

Mediating Effect of the Role of Teacher-Child Interaction on the Professional Development of Early Childhood Education Teachers and the Well-Being of Preschool Children

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Abstract

In order to promote the overall growth and development of children, early childhood educators may benefit from specialised professional development programmes that are designed to improve their abilities and pedagogical techniques. Understanding the exact influence that professional development has on the well-being of children is something that needs to be investigated, despite the fact that its significance is well acknowledged. In the context of early childhood education in China, empirical research is required because of the complex links that exist between teacher professional development, teacher-child interactions, self-efficacy, and the well-being of preschoolers. The purpose of this research was to investigate the relationships between early childhood education teacher professional development, teacher-child interactions, self-efficacy, and the well-being of preschoolers via the use of quantitative analysis. As a result of professional development, the results demonstrate improved relationships and self-efficacy, with considerable mediation occurring via interactions between teachers and students. An emphasis was placed on the moderating impact that teacher expertise has in relation to development consequences. 230 Chinese early childhood educators participated in this study, which highlights the significance of providing opportunities for professional development for educators. The research provides valuable insights that may be used to improve educational practices by illuminating the linkages that exist between professional growth, relationships, and well-being.

Keywords: teacher-child interaction; early childhood education; preschool children well-being; teacher professional development; teacher self-efficacy

1.0 Introduction

Early childhood education (ECE) is well acknowledged for the positive impact it has on the development and well-being of young children. The educational experiences, socio-emotional development, and overall wellbeing of young learners are all influenced by educators working in early childhood education (LaForett& De Marco, 2020). As a result, it is of utmost importance to

have a comprehensive understanding of the factors that contribute to effective instructional strategies and positive outcomes for young people. According to Noguerón-Liu's research from 2020, it is essential for early childhood educators to participate in meaningful professional development opportunities. Active participation in professional development events is necessary in order to enhance both one's teaching and the lives of one's students. It is possible for instructors to improve their educational knowledge and abilities by participation in cooperative learning experiences, seminars, workshops, and symposia (Johnson, 2022). There have been a great number of studies that have shown that successful professional development may enhance educational methods, as well as the academic achievement and overall well-being of students. It is possible for targeted professional development activities to result in improvements in pedagogy as well as improvements in the academic performance of students (Hauerwas et al. 2023). Some examples of such initiatives are those that focus on early literacy teaching, social-emotional development, and inclusive practices.

2.0 ECE's Teacher Professional Development

Due to the significance of early childhood education (ECE) in influencing the overall health and academic performance of preschool-aged children, the goal of this research is to investigate the significance of ECE. There have been instances when professional development programmes have been used to provide information and direction (Dydia et al. 2020). Nevertheless, it is necessary to acknowledge the processes by which professional development influences the well-being of children, as well as the contextual elements that have the potential to influence the interaction between the two components (Peele & Wolf, 2021). This research focused on the role that teacher-child contact and teacher self-efficacy play as mediators in the relationship between the two. Relationships between teachers and students that are favourable are beneficial to the mental, emotional, and social development of children. Cognitive, social, and emotional growth are all facilitated by interactions between teachers and students that are of a high quality (Noguerón-Liu, 2020).

Additionally, teaching methods and student progress are impacted by a teacher's sense of self-efficacy. It is possible that professional development programmes will be impacted by the fact that experienced instructors use a variety of teaching strategies. Because of this, the purpose of this study is to expand upon the findings of prior research by investigating the ways in which the development of Chinese preschoolers, teacher self-efficacy, teacher-child interaction, and teacher professional development in early childhood education are connected. This study investigated the relationship between the happiness of preschoolers and the professional growth of their instructors in early childhood education (ECE). The specific focus of this study was to investigate the ways in which teacher-child interaction and teacher self-efficacy play a role in the relationship examined. In addition, the influence of the years of experience that instructors have while acting as moderators on these connections was investigated.

The objectives of this study are as follows:

- to investigate the ways in which Early Childhood Education (ECE) Teacher Professional Development, teacher-child interaction, teacher self-efficacy, and the well-being of preschool children are connected in the Chinese ECE setting,
- to investigate the ways in which teacher-child interaction and teacher self-efficacy influence the connection between ECE Teacher Professional Development and the well-being of preschool children, and
- to determine the ways in which teacher experience influences the connections between Teacher Professional Development, teacher-child interaction, and the well-being of preschool children receiving ECE.

Taking into consideration the aforementioned goals, a framework has been established, as can be seen in Figure 1.

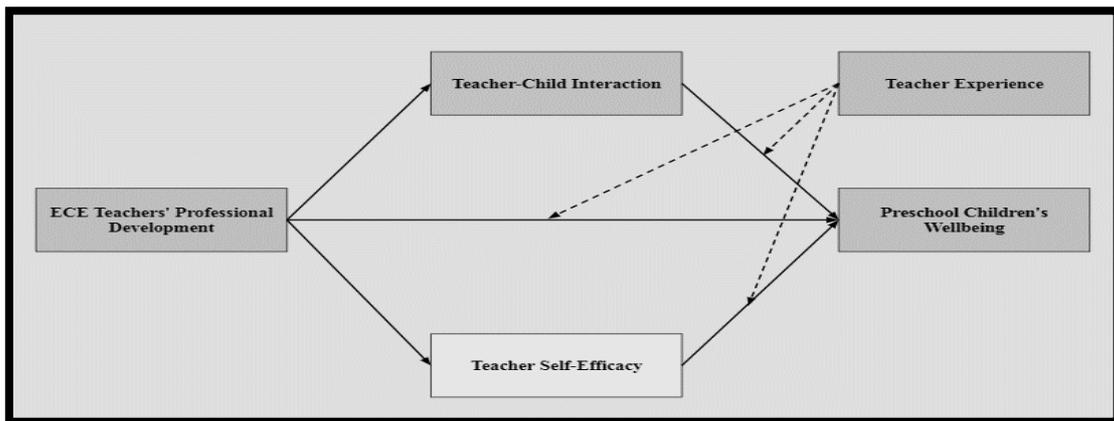


Figure 1. Conceptual Framework

3.0 Methodology

The technique of this quantitative research was developed with the purpose of investigating the link between the well-being of preschoolers and the possibilities for professional development that are available to early childhood educators. A particular focus was placed on investigating the moderating impacts of teacher experience, as well as the mediating effects of teacher-child contact and teacher effectiveness. For the purpose of analysing the correlations between the variables, a research method known as cross-sectional study was used. In this study, we investigated the connections between the professional development of early childhood education instructors and the well-being of children, as well as any relevant factors that may act as mediators or moderators. Through the use of a random sample method, information was gathered from 230 early childhood education instructors working in China's different educational institutions. It was adapted from Dynia et al. (2020) that five questions were used to assess the professional growth of teachers. Items are included in this package. For the purpose of assessing the well-being of preschool-aged children, five items that were modified from Suteja et al. (2022) were used. An evaluation of the teacher-child interaction was carried out using five items that were modified from Taylor et al. (2023). The level of self-efficacy of teachers was evaluated using five measures that were modified from Guo et al. (2021).

4.0 Results

Table 1. Model Fit

Goodness of Fit Measure	Criteria	Values
CMIN/DF	< 5.0	2.21
TLI	>0.9	0.851
CFI	>0.9	0.883
IFI	>0.9	0.884
RMSEA	<0.1	0.298
GFI	>0.9	0.810

We used structural equation modelling (SEM) to carry out confirmatory factor analyses (also known as CFA) using AMOS 24.0. As well as evaluating hypotheses, structural equation modelling (SEM)

was used to evaluate convergent and divergent validity, model fitness for structural and measurement models, and model fitness. As a strategy that produces accurate and trustworthy findings, structural equation modelling (SEM) is regarded as being superior to regression. First, the CFA was carried out in order to analyse the model fitness statistics for the measurement model. This was done before the SEM analysis was performed. As a result, the measurement model was generated using AMOS using the constructs and 230 answers received from the participants. Nevertheless, there was a problem with the fitness of the model in the first effort at CFA, which was mostly caused by the low loadings of one item (see Table 1 for more information). In order to evaluate the fitness of the model, this component was eliminated from the study. It was determined that the item removal remained below the specified threshold of twenty percent, which is permitted in order to achieve model fitness. After that, the results of the CFA showed that the model was a good fit based on the various indices, such as $\chi^2/df = 2.21$, GFI = 0.810, TLI = 0.851, IFI = 0.884, CFI = 0.883, and RMSEA = 0.298, which was reported by AMOS 24.0.

Table 2. Confirmatory Factor Analysis

Variables	Items	Loading
Teacher Professional Development	TPD1	.841
	TPD2	.789
	TPD3	.820
	TPD4	.774
	TPD5	.845
Preschool Children Well-being	PSCWB1	.826
	PSCWB2	.812
	PSCWB3	.742
	PSCWB4	.632
	PSCWB5	.310*
Teacher Self-efficacy	TSE1	.759
	TSE2	.745
	TSE3	.745
	TSE4	.804
	TSE5	.825
Teacher-Child Interaction	TCI1	.795
	TCI2	.761
	TCI3	.762
	TCI4	.823
	TCI5	.731

A calculation was made to determine the convergent validity of all of the variables, which included TPD, PSCWB, TSE, and TCI. (please refer to Table 2). The Fornell-Larcker criteria was also used in order to evaluate the discriminant validity of the survey. The findings of the CFA were used to determine the level of mutual disagreement among the latent constructs (i.e., TPD, PSCWB, TSE, and TCI). This was done in order to accomplish the aforementioned purposes. The findings showed that the values that were retrieved from Table 4 to reflect the square root average variance were greater than the correlation that was derived between the latent constructs that were investigated in this study (i.e., TPD, PSCWB, TSE, and TCI) (see Table 3).

Table 3. Convergent and discriminant Validity

Variables	α	CR	AVE	TPD	PSCWB	TSE	TCI
TPD	0.875	0.933	0.653	1			
PSCWB	0.822	0.922	0.733	0.233	1		
TSE	0.911	0.966	0.697	0.452	0.166	1	
TCI	0.932	0.986	0.733	0.284	0.275	0.153	1

When the validity, reliability, and measurement model fitness were all established, the next step in the research process was to determine the fitness of the structural models. According to the indices that were used, the outcomes were reliable. During the process of testing hypotheses, the method of route analysis was used. The first hypothesis was that the well-being of preschool children is directly impacted by the professional development opportunities available to early childhood educators. The results of the path analysis indicated that the professional development of early childhood education (ECE) teachers had a positive and statistically significant effect on the well-being of preschool children ($\beta = 0.625$ and $p = 0.001$). As a consequence of this, Hypothesis 1 was shown to be correct (refer to Figure 2 and Table 3). Similarly, the second hypothesis was that the professional growth of early childhood education instructors had a direct influence on the connection between teachers and children. The findings of the path analysis indicated that the professional development of early childhood education instructors had a significant and favourable influence on the relationship between teachers and children ($\beta = 0.446$ and $p = 0.001$). In light of this, the hypothesis H2 was verified (refer to Figure 2 and Table 3).

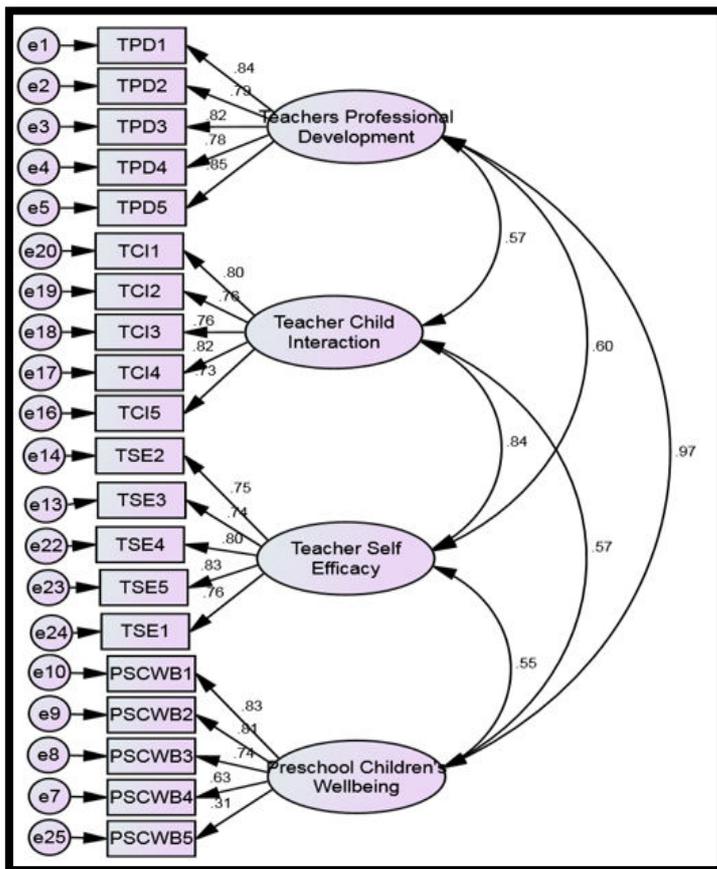


Figure 2. Measurement Model

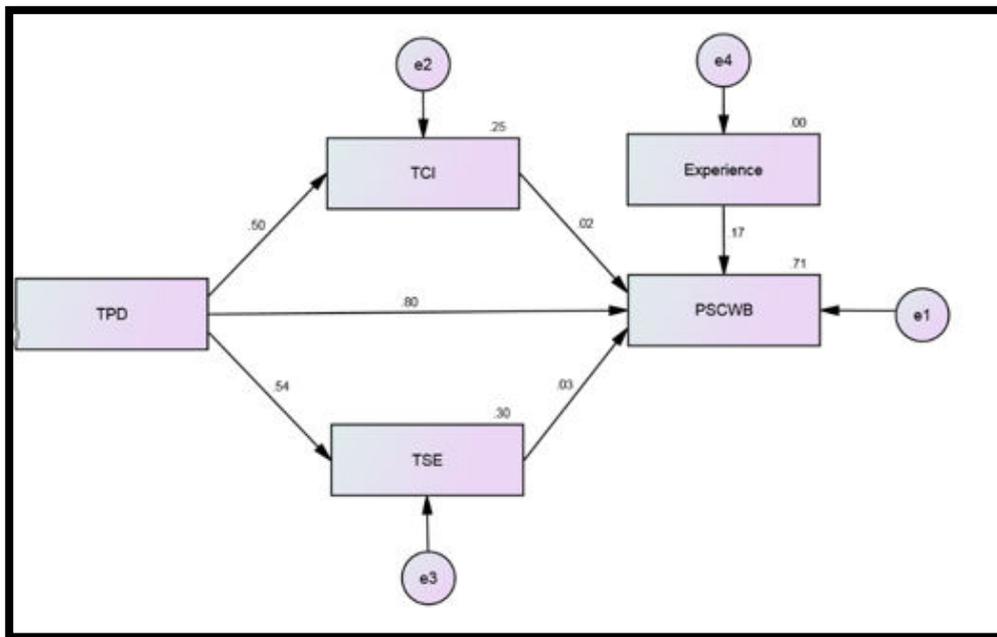


Figure 3. Structural Model

There is a substantial relationship between professional development for early childhood education instructors and teacher self-efficacy, according to the third hypothesis. Based on the findings of the path analysis, it was determined that the professional development of early childhood education teachers had a significant and positive influence on teacher self-efficacy ($\beta = 0.455$ and $p = 0.001$). As a consequence of this, the hypothesis H3 was verified (refer to Figure 3 and Table 4). Both the fourth and fifth hypotheses stated that the well-being of preschool children is greatly influenced by the level of teacher-child interaction (H4) and the level of self-efficacy that teachers possess. The findings of the path analysis indicated that the level of contact between teachers and children ($\beta = 0.393$ and $p = 0.001$) and the level of self-efficacy of teachers ($\beta = 0.142$ and $p = 0.001$) had a positive influence on the well-being of children. As a consequence of this, Hypotheses 4 and 5 were approved (see to Figure 3 and Table 4).

Table 4. Direct Path Analysis

Model	β	T value	P value	Decision
TPD -> PSCWB	0.625	16.845	0.001	Supported
TPD -> TCI	0.446	8.811	0.001	Supported
TPD -> TSE	0.455	9.791	0.001	Supported
TCI -> PSCWB	0.393	10.701	0.001	Supported
TSE -> PSCWB	0.142	4.851	0.001	Supported

Based on the sixth hypothesis, it was argued that the link between early childhood education teachers' professional growth and the psychological well-being of preschool children is strongly mediated by the contact between teachers and children. According to the findings of the path analysis, the link between early childhood education teachers' professional growth and the psychological well-being of preschool children is largely mediated by the contact between teachers and children. $p = 0.001$ and $\beta = 0.383$ are the results. This led to the validation of hypothesis H6 (see Table 5). The seventh hypothesis stated that the link between early childhood education teachers' professional growth and the psychological well-being of preschool children is largely mediated by

the teacher's sense of self-efficacy about their own abilities. Based on the findings of the path analysis, it was determined that the contact between teachers and students plays a key role in mediating the connection between teacher self-efficacy and the psychological well-being of preschool children. $p = 0.001$ and $\beta = 0.353$ are the results. As a consequence of this, H7 was verified (refer to Table 5).

Table 5. Mediation Analysis

Relation	B	T value	P value	Decision
TPD -> TCI-> PSCWB	0.383	1.942	0.001	Supported
TPD -> TSE-> PSCWB	0.353	2.982	0.001	Supported

This study utilised the stepwise approach that Hayes recommended in order to confirm the moderating role that teacher experience plays between early childhood education (ECE) teacher's professional development and preschool children's well-being, teacher-child interaction and preschool children's well-being, and teacher self-efficacy and preschool children's well-being. An additional model was generated in order to assess the moderating impact. This model included the interactional factors (TPD x Exp), (TCI x Exp), and (TSE x Exp), respectively. Table 8 demonstrates that the experience of the teacher has a positive and substantial moderating influence on the link between the professional growth of early childhood education instructors, the interaction between teachers and children, the educator's sense of self-efficacy, and the well-being of preschool children. 0.001 is the value of the p-value for each of these associations. Because of this, the data provide support for hypotheses H8a, H8b, and H8c respective.

Table 6. Moderation Analysis

Relation	B	T value	P value	Decision
TPD x Exp -> PSCWB	0.245	4.320	0.001	Supported
TCI x Exp -> PSCWB	0.144	3.653	0.001	Supported
TSE x Exp -> PSCWB	0.214	2.183	0.001	Supported

Table 7. Hypothesis Validation

	Hypothesis	Testing
H1	Preschoolers' well-being is considerably and favourably impacted by ECE teachers' professional development.	< 0.05 Approved
H2	The teacher-child connection is greatly and favourably impacted by ECE's teacher professional development.	< 0.05 Approved
H3	The professional development of ECE teachers has a substantial and advantageous effect on teachers' self-efficacy.	< 0.05 Approved
H4	Preschoolers' wellbeing is significantly and favourably impacted by teacher-student contact.	< 0.05 Approved
H5	Preschoolers' wellbeing is significantly and favourably impacted by teachers' self-efficacy.	< 0.05 Approved
H6	The association between preschoolers' wellbeing and ECE teachers' professional growth is mediated by teacher-child contact.	< 0.05 Approved
H7	Teacher self-efficacy modulates the association between ECE's teacher professional development and preschool children's well-being.	< 0.05 Approved
H8a	The association between preschoolers' wellbeing and ECE teachers' professional growth is moderated by teacher experience.	< 0.05 Approved
H8b	Preschoolers' wellbeing and teacher-child connection are mediated by the teacher's experience.	< 0.05 Approved
H8c	The association between preschoolers' wellbeing and teachers' self-efficacy is moderated by teacher experience.	< 0.05 Approved

5.0 Discussion

According to Hypothesis 1, Early Childhood Education's Teacher Professional Development has a large and positive influence on the well-being of preschool children. This finding is in line with previous research (Gardner-Neblett et al. 2012). (Khamsuk & Whanchit, 2021) Early childhood educators have the opportunity to significantly improve their knowledge, skills, and instructional strategies by participating in professional development courses of the best possible quality. New teaching tactics, approaches, and ideas for supporting the well-being of their pupils are provided to teachers who engage in continuing professional development (CPD). Teachers may increase their understanding of child development, learning theories, and practices that have been proved effective via research by participating in professional development opportunities. According to Gross et al. 2022, they acquire the knowledge necessary to create learning environments that are both exciting and helpful, with the goal of fostering children's cognitive development, social-emotional growth, and overall academic achievement. Instructors are able to address the unique needs of their students, including those who have specific educational needs or come from a variety of cultural backgrounds thanks to the skills that are offered via professional development. As a result, H1 is approved. The Teacher Professional Development programme offered by ECE has a large and beneficial impact on the interaction between teachers and students, as stated in Hypothesis 2. Through participation in professional development, educators acquire knowledge about effective communication strategies, flexible instructional approaches, and the establishment of learning environments that are conducive to learning (Hu et al. 2022). They acquire the ability to form relationships with children that are warm and trustworthy, to pay attention to the requirements of the children, and to provide support and guidance. In addition, professional development places an emphasis on personalised teaching, which recognises and appreciates the unique abilities and interests of each individual child. When educators participate in high-quality professional development and put the strategies they have learned into practice, the relationship between teachers and students is enhanced (Mandak et al. 2019). Teacher-child interactions are improved. An atmosphere that is loving and secure for learning is created when there are positive relationships between teachers and students that are characterised by warmth, responsiveness, and support. The children benefit from these interactions because they help them develop their social and emotional abilities, build a feeling of belonging and emotional control, and encourage healthy connections with their peers. Consequently, H2 is being supported.

The third hypothesis (H3) asserts that the Teacher Professional Development programme offered by ECE has a positive and substantial influence on the self-efficacy of teachers. A examination of the relevant literature also lends credence to this result. According to McLeod and Giardiello (2019), professional development programmes help teachers feel more confident in their abilities for the purpose of strengthening both their knowledge and their technical expertise. As time goes on, educators have a greater sense of confidence in their ability to positively affect the learning outcomes of their students. They have a better understanding of effective teaching strategies, the development of curricula, the administration of classrooms, and assessment procedures (Wang & Jia, 2023). Participating in high-quality professional development offers educators the opportunity to boost their self-assurance in their capacity to meet the diverse requirements of their pupils. When teachers have greater levels of self-efficacy, it has a favourable influence on both the effectiveness of their teaching and their overall well-being. In accordance with Ahmed et al. 2020, instructors who have a high level of self-efficacy are more likely to set challenging objectives for themselves, to persist in the face of challenges, and to alter their instructional strategies in order to meet the needs of particular pupils. It is clear that they are enthusiastic and motivated about their work because of the interactions they have with youngsters. As a result, H3 is acceptable. According to Hypothesis 4, the interactions that take place between instructors and students have a considerable and positive impact on the well-being of young children. This hypothesis is supported by the results of the literature review, which gives support overall. According to Sidi et al. 2023, the interactions that take place between teachers

and students have a substantial impact on the cognitive, emotional, and psychological development of children. Children flourish in circumstances that are nurturing, which may be characterised by the presence of warmth, responsiveness, and assistance between professors and college students. According to Manuti et al. 2022, teachers are able to establish robust relationships with college students; these connections are founded on mutual appreciation, comprehension, and meaningful interactions with the students. This is beneficial to children because it helps them develop a feeling of emotional safety and belonging, both of which are of critical importance to their health. The conclusion is that H4 is supported.

According to Hypothesis 5, the self-efficacy of preschool teachers has a significant and beneficial effect on the overall well-being of preschool-aged children. The results of this theory are supported by the existing body of literature. (Buffenn, 2021) Research has shown that teachers who have a strong sense of self-efficacy are more likely to provide outstanding and supportive faculty environments. They impart in children a feeling of security, acceptance, and recognition, all of which are elements that are necessary for the development of appropriate behaviour in children. It is far more probable that teachers will give emotional support, encouragement, and individualised attention to their college students if they accept as true within their own personal capabilities (Yin et al. 2022). This helps youngsters develop a sense of belonging, boosts their self-esteem, and contributes to their overall emotional well-being. H5 is supported as a consequence of this.

It was hypothesised in Hypothesis H6 that the relationship between the well-being of preschool children and the professional growth of early childhood education instructors is mediated by the interactions that take place between teachers and the pupils they teach. According to the research, the results are correct. ECCE According to Rodriguez and McKee (2022), teacher professional development is the means by which educators acquire the knowledge, skills, and strategies necessary to connect with children in a manner that is appropriate and productive. As a result, these interactions contribute to the overall improvement of the well-being of children. According to Christodoulakis et al. 2021, positive relationships between teachers and students, which are characterised by warmth, responsiveness, and sensitivity, have been frequently linked to increased cognitive development, social-emotional growth, and overall well-being in preschoolers. The formation of meaningful connections with students is one of the most effective ways for teachers to foster academic achievement, cognitive growth, and social and emotional competence in their pupils. The conclusion is that H6 is correct. The well-being of preschoolers and the professional growth of teachers are said to act as mediators in the relationship between early childhood education and teacher self-efficacy, as stated in Hypothesis 7: All of these findings are supported by the literature study. According to Narea et al. 2022, educators who have high self-efficacy beliefs are more likely to set lofty objectives for themselves, remain steadfast in the face of adversity, and use effective instructional strategies. They modify their teaching methods in order to meet the many requirements of the students in order to achieve the goal of providing the pupils with high-quality learning abilities and positive health outcomes. According to Yildirim and Roopnarine (2019), educators who have high levels of self-efficacy are more likely to take steps to create an environment in the classroom that is friendly to students. Developing trustworthy connections with children, offering emotional support, and cultivating an environment in which children feel loved, safe, and respected are all things that they do. According to Ong'ayi et al. 2020, toddlers benefit from these positive connections between teachers and students because they help them develop a sense of network, self-worth, and general well-being. The conclusion is that H7 is correct.

According to Hypothesis 8a, the level of experience possessed by the educator acts as a moderator in the relationship between Early Childhood Education Teacher Professional Development and the well-being of preschool children. According to the research, the results are correct. Due to the fact

that they have been exposed to a variety of teaching contexts, diverse student demographics, and a variety of problems, experienced teachers have a greater chance of successfully integrating their professional development experiences into classroom practices that positively influence the well-being of children (van Driel et al. 2023). According to Heyd-Metzuyanim (2019), they have a more in-depth understanding of child development, as well as excellent teaching strategies and ways for building learning environments that are friendly to students. As a result, H8a is acceptable. The experience of the teacher is said to operate as a moderator in the relationship between the interaction between the instructor and the child and the well-being of preschoolers, as stated in Hypothesis 8b. According to the research, the results are correct. According to Rancher and Moreland (2023), teachers who have more experience have had plenty of opportunity to refine their skills in developing friendly and responsive connections with the students in their classrooms. The capacity of these individuals to effectively react to the wants, sentiments, and pursuits of youngsters has been significantly improved. According to Byun et al. 2022, as a consequence of their delight, they have a greater understanding of how to create learning environments that are safe and helpful, how to offer the appropriate supervision, and how to connect with children in meaningful discourses. As a result, H8b is acceptable. It is suggested by Hypothesis 8c that the relationship between teacher effectiveness and the well-being of preschoolers is modulated by the level of experience that teachers have. According to the research, the results are correct. According to Taherkhani et al. 2022, teachers who have more experience have had more opportunity to perfect their instructional methods, classroom management skills, and pedagogical methodologies. Through their combined experiences, they have encountered a wide range of educational settings, and as a result, they have acquired the knowledge and skills necessary to effectively navigate challenges and meet the diverse needs of children. These experiences assist experienced teachers feel more capable of accomplishing their objectives (Buffenn, 2021). This is because they have evidence of their previous successes and are aware that they have triumphed over problems in their teaching practice. Teachers who have a high level of self-efficacy and knowledge are more likely to use successful teaching techniques, create a learning atmosphere that is both exciting and engaging, and boost children's enthusiasm and passion for learning. According to Yin et al. 2022, individuals who have self-assurance in their abilities are better able to adapt to constantly shifting circumstances, make intelligent choices, and provide the necessary support and guidance to ensure the well-being of children. Because of this, H8c is recommended.

6.0 Conclusion

The purpose of this research was to investigate the connections that exist between Early Childhood Education Teacher Professional growth, teacher-child interaction, teacher self-efficacy, and the growth of preschool teachers. It was found that the data validated the hypothesised positive benefits of Early Childhood Education's Teacher Professional Development on the happiness of preschoolers, the relationship between teachers and children, and the confidence of teachers. Additionally, it was shown that the link between Early Childhood Education's Teacher Professional Development and the happiness of preschoolers was moderated by the interaction between instructors and students as well as by teachers' perceptions in their own capabilities. This research has significant implications for theoretical frameworks. If we provide evidence to back up the hypothesised links, it will help us get a deeper understanding of the complex processes that are at play in early childhood education. Through its emphasis on the relevance of teacher-related variables and their interplay in influencing the development and happiness of preschoolers, this study contributed to the current theoretical framework by concentrating on the significance of these aspects. It places an emphasis on the need of professional development programmes that encourage healthy interactions between teachers and students, enhance teachers' confidence, and expand

instructors' pedagogical skills. This comprehensive approach to improving teaching methods is in accordance with contemporary ideas of early childhood education (ECE) and is backed by a considerable amount of data sources. The findings brought to light the significance of individualised professional development programmes for early childhood educators in order to cater to the specific requirements of this teaching profession. If they are provided with the resources, support, and training that they need via these programmes, teachers have the potential to develop and deepen their relationships with pupils. Improvements in the quality of interactions between teachers and students may be made by the implementation of various initiatives, such as peer observations, collaborative planning, and reflective practice, in educational institutions and schools. The need of instructors having faith in their own capabilities to make a positive difference in the lives of the students under their care is also emphasised. The confidence that teachers have in their own talents may be bolstered by providing them with chances for professional growth, public acclaim, and regular support.

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