



Authentic caring in online professional development for early childhood teachers in South Africa



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Background: The professional development (PD) of early childhood teachers is of strategic importance in higher education and the profession given the need to improve responsiveness and progress towards millennium goals.

Aim: The purpose was to analyse classroom practices and teachers' experiences of PD programmes, through the theoretical lens of the UNESCO ICT Competency Framework for Teachers to construct an authentic data-based model, which can be used to understand PD challenges and guide decisions about the improvement of education quality.

Setting: The study was conducted in Gauteng with teachers from a selection of early childhood centres.

Methods: A phenomenological inquiry explored the settings and practices of 23 selected teachers in Gauteng province. Interview and observation data were analysed for content categories and grounded theory articulations.

Results: The main finding is that teachers facing everyday educational challenges benefit from school-based support and available media but need additional learning to advance their professional aspirations. The grounded theory analyses of the data highlighted that early childhood practices and articulated development needs are best explained as authentic caring. This was conceptualised metaphorically as garden spaces where careful tending, deliberate planning and various elements of nurturing knowledge may harmoniously be blended. The model extends prevailing theories of PD and the flipped ICT Competency Framework for Teachers.

Conclusion: The model of authentic caring is a grounded theory articulation based upon beliefs of practising EC teachers.

Contribution: The article provides a comprehensive online teacher professional development framework for EC teachers, emphasising authenticity, care and alignment with global educational standards.

Keywords: professional development; online teacher professional development; teacher education; early childhood education; South Africa; adult learning; digital learning; authentic caring; phenomenological research; authentic caring.

Introduction

Calls for the improvement of Early Childhood Education (ECE) in context of policies and government strategy documents have been ongoing. The realities in ECE are that professional development (PD) programmes are questionable (Hadley, Waniganayake & Shepherd 2015) with limited evidence when it comes to for example, online technology-based offerings (Simpson et al. 2023). The ECE sector is fragmented, teachers are mostly underqualified, and in-service education in non-governmental organisations (NGOs) and higher education institutions (HEIs) is inadequate and historically less-regulated (Ebrahim 2022; Ebrahim, Martin & Excel 2021; Harrison 2020).

In South Africa, official PD programmes presented by the Department of Education appear ineffective in schools because they were too academic with not much practical significance for teachers (Steyn 2010:356). Harrison (2017) reported on the National Audit of 19971 Early childhood development (ECD) centres, which shows that 'only 30% of practitioners had ECE certificates on any level and that diplomas and degrees were rare. A total of 55% of practitioners had no formal qualifications' (Harrison 2017:19). It remains important for the teachers to continuously develop and acquire new skills, to remain effective in their teaching (Geldenhuys & Oosthuizen 2015:203),

†, 1954–2023.

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but the impact of programmes must also be considered. It is therefore imperative to make relevant continuous development programmes more accessible to all teachers including all ECD teachers.

Among others, the realities of the early childhood sector's low qualification levels, inadequacy of programmes and provision, and fragmentation in the sector, result in poor literacy performance levels and academic performance in schools and universities (Harrison 2018:19). Professional development needs for early childhood teachers has been described by Schachter (2015:5) in terms of the need for PD to be more theory informed and that topics such as general excellent care for young children need to include a thorough examination of the larger quantity of PD. The quality of PD in ECE is lacking instruction in content areas such as math, science, or children's socioemotional development (Schachter 2015:4), and there is no obvious understanding of how researchers establish and are responsible for impact related to their PD.

While PD of early childhood teachers is a policy requirement in South Africa (Department of Higher Education and Training 2017), it is also aligned with United Nations Sustainable Development Goals (SDG), specifically SDG 4.2, which states that by 2030 'all girls and boys must have access to quality early childhood development, care and pre-primary education so that they are ready for primary education' (United Nations 2015:21).

An online PD programme can provide a practical solution to this challenge with the potential to make PD accessible and create an opportunity for the teachers to complete the PD activities in their own time. Online teacher professional development (OTPD) is progressively used to help focus on concerns such as time, finances and geographic limitations (Powell & Bodur 2019:19).

To this end, a comprehensive model would need to be based upon empirical data, informed by theories appropriate to teacher realities and needs, and shaped by theoretical understanding embedded in data from teachers in practice. A model for online PD for teachers, especially early childhood teachers, to enhance their teaching, techno-pedagogical and professional skills in practice will contribute to the professional status of teaching.

The scientific value of this study is the authentic caring model of early childhood teacher development based on a data-based analyses of teacher perspectives on current classroom and PD challenges and needs. It is a grounded theory articulation representing an integrated understanding of what PD of early childhood teachers can entail, and is aligned with the United Nations Educational, Scientific and Cultural Organization (UNESCO) ICT Competency Framework for Teachers (ICT-CFT), reflective of prevailing adult learning theories and aligned to policy and teacher roles.

The main focus of this study is on the question, what is involved in PD of ECE teachers in the light of the shifting

digitalisation contexts? To what extent is moving online in PD opportunities a workable solution in all the diverse ECE settings in South Africa? The main question for this study therefore is: What are the features of a model for online PD of ECE teachers in South Africa that can be relevant and appropriate to address the current challenges teachers experience?

The literature overview directly connects to the study's aims by addressing the PD challenges and needs within the ECE sector in South Africa. By examining the integration of ICT and online platforms in PD, the study explored how digital solutions can address the diverse needs and challenges faced by ECE teachers in different settings. The discussion on information and communications technology (ICT) integration and online learning directly relates to the research questions by examining how online PD and identifying features of an effective model addresses the current challenges faced by ECE teachers.

Professional development

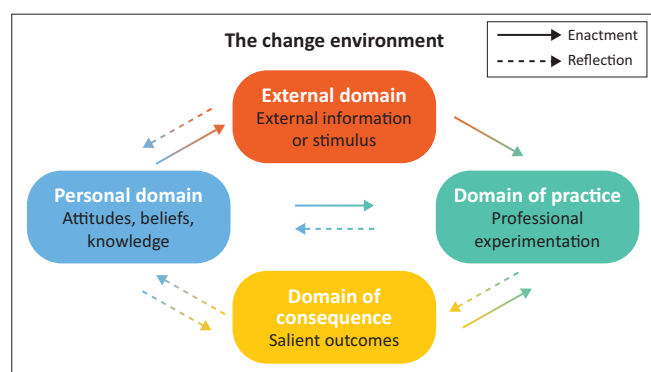
The National Policy Framework for Teacher Education and Development in South Africa (2006:17) states that the Continuous Professional Teacher Development (CPTD) system should ensure that the PD of teachers emphasises the professional status and improves the value of teaching. The ultimate responsibility for the execution and supervision of the CPTD lies with The South African Council for Educators (SACE) as the statutory body for professional educators. An overview on the CPTD in South Africa by Richard Thwala, manager PD from SACE (2021), confirms that since the implementation of the CPTD system in 2007, almost all the educators have signed up but are not revisiting their CPTD accounts to update information or upload participation in PD programmes and points scored. As a result, the PD of the teachers is not improving accordingly, and the provision of PD is inadequate. The process of bridging the gap between national policy and pedagogy can be slow, as stated by Coe, Carl and Frick (2010:210). Furthermore, they recommend that the implementation of the CPTD should not be hurried; support to the teachers should be offered at school level; the CPTD system needs to find high-level PD programmes that would influence teachers' classroom practice and learner performance, and a strong foundation of service providers applicable to the needs of the area should be determined.

In addition, the ECE sector is fragmented and the training is varied among NGOs and only more recently, included in HEIs. Higher education institutions need to make provision for the professionalisation of the existing workforce by providing Higher Certificates in Education, Advanced Diplomas in ECCE and online diplomas in ECCE so that under-qualified ECD teachers can also have a chance to upgrade their qualifications (Bipath & Theron 2020:237). At present, Early Childhood teachers' initial professional training is historically unregulated. In terms of the *South African Council for Educators Act, No. 31 of 2000* (SACE Act 2000:13); 'No person may be employed as an educator by any employer unless the

person is registered with the Council'. However, not everyone working in ECE meets the minimum requirements to register, which is set at 'ECE teachers with a minimum National Qualifications Framework (NQF) level 4 ECE qualification employed in public schools in Grade R' (UNICEF 2006:66). Therefore, there is a conundrum for the sector, birth to 4 years, regarding regulation of professionalisation and through the CPTD provided by SACE.

Teacher PD according to Schindler et al. (2021:1), involves addressing teachers' beliefs, providing practice strategies and addressing learners' learning. It encourages teacher change that can be seen as an interconnected process taking place in four different domains as depicted in Figure 1 (Schindler et al. 2021:2). Firstly, the *external domain* that sets the stimulus for change (e.g. conversations with colleagues, etc.). In this study, teachers must network with other teachers on online platforms such as cell phones and share ideas, ask for advice and share success stories in their classrooms. Secondly, the *personal domain*, which includes teachers' individual personalities in terms of knowledge, beliefs and attitudes. In this study, teachers should enhance their knowledge of teaching practices, affirm their beliefs and adapt their attitudes where necessary. Thirdly, the *domain of practice* reflects the supposed professional experimentation where teachers are asked to challenge old teaching strategies and venture in new teaching strategies in their classrooms. The idea with PD and an online model is for teachers to evaluate their old teaching practices and venture into new teaching practices that will encourage them to share that with other colleagues. Lastly, the *domain of consequence* that focusses on outcome actions of the change process (e.g. the learners' learning development). The consequence of adapting to new teaching practices will enhance learner development.

For the sake of this study, teacher PD is defined as the improvement of teachers' content knowledge and pedagogical content knowledge (Jita & Mokhele 2014:1). Professional development is an important lever for improving teaching practice in ECE. This leads to higher classroom quality and for some researchers, it is the most impactful way of improving children's learning (Schachter 2015:2).



Source: Adapted from Schindler, A.K., Seidel, T., Böheim, R., Knogler, M., Weil, M., Alles, M. et al., 2021, 'Acknowledging teachers' individual starting conditions and zones of development in the course of professional development', *Teaching and Teacher Education* 100, 103281. <https://doi.org/10.1016/j.tate.2021.103281>

FIGURE 1: Interconnected model of teacher change.

Furthermore, it is an important foundation for enhancing the capacity of the teachers' teaching, inventing new teaching methods and ultimately showing how students improve their learning (Zhang & Liu 2019:145). In addition, OTPD denotes courses, workshops or learning modules that are offered in an online layout for teacher PD (Powell & Bodur 2019:21). The method in which teacher PD has transformed, is because of the fast development of information technology from face-to-face approaches to a blended style, a combination of online learning and contact teaching practice. This resulted in the change in subject matter, learning resources and settings for PD (Zhang & Liu 2019:145). Technologies are exploited to empower people to work together in profoundly new ways. Practices that were previously impossible are now possible. People cooperate across predictable geographic, punitive organisational and sectoral restrictions (Littlejohn & Margaryan 2014:1).

Early childhood education in South Africa

In the national education system, the early childhood sector plays an important role in fostering young children's care, development and learning, and in so doing contributing to SDG, specifically Goal 4.2 (UN 2015). Distinctions between ECE, Early Childhood Care and Education (ECCE), and ECD are varied and used in this article interchangeably. The concept of ECE often refers to formal educational programmes for young children, while ECCE encompasses both care and educational aspects (Black, Walker & Fernald 2017). Early Childhood Development encompasses holistic child development (Fadlillah 2019). This study is a contribution to the standards of ECE as noted in policy documents (DHET 2017). While infrastructure and resources, outlined by policy documents, are vital for facilitating quality ECCE (Aina & Bipath 2022), it also requires teaching materials and human resources (Aina & Bipath 2022). Overall, ECE prioritises education while considering the holistic development goals of ECCE and ECD (Tahira et al. 2021).

Learning theory perspectives

Analyses of PD of ECE need to consider adult learning theories for understanding how teachers use work and life experiences when learning and reject biases that may hinder the construction of new or modified knowledge (see Darling-Hammond et al. 2017).

Conceptualisations of teacher learning in the context of development programmes would need to account for constructivism theory, and perspectives of andragogy, heutagogy, paragogy, humanism and self-directed learning, all of which describe adult learning as self-directed process. This is embedded in Kelly's (2006) outline of what teacher learning is about. In addition, in the Behaviourism and African perspectives ECE teacher training is conceived of as learner-centred, self-directed and reflective. These pedagogical frameworks support the understanding that teacher learning is about taking ownership, collaborating with peers and engaging in self-directed inquiry.

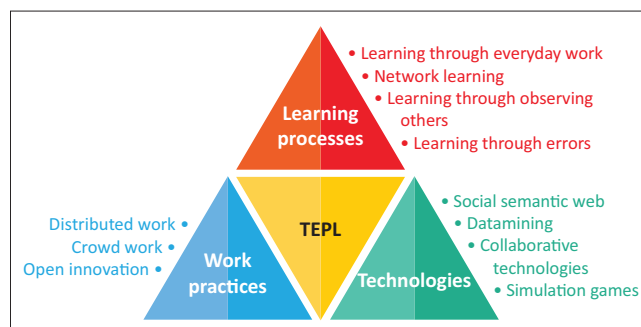
African Philosophy of Education (APE), relevant to this study, is a way of thinking that highlights reflective creativity to balance the interests of an individual and that of the community (Majani 2021:140). Moral norms and values such as generosity, kindness, courtesy and caring for others are crucial to this philosophy. Education must therefore have a moral purpose, while educators of adult learners must be guided by principles of andragogy and the classroom practices must be formed by *ubuntu*. *Ubuntu* is an African lifestyle of sharing, togetherness and a feeling of familyhood (Majani 2021:141). Through oral culture, proverbs, riddles and other traditional means of knowing, learners are taught to abide by social and cultural values of African people.

Elsewhere in Africa, in the East African Madrassa programme, childhood teachers are placed in the community where the children grow up to assist in providing the necessary care and education (eds. Nsamenang & Tchombe 2011:119). This links to theories of cognitivism where the adult teacher forms an understanding between the environment of the child and how to make it part of the learning process. Other innovative programmes such as 'The Little teacher' programme in Botswana involves the older children supporting the education of the young children. This is a form of humanism where the learners take responsibility for their own learning and the teachers are the facilitators. The Senegalese 'Grandmother Project' recognises the role of grandmothers in children's education and early childhood teachers need to form a bridge between the home and the school (eds. Nsamenang & Tchombe 2011:120). It emphasises the importance of communal involvement and highlights the understanding that a child's upbringing is influenced by the collective efforts of the entire community. Thus, confirming the beliefs that it takes a village to raise a child, beyond immediate family.

The integration of information and communications technology in professional development

The three critical dimensions mentioned in the Technology Enhanced Professional Learning (TEPL) model, depicted in Figure 2, enhance the structure of an online PD programme and contribute on different levels to this model. Firstly, *work practices* where the work is distributed to people with different forms of expertise, from detached geographic, sectorial or disciplinary locations where they work on a shared work problem, connected via the Internet. Secondly, *learning processes* where with the aid of Internet teachers can access feedback from educators and peers and capture knowledge otherwise not shared. Thirdly, *digital technologies* provide realistic environments for professional learning. Presenting learning activities that imitate real-world work situations and suggest an opportunity for individuals to investigate and not succeed in a safe environment seems a favourable way to motivate people to engage in professional learning (Littlejohn & Margaryn 2014:9).

Online learning involves remote learning that is manageable and accessible, and has the advantages of reduced travelling



Source: Littlejohn, A. & Margaryan, A., 2014, 'Technology-enhanced professional learning', in S. Billett, C. Harteis & H. Gruber (eds.), *International handbook of research in professional and practice-based learning*, pp. 1187–1212, Springer, Dordrecht

TEPL, technology enhanced professional learning.

FIGURE 2: Technology-enhanced professional learning.

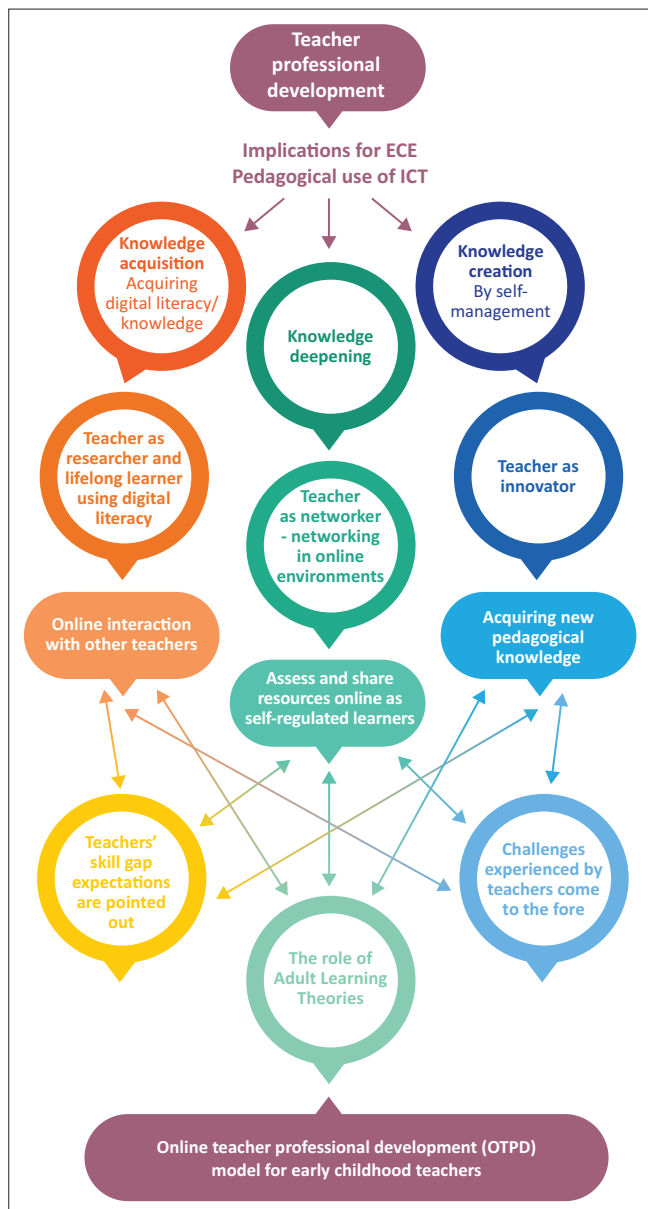
and other expenses (Mitchell & Delgado 2014:379). The administrative task of recording contact sessions and marking attendance is another advantage of online learning. The learners become self-directed learners and learn asynchronously at any time of the day (Mukhtar et al. 2020:5). According to Mitchell and Delgado (2014:379), advantages of online learning for many learners are the flexible hours and access to resources not readily available in all geographic areas.

Theoretical framework

This study of PD experiences, beliefs and needs of early childhood teachers is informed by the UNESCO ICT-CFT, updated and 'flipped' (see Figure 3). It depicts three phases of teacher development – knowledge acquisition, knowledge deepening and knowledge creation in relation to the development of teachers' competencies and ICT pedagogical use.

The Online Teacher Development Programme (OTDP) model serves as a representation of PD components and their interrelations but also aligns with the broader theoretical framework. The study's data, exploring these components and relations, delves into metaphorical expressions, framing the OTDP model as contextualised and rooted in authentic caring. This metaphorical exploration enriches the interpretation of findings, connecting the theoretical framework's emphasis on teacher-centred development with the nuanced and caring aspects embedded within the OTDP model.

This approach emphasised the teacher's role as a researcher, lifelong learner, networker and innovator within online PD environments. Aligned with UNESCO's (2011) perspective on lifelong learning, the study explored how the ICT-CFT could be integrated into the various phases of teacher development, particularly focussing on in-service PD. Through this lens, the study aimed to understand the contextual realities and needs of ECE teachers, identifying their skills gaps, strengths and challenges, while also considering the role of adult learning theories in shaping an effective online model rooted in authentic caring and tailored to their professional growth.



ECE, early childhood education; ICT, information and communication technology.

FIGURE 3: Online Teacher Development Programme 'Flipped' UNESCO ICT-Competency Framework for Teachers.

Research methods and design

Design

This research is a phenomenological interpretivist inquiry into EC teachers' current teaching experiences and beliefs about challenges and needs for PD.

The initial sample consisted of 25 teachers, with 23 female teachers from 4 ECD centres the greater Tshwane area finally participating. Participants were identified by means of snowball sampling, which started from centres deemed accessible. Initial selection criteria included experience, qualifications, age, gender and previous PD courses attended.

Data generation

Data generation involved structured questionnaires and interviews following methods outlined by Creswell (2012

and 2020). Questionnaire data covered biographical information (see Table 1), and transcriptions from interviews with participants of their PD experiences. Semi-structured in-depth and focus group interviews covered questions of PD, classroom teaching challenges, online learning, face-to-face programmes, development needs and contextual challenges.

Data analysis

Data analyses took the form of an Interpretative Phenomenological Analysis (IPA), following Alase (2017:9), and Reeves and Hedberg (2003:32). This design was participant oriented, assumed that participants shared beliefs about lived experiences, and participants were encouraged by the researcher's attempts to create bonding relationships. Following Creswell (2012) and Charmaz (2011), the content analysis was performed through coding and categorisation. ATLAS.ti software was used to analyse the networks of relationships between and among codes and categories.

The IPA, by design, enabled the researcher to develop a bonding relationship with the participants and required a high level of expertise from the interviewer, with 'a combination of strong empathic engagement and highly attuned antennae ready to probe further important aspects' (Smith & Osborn 2015:42). As an approach, it is participant-oriented where they express their 'lived experiences' without being judged or prosecuted (Alase 2017). The IPA is associated with the interpretivist paradigm focussing on participants' own stories and experiences. In the data analysis process, the interview transcripts were read by the researcher to identify the gist of what the teachers' subjective experiences had been.

Methods of data gathering included interviews aimed at eliciting views of participants regarding their school experiences and professional teacher development. Interviews were recorded and transcribed and content was analysed for themes, tying the units of significance together into layered meanings to identify and explore the deeper structures.

Grounded theory method

The second level of data analysis aimed at describing the underlying theoretical conceptions participants had of the main question of PD programmes and needs. This was performed by means of model development methods designed by Havenga, Poggenpoel and Myburgh (2014), drawing on Chinn and Kramer (2014) and was the inductive theory generating part of the inquiry. The methods involved concept analysis, relationship statements, description of the model and evaluation of the developed model. This method mirrors the grounded theory analyses methods described by Cathy Charmaz (2011) transcribing concepts and/or views participants share in interviews and questionnaires, doing line by line coding and categorisation of codes, and constructing theoretical understanding of views through memo writing and network results from ATLAS.ti.

TABLE 1: Biographical data of participants per school.

School	Participant	Age	Teaching experience	Qualifications
1	H	49	20	ECD NQF 4
	I	21	2	ECD NQF 4
	J	34	5	BEd Foundation Phase
	K	21	1	ECD NQF 5
	L	50	15	ECD NQF 4
	M	50	11	BEd Foundation Phase NQF 4
	N	42	12	ECD level 4
2	F	64	40	Non-formal VVOS
	A	64	21	Gr 10
	B	52	12	Gr 12
	D	34	16	None
	G	32	15	NQF 4
	E	32	8	None
	C	24	3	HS ECD NQF 5
	3	O	60	6
P		29	1	Level 4 ECD
Q		30	7	BEd Intermediate Phase
R		29	3	None in ECD
S		61	5	None in ECD
4	T	49	18	None in ECD
	U	24	4	BEd Foundation Phase
	V	49	8	None in ECD
	W	23	2.5	None in ECD

NQF, National Qualifications Framework; ECD, Early Childhood Development; BEd, Bachelor of Education degree; VVOS, Verentiging vir Voorskoolse Opvoeding en Sorg; Gr, Grade; HS, high school.

Written participant consent confirmed confidentiality, non-disclosure, voluntary informed consent and voluntary participation, as well as recognising the participants' right to withdraw from the study at any point and promoting openness and justice in interactions with research participants. Permission was also gained from the Gauteng Department of Education, as well as from the principal(s) of the preschool(s) involved.

Measures were taken to ensure relational ethics, which involved considerations of how the researcher's practices and representations might potentially affect the participants. This ethical framework ensured that the research process prioritised the well-being and rights of the participants, maintaining their confidentiality and anonymity, securing their voluntary and informed consent, and representing their perspectives accurately. The commitment to these ethical principles, in alignment with the guidelines outlined by Tracy (2019), underscored the integrity, transparency and ethical rigour of the study. The researchers were dedicated to providing a clear and faithful representation of the participants' ideas and experiences, ensuring that their voices were accurately conveyed. It was of paramount importance to ensure that the study did not cause any harm or inconvenience to the participants, upholding their well-being throughout the research process. This commitment to ethics underscored the integrity and credibility of the study.

The ethics of care underscores the fundamental significance of interpersonal connections in human existence. Noddings

(2003) posits that compassion is a universal trait, emphasising the ethical importance of nurturing caring relationships. In her perspective, genuine caring involves active engagement and responsiveness, where the carer is attuned to the needs and experiences of the cared-for individual. Central to care ethics is the specificity of relationships, which entails a reciprocal commitment to each other's well-being. In this study, the ethics of care was based on the moral imperative of fostering empathetic connections with and being responsive to participants to understand the PD of early childhood teachers in South Africa.

The research process

The data generation involved visits to school sites by appointment and meetings with all staff where purpose, scope and implications of their involvement were explained.

From the onset, it was clear that participants were enthusiastic to engage. They were especially driven to look into ways to preserve alignment with parental expectations, take care of children's needs and utilise technology. These topics have undoubtedly been discussed informally and formally within the environment of the school and contributed to the responses in the interviews.

Researcher and participant relationships were fostered through dialogues and reflections with the participants during their interviews, creating a favourable setting for in-depth discussions. The generated data were rich and covered a broad range of participant requirements, interests and objectives for PD. From these interactions with participants, the researcher became aware of the range of needs for clarity on PD processes available to them at school and the departmental level.

Some changes in research planning were made because of realities encountered at school sites. The primary goal of the sampling criteria and plan was to include teachers with at least 5 years of experience to benefit from experienced viewpoints. However, as the study progressed, it was decided to include every member of staff at each school. This was as a change towards inclusivity and the participants' diverse backgrounds, so that a wider range of perspectives was made available. This also enabled exploring research questions in greater detail.

Participants' commitment throughout the duration of the data generation was noteworthy. Their participation indicated a sincere involvement in the study process and provided authenticity and credibility to the insights gained. Likewise, the instruments used to generate data were crucial in highlighting important areas of interest. Notably, the sections of Continuous Teacher Professional Development (CTPD) devoted to current opportunities stood out as being particularly significant.

Ethical considerations

Ethical approval to conduct this study was obtained from the University of South Africa College of Education Ethical Review Committee (No. 2022/02/09/44582463/15/AM).

Findings from content analyses of teacher's views

The content analysis of teachers' views from questionnaires and interviews addressed research questions about professional development and online programmes they attended. Data covered views on the traditional face-to-face programmes attended, contents covered, and challenges and benefits of PD. The broad themes from the content analysis follow, illustrated by verbatim quotes from teachers.

Engagements and beliefs about professional development programmes

Participants noticed a range of ways in which they engaged with and draw upon PD programmes, encompassing a spectrum from formal qualifications to departmental and school-based initiatives. Notably, there is considerable variability in teachers' awareness and participation in CPTD programmes, with some well-informed while others remain less acquainted with available opportunities.

Participants (A), (B), (C), (D), (E), (F), and (G) reported that they regularly attended Association for the Education and Care of Young Children (AECYC) morning programmes at University of South Africa (UNISA) covering diverse topics throughout the year. Participant (G) was engaged in a level 5 ECD programme, while participant (C) pursued programmes through OASIS and EduExperts. Participant (E) completed a programme via SA Childcare, while participants (R), (T), (U), (V), and (W) attended short programmes at Koeitjies and Kalfies nursery school. Notably, participant (W) obtained a formal Bachelor of Education degree in Foundation Phase through Aros, though distinct from PD.

The identified CTPD topics of relevance include sensory stimulation, cognitive development, music and pedagogies focussing on classroom organisation, routines, appearance and stimulation. The reported benefits and challenges of PD vary among teachers, with perceived advantages encompassing the acquisition of new ideas, self-empowerment, knowledge enrichment and a deeper understanding of emerging challenges. Recommendations for CTPD needs covered areas such as discipline, psychology, art, Down syndrome, mathematics, infant care, music and managing tantrum behaviour.

Peer collaboration for purposes of professional development

Questionnaire and interview data indicated that teachers actively collaborate with peers for their PD, seeking valuable and engaging ideas. In relation to questions about the nature and availability of OTPD programmes, participants reported a range of topics, which include '... the mellow world of music...', to the intricate details of classroom stimulation and the art of routine management. Participants described these workshops as empowering and knowledge-enriching.

Findings from network analyses

Network (Figure 4, Figure 5, Figure 6 and Figure 7) are the findings from the ATLAS.ti analyses of actual data transcriptions. Network connections in data around teacher beliefs, face-to-face programmes, online programmes, and lastly a comparison of the latter two networks are reported.

Codes and categories

The findings in Figure 4 on teacher beliefs portrays six broad categories of codes, namely demographics (TID), working with teachers (TIW), knowledge of CPD (TIK), recommendations for development programmes (TIR), programmes attended, (TIP) and benefits of programmes (TIB).

Figure 5 presents results of the network analysis of data on face-to-face programmes. The network diagram presents the codes in the data linked to two categories face-to-face benefits (FTFB), five code and face-to-face challenges (FTFC), eight codes, respectively. The codes represent the range of understanding participants shared in response to questions about benefits of face-to-face programmes and the extent to which they described challenges with such programmes. Participants noticed specific benefits of in-person attendance, interaction, communication, sharing ideas, learning from the presenter, space to interact around questions, 'to really see what is going on', work in smaller groups and to see methods demonstrated. Challenges with face-to-face programmes are described in terms of disadvantages in big groups, finances to attend, not having time, transport, family commitments, distance to travel.

The network diagram on online programmes is portrayed in Figure 6. Within this analyses, five broad categories namely, shared activities (OPSA), benefits (OP), challenges (OPC), assessment types (OPA) and skill needed (OPS) highlight teachers lived experiences of OTPD. Participants faced challenges in terms of access to Internet and Wi-Fi, not having a computer, not feeling comfortable with technology, absence of in-person interaction, difficulty with applications, inadequate space for asking questions, poor interaction and slow or fast pace. Benefits include space to ask questions, exposure to new ideas, own time, listening to recordings, busy house routines, which prevent face-to-face interaction, note taking, better concentration, demonstrations, time available at school, specific foci possible, enjoyability, comfort at home, cost and varied formats.

Lastly, the contradictions between and associations among categories in the face-to-face and online network diagrams are presented as a comparison in Figure 7.

Online programmes have been described as beneficial because they allow own time, are not so expensive, can be done in own home, with no transport needed. The face-to-face programmes require time, costs, they are too expensive and offered at a distance. These differences in views indicate variations in background, qualification and experiences.

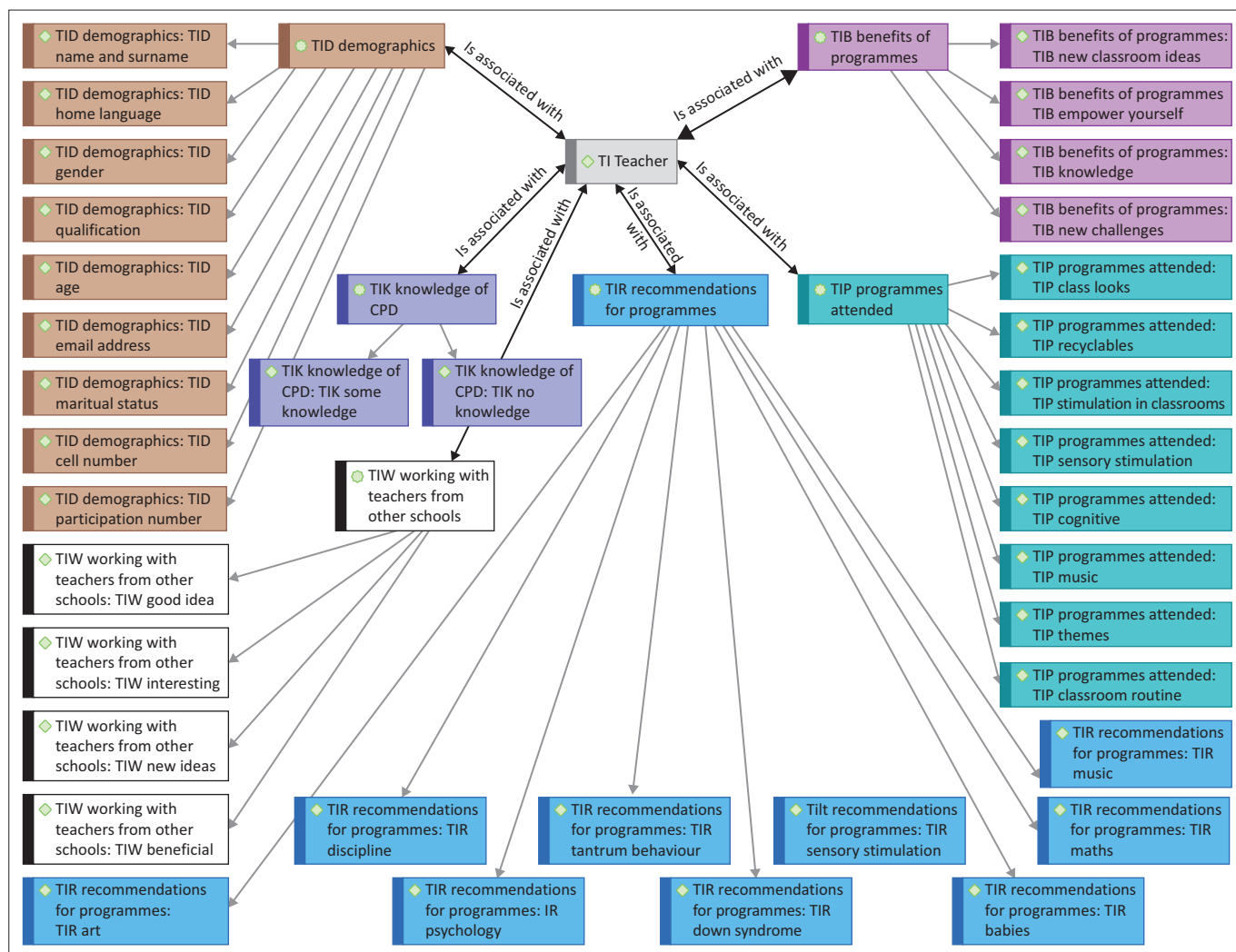


FIGURE 4: Network diagram: Teacher views.

Depiction – Early childhood education teacher professional development as authentic caring

The findings of the content and network analyses were used as bases for a conceptualisation of a metaphor integrating the theoretical framework, the Flipped ICT-CFT, the various concepts gleaned from the literature and the evidence in the data. This metaphor as depicted in Figure 8 is akin to a blooming garden. In the same way that a garden requires careful tending, deliberate planning and a harmonious blending of various elements, PD in ECE necessitates the nurturing of knowledge, the deliberate design of a supportive environment and the cultivation of a caring ethos. According to this concept, online environments act as the ideal conditions for learning and the development of teachers' competences and is comparable to caring for a flourishing garden. This concept encourages constructive engagement and activities with teachers about their PD, promoting an environment of genuine care and holistic growth, just as a well-tended garden produces blooming flowers. The various elements of the garden, in relation to this study and the intended use of the model, are as follows:

1. *Teachers as seedlings*: The ECE teachers represent the potential seedlings, each with unique requirements and skills. The approach places emphasis on appreciating and respecting each teacher's uniqueness well represented in the data reported, understanding that their development is necessary for professionalising ECE.
2. *Ethics of care as soil*: This study compares the supportive environment that fosters teachers' development to fertile soil. It provides a caring and understanding foundation for teachers' PD, embodying the ethics of care. This metaphor of soil represents the school and classroom settings in ECD, enhanced by sincere care and encouragement, guarantees that ECE teachers are enabled to flourish.
3. *Teachers' voices as sunlight*: The rich sunshine that fosters growth and development in the garden is provided by the warmth of teachers' voices and how they express their care of children as everyday practice and lived experiences. Teachers' voices are crucial to this concept, just like sunlight is necessary for life in the garden. It is posited that teachers need to be involved in understanding and engaging in their own development. Through the process of amplifying these voices, the

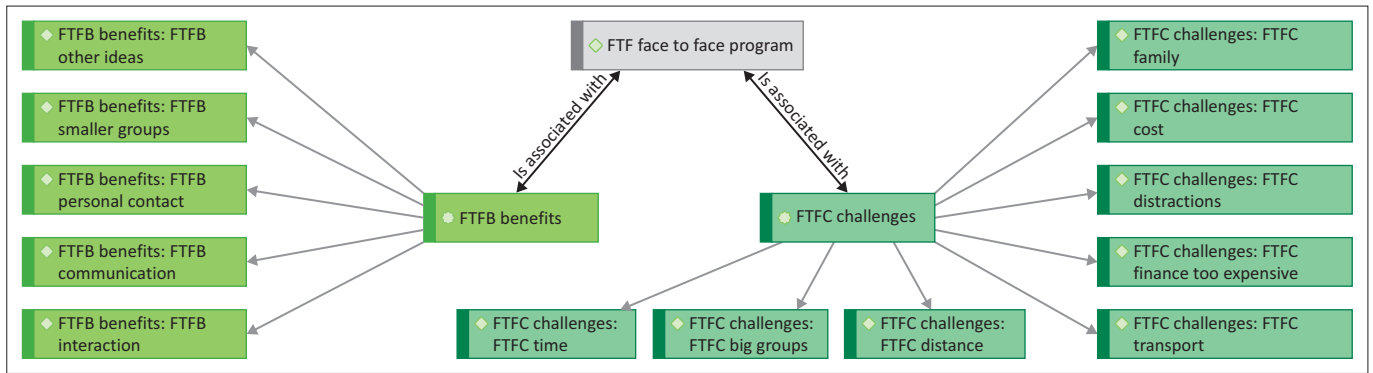


FIGURE 5: Network diagram: Face-to-face programmes.

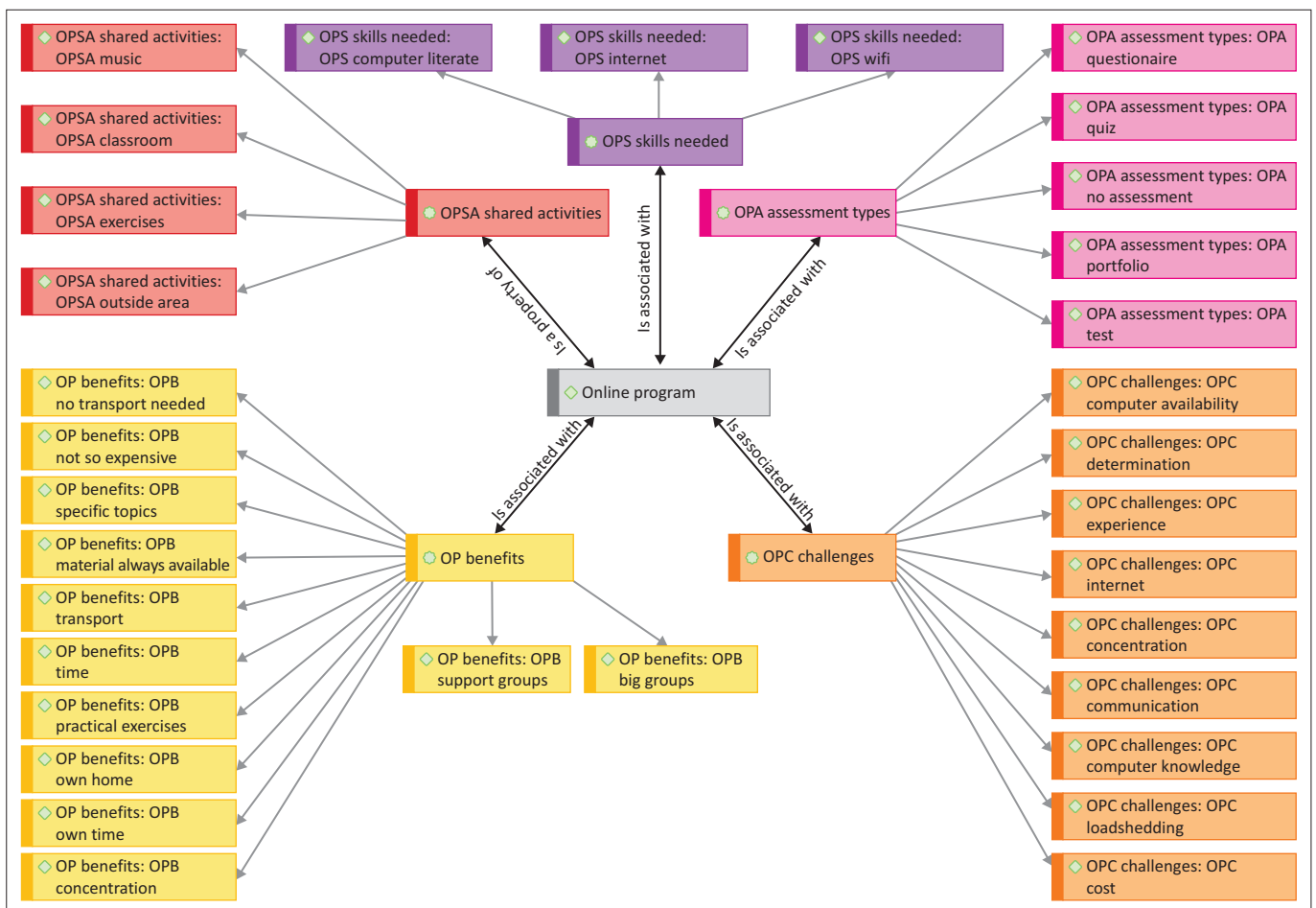


FIGURE 6: Network diagram: Online programmes.

metaphor emphasises using ECE teachers' insights to promote their PD.

4. *Contextual responsiveness as rain*: The metaphor included contextual responsiveness, much like a garden needs rain to thrive to its full potential. It recognises that South Africa's educational landscape is shaped by a variety of environmental and contextual factors. Consequently, this notion ensures that ECE teachers receive ample and individualised support by adjusting and providing resources based on the particular scenario.
5. *Authenticity as blossoming flowers*: In the spaces where ECE teachers work and need development support, as a metaphorical garden, the blooming flowers represent

authenticity. Early childhood education teachers are urged to be authentic and to openly embrace their own PD. Like flowers in full bloom, the metaphor celebrates the authenticity of teachers as they engage in self-regulated learning, gain new expertise and grow professionally.

6. *Research, innovation and networking as vibrant petals*: The theoretical framing of the study includes the concepts of networking, research and innovation skills. These concepts function as the unique, colourful petals of empowered early childhood educators' flowers. These capacities add vitality and colour to the educational garden, fostering a vibrant ecosystem of growth and PD in ECE.

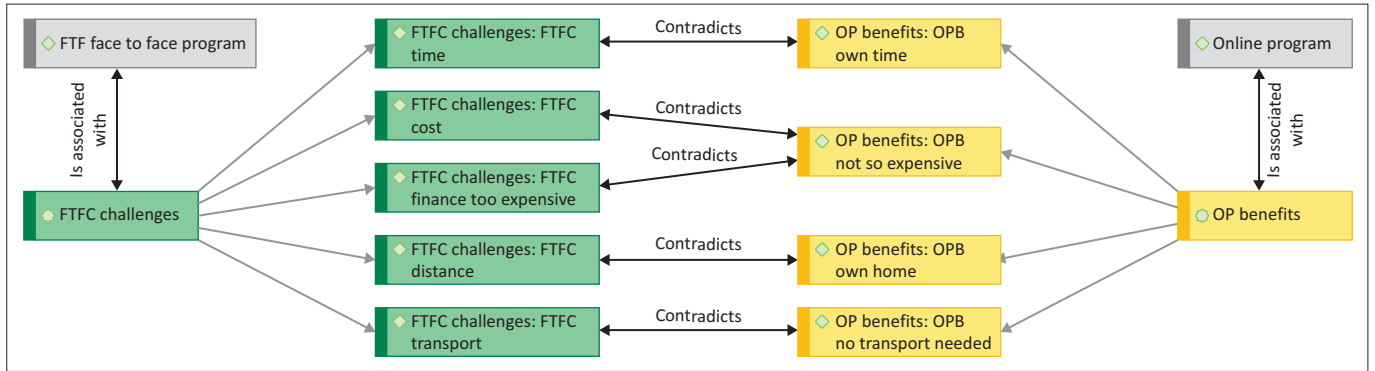


FIGURE 7: Categories in the face to face and online network diagrams for comparison.

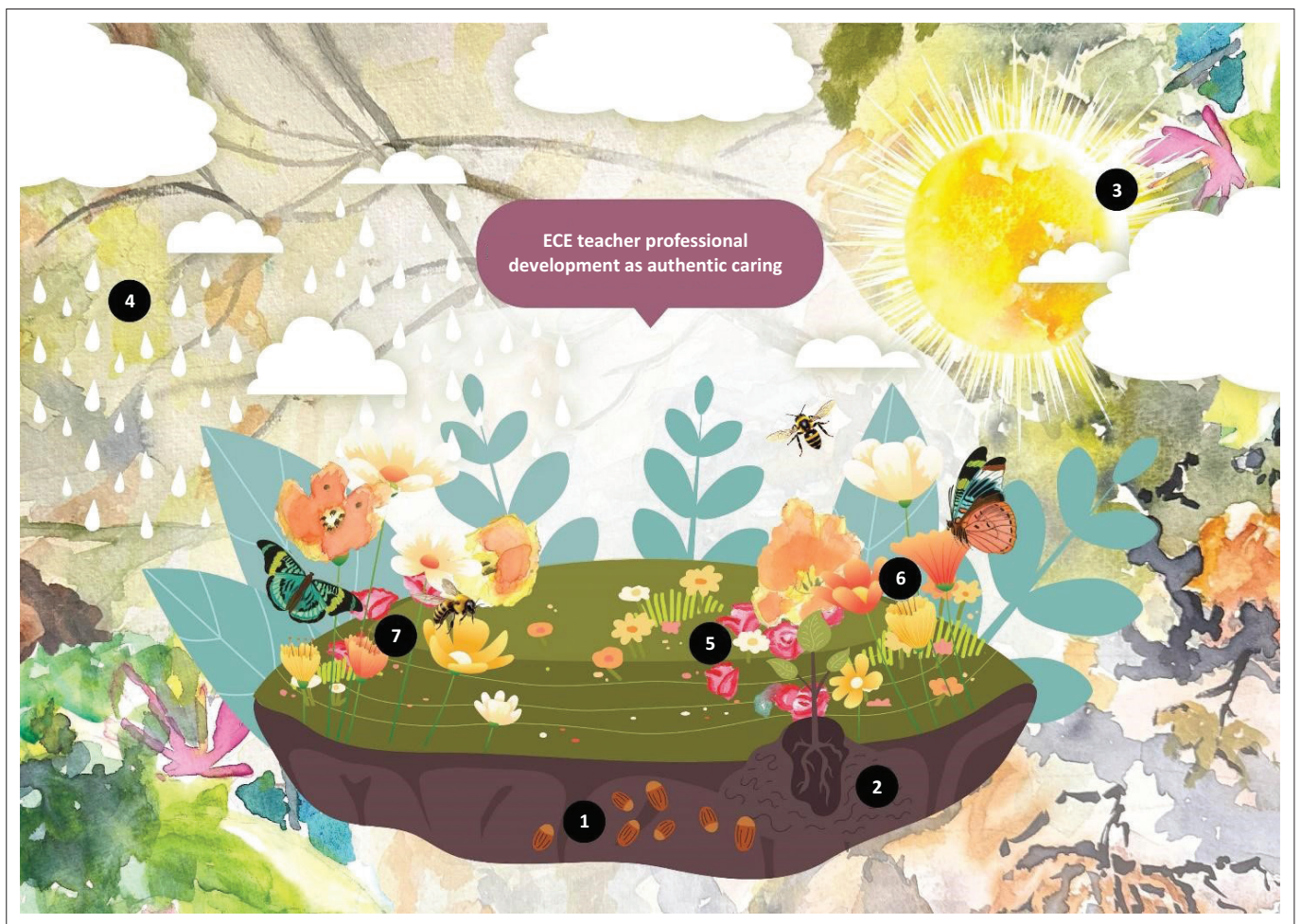


FIGURE 8: Early childhood education teacher professional development as authentic caring.

7. *Collaboration as pollinators:* In this model, teacher and mentor collaboration is critical, just as bees and butterflies are important for pollination. Through online interactions, ECE teachers in South Africa can communicate ideas and experiences, leading to a dynamic interchange of knowledge and insights that can improve their own development and ultimately, the state of ECE.

Online environment as Virtual Garden: The overall illustration of a virtual garden represents the online environment, which caters to the particular needs of South African ECE teachers and provides accessibility, affordability and ways to

overcome obstacles. The illustration fosters a thriving digital educational environment in South Africa by pledging that teachers have a space to grow and flourish, despite physical obstacles or constraints.

Discussion

The study’s findings resonate strongly with the theoretical framework grounded in the updated UNESCO ICT-CFT, which places early childhood educators at the core of PD. Delving into three pivotal phases – knowledge acquisition, knowledge deepening, and knowledge creation – the analysis

highlights the trajectory of teacher development and their adeptness in integrating ICT pedagogy. Teachers emerge as active participants, embodying roles as researchers, networkers and lifelong learners, in line with the framework's emphasis on teacher-centred development.

Moreover, the study sheds light on the significance of OTDP, showcasing teachers' impact on student growth. It becomes evident that an effective OTDP should cultivate autonomy, adaptability and continuous support, echoing the theoretical framework's emphasis on teacher empowerment and ICT integration.

The empirical findings further elucidate the evolving roles of early childhood teachers in the digital age, demonstrating the practicality and relevance of the theoretical underpinnings. Through a phenomenological lens, the study exposes teachers' lived experiences, unveiling intricate layers of significance. This aligns with the framework's focus on understanding the complexities of PD journeys and underscores the need for tailored, contextually relevant approaches.

The findings of the study not only validate the theoretical framework but also provide actionable insights for designing and implementing effective PD initiatives, which enabled the development of the metaphorical model of Early Childhood Education Teacher Professional Development as Authentic Caring. This served as a testament to the symbiotic relationship between theory and practice, enriching our understanding of teacher PD in the digital era.

Based on findings of this study, there are several implications at theoretical, practice and policy levels:

- The study highlights the value of incorporating different learning theories, such as behaviourism, cognitivism, constructivism andragogy, heutagogy, paralogy, humanism and self-directed learning, into the theoretical framework for ECE OTPD. In order to accommodate the various requirements and preferences of adult learners, this integration fits with the complex and diversified nature of teacher PD.
- The theoretical framework places teachers at the centre of their professional growth, emphasising their responsibilities as engaged participants, researchers, networkers and innovators. This learner-centric viewpoint emphasises the significance of personalising OTPD to their unique needs and settings while acknowledging teachers' agency in directing students' educational experiences.
- The study emphasises the necessity of high-quality ECE for all children and the relevance of ECE to SDG 4.2. This theoretical congruence highlights the importance of supporting ECE teachers' professional growth in order to ensure equal access to high-quality education.
- According to the study, online PD should be personalised to accommodate ECE teachers' various needs and interests. To design interesting and efficient OTPD

programmes, this customisation takes into account adult learning principles including self-directed learning, collaborative knowledge-sharing and learner autonomy.

- Online teacher PD can be a workable answer to problems in ECE such as a shortage of competent teachers. Through the creation of multimedia content and interactive teaching tools, integrating technology into PD enables teachers to increase the quality of ECE and their techno-pedagogical skills.
- The study underscores how critical it is to help instructors improve their abilities in the cognitive, intrapersonal and interpersonal domains. Online teacher PD programmes should support ECE instructors' development of critical thinking, problem-solving, creativity and self-regulated learning.
- The results highlight the urgency of responsiveness and professionalisation of the ECE sector, particularly in areas where services are inadequate. The goal of policy should be to encourage teachers' ongoing PD and to ensure that all children have access to high-quality ECE, through PD of high-quality ECE teachers.
- The constructed model of OTPD is the knowledge contribution of this study, advancing specific ways of looking at ECE practices at school level and encouraging practitioners as well as officials and policy makers to value authentic caring as change focus in ECE.
- Policymakers should be aware of the advantages of online learning, especially its adaptability and accessibility. The difficulties faced by ECE teachers, such as time constraints and location limitations, can be addressed through OTPD, which provides a flexible and affordable approach of PD.
- Policymakers ought to stress the value of high-quality ECE by aligning ECE policy with SDG 4.2. This alignment highlights how important it is to support ECE teachers' professional growth in order to ensure all children have access to high-quality education, especially those who are less privileged.

These implications translate into several practical recommendations for educational policymakers and institutions. Online PD should be personalised to accommodate ECE teachers' various needs and interests. Customising OTPD programmes by considering adult learning principles, such as self-directed learning, collaborative knowledge-sharing, and learner autonomy, can create more engaging and effective experiences. Additionally, OTPD can address problems in ECE, like the shortage of competent teachers, by integrating technology into PD through multimedia content and interactive teaching tools, thereby enhancing the quality of ECE and teachers' techno-pedagogical skills. Online teacher PD programmes should also support ECE instructors' development of critical thinking, problem-solving, creativity and self-regulated learning, improving their cognitive, intrapersonal, and interpersonal abilities. Policies should promote the professionalisation of the ECE sector, particularly in underserved areas, to encourage teachers' ongoing PD and ensure that all children have access

to high-quality ECE. The constructed model of OTPD emphasises authentic caring as a focal point for change in ECE, offering insights into ECE practices and encouraging stakeholders to prioritise a culture of caring.

While the study offers significant insights, several limitations must be acknowledged. Potential biases may have arisen from the self-reported data and the specific context of South African ECE teachers, which could affect the generalisability of the findings to other regions or contexts. Additionally, methodological constraints such as sample size and selection bias may limit the extent to which the findings can be generalised.

Further research evaluating the efficacy of particular OTPD programmes would be beneficial. The effects of various online PD approaches on teacher learning outcomes, classroom practices and student outcomes can be assessed through comparative research. The optimal methods for designing and delivering OTPD could be identified.

In addition, future studies can also examine how OTPD can be made more inclusive given the emphasis on equitable access to education. This entails researching ways to reach teachers in underprivileged and remote locations, overcoming communication difficulties and assisting teachers with a variety of needs and backgrounds.

Lastly, research could focus on how newly developed technologies, such as augmented reality, virtual reality and artificial intelligence, can be applied in OTPD to improve teacher learning experiences and classroom practices as technology grows in sophistication.

Conclusion

Professional development of ECE cannot be underestimated by teachers themselves, as well as policymakers and those responsible for implementation. This study underscores the implications for theory, practice and policy in ECE PD. It emphasises the need for personalised OTPD tailored to the unique needs and interests of teachers, leveraging technology to enhance teaching quality and techno-pedagogical skills. The model produced in this study is based upon experiences and views of teachers in the field and is an instrument, which can be used in conversations about changes in ECE on all levels – from schools to districts. The constructed model of OTPD serves as a valuable contribution, offering specific insights into ECE practices and advocating for a culture of authentic caring within the sector. The study expresses a vision of growing a culture of caring in ECE and grounding day-to-day decisions on PD on the richness of classroom ecologies.

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of inspiring and supporting others will live on in our hearts and minds.

Competing interests

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

Authors' contributions

L.v.d.W. and D.H. contributed to the design and implementation of the research, to the analysis of the results and to the writing of the article.

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Data availability

The data that support the findings of this study are available from the corresponding author, D.H., upon reasonable request.

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