over the total number of studies, and equating them with other studies of less depth and relevance. Thus, in the authors' opinion, the selection by relevance is more instructive and useful to know the field of research.

Conducting a systematic review distinguishing between different research approaches can also make the compilation obtained highly sensitive to the multiple concerns of the researchers that led them to select each research modality. As explained above, this research approach helps to focus on micro or macro aspects of teaching effectiveness and to consider quantitative aspects or ecological validity. Thus, the compilation presented in this review succeeds in describing current research trends on a broader spectrum and with a greater sensitivity than a review based exclusively on the criteria of article impact and citations. It is even possible to expand the review of each approach in the future in order to describe in greater depth the state of the art of each methodological approach.

Considering the above, and as a conclusion to this theoretical review, it is possible to state that any educational model that seeks educational excellence should first emphasize caring and respecting its own teaching professionals, since they are fundamental in obtaining fruitful results and in turning a certain educational model into an excellent one, regardless of the economic investment or availability of resources. The countries and educational administrations that undervalue teachers and hinder their professional performance find counteractive results, since they harm what they are longing for: quality education.



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