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Induction Programs' Effectiveness in Boosting New Teachers' Instruction and Student Achievement: A Critical Review

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Abstract. Induction programs are a set of systematic structures aimed at for supporting and guiding novice teachers and in helping them to learn responsibilities and to improve practices related to the effective teaching process and its impact on students' achievement. The purpose of this critical review was to examine ten empirical studies conducted between 2000 and 202, in order1 to determine the impact of induction programs on teachers' self-efficacy and teaching practices as well as students' learning and achievement. These studies were selected based on their direct relevance to the induction programs for novice teachers; and they are distinguished by the clarity of the methods used, the results, and the presence of experimental evidence. In addition, the quality of these studies must be high. Most of the studies empirically support the claim that induction programs for new teachers positively impact both the instructional practices and the students' achievement. However, some of the studies showed no significant relationship between them. Therefore, this review attempts to reconcile the results of these studies that were showed by each study, and highlight the elements that contribute to variations in the results, including potential flaws in research design or other shortcomings, if any. The most prominent results of this review were that eight studies, which demonstrated that induction programs have a positive effect on teachers' classroom practices and students' achievement; while two studies indicated that there was no relationship between teachers' induction and students' achievement. Finally, the relevant questions not addressed in the literature are suggested for promoting additional research that would demystify some of the ambiguities among the existing studies.

Keywords: instructional practice; mentoring; novice teachers; student achievement; teacher induction

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1. Introduction

Over the past years, researchers have pointed out in their studies related to the field of education the challenges and problems faced by new teachers during their practice teaching (Han, 2023; Wu, 2018; Ren, 2016). Also, there was no interest in induction programs that support and guide new teachers. Moreover, in recent years, the issue of supporting and guiding novice teachers has become a problem that many countries suffer from, due to the lack of teachers (Han, 2023). In addition, many recent studies have found that the most important challenges teachers face during the early years of practising the profession are a lack of self-efficacy, defining thereby a teaching identity, managing work-related stress and requirements, meeting performance expectations, enduring and dealing with heavy teaching loads and intense competition, and navigating relationships with students, colleagues, parents, and administrators (Han, 2023; Headden, 2014; Atteberry et al., 2015; Ren, 2016; Wu, 2018).

Teachers' induction programs (TIPs) represent bridges through which new teachers move into the process of teaching students, as the main aim of these programs was to provide teachers in the early years with support and guidance from experienced teachers in the field of teaching, in order to enhance the quality of teachers' teaching and cooperation in the classroom, and thus to retain new teachers who are able to manage their classes effectively; and this is reflected in the quality of students' achievement (Han, 2023; Porter & Thompson, 2022).

The intent of this research is not to denigrate or trivialise the practices of any teacher; rather, it seeks to highlight the need for policy-makers and educators to create a backbone of support aimed at helping less experienced teachers to develop their teaching practices and skills. Moreover, the support and guidance provided to novice teachers by expert teachers is important for their survival in the profession and for the development of their teaching level by providing suggestions for modern teaching methods, as well as the transfer of knowledge and experience (Jin et al., 2019). New teachers need targeted support to overcome the challenges of teaching and to become optimally effective instructors. Induction programs (IPs) are one way that new teachers can gain experience in various critical areas, such as teacher retention (Bastian & Marks, 2017; Ronfeldt & McQueen, 2017), instructional practices (Davis & Higdon, 2009), and student achievement (Fletcher et al., 2008).

The importance of globally improving students' learning and academic achievement has become a dominant concern within the educational sector (Darling-Hammond & Rothman, 2015). Teachers are always seen as one of the most central and influential figures in promoting students' performance, so that the highest possible level can be reached (Opper, 2019). For that reason, many researchers and policymakers are interested in quality teaching (Odden et al., 2004). It has been proven consistently through existing research that higher-quality teaching leads to greater student achievement (Kyriakides et al., 2009). Recent studies have displayed that TIPs play a significant role in improving and developing teachers' performance, as well as students' outcomes (Kwok et al., 2021; Bastain & Marks, 2017). Thus, as administrators and educators prepare

teachers to enlighten future generations, the significance of induction programs within schools must not be underestimated.

In day-to-day school life, administrators employ new and experienced teachers, who have varied capacities for teaching. According to research, the quality teaching of new teachers is clearly and surprisingly lower than the quality teaching of practised and experienced teachers (Bastian et al., 2023). For practical reasons, new teachers tend to face common challenges, such as not being able to promote a supportive learning environment, not being able to deliver clear or in-depth instruction, and an inability to attend or adequately adapt to the varying needs and requirements of students. On the other hand, more experienced teachers are almost exclusively competent and capable in all of the afore-mentioned areas (Maulana et al., 2012).

Researchers still have not come to a consensus on a clear definition of induction, and what it includes (Kessels, 2010). There is a one-day mentoring program or random assignment that some schools use with the aim of motivating a teacher to become a mentor-teacher. Other schools may consider teacher induction as a major ongoing professional development that is designed to meet the needs and requirements of new teachers and to eliminate their concerns, including revisions of lesson plans, classroom observations, and important feedback, which is built on clearly defined educational benchmarks.

Given the complex nature of induction programs for new teachers, it is sometimes difficult to understand which strategies or mechanisms are likely to influence the enhancement of new teachers' education and students' achievement. Accordingly, there is a need for more high-quality studies and research focusing on induction programs and their impact on the retention of novice teachers in the field of teaching, as well as the impact of these programs on the academic achievement of students, in addition to focusing on research in these areas at the present time, in order to emphasise the efficiency of induction programs for the novice teachers and students' achievement, and thus develop, improve and implement modern policies in these programs. Therefore, in our current review, some empirical studies were examined, in order to identify the most important induction programs, which had a positive effect on new teachers, and to determine their effectiveness in enhancing teacher education, and thereby its impact on students' achievement.

2. The Literature Review

2.1 Induction programs and teachers' effectiveness

Induction programs are gradually becoming institutionalised, and countries around the world are adopting more centralised approaches to mentoring, An example of this is the state of California, which adopted induction programs as a way to secure effective and efficient teachers, and thus solve the problem of the shortage in the number of teachers (Beagle, 2020). In addition, some countries have taken care to develop induction programs, in order to solve the problem of teachers' attrition, and to address the challenges and concerns of newly qualified teachers (Olsen et al., 2020; Helms-Lorenz et al., 2016).

Kessels (2010) has stated that the over-arching purpose of induction programs is to aid beginning teachers in developing a sense of comfort, thereby

demonstrating their professionalism, and helping students to achieve standard learning outcomes. Munshi (2018), through his study on new teachers, indicated that there is a relationship between teacher effectiveness and familiarisation programs and that these programs have two main components: professional development and guidance, and their importance stands out in supporting the feelings of novice teachers and raising their level of self-efficacy.

Mansfield and Gu (2019) define induction programs as the period that represents the move from pre-service preparation to continuing professional development, which encompasses the early years of a teaching career. Others refer to induction programs as an intense phase, during which beginning teachers increase their knowledge and are exposed to the more difficult aspects of teaching (Darling-Hammond et al., 2009).

Several recent studies have indicated the importance of teacher induction in the early years of their practice of the teaching profession and have shown that there is a positive correlation between teacher induction and professional development, as well as student learning outcomes and classroom skills (Aarts et al., 2020; Kelly et al., 2019; Tammets et al., 2019; Nguyen et al., 2020; Whalen et al., 2019).

See et al. (2020) indicated in their systematic review, which included the topic of international interventions and evidence used to attract and improve the level of teacher recruitment and retention in the profession to the effectiveness of induction programs, is not sufficiently clear, and among the promising interventions were induction programs, such as early professional support and continuing professional development for teachers, in order to retain them in the profession, but there is no evidence of their success or effectiveness, although there is increasing interest in related strategies and policies. The reason for this is the lack of a basic and clear evidence base, in addition to the lack of studies related to this.

As articulated in Zey's (1984) model, teacher induction programs are a bridge between pre-service and in-service teacher professional development programs before practising the profession (pre-service) and during its practice (in-service). Pre-service induction programs, which occur at a stage of education, have included intensive preparation of this is provided to pre-employed candidates, while induction programs for in-service functions targeted ongoing professional development sessions aimed at upgrading and reshaping the capacities of individuals in the profession during work. Theoretically, induction is designed for teachers, who have already completed important basic pre-service training and preparation (Ingersoll & Strong, 2011). Universities and all colleges that care for and offer teachers of the future the pre-service preparation for education recognise the unique influencing factors related to the characteristics of their students and respond by creating individually adapted programs to meet their unique needs (Van-Nuland, 2011). Pre-service education programs typically include both practicums and course-work (Nicol & Crespo, 2006). The aim behind these programs is for teachers to be fully prepared for the field by not only learning concepts, but also by practising them in a supportive environment. Thus, one of the most important things that demonstrate teachers' readiness for teaching and practising the profession is that they have the ability to manage

tension and self-efficacy in the areas of student participation, classroom management, and education provision at a good level in addition to the fact that support by induction programs enhances the professional identity of new teachers, which makes them more committed and to act in performing their job (Han, 2023). However, many researchers' document that even after taking pre-service educational programs, a large number of teachers enter the classroom without having a proficient understanding of the subject matter, particularly in mathematics (Ball & Bass, 2000; Usiskin, 2001).

2.2 Instructional practices and students' achievement

Exposing new teachers to induction programs, especially those that place the emphasis on classroom management and planning skills, can improve teachers' in-classroom practices (Maulana et al., 2015). Ulubey (2018) conducted a study aimed at evaluating an induction program for new teachers by selecting a group of new teachers from different fields in Turkey. The most important results obtained were that the practices and classroom observations, both inside and outside the school which were recommended by the novice teachers training program, were useful and aimed at improving professional skills, knowledge, and professional adaptation to the school, class, and students. Several positive indicators of quality teaching connected with efficient classroom management included ensuring that lessons start and end on time, making the transition between classroom activities flow more efficiently, minimising the time spent on non-task-related matters, and dealing with students' misbehaviour (Opdenakker & Minnaert, 2011). In addition, through systematic and in-depth planning, new teachers can maximise the clarity of their instruction, which is a key component of instructional quality. This can provide increased clarity for lesson structures, interchanges of explanations and lesson presentations, independent work, and group assignments (Stanulis et al., 2007). However, these skills do not come without work, or happen overnight; rather, they come with carefully designed induction programs (O'Malley, 2010).

Tekir (2022) conducted a study aimed at comparing between United States of America and Turkey regarding teachers' induction practices and policies; and one of the most important results he reached was that the effectiveness of beginning TIPs leads to the production of practitioners from those teachers who have effectiveness in their classrooms, which ensures the success of the educational experience with high quality for all the students.

Teachers have a significant impact on student achievement, for example, Sancassani (2023) conducted a study whose purpose was to investigate the effect of teachers' characteristics and qualifications on students' test scores. Through the results, he found that these characteristics and qualifications have a positive effect on students' test scores for scientific subjects. In addition, the results of some previous studies have shown that students, who had teachers that have proven their participation in Ips. They had higher test scores and higher academic achievement gains (Ingersoll & Strong, 2011; Thompson et al., 2004; Fletcher & Strong, 2009). One of the aims of IPs is the satisfaction of new teachers with their profession, thus their survival in the field of teaching, and teachers' satisfaction affects the students' achievements. A recent study mentioned that the more job satisfaction the teacher has, the greater its impact on students'

achievement; and this is evident from the lessons that the teacher conveys to the students, and the achievement of the students is represented in their performance in the examinations of various academic disciplines (Hoque et al., 2023).

As teachers develop their instructional practices, the achievement of their students also develops. Brannon et al. (2009) reported that the lack of investment in teachers, particularly the inadequate induction of beginning teachers, significantly impedes quality teaching and student achievement. In addition to that, Brannon et al. saw that new teachers need more new mentoring programs, which include a broader scope, although there is development and improvement in these programs that provide some guidance to these teachers, it was not enough. Because in order for new teachers to get excellent guidance, there must be continuous guidance courses, mentors with expertise in the same field, and seminars designed to meet the needs of new teachers and to save time for new teachers to communicate with their administrators and other teachers. Thus, when guidance programs are available that meet the needs of new teachers, the quality of teaching is at the required level, and students' academic achievement improves. Fletcher et al. (2008) posit that students' learning gains are improved if induction programs are created with the aim of providing opportunities for new teachers to obtain knowledge and implement that knowledge within the confines of the classroom. Instructional practices may also change, as a result of students' achievement. This is evidenced by the results obtained through the study they conducted in California. They found thatwhen hiring newly qualified teachers through induction programs and supported by specialised mentors, had a positive effect on students' achievement.

The present review expands the purview of the literature to include the effects of induction on teachers' classroom practices, as well as students' achievement. The purpose of this review is to reconcile the inconsistent findings in the literature, in order to determine whether induction programs positively impact both teachers' instructional practices and students' performance. Additionally, it provides researchers, policy-makers, and educators with a reliable, up-to-date evaluation of the influence of teacher-induction programs.

3. The Method

3.1 Search Strategy

In our current critical review, the qualitative methodology is used as an integrative approach with the aim of achieving the purpose of the review, which is to identify induction programs for new teachers and these programs' impact on students' achievement. Therefore, the review process was carried out by carefully reading the studies included in the reviewimg and excluding those studies that did not address any aspects related to induction programs for new teachers. In addition, we described how this topic is perceived through the literature, as well as our analysis and criticism of this literature and its classification based on the strengths and weaknesses that we focused on. Accordingly, the authors began this review by examining the existing systematic, narrative, and traditional reviews and studies in the field of education. The authors searched online databases, including dissertation abstracts, the Educational Resources Information Clearinghouse (ERIC),

sociological abstracts, PsychInfo, psychological abstracts, the Sage Online Database, the Wilson Index, and Google Scholar. In the online searches, the authors used combinations of the following key terms: new TI, program evaluation, teacher improvement, effectiveness, student achievement, and teaching practice. The authors also included published documents on teacher induction and studies both from the U.S. and other countries in the selection criteria. The Published studies are factual and allow the incorporation of facts and statistics into the research. The authors chose only one unpublished study; because it was highly cited by other authors of published studies.

3.2 Selection of the Criteria

The selection criteria for the current critical review included studies from 2000 to 2021; because there were not many other studies during this period; and most date from the mid-1980s to the early 2000s. This 20-year interval provides a good basis for research. Synthesising of the evidence during this period allows for ease; and therefore the results are not replicated. The initial search results yielded over 400 previous studies concerning teacher induction programs. The authors proceeded to exclude all those documents that were not empirical studies, or which did not meet with the criteria. This reduced the list to ten empirical studies. These ten experimental studies were selected due to their focus on IPs for new teachers, and the impact of these programs on students' achievement. In addition, these studies relied on methods to obtain data experimentally, and thus the results were more accurate and clear. Moreover, these studies conformed to the criteria on which they were selected. The inclusion and exclusion criteria on which these studies were selected and included in the article review are briefly shown in Table 1.

Table 1: Inclusion and exclusion criteria of article review

Inclusion criteria	Exclusion criteria
Articles highlighted in this critical review from 2000 - 2021	Focus only on articles on the impact of mentoring programs in enhancing the education of beginning teachers
Articles published in the English Language	Articles published in other than the English Language
Quality articles available in peer-reviewed journals	Weak articles available in non-referred journals
Articles directly related to teacher induction programs	Irrelevant to the study of teacher induction programs
Articles with empirical evidence or that meet the criteria	Articles that do not include empirical evidence, or do not meet the criteria
Choosing studies that examined internal consistency, reliability, and validity	Studies that do not indicate reliability and validity are not selected
Studies that clearly and sufficiently describe the data and information sources existing therein, population and sample sizes, study methods, and results	Studies whose results are not sufficiently measured or well-defined

Regarding the data-acquisition process from selected studies that related to teacher-induction programs that sought to summarise, process, and content of induction programs, the data were collected from the included articles (n = 10);

and the basic data for these articles were as follows: the full names of the selected articles, the names of the authors, and the date of the publication (see Table 2). All of these articles provided clear data and results that could be relied upon during this critical review.

Table 2: Shows those studies related to teacher-induction programs in terms of name, selected articles, authors, strategy and induction programs, and the publication date.

Number	Title of selected articles	Name of authors	Strategy and induction program	Date of publication
1	The effects of mentoring/induction support on beginning teachers	Davis, B., & Higdon, K. UK	School/university induction program (Contributed to the development and improvement of the effectiveness of new teachers)	2009
2	An investigation of the effects of variations in mentor-based induction on the performance of students in California	Fletcher et al. USA	Beginning Teacher Support and Assessment (BTSA) program (It is based on a formative assessment system and has shown that induction based on mentoring new teachers has a positive effect on students' achievement)	2008
3	The relationship between beginning teachers' engagement with induction program components and student achievement.	Holt, J. H. Western Carolina	Beginning Teacher Induction Program(The program relies on orientation, professional development, and the support of both the mentor and the administrator, Participating teachers were low in support from administrators and high engaged in support from mentors)	2012
4	Beginning secondary science teacher induction: A two-year mixed methods study.	Luft et al., Arizona	Science Specific University Programs (SSUP), electronic mentoring programs (eMP), general induction programs (GP), and internship programs (IP)(These induction programs were characterized by their different duration, form and structure)	2011
5	A longitudinal study of induction on the acceleration of growth in teaching quality of beginning teachers through the eyes of their students	Maulana et al., The Netherlands	Induction arrangements in secondary education (This induction program demonstrates changes and perceived differences in teaching quality)	2015
6	Induction experiences of novice teachers and their	Mitchell et al.,	Center Teacher Innovation (CTI)	2021

	coaches	USA	induction largest training program (Demonstrates the importance of the Learning Management System, trainers and curriculum for the development of new teachers)	
7	The effects of new teacher participation in high quality induction programs on student achievement	Nickels, L. S. US	Induction program designed by the school to see its impact on the teacher's educational skills and students' achievement	2011
8	Does an urban teacher residency increase student achievement? Early evidence from Boston	Papay et al., US	Boston Teacher Residency (BTR) is an induction program based on an innovative, practice-based setting in which teacher candidates work with a mentor teacher for one year	2012
9	Intensive mentoring as a way to help beginning teachers develop balanced instruction	Stanulis, R. N., & Floden, R. E US	Regular district induction program (It is a powerful and comprehensive mentoring program designed to accelerate and support teacher effectiveness)	2009
10	Study of the impact of the California formative assessment and support system for teachers	Thompson et al., California	California Formative Assessment and Supportive System for Teachers (CFASST) and Beginning Teacher Support and Assessment Program (BTSA)(Induction programs aimed at identifying the interaction of individual teachers with it and it consists of 4 dimensions: Support, the relationship between the support provider and the beginning teacher, the access of the support provider, and thematic focus on teaching and learning)	2004

4. Results and Discussion Overview of the Studies

In terms of the effectiveness of induction and mentoring programs for beginning teachers and students' achievement, there are studies that focused on the impact of IPs on teaching practices and the educational methods for new teachers; and the studies focused on the effectiveness of induction programs on students' achievements. Therefore, in the following review, these two strands of ithe mpact are reviewed respectively.

This review critically explored the ten empirical studies described in Table 2, in an effort to determine the impact of the proposed IPs on teachers' educational practices and on students' achievement.

Half of the studies reviewed in this section provided significant evidence that the induction of new teachers tends to positively affect teachers' instructional practices, namely Davis and Higdun, 2009; Luft et al., 2011; Mitchell et al., 2021; Stanuli and Floden, 2009; and Maulana et al., 2015. Four other studies displayed evidence that such programs also help with students' achievement: Fletcher et al., 2008; Holt, 2012; Nickels, 2011; and Papay et al., 2012. One contained both sets of data: Thompson et al., 2004. The selected studies varied in data and in terms of the methodology. That means the methodologies on which these studies relied to obtain qualitative or quantitative data were different. While some evaluated districts (i.e., Davis & Higdun, 2009; Luft et al., 2011; Maulana et al., 2015; and Stanuli & Floden, 2009) or State induction programs (i.e., Mitchell et al., 2021; and Thompson et al., 2004), others concentrated heavily on small samples in the hopes of gaining more enriched results (i.e., Davis & Higdun, 2009; Luft et al., 2011; Maulana et al., 2015; and Stanuli & Floden, 2009). The empirical studies of districts or states relied on large-scale databases to examine whether there was a possible link between induction and better outcomes in schools.

4.1 Criticising and analysis of studies related to the instructional practices of teachers

Of the five empirical studies that concentrated on the effect of IPs on teaching practices (i.e. Davis & Higdun, 2009; Luft et al., 2011; Maulana et al., 2015; Mitchell et al., 2021; and Stanuli & Floden, 2009), all of them provided evidence that new teachers benefitted from the exposure to induction programs.

In the study by Maulana et al. (2015), the authors found that it took up to three years for new teachers to reach significant growth in quality teaching – measured by management of the classroom, learning climate, activated learning, clarity of instruction, adaptation, and the teaching strategy. They reviewed the progression of quality teaching during the time when the new teachers received induction––the first three years of their practice. The authors randomly selected 68 schools, as experimental settings to study induction programs for newly recruited teachers. At first, a total of 276 new teachers and their respective 4,932 students from 68 schools participated. However, half of the teacher sample eventually dropped out of the study. The results of the study indicated that the quality of the climate of classrooms for junior teachers, as well as the clarity of teaching were good during the first three years of the teaching process. They indicated that the remaining measures of teaching skills activated learning, adaptation, and teaching strategy were sufficient. While the skill domains of new teachers began at different levels, all the skills improved across the first three years of teaching. The findings from classroom observations and student surveys converged to suggest that both observers and students noticed the instructional quality of new teachers in similar ways. The authors evaluated quality by using various observational instruments. It is critical to study the art of teaching from the viewpoint of students, as doing so contributes greatly to a more wholistic understanding of teachers' practices. However, it is important to

note that student perceptions are based on their classroom experiences over time and are therefore not discoverable with a single observational snapshot.

Mitchell et al. (2021) explored the experiences and the effect of a California-based induction training programs on novice teachers. To do this, the authors invited teachers and coaches from the Centre for Teacher Innovation (CTI) to be a part of their mixed-methods study. They used the Candidate-Coach Match Satisfaction Follow-Up Survey to gather the data from those teachers and coaches within the learning-management system. The total survey population was 2,621 teachers and their assigned 1,262 coaches enrolled in the program; while 2,351 teachers and 1,127 coaches completed the survey. Aside from the quantitative portion, the authors employed a qualitative analysis to the participants' responses to several open-response questions.

Although the teachers and coaches reflected on induction differently, the survey results revealed that CTI's induction program positively impacted new teachers' practices. However, despite the positive impacts of the induction program on teachers' growth, the results also highlighted several roles and responsibilities of coaches that were required for successful learning experiences. For example, coaches must allocate special time for coaching, building positive relationships, providing professional development in the form of coaching; and these serve as mediators between teachers and induction programs (Mitchell et al., 2021). In order to give proper attention to the inclusion of coaching in the induction process, Mitchell et al. (2021) stress the importance of careful planning in the induction operation, design and curriculum, the time allocation for coaching, the pairing process assignment, and consideration of the various characteristics of teachers and coaches. Their suggestion is one-of-a-kind; because it derives from findings that were based on a large number of participants in the study.

Adding to the contributions of the previous two studies mentioned above, Luft et al.'s (2011) research stressed the importance of examining science teachers' induction programs. One of the core objectives of their research was to examine the changes occurring in the attitudes of secondary science teachers. This was done in a timeframe that ranged from the beginning of their practice to their second year of induction. Pedagogical content knowledge (PCK), practices, and various induction programs were included to identify these changes. The authors intentionally used mixed methods with focused sampling to conduct their study. The total number of new teachers in the selection process was 98. Each teacher who participated was in one of four induction programs: SSUP, eMP, GP, or IP. These programs differed in many aspects, such as the number of mentors provided and their specialties, experiences, and duration of stay; the amount of contact between teachers and their mentors; and the structure and content of each program.

The SSUP and eMP programs revealed that first-year teachers who participated in science-specific induction programs were strengthened in their beliefs, PCK, and practices. Furthermore, teachers in the science IPs continued to perform increasingly well in interactive learning settings. This was not the case with teachers who were not included in any induction schemes. Luft et al. (2011) acknowledged that they had no intention to control each specific program. In addition, it is clear that both unobserved and observed differences in the

participants were not balanced among the groups. This may have contributed to the diminution of causal relationships; since all the participants were exposed to different induction programs that had different components, which could have affected the outcomes of the research.

The last two studies of this section, by Davis and Higdun (2009), and Stanuli and Floden (2009), had some similarities in terms of their respective methods and outcomes. For example, Davis and Higdun (2009) tested the impacts of receiving district-based, or school-based mentoring compared with having a mentor supplied by the Teachers' Fellowship Program (TFP). Stanuli and Floden (2009), on the other hand, they examined the effects on schools of receiving district programs. They then compared the results against those receiving intensive mentoring provided by the various school and university partnerships.

As Davis and Higdon (2009) stated, college and university training partnerships contributed to the improvement of teachers' instructional effectiveness during the initial years of their practice. The main objective of their study was to test the effect of the TFP on the beginning of the classroom practices for teachers in early elementary classrooms. The participants involved the first ten years of teachers who all graduated from the same teacher-preparation program. One group (n=5) participated in the TFP and received induction support from the district; while the other group (n=5) only received induction support from the district.

The results showed no significant variations between the two groups during the semester. The researchers supposed that the two groups were comparable at the beginning of their initial year of practising their profession. However, later on, teachers in the TFP outscored their counterparts on several APPEC items–– especially in the areas of instruction and collaboration. The study concluded that the Teacher-Fellows Program was capable of helping educators to become accomplished teachers.

Davis and Higdon's (2009) findings supported the results of Maulana et al. (2015) in that they both stated that the effects of induction programs happen over time. Davis and Higdon (2009) acknowledged only one limitation: the small number of new teachers who participated. Indeed, the authors pointed out that the objective of their research was not to generalise the findings, but rather to determine the effect of induction on new teachers' practices. Aside from this limitation, the authors stated themselves that the study suffered from several other critical limitations that affected the internal validity. The main limitations were that both participating groups had already received some induction training; and none were randomly assigned.

As for Stanuli and Floden's (2009) study, the authors analysed the effects of in-depth mentoring on two matched groups of teaching professionals: a treatment group of 12 and a comparison group of 12. Although both groups had not been randomly assigned and the compared group had received a regular district induction program, the findings demonstrated that the development of the new teachers' scores over two semesters was higher for the experimental group. Stanuli and Floden (2009) indicated that in-depth mentoring emphasizing balanced teaching could enhance instructors' overall teaching practices.

All five studies in this section (i.e., Davis & Higdun, 2009; Luft et al., 2011; Maulana et al., 2015; Mitchell et al., 2021; and Stanuli & Floden, 2009) reported the positive effects of their induction and mentoring-treatment groups. None of the studies conducted an authentic random-assignment experiment; rather, two groups were specifically appointed and designed for the study. The main priority of each study was that both groups participated in the induction programs––whether from districts, universities, or researcher-provided groups. The amount of time, the level of support, and content received by the participants varied. In addition, using multiple data-collecting methods––such as quantitative data, the close observation of teachers' attitudes and behaviors in the classroom, and the careful assessment of teachers' practices through some sort of reflective interview–, which strengthened the studies and moderated the threats to their internal validity.

The researchers all conducted at least two classroom observations for each teacher, which usually lasted several hours. Data-gathering was time-consuming; and all the studies, except for one, focused on a smaller sample size of teachers (ranging from ten to 276 teachers). Studies with small sample sizes, sampling bias, and high variability are not usually accurately representative of the relationship between any two variables measured. Moreover, they frequently cannot rule out the possibility that there is a third variable that is affecting the first two.

In addition, there are studies that confirm the results of the studies that have been analysed and criticised; and we mention the most important results of these studies here, as the support for the studies on which our review focused. Among these studies, the multiple use of instruments varied. For example, Maulana et al. (2015) surveyed the students in their study multiple times in order to determine any changes in their teachers' practices––rather than just observing their classroom a couple of times, as demonstrated by other studies. Alternatively, Mitchell et al. (2021) used a questionnaire with multiple-choice and open-response questions to examine the effectiveness of the induction programs through the eyes of the teachers and their assigned coaches. Notably, these professionals' input and judgment varied regarding the induction quality. In cases where the responses are inconsistent, the utilisation of one to three instruments can play a critical role in determining real causal relationships, when testing hypotheses (Davis & Higdon, 2009). For example, when Mitchell et al. (2021) used a questionnaire with a qualitative portion that allowed for comments, their findings indicated that induction, and especially coaching skills, have a positive impact on teachers' practices in the classroom. However, by incorporating a qualitative method like observation, would give a stronger and clearer picture of the given phenomena, instead of taking teachers' opinions and self-reports at face value.

4.2 Criticising and analysing those studies related to students' achievements

This section provides a critical review of four empirical studies (Papay et al., 2012; Fletcher et al., 2008; Holt, 2012; & Nickels, 2011) with the intention of investigating the impacts of teacher IPs on students' achievements. Locally-based programs were explored in terms of their efficiency and feasibility, so that educators could make reasonable decisions regarding the content and direction

of their instructional strategies. Two of the four studies (i.e., Fletcher et al., 2008; & Papaat et al., 2012) provide evidence about the effects of induction programs on students' achievements. Interestingly, the other two studies (i.e., Holt, 2012; Nickels, 2011) found no relationship between beginning teachers' participation in IPs and the academic achievements of their students.

In the first study, Papay et al. (2012) focused on the feasibility of the Boston Teacher Residency (BTR) program. This new program is based on an innovative idea, which is that the candidate teachers work with a mentor teacher before practising the teaching profession for a year. In this study, the methodology of obtaining data was to collect them from the records in the Boston Public Schools (BPS) administration, which contain records of teachers and students for specific school years, especially teachers who graduated from the BTR program. The most important aim of this program was that the graduate teachers should have the capabilities to teach important subjects, such as science and mathematics, and their educational practice develops over time, and thus it improves the level of students' achievement in the test. Moreover, the impact of the BTR program is demonstrated by the retention of new teachers in their profession and the effectiveness with which they are able to improve the test scores of the students.

The second study, by Fletcher et al. (2008), provided similar perspectives to those of Papay et al. (2012). In their study, they focused on exploring how mentor-induction programs would affect the academic performance of students in the state of California. Three districts in California––identified by the authors as Districts A, B, and C––provided the data on students' achievement, students' demographics, and teachers' experience for grades two through six (Fletcher et al., 2008). The three districts varied in size and student demographics, and District C had considerably more new teachers than those of the other two districts. A total of 2,421 students and 99 teachers participated. The methodology on which this study relied to obtain the data on students' achievement and years-of experience for new teachers was to collect the data from three regions in California that have a Beginning-Teacher's Support and Assessment (BTSA) program that allowed for the sharing of information and data related to the achievements of students and new teachers who participated in this program.

The data-analysis method used by the authors was the hierarchical linear model, which strictly defined the variables of student demographics and the induction intensity of the teachers. The data showed that classes taught by new teachers had more students from lower-income areas and more minority students than the district average. Fletcher et al.'s (2008) results indicated that mentor-based induction provided by districts had a positive impact on students' achievement. In addition, the BTSA program has achieved success in helping new teachers to obtain information and knowledge and in training them, thereby improving the educational performance level of students. This indicates that there is a positive correlation between induction and guidance for new teachers and the achievement of students. However, this was only the case if the program allowed for regular contact with a mentor, and if the level of mentor selectivity was high. Some important elements were not stated in the study, such as how the selection process of new teachers was managed and what limitations the

study had. Therefore, the chances are low that definite causal conclusions were drawn between teacher induction and student achievement.

In comparison, the results gathered by Holt (2012) and Nickels (2011) on the impact of IPs on students' achievement showed no relationship. Holt (2012) found no association between new teachers' engagement with IPs and student achievement. The study took place in North Carolina public schools over the course of eight weeks; and the focus was on teachers in their second year of teaching, who had already completed a one-year induction program. The teachers were still enrolled in an induction program during the time of the study and taught courses that required State-mandated standardised tests. However, although the author emailed a total of 173 teachers from 21 systems, he received only 52 responses. Of those 52 respondents, only 22 were eligible to participate in the study. The standardised test scores of the students whose teachers had participated in induction programs were then analysed. No positive indicators between induction and student achievement were found (Holt, 2012).

In Nickel's (2011) study, she evaluated a full induction program that included certain key elements of a modified program. The intervention group consisted of nine teachers and 180 students; while the comparison group consisted of nine teachers and 183 students. The author compared the 4 Sight-Reading assessment scores of students whose teachers were exposed to the full induction-training program with the scores of students whose teachers were trained in an induction program developed by the school district. She did this to see whether the type of induction program in question would impact teachers' instructional skills and student outcomes in a unique way. A closer look at the data indicated that there was no statistically significant difference between students' reading achievements. The author acknowledged several limitations, which could have skewed the outcomes of the study, namely a small number of participants and the use of convenience sampling, as opposed to random or assigned sampling.

Moreover, the results obtained by Holt (2012) and Nickels (2011) related to the effect of induction programs (IPs) on students' achievement were contradictory to the findings of Papay et al. (2012) and Fletcher et al. (2008). They found that there is no positive or statistically significant correlation between the IPs in which new teachers participated and the students' achievements. The reason for the contradictory results of the studies included in this section may be the difference in the method used by the researchers to collect data, in addition to the different regions and school systems applied in them, the climate, and economic conditions. All these factors affect the teaching power of junior teachers, even though they participated in induction programs and received support and guidance. Accordingly, contradictory results emerged regarding the effect of induction programs on educational achievement and on the test scores of the students.

Of the four studies in this section, neither students nor teachers were randomly assigned. In addition, district- nduction resources may have been differently distributed among the schools. Finally, student characteristics varied from one class to another and from district to district. Unless these factors and differences are carefully controlled, one cannot ultimately attribute students' achievement gains to teachers' induction programs.

4.4 Criticising and analysing Studies related to Both Teachers' Instructional Practices and Students' Achievements

Of the ten empirical studies reviewed in this paper, only one focused on the effects of induction programs on both teachers' instructional practices and students' achievement. That study, conducted by Thompson et al. (2004), was unique in its approach and sample size, and has been cited repeatedly in the literature, despite the fact that it is still unpublished. At the beginning of the study, the authors were challenged by the fact that induction programs in California; as the studies was conducted, were mandatory. New teachers were expected to enrol in the Beginning-Teacher Support and Assessment Program (BTSA) and the California Formative Assessment and Supportive System for Teachers (CFASST). Consequently, the researchers were unable to find pure treatment and control groups. Therefore, the study compared teachers, according to how much exposure they had had to the induction programs and how much support they had received. The group that received the most exposure and support was classified as the treatment group; the group with less support was the control. A previous study by Thompson et al. conducted in 2001 identified that BTSA and CFASST were both highly variable in quality.

The team surveyed a population of 1,125 third-to-fifth-grade public schoolteachers in their third year of teaching in California. The teachers were from 78 California BTSA programs in 107 school districts. The number of respondents to the survey was very low, with only 287 teachers (26%) responding––not likely to be a representative sample. In addition, it is important to note that in the new year, the teachers had been involved in choosing their own levels of engagement with the programs, rather than those levels being assigned exogenously. These variations in engagement may have resulted from unobserved traits and differences among the support providers, BTSA staff, or principals.

Selection bias was also present in Thompson et al.'s (2004) study; as some members of the population were less likely to be included than others. This is also referred to as voluntary-response bias, which occurs when sample members are self-selected volunteers. For example, the absence of teachers from the survey response pool raised the number of low-engagement groups within the population (Thompson et. al., 2004). The reason for this is that the sample groups being compared probably received a greater "dose" of the program than those who did not respond to the survey; because they were particularly disengaged from the induction programs. Furthermore, the low response rate (26%) and the request for STAR (Standardised Testing and Reporting) student test scores (only 50%) may have significantly reduced the generalizability of the study. Another aspect of the research process was that the authors included a middle-level teacher group (medium engagement) to boost the total sample size. This, in turn, allowed them to gain a greater understanding of the overall teaching practices. However, these teachers were not included in a high-low comparison analysis, thereby effectively reducing the sample size to 27 teachers in the study of teacher practices (15 in high; 12 in low). This also reduced the student-achievement sample size to 73 (45 in high; 28 in low).

After surveying new teachers, the researchers contacted and interviewed a sample of 64 of the 287 total teachers to verify the reliability and validity of the survey data (Thompson et al., 2004). From this sample, 34 teachers were recruited for case studies, which included face-to-face interviews and classroom observations. This was done to examine their teaching practices through nine measures. The study found that new teachers with high levels of engagement in induction programs out-performed those who were less engaged in seven of nine measures of instructional practices. The researchers concluded that the results of the study indicated a positive impact of BTSA and CFASST on teachers.

Regarding student achievement, the authors stated that the students of teachers who had high levels of correlation with BTSA or CFASST out-performed the students of lesser-engaged teachers across all six California STAR sub-tests (Thompson et al., 2004). However, none of these differences in scores were statistically significant. The researchers discussed their findings in great detail and acknowledged the limitations and weaknesses of the study. The main weaknesses included a lack of proper representation for the selected population and a few defects in interview data and processing. In addition, selecting two groups of teachers without randomly assigning them and exposing them to the induction programs threatened the internal validity of the study. Moreover, equality and expectations were not the same within both groups of students. Finally, the results of the study were not perfectly conclusive; because they were not all attributable to BTSA and CFASST induction programs. Also, Thompson et al. (2004) found that the students of teachers who had high levels of engagement with CFASST and BTSA ou-tperformed the students of lower-engaged teacher groups. However, unless studies are done in random assignment experiments, researchers cannot certainly conclude that induction programs contribute to, or have any effect on, quality teaching and students' achievement. This statement typifies most of the studies reviewed. Using random assignment helps to ensure that any variances among groups are not systematic at the beginning of the experiment. Thus, any variances between groups recorded at the end of the experiment can be more assuredly attributed to any correlation.

One possible explanation for the mixed findings regarding the impact of IPs on teachers' instructional practices and students' achievement could lie in the differing length of the induction programs implemented in the studies. Maulana et al. (2015) showed that it takes up to three years for new teachers to reach significant growth in quality teaching in all domains. The steep growth was noticeable, particularly in the last year of their study. Similarly, Davis and Higdon (2009) found no significant differences between the two groups during a single semester; however, the results looked different after more time. In similar manner, Papay et al. (2012) found that the achievement of students of teachers with BTR-program experience underperformed students of veteran teachers; however, the opposite was true after a period of three years. Furthermore, this may be the reasons for the contradictory results of the studies that were focused on in this review being the use or non-use of multiple instruments in the studies, induction programs implemented within the studies varied. For example, the frequency and duration of each activity was different among all the programs. In

addition, Luft et al.'s (2011) research compared four different induction programs; and each one had a different mentor selection-process, program structure, and intensity. These different results could be due to both unobserved and observed characteristics of all participants across the four induction programs, none of whom were randomly assigned. Holt (2012) compared the scores of students in classrooms of teachers who participated in a full induction-training programs with students of teachers who attended an induction program designed by the school district––in the end, no relationship was found.

In general, the empirical studies included in our review gave a point-of-view that induction programs for new teachers aimed at motivating them to have a positive effect, despite their shortcomings. Moreover, those studies reviewed showed that new teachers, who were mentored and engaged in at least any type of induction had higher retention, which means that they had a greater satisfaction and commitment to the teaching practice. Also, with regard to the practices of new teachers in their classrooms, the majority of studies included in our review and whose strengths and weaknesses were reviewed and discussed showed that novice teachers who were put through and participated in any type of induction program performed significantly better in several aspects of teaching, such as developing a plan for rigorous practical lessons and keep students focused on the task, in order to raise their level of educational attainment, and to modify and develop classroom activities, in order to meet the needs and interests of students, and to maintain a positive classroom atmosphere, and work to manage the classrooms successfully. As for the aspect of student achievement, the studies that we reviewed and looked at the role of familiarisation programs; and their impact on the level of achievement and learning among students, showed that students who were among the ranks of novice teachers and had participated in at least one type of induction had a high level of academic achiecement through their achievement of High scores in subject tests.

Based on what has been discussed from the results of the studies included in our critical review, there is an urgent need for future induction programs that are designed to be effective, comprehensive, and flexible, that can be implemented over a long period of time, and that play an important role in providing support to novice teachers and in helping them to face the challenges. In addition to the components on which these programs depend, they must be applicable and work to develop and improve the skills of teachers to become competent, and experienced and have a positive impact on the achievement of their students.

Our critical review indicates the importance of induction programs for teachers in their early years; as we found that there are a few recent studies that began to present the various types of induction programs aimed at support from teachers. Furthermore, some recent studies have indicated the correlation between the improvement of students' achievement and the retention of teachers, as well as the subjection of new teachers to a kind of induction programs, but no specific induction programs have been identified that are effective in recruiting and retaining new teachers. Moreover, there are several factors that affect these programs, and therefore there are deficiencies in some of them. Among these factors is the difference in development and the awareness of the importance of

these programs for guiding new teachers between countries, the continuous evaluation of induction programs, as well as making efforts to improve them, and the keenness of the various educational regions to apply induction programs and to evaluate the impact of these programs on new teachers and students in their respectivelevels of achievement.

5. Limitations between Studies

In reviewing these empirical studies, the authors found that they all held limitations and weaknesses. Nonetheless, most of them (eight of ten) indicated that the introduction or mentoring of such programs for new teachers had a positive impact. As far as instructional practices are concerned, five studies showed that new teachers who participated in some type of IP outperformed their peers and improved in many aspects of teaching practices. Examples of such improvements included advances in classroom management skills, increased effectiveness in creating lesson plans, increased engagement with students through instruction, and more adjustment of classroom activities to meet these students' needs. However, two of these studies concluded that improvements only happened gradually, in the long run. As for student achievement, three studies showed that students of new teachers who had participated in some kind of induction obtained higher test scores than did their peers. Two other studies revealed that there was no significant difference or effect from induction programs on students' achievement. Moreover, our review included studies with mixed results that are puzzling and create paradoxes in the field of education regarding induction programs. For both research and policy, it is imperative that scholars should not overlook the conflicting findings of others. Instead, they must take the initiative and provide explanations that unravel the threads of confusion. In this way, they may reconcile contradictory findings and suggest what research is still needed, in order to test new hypotheses. A limitation of the review is the inconsistent results between studies regarding the effects of induction on instructional practices and students' achievement, which may have had a possible explanation for the external validity (i.e., small sample sizes). This deteriorates the generalisability of the findings; and it decreases their statistical power.

A study with low statistical power, in turn, has a reduced chance of detecting a true effect and a reduced likelihood that statistically significant results would reflect those effects. Unfortunately, most studies either suffered from a small sample size or a significant dropout rate.

The need to reconcile inconsistent findings generally suggests the existence of gaps in the research base. It also suggests that further research is needed, in order to answer any relevant questions. Existing studies offer many explanations to researchers and policy-makers that challenge the varying implications of induction programs and warrant further investigation. These studies, for example, suggest that growth and positive effects can be seen in the long run. The studies recommend that induction programs need to be more comprehensive, and include more depth, and contain more supporting evidence; yet how intensive do induction programs need to be? On the other hand, some studies suggest that regular contact should occur between mentors and mentees in the training process; but what is the optimal support rate and amount of

contact required for such mentee-mentor partnerships? Can teachers improve in their teaching without depending on mentors? Studies suggest that intensive university induction programs yield positive results in teachers' and students' achievements;, but how different are these programs from those in various school districts? Is it the quality of the staff; or is it the resources implemented? Is there any ideal configuration of an induction program for every grade level and subject matter? If so, what is it? If not, what should be the framework for such a program? Can these questions be answered through natural experiments? Researchers need to work out these questions, in order to identify any real causal relationships, and to rule out all other possibilities.

The next step in trying to understand the effects of induction programs is to conduct a study with randomly assigned groups by locating a district that is willing to randomly assign beginning teachers to the treatment and control groups. The key to a random-assignment experiment is that members of both the treatment group and the control group are equal in expectation. As seen previously in this paper, researchers used many non-random experimental methods to try to make the involved participants as similar as possible. However, even very complex non-experimental studies cannot compete with a simple, well-implemented, random assignment studies for determining whether induction programs have positive outcomes and growth

6. Implications to Teacher Preparation and Teacher Induction

Many recent studies have indicated the most important effects of preparing and teacher induction through his participation in IPs during the first years of practising the teaching profession (See et al., 2020 & Han, 2023). Among the most important effects that have been referred to is increasing the self-efficacy of teachers by determining the efficiency of teaching and planning, and thus retaining teachers and not dropping them out of the teaching profession in the first years, as well as helping teachers to provide a good level of education for their students (Han, 2023). Moreover, when teachers, especially beginners, get support in their professional lives, this leads to developing their level of performance, gaining confidence, and the ability to manage the class and make students participate in the learning process and perform tasks. The guidance and advice that teachers receive through induction and evidence-based programs leads to a significant improvement in their overall performance and student outcomes (Kwok et al., 2021). Thus, raising the level of teaching performance by teachers who undergo training and guidance through various induction programs, and leads to a successful teaching process in the future.

7. Conclusion and Recommendations

The Findings from most of the empirical studies in the current review confirmed that IPs have a positive impact on teachers' classroom practices and student achievement, this is evidenced by new teachers' acquisition of more successful classroom management skills and a better performance in keeping students on their tasks. While the results of some studies showed that the impact of induction programs on new teachers' and students' achievement levels occurs gradually over the course of a semester, a year, two years, or more. In addition, the results of some studies showed that students of new teachers participating in

induction programs obtained higher scores on academic achievement tests than did their peers.

Accordingly, our current critical review includes studies that play an important role in shedding light on the need to pay attention to induction programs for new teachers, and to learn about these programs, as this helps in developing them and setting policy initiatives, and strategies to train novice teachers to face challenges and their retention in the educational filed, and thereby improve the level of achievement among such students.

In addition, it is expected to facilitate the comparison between the various induction programs for new teachers and their impact on the effectiveness of these teachers and the achievement of students to provide suggestions and perceptions represented in the design of comprehensive and effective induction programs and their implementation on novice teachers. As well as monitoring and evaluating their positive impact on the teacher's influence in the field of education for a longer period, as well as the interaction of students with those inside the classroom. Furthermore, the focus and expansion of research on this topic is crucial for improving and developing teachers that are able to face the challenges and deepen their relationships with their colleagues, students and parents, and to become highly qualified teachers that help to raise the level of their students' achievements and inspire them to learn better.

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