

CONTEXTUAL FRAMEWORK FOR ENHANCING PRE-SERVICE ECE TEACHER TRAINING IN PAKISTAN ALIGNED WITH SUSTAINABLE DEVELOPMENT GOAL (QUALITY EDUCATION)

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Abstract:

The Early Childhood Education (ECE) classroom observation summary by UNICEF Pakistan (2023) revealed a nationwide lack of in-service teacher training, resulting in poor induction and low qualification levels. While prior studies have explored ECE quality, a gap remains in context-specific training frameworks aligned with Sustainable Development Goal 4 (SDG 4) for Pakistan. This study aims to enhance ECE teaching quality through a mixed-method investigation grounded in constructivist and behaviorist theories. Quantitative data were collected via questionnaires from 400 ECE teachers, while qualitative insights were obtained through focus group discussions with 52 education experts across five Pakistani provinces. Tools like SPSS and Voyant were used for analysis. Findings indicated that Pakistan's ECE curriculum (2007–2025) supports training activity design, but gaps remain in implementation. Based on the findings, a SCAPE model framework (Setting criteria, Courses, Alignment, Practicum, Evaluation) was developed to guide ECE teacher training. The study recommends its adoption by teacher education institutes and policymakers to ensure equitable, quality education. Future research may be conducted to evaluate the impact of proposed model.

Keywords: Teacher training; ECE; Quality Education; curriculum development; Contextual framework

1. INTRODUCTION

According to the United Nations (2015), the 17 Sustainable Development Goals are a global call to eliminate poverty and hunger, protect the planet, and provide equitable education by 2030. The 4th goal is to provide equitable quality education opportunities for everyone across the globe by 2030. According to the United Nations General Assembly Economic and Social Council [UNGAESC] (2024), the world is off-track to achieve the agenda by 2030 as only 17% of targets are completed, and the world's progress in the education sector is very slow as a larger share of countries is failing to achieve their learning outcomes. Some countries face teacher shortages, high student-teacher ratios, inadequate training, and a lack of professional development opportunities for teachers. The priority should be given to expanding progress towards equitable quality education as it will have a catalytic impact on achieving the overall 2030 Agenda. As per the UNGAESC (2024), 15% of teachers were still untrained according to national minimum criteria, a figure unchanged since 2015. A study concluded that teachers were not able to play their appropriate role for shaping the good behavior among students in schools. Most of parents also acknowledged that their role at home in front of their kids is also inappropriate (Niwarz & Attaullah, 2018).

The UN has been supporting Pakistan in various aspects to achieve the SDGs, especially providing equitable quality education to all (UNP, 2024). Pakistan has developed specific targets to meet SDG 4. One of the targets is to give all children equitable access to quality early childhood education to give them primary education by 2030 (Idara-e-Taleem-o-Aagahi, 2020). In this regard, Pre-service ECE teachers' training is crucial to increasing learners' output and the efficacy of the school and the entire educational system (Tasdemir et al., 2019). However, the ECE classroom observation summary prepared by UNICEF Pakistan observed no evidence related to teachers' training on inclusive classroom practices nationwide. As a result, the medium of instruction was either Urdu or the mother tongue, and the social and collaborative skills were low (Hall, 2023). Other challenges, such as poor induction, low levels of teachers' education, and lack of motivation among teachers, were also found (Siddiqui et al., 2021). Improving teaching quality should, therefore, be focused on achieving learning outcomes (Siagian & Artha, 2023).

Besides discussing practices in ECE and development, Tahira et al. (2021) highlighted issues and challenges related to quality of ECE, overpopulation, low income, poor socioeconomic status, illiteracy, the war against terrorism, political instability, lack of equity and access to basic education, lack of resources, untrained teachers, lack of facilities, poor quality of education, disparities in public sectors, lack of proper evaluation system, lack of ECE awareness, and

weak governance. Sain et al. (2024) explored innovative strategies for teachers' training in Pakistan. The study recommended enhancing teamwork, ensuring scrutiny and merit-based decisions, allocating sufficient resources, developing exclusive training programmes, and establishing progression. The findings concluded that improving teacher training practices in Pakistan is crucial to addressing challenges like low-quality induction and lack of training and resources. This is equally important for enhancing the overall quality of education in Pakistan.

Based on the various associated challenges globally, different researchers have proposed different teacher training frameworks to enhance the quality of education in multiple settings. Harding and Parsons (2011) proposed suggestions to strengthen teacher education programmes for master teachers. They offered a to-do list to develop activities to improve the quality of the master teacher education programmes. They suggested focusing on action research processes, engaging teachers in collaborative works, supporting and enhancing community, agency, and service within classrooms, allowing teachers to improve individual skills, and allowing teachers to actively discuss the kind of culture they hope to build in their classrooms. Cadosales (2017) again identified areas that needed to be the basis for improving teachers' training programmes. These areas included adviser-advisee relationships, the art of questioning, budgeting, classroom management, computer literacy, practical communication skills, preparing audio-visual materials, team building, test construction, and transformative education, etc. These areas were suggested according to region, and the extent of development needed per region was displayed through numbers in the table. Puertas-Aguilar et al. (2021) also developed a teacher training model for developing training programs in Spain in line with the United Nations' SDG4. The Teacher training framework model was proposed to improve competencies in sustainability. Through this model, a wide range of elements and views have been considered, such as curricular sustainability, resources, and the school environment. Lim et al. (2011) proposed a framework for developing pre-service teachers' competencies in using technologies to enhance teaching and learning. The study attempted to strengthen the capacity of teacher training institutions through six strategic dimensions: vision and philosophy; programmes; professional learning of deans, teacher trainers, and support staff; ICT plan, infrastructure, resources, and support; communications and partnerships; and research and evaluation.

The above discussion shows a need to investigate the ECE teacher training framework aligned with the United Nations' SDG4, especially in Pakistani settings. While the researcher's previous research focused on assessing the need for quality in early childhood pre-service teacher education in Pakistan: a focus on equity and access through technology-enabled learning, which is under process, it further highlighted the need for an extended investigation into challenges related to ECE teachers' training programs. Based on these findings, the present study intends to address these challenges and improve early childhood teaching quality by developing a contextually grounded framework to strengthen pre-service and in-service ECE teacher training. This will be particularly significant in Pakistan, where ECE teachers face unique challenges. This study addresses that gap by proposing a locally tailored framework—the SCAPE Model—to enhance the quality and structure of ECE teacher training in Pakistan. Grounded in the constructivist and behaviorist learning theories, the model integrates curriculum alignment, training resources, supervision, and evaluation mechanisms to support teacher development.

2. Early Childhood Education

Shaughnessy and Kleyn (2012) stated that the early childhood education (ECE) environment needs to be secure, nurturing, and stimulating to support children's transition into early grades. Based on its growing demand, ECE has become a significant feature of the education system in America and across the globe. While discussing the importance of ECE, the authors stated that educated families want their children to perform well on school premises and in practical life. Unfortunately, not all parents know early childhood progress and the importance of playing games in stimulating children's development. They further added that most of the parents lack sufficient skills to realise challenges related to developmental delay, speech problems, or a vision problem and what issues they can bring for the children. Fortunately, early childhood centres and Head Start facilities have been provided in America and the rest of the world. Kindergarten classrooms are now being used to provide a nourishing environment for the children. The definition and the extent of nourishment differ from parent to parent, while stimulation management depends on the individual teacher and the school concerned. Early childhood education emphasises teaching letters, colours, shapes, sizes, and forms that foster children's communication skills. This enhances language competency, sharing with others, and primary social skills. Early Childhood Education, therefore, serves as a foundation to supply a suitable environment, security, and nourishment that replaces a home-like atmosphere.

Cabansag and Santiago (2023) identified key elements related to pre-service training, including knowledge, skills, and personality characteristics. The study suggested that the highlighted key features would uplift teachers' competency, professionalism, and confidence at the initial stage, which would be helpful for them in actual classrooms. The identified key elements would not only help pre-service teachers cope with challenges associated with the workplace but also overcome the inequality related to jobs in the education sector. Pre-service teachers face multiple challenges during their training practicum. (Pakpahan, 2023). The researcher emphasised that teachers must be aware of the difficulties they may encounter during their training. This would enable them to deal with the actual classrooms. The study highlighted external challenges in the form of students' motivation and lack of resources. On the other hand, the internal difficulties included classroom management and teachers' competency.

Contextual factors also play an essential role in shaping teacher education, teacher training, and innovative approaches in high-performing educational systems (Nwabufo, 2024). National policies, cultural norms, and socioeconomic conditions significantly shape teachers' education and training. Nwabufo (2024) stated that education is essential for social development and is primarily connected with teachers' competency level to determine the education system's

success. The study concluded that teachers are crucial to impacting students' results. There should be quality teacher training programmes to develop well-trained teachers while comprehending contextual variables.

It is also crucial to align teacher training with local needs and realities such as classroom practices, etc, to fulfill learners' needs. Ajani (2023) recorded that ensuring high-quality education, well-designed activities, teachers' empowerment, and improved instructional delivery is based on the quality of professional development. The findings concluded that teachers' professional training enables them to cater to contemporary knowledge, skills, norms, and behaviours to uplift the quality of the teaching and learning process. The well-structured and useful supplementary materials and activities foster pedagogical and academic results. The study concluded while emphasising the importance of learner-focused pedagogical approaches and continuous professional training programmes to improve educational achievements.

This debate establishes the link between quality education and the United Nations SDG4. Numerous studies have emphasized the critical role of trained teachers and inclusive, well-structured ECE programs in achieving sustainable development goals (Kaplan et al., 2022; Selenius & Fäth, 2023). Takin (2019) stated that achieving a high-quality education to create sustainable development is highly significant. The United Nations' sustainable development goal 4 is to ensure accessibility of free-of-cost primary and secondary level education to all by 2030. Considering early childhood education (ECE) as essential for children's growth, development, and learning, the United Nations sets it as a sub-goal of Sustainable Development Goal 4.2. The committed member countries, under the supervision of the United Nations, developed an action plan, specifically for developing countries, to achieve goal 4. The action plan emphasised addressing the areas of access and equity, ECE governance, curriculum and pedagogy, teacher training, family-school-community partnerships, standards for the learning environment, and use of technology and digital materials. While discussing teacher training, Takin highlighted challenges such as many ECE teachers not meeting the minimum requirement, a shortage of trained teachers, and a lower proportion of primary teachers. The study emphasised developing standards of professional qualification and working conditions by focusing on the professional training of ECE teachers, developing ECE training programmes, and equipping ECE teachers to use appropriate childhood care and education techniques. Such training programs would help minimize the adverse effects of unqualified ECE teachers. The ECE training programmes should be designed in separate modules targeting specific areas such as activities for cognitive, language, emotional, social, and academic domains.

These studies underscore the global importance of teacher training for early childhood educators. However, a noticeable gap remains in contextually grounded, SDG4-aligned frameworks specific to Pakistan's educational and cultural landscape. This study addresses that gap through a locally validated, practically oriented training model (SCAPE), offering both theoretical grounding and practical utility. Pakistani Early Childhood Education (ECE) teachers face challenges due to insubstantial and uneven access to high-quality teaching skills development due to inadequacies in existing teacher training programs. Consequently, ECE teaching quality in Pakistani settings remains insignificant. The study was carried out in order to achieve the following objectives;

1. To examine the supervision and support systems for Pakistan's pre-service and in-service ECE teachers.
2. To improve ECE teachers' training programmes to address the current challenges.
3. To develop guidelines and frameworks to enhance ECE teacher training in Pakistan.

Few research questions were also developed in order to keep the side on right track and to devise methodological strategies to achieve their satisfactory answers. These were;

1. What supervision and support systems exist for Pakistan's pre-service and in-service ECE teachers?
2. How can pre-service ECE teacher training programmes be improved to address the current challenges?
3. What guidelines and frameworks can be developed to enhance ECE teacher training in Pakistan?

3. THEORETICAL FRAMEWORK

Using theoretical triangulation, the study will be grounded in the constructivist and behaviorist approaches to learning as a basis of the theoretical framework. The theory of behaviorism was developed through the pedagogical works of Thorndike (1911), Pavlov (1927), and Skinner (1957). Behaviourism is based on the notion that all behaviours stimulate and receive learning experiences by interacting with their surroundings, while the surrounding serves as a reaction to stimuli. The stimulus-response interplay is reflected through positive and negative reinforcement that works to engage learners. Learners tend to receive and process information while remaining passive in the learning process. The behaviourist approach to learning supports teacher-centered pedagogies and classroom methodologies focused on how the teacher influences and impacts the students (Geographical Association, 2024). On the other hand, constructivism holds the notion that people actively construct new knowledge, and the knowledge is based on the experiences of the individual learner (McLeod, 2024). Constructivism allows students to ask questions and follow their interests. The students learn through interaction in a student-centred environment. According to Niwaz et al (2011) Effective teachers provide opportunities for students to learn, and have well organized learning environment. Teachers become negotiators and communicators. In the context of the ECE teachers' training framework, the constructivist and behaviouristic approaches to learning would be suitable for the proposed study. ECE teachers need professionals who can aptly influence their students using teacher-centred techniques. Constructivism focuses on mental processes in building new knowledge through communication and personal experiences. The teacher trainees would learn to become facilitators. They would be required to engage actively through problem-based learning involving internal mental processes. They may be assessed based on their understanding and internal cognitive processes. The behaviouristic approach would also focus on external factors and

their impact on teacher trainees' behaviours. Teacher trainees would gain experience by observing each other and their trainers. The lead trainer, therefore, must have sound knowledge to train the teacher trainees. The trainees would passively receive feedback to respond accordingly in the future. This would allow them to achieve measurable outcomes while modifying their behaviours. The approaches are suitable for the trainers in ECE training, using the proposed training model, which will supervise and promote the ECE teachers through various means. The trainee teachers will be engaged through positive reinforcement techniques within the classrooms, ongoing and end-of-training assessments, etc. The practice will enable them to implement strategies similar to those they use with their students.

4. METHODOLOGY

The mixed-method study was based on two phases followed by an explanatory sequential research design. The tools in the present study consisted of a questionnaire and a focus group discussion to answer questions 1 and 2. A 4-point Likert scale was used for the questionnaire. The questionnaire provided quantitative data, whereas the focus group discussion offered qualitative data for an in-depth analysis of questions 1 and 2. The participants included the government and private sector ECE teachers of the beacon house school system, the city school, and the government schools in selected 11 districts of KP (Mansehra, Mardan, Peshawar, and Abbottabad), Sindh (Malir) Punjab (Chakwal, Lahore and Rawalpindi), Baluchistan (Quetta), and Gilgit Baltistan (Ashore and Chilas). The quantitative sample consisted of a population of 400 ECE teachers, and the qualitative sample consisted of 52 ECE experts. At first, a random sampling technique was used to select the 11 districts. The 51 schools from the public sector, 57 schools from the Beacon House school system, and 49 schools from city schools were selected using the convenience sampling technique. In the third stage, those ECE teachers who had B.Ed degree. For this, 114 teachers were selected from the government sector, 140 from Beacon House, and 146 from city schools were selected disproportionately. The public sector ECE teachers were dispersed in rural areas. However, the ECE teachers working in government sectors from urban areas was comparatively lower. To avoid tedious data collection and maintain data reliability in sub-groups, disproportionate sampling was preferred for the present study. Data regarding ECE teachers' competencies and qualifications were obtained from 157 schools. Table 1 shows the overall sampling frame of the selected schools and the teachers, as shown below. Before large-scale administration, the questionnaire was pilot-tested with a small group of ECE teachers to ensure the clarity and reliability of items. At the same time, qualitative data coding was cross-checked among two researchers to enhance inter-coder reliability.

Table 1: The Province-Wise Total Population Out of Selected Schools

Sr. No	Province	Government Schools	Government School ECE Teachers	BSS	Beacon House School Teachers	TCS	City School ECE Teachers
1	Punjab	18	1568	19	324	17	406
2	KPK	15	1,100	16	250	12	207
3	Sindh	9	690	6	180	7	105
4	Baluchistan	3	150	8	87	5	115
5	Gilgit Baltistan	6	300	8	209	8	206

Out of the above population, the overall sampling for the questionnaire is shown in Table 2.

Table 2: Study Sample of the Questionnaire

Sr. No	Province	Government School ECE Teachers	Beacon House School Teachers	City School ECE Teachers
1	Punjab	50	60	60
2	KPK	24	33	33
3	Sindh	20	26	20
4	Baluchistan	10	12	15
5	Gilgit Baltistan	10	9	18
Total		114	140	146

A purposive sampling technique was used to gather qualitative data for focus group discussion. The focus group population included 45 different experts and professionals. The sampling data regarding the participants of the focus group is as under:

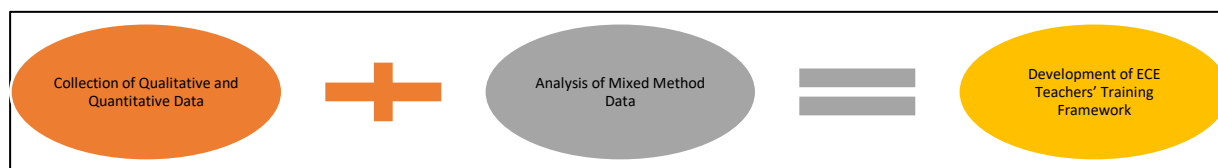
Table 3 : Table of the Study Sample of the Focus Group Discussion

ECE Teachers	Headmistresses, Coordinators	Principals
15	15	15

In the first phase, the data were gathered from the participants through a questionnaire and a focus group discussion to answer questions 1 and 2. The data collected through questionnaires were analysed quantitatively using SPSS. For

an in-depth analysis, the qualitative data were gathered through group discussion. The focus group discussion sessions were arranged on Microsoft Teams, and the data were recorded and saved in written form simultaneously. Then, qualitative data were analysed through codes and themes. The qualitative data were analysed thoroughly using Voyant tools to develop graphs using themes drawn from qualitative data. The line graphs using the trends option in Voyant tools helped analyze the frequently used codes in each theme. In the second phase, the participants' views regarding available supervision and support to ECE teachers and suggestions to improve ECE teachers' training were used as a guideline to form a model for the ECE teachers' training in Pakistan. This helped to answer research question 3. Using mixed method techniques allowed for an in-depth analysis of the research problem. The study was limited to ECE teachers from government and private sector schools, principals, and trainers from selected districts from provinces, i.e., KP, Punjab, Sindh, Baluchistan, and GB province. The sequence of data collection and analysis and development of ECE teachers' training framework is as follows:

Figure 1 A Visual Description of Data Collection, Analysis, and Development of ECE Teachers' Training Framework



The data analysis section is divided into three parts: quantitative data analysis, qualitative data analysis, and developing an ECE teachers' training framework based on mixed-method data results.

1. Quantitative Data Analysis

The analysis and interpretation of quantitative data have been divided into five (5) parts. Values in the tables represent specific Likert scale categories, such as V.E for very practical, S. L. for satisfactory level, V. W. for very weak, and V. for very ineffective. The word "government" has also been written as Govt.

Table 4: Observation and Assessment of Children

Sr. No.	Statements	Sector	Response Frequency				X2	P
			VE	SL	VW	V.I		
1	Use of observational forms concerning children	Govt.	5%	43%	49%	6%	0.13	0.99
		Private	5%	41%	51%	6%		
2	Use of information related to individual learners	Govt.	5%	36%	54%	7%	0.81	0.85
		Private	6%	41%	51%	6%		
3	Making changes in surroundings through observations	Govt.	7%	41%	49%	7%	0.35	0.96
		Private	8%	39%	51%	6%		
4	Use of observational knowledge during lesson planning	Govt.	6%	31%	61%	6%	0.47	0.93
		Private	11%	26%	59%	8%		
5	Gathering records of children's work	Govt.	10%	30%	51%	13%	3.54	0.47
		Private	7.5%	22.5%	59.5%	14.5%		
6	Preparing students' folders	Govt.	6%	20%	71%	7%	14.20	0.00
		Private	13%	8%	70%	13%		
7	Monthly evaluation	Govt.	6%	21%	64%	11%	20.28	0.00
		Private	7%	23%	69%	5%		
8	Maintaining record	Govt.	9%	22%	65%	8%	6.77	0.13
		Private	8%	12%	75%	9%		
9	Focusing on the child's environment	Govt.	6%	30%	62%	6%	4.82	0.29
		Private	8.5%	22.5%	62%	11%		
10	Evaluation of	Govt.	10%	22%	60%	11%		

	observational data	Private	2.5%	23.5%	71%	6%	12.28	0.02
11	Evaluation of the child's progress	Govt. Private	5% 9%	41% 42%	46% 47%	11% 5%	6.42	0.15

Table 5: Knowledge and Understanding of Students

Sr. No.	Statements	Sector	Response Frequency				X2	P
			VE	SL	VW	V.I		
1	Understanding child development	Govt. Private	6% 7%	17% 19%	71% 68%	6% 6%	0.33	0.95
2	Theories of learning	Govt. Private	5% 5%	28% 29%	62% 60%	5% 6%	0.18	0.97
3	Methods of teaching	Govt. Private	19% 13%	25% 21%	48% 59%	8% 7%	2.30	0.51
4	Shaping children development	Govt. Private	5% 6%	14% 15%	75% 73%	6% 6%	0.70	0.87
5	Developing social behaviour	Govt. Private	6% 8%	29% 38%	59% 46%	6% 8%	4.50	0.21

Table 6: Language and Literacy of Children

Sr. No.	Statements	Sector	Response Frequency				X2	P
			VE	SL	VW	V.I		
1	Involving children in conversation	Govt. Private	5% 5%	28% 28%	62% 64%	5% 3%	0.76	0.85
2	Describe -objects	Govt. Private	8% 8%	35% 42%	49% 44%	8% 6%	1.72	0.85
3	Describe - events	Govt. Private	6% 8%	19% 13%	68% 73%	7% 6%	2.07	0.55
4	Describe plants of the day	Govt. Private	8% 7%	13% 14%	72% 73%	7% 6%	0.13	0.98
5	Creating an enjoyable environment	Govt. Private	5% 6%	19% 9%	71% 79%	5% 6%	6.98	0.07
6	Making up their own stories and Rhymes	Govt. Private	6% 6%	37% 36%	51% 53%	6% 5%	0.24	0.97
7	Preparing them to enjoy books	Govt. Private	7% 6%	28% 33%	58% 50%	7% 11%	2.12	0.54
8	Recognizing familiar words in texts	Govt. Private	10% 8%	19% 26%	63% 58%	8% 8%	2.17	0.53
9	Pictures' usage to communicate meanings	Govt. Private	6% 8%	16% 11%	72% 73%	6% 8%	2.38	0.49
10	Use of symbols to communicate meanings	Govt. Private	6% 7%	10% 7%	79% 80%	5% 6%	2.36	0.49
11	Familiar letters usage to communicate meanings	Govt. Private	7% 6%	17% 16%	70% 71%	6% 7%	0.16	0.98

Table 7: Teaching and Learning Process of the Children

Sr. No.	Statements	Sector	Response Frequency				X2	P
			VE	SL	VW	V.I		
1	Motivating children for active interaction	Govt. Private	6% 5%	40% 41%	52% 51%	6% 7%	0.31	0.97
2	Accepting individual	Govt. Private	7% 6%	36% 38%	53% 51%	8% 9%	0.34	0.96

	differences							
3	Developing activities	Govt. Private	7% 6%	15% 18%	72% 73%	10% 8%	15.77	0.00
4	Ordering learner-focused planning	Govt. Private	6% 8%	29% 31%	63% 61%	6% 4%	1.66	0.65
5	Enhancing children's emotional intelligence	Govt. Private	28% 6.5%	26% 23.5%	41% 49%	9% 25%	35.59	0.00
6	Use of information technologies	Govt. Private	6% 8.5%	21% 15%	71% 76%	6% 4.5%	3.72	0.44
7	Enhancing children's activity	Govt. Private	7% 6%	30% 31%	60% 59%	7% 8%	0.26	0.97
8	Being relaxed during practice	Govt. Private	6% 7%	28% 31%	63% 61%	6% 5%	0.38	0.95
9	Motivating children to engage in activities through cooperation	Govt. Private	6% 7%	41% 32%	51% 56%	6% 8%	3.31	0.51

Table 8: Requirement of ECE Teachers' Training

Sr. No.	Statements	Sector	Response Frequency				X2	P
			VE	SL	VW	V.I		
1	Arranging supportive environment	Govt. Private	8% 9%	23% 22%	67% 66%	6% 7%	0.25	0.98
2	Choosing activities to ensure safety	Govt. Private	7% 6%	47% 49%	41% 43%	9% 6%	2.24	0.75
3	Maintaining safety rules	Govt. Private	6% 8%	29% 28%	63% 61%	6% 7%	0.28	0.97
4	Assessing the nutritious food	Govt. Private	11% 9%	31% 40%	50% 46%	12% 9%	3.21	0.37
5	Developing games	Govt. Private	11% 7%	20% 28%	61% 61%	12% 8%	5.95	0.12
6	Teaching children safety	Govt. Private	9% 8%	16% 15%	71% 61%	8% 15%	5.54	0.21
7	Arranging self-help activities	Govt. Private	6% 6%	20% 21%	72% 69%	6% 7%	0.55	0.92
8	Increasing hand and eye coordination to handle tools	Govt. Private	7% 9%	38% 36%	52% 51%	7% 8%	0.92	0.83

The questionnaire was analysed based on the observation and assessment of children, students' knowledge and understanding, language and literacy of children, teaching and learning process, and ECE teachers' training requirements. The analysis of Tables 4, 5, 6, 7, and 8 displayed no noteworthy difference between the responses of ECE teachers in the government and private sectors. The analysis reflected the answer to question 1: ECE teachers in both sectors need supervision and support through better training opportunities.

2. Focus group discussions Data Analysis

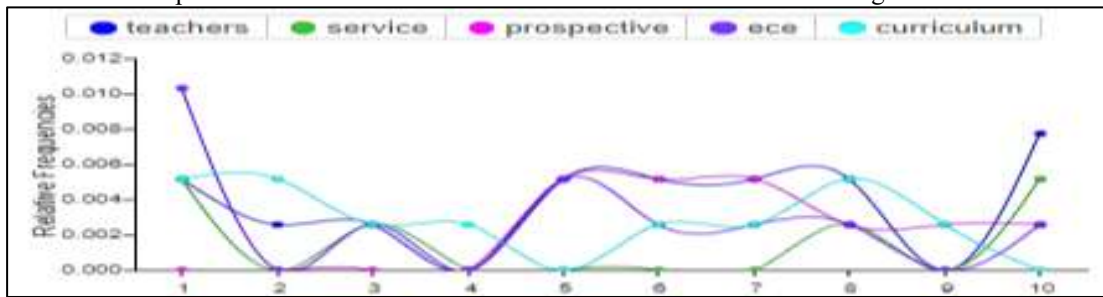
To get information on different methods to strengthen ECE teachers' training programmes Four focus group discussions were arranged. Thematic analysis was used for data analysis. Data were recorded through interviews to save information. Recorded data were played many times, and initial thought analyses were noted. Codes were produced after revisiting data, and a list of codes was identified. The coded data were arranged in themes and drawn-out line graphs using Voyant tools' tend option. A detailed summary of each theme was also discussed, along with the visual presentation of each theme.

2.1 Theme No.1: ECE 2007-2024 Curriculum for ECE teachers' training

The discussion related to theme no. 1 showed that the curriculum is based on exposing the children to real environments and situations. Emphasis should be given to activities mentioned in the curriculum. Longer teaching practices are required in schools during teacher training. Teacher trainers should properly assess tasks assigned to teachers.

Figure 2

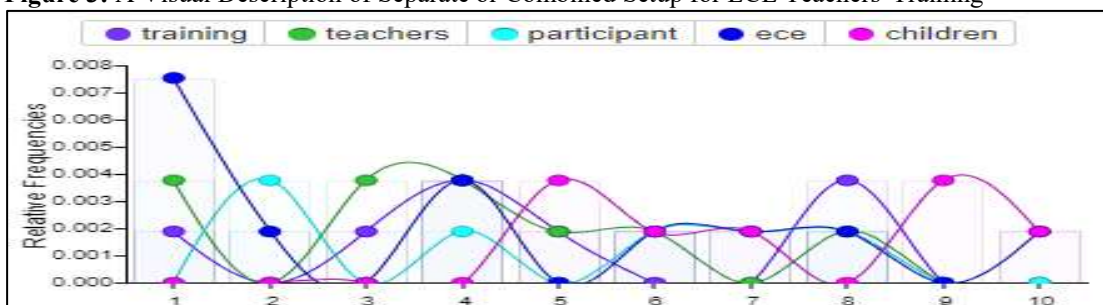
A Visual Description of Curriculum of ECE 2007-2024 for ECE teachers' training



2.2 Theme No.2: Separate or combined setup for ECE teachers' training

To conclude, participants stated that both of the fields (ECE and secondary education) are quite different with divers needs and requirements, such as environment, routine, assessment practices, and room arrangements. During early years, children pass through a sensitive period, so the teacher must be trained in every aspect through specialisation.

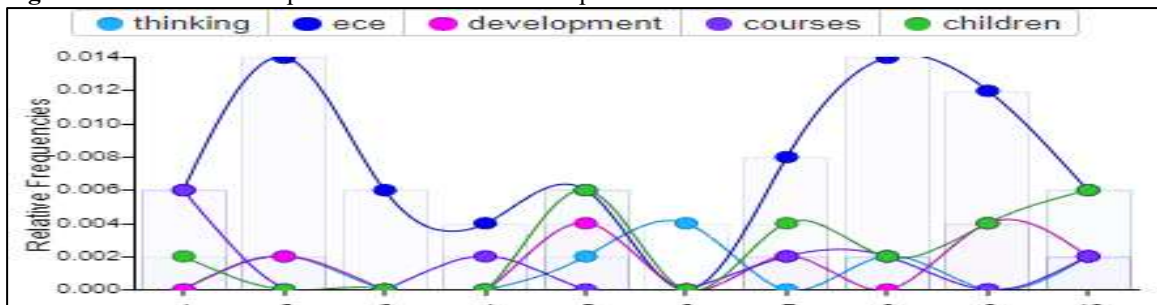
Figure 3: A Visual Description of Separate or Combined Setup for ECE Teachers' Training



2.3 Theme No.3: Courses for ECE Specialisation

It was concluded that ECE involved children from all walks of life, so meaningful and practica courses should be included, such as key learning areas, competencies, and expected learning outcomes in ECE, teaching phonics in ECE, administration of ECE, reflective thinking in ECE, ECE curriculum and methods, communication and language development in children, children's literature, ECE psychology, ethics, policies of ECE, and its history.

Figure 4: A Visual Description of Courses for ECE Specialization



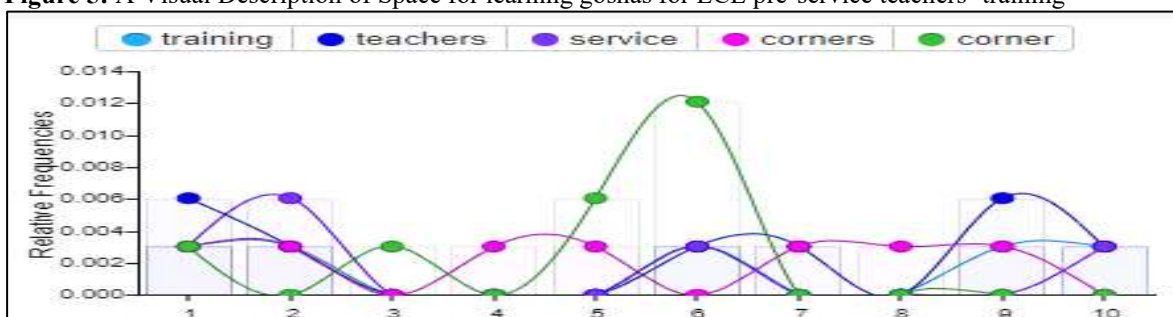
2.4 Theme No.4: Resources for ECE

Themes related to resources for ECE were further divided into different themes, and the details are as follows:

2.4.1 Space for learning goshas for ECE pre-service teachers' training

The discussion shared that it is necessary to establish reading, learning, science, home, art, and math corners in teacher training institutions so that teachers can implement different reading activities with children after joining the profession. Teachers must become accustomed to arranging their classroom corners to enhance children's real-life skills effectively.

Figure 5: A Visual Description of Space for learning goshas for ECE pre-service teachers' training

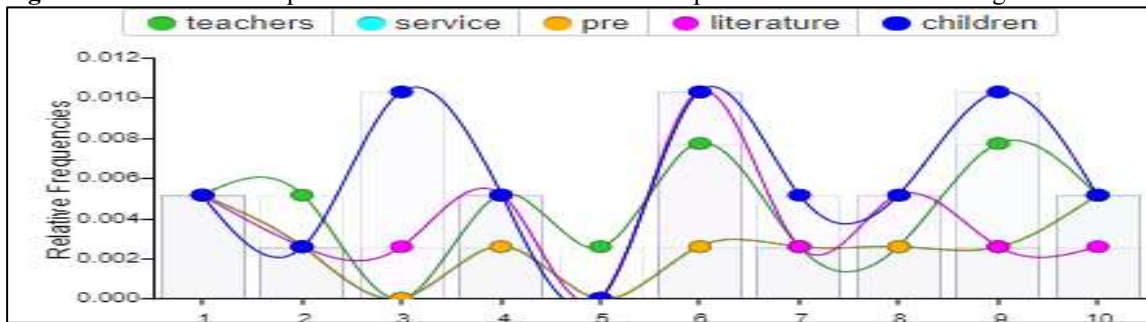


2.4.2 Children's literature for ECE pre-service teachers' training

To conclude the discussion, all participants agreed that children's literature should be considered in ECE teachers' training so that teachers can gain a comprehensive understanding of it during training. If teachers study the relevant

materials during ECE teachers' training, they can entertain and guide children better after entering the profession.

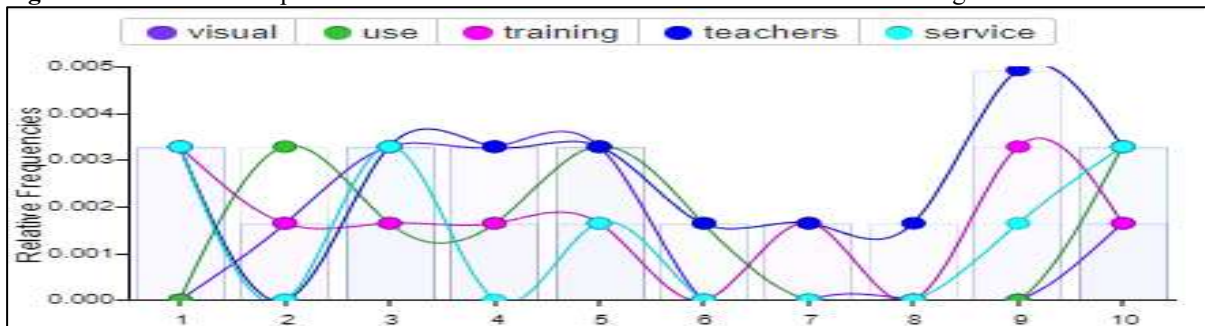
Figure 6: A Visual Description of Children's literature for ECE pre-service teachers' training



2.4.3 Electronic and print media for ECE teachers' training

To conclude the discussion, electronic and print media enhance students' awareness and broaden their visions regarding global perspectives. Print materials help students study their subjects in less time, fostering creativity and appropriate content. They also allow teachers to assess each student's knowledge of the subject matter. Digital technology courses during teacher training are needed to equip teachers with the skills to incorporate visual content into their teaching and offer them proper guidance on its usage.

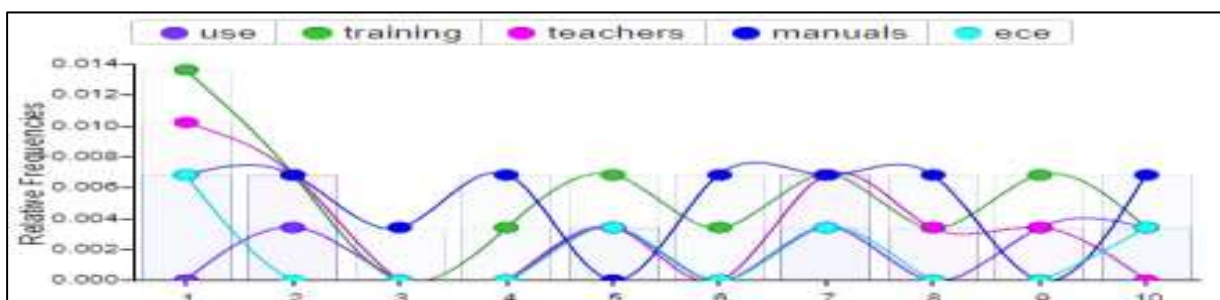
Figure 7: A Visual Description of 3 Electronic and Print Media for ECE teachers' training



2.4.4 ECE pre-service teachers' training manuals

To summarize the discussion, theme-based and task-oriented training manuals must included in ECE prospective teachers' training. Training manuals assist teachers in utilizing various resources to make the subject enjoyable and straightforward for ECE pupils.

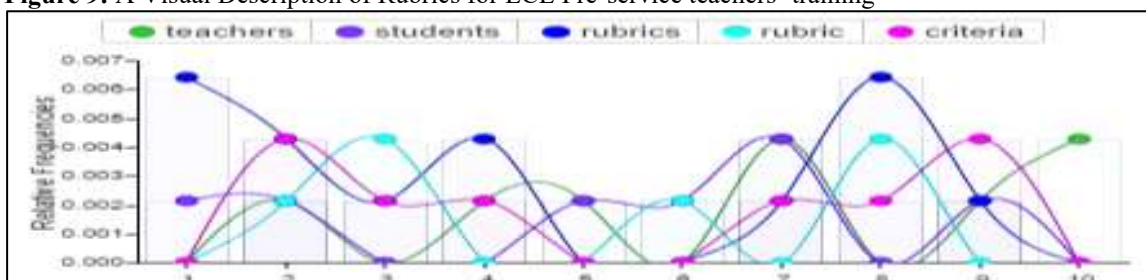
Figure 8: A Visual Description of Training manuals



2.4.5 Rubrics for ECE Pre-service teachers' training

After discussion, it was concluded that criteria and description-based rubrics should be introduced to teachers practically and effectively so that they can focus on providing detailed explanations for rubrics.

Figure 9: A Visual Description of Rubrics for ECE Pre-service teachers' training

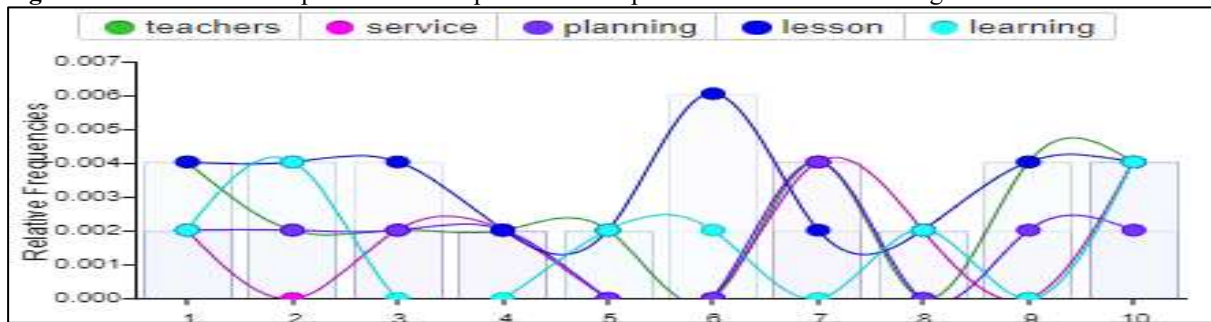


2.4.6 Lesson plans for ECE pre-service teachers' training

It was concluded by the discussion that standards-based lesson planning should be introduced to teachers practically and thoroughly so that they can consider objectivity in each lesson. Teachers will be able to combine the objectives of the curriculum with pedagogy and knowledge of their particular teaching context when they have sufficient practice during pre-service training. Lesson plans must include benchmarks and performance standards, intended learning

outcomes, organisation of learning outcomes, and environment organization.

Figure 10: A Visual Description of Lesson plans for ECE pre-service teachers' training



2.4.7 Worksheets for ECE pre-service teachers' training

To summarise the discussion, skills-oriented (shapes, patterns, tracing, and fine motor skill development) worksheets must be introduced in ECE teachers' training. In this way, teachers can understand challenging topics, identify critical learning gaps, encourage active learning, and raise the students' interest levels. Worksheets can help pinpoint key gaps in the learning process, promoting active learning and increasing students' interest. Worksheets must be designed based on instructional objectives, and the teacher can adequately explain to the class how to use the worksheet by fully understanding its application.

Figure 11: A Visual Description of Worksheets for ECE pre-service teachers' training



3 Early Childhood Education Pre-service Teachers' Training Model

A model for ECE teachers' training was developed based on data analysis (from a questionnaire and focus group discussion). For this purpose, expert opinion was sought. This model was validated by using the Delphi technique (The Delphi method is used internationally. It is a recognised method for gathering data from participants according to the range of their expertise). The technique functions as a group communication process and aims to view individuals on a specific real-world issue comprehensively. Validation of the proposed model was completed in two phases. The initial draft of the proposed model of ECE teachers' training was sent (via email) to the experts (which consisted of 8 members). These eight members were the principals of the government and private sector schools, and their selection was based on a purposive sampling technique. All of the eight members had over ten years of experience. They proposed changes, and their suggestions were incorporated. A revised draft of the ECE teachers' training was prepared and emailed to the experts. The experts approved the ECE teachers' training model.

ECE pre-service teachers' training institutions' Framework of the model

Review of related literature (theories of learning in early childhood, the model of ECE, previous studies) was conducted carefully. After that data was collected from questionnaires and focus group discussions, the knowledge/theory to action/practice gaps were pursued, and a model for ECE teachers' training was developed. Graham et al. (2006) "knowledge to action cycle was utilised for this process.

Table 9: Knowledge to action cycle's alignment

Sr. No	Steps of expertise to action cycle	Actions taken	Rationale
1	Identify knowledge to action gaps	Primary data about the ECE teachers' training model were collected from ECE Teachers. Curriculum of ECE teachers' training was the primary source. Questionnaires and focus group discussions were administered to ECE teachers, principals, and ECE experts to collect data. All the items in the questionnaire for ECE teachers were relevant to the need for ECE teachers' training. The researcher arranged focus group discussions with 52 ECE teachers, Principals, and ECE experts in the selected institutions.	Needs assessment is ideal for developing a teachers' training model for suggesting interventions.
2	Adapt knowledge to the local context	This model was developed to adapt knowledge to the local context, based on a review of related literature and the	Previous researches and experiences provide a solid

		study's qualitative and quantitative data findings.	base for proposing new interventions.
3	Assess Barriers and Facilitators to Knowledge Use	The following things were considered to get a detailed description of ECE in Pakistan (i)The literature on the ECE teachers' training programmes provided knowledge about the condition of ECE existing in different countries around the world (ii) A detailed analysis of ECE teachers' training in government and private schools of Pakistan (through focus group discussions and questionnaires).	The prevalent ECE pre service teachers' training were assessed. Upcoming obstacles and requirements for a pilot study implementing the proposed ECE teachers' training model will be suggested.
4	Select implementation strategies	The theories of child development and learning and ECE teachers' training models have been described . A questionnaire about teaching competencies for ECE was developed, and focus group discussions were arranged with ECE experts regarding ideas for implementing ECE teacher training.	The experts recommended a model based on ECE teachers' training. This was also derived from literature and different prevailed practices in ECE.
5	Tailor implementation strategies	The feedback from the teachers and experts was gained through focus group interviews and questionnaire. It provided guidelines for creating a framework for the model.	This process has been proposed keeping in view existing status of facilities and it has not been pilot tested.
6	Implement	This model has been developed but not implemented yet. It is based on data from related literature and collected from the field, using the Delphi technique, and considers experts' views.	
7	Monitoring and evaluation and implementation	Courses have been proposed in ECE teachers' training for the holistic development of children and the ECE teachers' training programme. However, at this stage, it has been proposed in light of the suggested intervention and target workplace.	A pilot implementation study will make monitoring and evaluating the program more valid and feasible, given the existing facilities and literature.
8	Sustain knowledge use	In their classrooms, prospective ECE teachers may apply their knowledge using teaching strategies (based on early childhood learning theories). (It may be refined after pilot-testing the model.)	The ECE teachers' training model has been proposed at this stage, but a pilot study will help make it more practical.

Model of ECE Teacher Training Framework

Figure 12: A Visual Illustration of the SCAPE Model



This model is anticipated to provide suggestions to the teacher training institutions for designing ECE teachers' training programs with suitable curricula, pedagogical approaches, practicum, and learning activities required to prepare competent ECE professionals. The framework also provides criteria for enrolling prospective teachers for ECE teacher training in Pakistan, selects a curriculum to train prospective ECE teachers, and provides guidelines for arranging learning activities and resources for training ECE prospective teachers. ECE teachers must have sufficient knowledge and experience in their relevant fields. Prospective ECE teachers must have completed sixteen years of education or at least a bachelor's or 14 years in any discipline to enroll in this programme. The programme will be limited to four years (eight semesters). The ECE experts suggested a B.Ed. Major courses which include: - competencies and expected learning outcomes in ECE, teaching phonics in ECE, fundamentals of ECE, administration of ECE, reflective thinking in ECE, ECE curriculum and methods, communication and language development in

children, children's literature, family and community in ECE, psychology, and culture in ECE, policies of ECE and its history. Comprehensive training manuals about **practical training** in everyday safety, **self-defense**, and the management of **bullying behaviors based on** themes and tasks must be included in ECE teachers' training to train teachers to develop different activities for children. Field visits must be arranged throughout the course.

Trained in-service teachers should monitor pre-service ECE teachers' progress through various techniques. Trainers should develop detailed evaluation reports of prospective teachers based on their performance. Such ECE teacher training programmes are needed to motivate teachers to develop skills and gain feedback and support.

RESULTS

Analysis of the questionnaire and focus group discussion showed that the national curriculum of ECE (2007-2025) provides ample opportunities to design activities for ECE teachers' training. ECE teachers' training should have a longer duration, providing structured and well-supervised teaching practice opportunities to prepare them for the successful implementation of the ECE curriculum at the classroom level (Government of Pakistan, Ministry of Education, 2007). The analysis showed that ECE and secondary education have different requirements, and the teachers must be trained and have sufficient knowledge in their respective fields. The findings concluded that necessary ECE specialisation courses must be added to ECE teachers' training so that teachers can improve students' real-world abilities meaningfully. The findings reflected that teachers must practise lesson-planning procedures and focus on including intended learning goals, the organisation of learning outcomes, and the arrangement of the environment. Teachers should have sufficient knowledge of rubrics, and a child's homework, assignments, attendance, and behaviour should be evaluated using rubrics. Training manuals must be task-based and theme-based and part of the preparation for ECE teachers in ECE pre-service teachers' training. Training guides can help teachers deliver their lessons more effectively. Task-based materials regarding everyday safety techniques, coping with bullying behaviour, etc., must be available for ECE teachers. The ECE teachers must have sufficient training using manuals about children's social and emotional development to meet their needs effectively. The analysis of qualitative data, quantitative data, and review of related literature a model named SCAPE (S for setting criteria entry, C means courses for ECE specialization, A stands for alignment of courses for ECE standards, P means practicum, E stands for evaluation) had been developed. The analysis revealed that required practices were mentioned in the ECE curriculum, but these were not implemented in teachers' training institutions. A suitable ECE teachers' training framework has been proposed for implementation in Pakistan. The proposed model was aligned with theories for ECE and provided guidelines for ECE pedagogical approaches and the rules for enrolling prospective ECE teachers.

DISCUSSION

The present study is about a contextually grounded framework to enhance ECE teacher training for achieving quality education and SDG 4. ECE programs provide guidelines for school and classroom-based learning experiences. The study, therefore, indicated that teachers should be trained in every aspect and that ECE specialisation must be required for a better future for children and improvement of education in Pakistan. The results also emphasised that teachers must have proper training to effectively implement quality ECE teachers' training. Niwaz et al (2014) stated that quality of education can be improved by regular training of teachers, timely provision of textbooks, and effective monitoring and supervision in Pakistan.

A practical and well-structured ECE teachers' training framework will enhance teachers' confidence. Proper ECE training will also uplift teachers' knowledge and lifelong skills by emphasising their learning abilities. Such a teacher training program would provide ample opportunities for teachers to plan, observe, and carry out activities under the guidance of trained supervisors. In this way, teachers would learn to tackle difficulties they might face inside classrooms. The proposed ECE teachers' training framework is a source for teachers to train children according to modern trends and highlights the value of early childhood programmes in the Pakistani context.

By emphasizing key components of the ECE programmes in Pakistan, such as accreditation, standards, curriculum, and programme philosophy, quality education can be improved, and better results can be achieved.

CONCLUSION

The proposed framework for ECE teachers' training may be helpful for teacher training institutes to initiate a more advanced training programme that may serve the actual purpose. It may be a guiding stone for the policymakers and training institutes to organise their policies and training programs and align their training materials with international ECE standards, especially SDG 4, to provide equitable access to quality education for everyone. Implementing the proposed framework for ECE training may also help improve the overall progress of ECE training quality in response to SDG 4 in Pakistan.

This study may guide teachers, headteachers, principals, stakeholders, policymakers, and teacher training institutions to foster and improve the quality of ECE teachers' training programmes. The study's findings may also be of significant value for researchers as they may provide a basis for further research related to ECE. The study will inform prospective teachers who wish to excel professionally during the ECE pre-service teacher training programme. There may be potential socioeconomic challenges, such as a lack of training facilities, inadequate infrastructure, teachers' resistance, cultural norms, and funding issues, which can pose constraints in implementing the proposed framework

in the diverse context of Pakistan.

This study was limited to selected districts and schools in Pakistan, which may affect the generalizability of the findings. Additionally, responses may be influenced by social desirability bias in focus group discussions.

REFERENCES

1. Ajani, M. A. (2023). Exploring the relationship between teachers' professional development and instructional delivery in early childhood education. *Journal of Islamic Education and Educational Technology (JIEET)*, 3(2), 95–104. <https://doi.org/10.21580/jieed.v3i2.17693>
2. Cabansag, M. G., & Santiago, G. (2023). Key Elements of Relevant Pre-service Training from the Perspectives of Science Education Graduates. *The Normal Lights*, 17(2) <https://doi.org/10.56278/tnl.v17i2.2162>
3. Cadosales, M. N. (2017). Training Framework for Teachers. *Asian Academic Research Journal of Social Science and & Humanities*, 4(3), 1-21. https://www.researchgate.net/publication/319113050_TRAINING_FRAMEWORK_FOR_TEACHERS#ullTextFileContent
4. Geographical Association. (2024). Learning Theories and Geography. Retrieved from Geographical Association: <https://geography.org.uk/ite/initial-teacher-education/geography-support-for-trainees-and-ects/learning-to-teach-secondary-geography/students-learning-in-geography/learning-theories-and-geography/>
5. Government of Pakistan. Ministry of Education. (2007). National curriculum for early childhood education <https://unesdoc.unesco.org/ark:/48223/pf0000216574>
6. Graham, I. D., Logan, J. R., Harrison, M. B., Straus, S. E., Tetroe, J., Caswell, W. R., & Robinson, N. (2006). Lost in knowledge translation: Time for a map? *Journal of Continuing Education in the Health Professions*, 26(1), 13–24. <https://doi.org/10.1002/chp.47>
7. Harding, K., & Parsons, J. (2011). Improving Teacher Education Programs. *Australian Journal of Teacher Education*, 36(11), 51–61. <https://doi.org/http://dx.doi.org/10.14221/ajte.2011v36n11.7>
8. Idara-e-Taleem-o-Aagahi. (2020). Tracking SDG 4 and Right to Education in Pakistan: Toolkit. Idara-e-Taleem-o-Aagahi. Retrieved from https://itacec.org/document/2020/6/Toolkit_Tracking_SDG_4_and_RTE_in_Pakistan.pdf
9. Iqbal, S., Naeem, A., & Ullah, U. (2024). Assessing the Need for Quality in Early Childhood Pre-Service Teacher Education in Pakistan: A Focus on Equity and Access through Technology-enabled Learning.
10. Kaplan, G., Mart, S., & Diken, İ. H. (2022). Transition to school process of children with disadvantages: A literature review. *Journal of Childhood, Education & Society*, 3(1), 28–47. <https://doi.org/10.37291/2717638X.202231106>
11. Lim, C. P., Chai, C. S., & Churchill, D. (2011). A Framework for Developing Pre-Service Teachers' Competencies in Using Technologies to Enhance Teaching and Learning. *Educational Media International*, 48(2), 69–83. <https://doi.org/10.1080/09523987.2011.576512>
12. McLeod, S. (2024, February 1). Constructivism Learning Theory & Philosophy Of Education. Retrieved from Simply Psychology: <https://www.simplypsychology.org/constructivism.html#:~:text=Constructivism%20is%20a%20way%20of,up%20with%20their%20own%20ideas.>
13. Niwaz, A. & Attaullah (2018). Importance of Morality in Islam: Development of Moral Values through Activities by Parents and Teachers as Agents of Change. *Journal of Islamic & Religious Studies*, Vol 3, Issue 1, Pp.49-62
14. Niwaz, A. Khan, M.S., Khan, A.N., Hussain, L., & Abbas, A. (2014). Managing quality education at primary level in Pakistan: current practices and future hopes. *Gomal University Journal of Research*, 30(2)
15. Niwaz, A., Rizvi, A.A., & Khan, M.S. (2011). Evaluation of Teachers' Training Procedure and Pedagogical Skills in Adult Literacy. *International Journal of Business and Social Science* Vol. 2 No. 11. 120-124.
16. Nwabufo, E. (2024). Contextual Factors Shaping Teacher Education and Innovative Approaches in High-Performing Educational Systems: A Review. https://www.researchgate.net/publication/379147092_Contextual_Factors_Shaping_Teacher_Education_and_Innovative_Approaches_in_High-Performing_Educational_Systems_A_Review
17. Pakpahan, E. M. (2023). Challenges Faced by Pre-Service Teachers During Teaching Practicum. *International Journal of Educational Narratives*, 1(5), 258–263. <https://doi.org/10.55849/ijen.v1i5.389>
18. Pavlov, I. P. (1927). Conditioned reflexes: An investigation of the physiological activity of the cerebral cortex (G. V. Anrep, Trans.). Oxford University Press.

19. Puertas-Aguilar, M.-Á., Alvarez-Otero, J., & Lázaro-Torres, M.-L. d. (2021). The Challenge of Teacher Training in the 2030 Agenda Framework Using Geotechnologies. *Educ. Science*, 11(8), 381. <https://doi.org/10.3390/educsci11080381>
20. Sain, Z. H., Chanda, T. C., & Abdullah, N. (2024). Advancing educators: Exploring innovative strategies for teacher training in Pakistan. *Jurnal Ilmiah Pendidikan Holistik*, 3(2), 115–124. <https://doi.org/10.55927/jiph.v3i2.10166> Also available at: <https://journal.formosapublisher.org/index.php/jiph/article/view/10166>
21. Samuel Hall. (2023). Review of Early Childhood Education (ECE) Models in Pakistan. UNICEF Pakistan. <https://www.unicef.org/pakistan/media/5316/file/Review%20of%20Early%20Childhood%20Education%20%28ECE%29%20Models%20in%20Pakistan.pdf>
22. Selenius, H., & Fälth, L. (2023). Teachers' experiences of promoting young students' language development in inclusive settings. *Journal of Childhood, Education & Society*, 4(1), 36–49. <https://doi.org/10.37291/2717638X.202341216>
23. Shaughnessy, M. F., & Kleyn, K. (2012). The importance of early childhood education. In M. F. Shaughnessy & K. Kleyn (Eds.), *Handbook of Early Childhood Education* (pp. 1–9). Nova Science Publishers. <https://www.scribd.com/document/675519351/62b52382e053f>
24. Siagian, R., & Artha, B. (2023). The Influence of Teacher Quality, Teacher Characteristics, and Teaching Experience on School Quality that Impacts Student Performance in Bandung: Evidence from High School. *Jurnal Pendidikan West Science*, 1(03), 184–192. <https://doi.org/http://dx.doi.org/10.58812/jpdws.v1i03.255>
25. Siddiqui, K. A., Mughal, S. H., Soomro, I. A., & Dool, M. A. (2021). Teacher Training in Pakistan: Overview of Challenges and their Suggested Solutions. *International Journal of Recent Educational Research*, 2(2), 215–223. <https://doi.org/10.46245/ijorer.v2i2.91>
26. Skinner, B. F. (1957). *Verbal behavior*. Appleton-Century-Crofts.
27. Tahira, S. S., Ali, M. S., & Jalal, H. (2021). Practices of early childhood education and development: Challenges and issues in Pakistan. *Ilkogretim Online - Elementary Education Online*, 20(3), 2210–2219.
28. Tasdemir, M. Z., Asghar, M. Z., & Tahir, A. (2019). Factors of Pre-service Teacher Education Affecting the Elementary School Teachers' Preparedness in Punjab. *Journal of Elementary Education*, 29(2), https://doi.org/https://pu.edu.pk/images/journal/JEE/PDF/2_v29
29. Tekin, A. K. (2019). How to Achieve Quality Early Childhood Education for All: Goal 4 of the United Nations Sustainable Development. *Journal of Sustainable Development Education*, 3(7), 71–80. <https://doi.org/http://dx.doi.org/10.17509/jsder.v3i1.17173>
30. Thorndike, E. L. (1911). *Animal intelligence: Experimental studies*. Macmillan.
31. United Nations General Assembly Economic and Social Council (UNGAESC). (2024). Progress towards the Sustainable Development Goals: Report of the Secretary-General (A/79/79–E/2024/54). United Nations. <https://digitallibrary.un.org/record/4051646>
32. United Nations. (2015). *Transforming our world: The 2030 Agenda for Sustainable Development (A/RES/70/1)*. United Nations. <https://sdgs.un.org/2030agenda>
33. UNP. (2024). *Our Work on the Sustainable Development Goals in Pakistan*. Retrieved from United Nations Pakistan: <https://pakistan.un.org/en/sdgs>