

Special Issue Reprint

Teachers and Teaching in Teacher Education

Edited by
Ainat Guberman and Vasileios Symeonidis

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Teachers and Teaching in Teacher Education

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About the Editors

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Teachers and Teaching in Teacher Education: Editorial

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§ This work was conducted during his previous employment at University of Education Freiburg in 2024.

1. Introduction

A decade has passed since Goodwin and colleagues asked who teacher educators are and what they need to know and be able to do [1]. During that time, multiple answers were provided concerning teacher educators' roles such as second-order teachers, researchers, curriculum developers, and coaches [2]. The answers continue to multiply and change in response to global policies and local contexts [3]. This Special Issue makes it possible to see how teacher educators adapt traditional roles to address contemporary challenges.

2. Content of the Special Issue

This Special Issue of *Education Sciences* has fourteen papers that can be divided into four different roles that teacher educators have: 1. supporting processes of professional identity formation among beginning as well as experienced teachers; 2. providing opportunities for professional learning to student and cooperating teachers; 3. curricula building; and 4. inquiry-based professional learning and development.

2.1. Supporting Teachers' Identity Formation

The authors in this section conceptualize teachers' identity formation as a process that takes place throughout teachers' careers and believe that supporting teachers' professional identity is one of the roles that teacher educators have. The contributors to this section are as follows:

1. Abramson, L.L.; Schachter, E.P. Beginning Teachers Navigating Identity Development Transitions: Identity Motives and Commitment to Teaching. *Educ. Sci.* **2024**, *14*, 1170. <https://doi.org/10.3390/educsci14111170>
2. Avgitidou, S.; Kampeza, M.; Karadimitriou, K.; Sidiropoulou, C. Pre-Service Teachers' Beliefs about Children's Participation and Possibilities for Their Transformation during Initial Teacher Education. *Educ. Sci.* **2024**, *14*, 236. <https://doi.org/10.3390/educsci14030236>
3. Schur, Y.; Guberman, A. Conceptual Change of 'Teaching' among Experienced Teachers after Studying Attentive Teaching. *Educ. Sci.* **2024**, *14*, 231. <https://doi.org/10.3390/educsci14030231>
4. Jefferson, S.; Gray, C.; Lowe, G. Comfort in the Role: The Core of Positive Veteran Teachers. *Educ. Sci.* **2024**, *14*, 998. <https://doi.org/10.3390/educsci14090998>

The first two papers (1 and 2) deal with beginning teachers, whereas the following two (3 and 4) focus on teachers with long years of professional experience.

Abramson and Schachter (contribution 1) found that beginning teachers interpret their field experiences in alignment with their identity motives and that the salience of the motives depends on individual as well as contextual factors. Teacher educators are, therefore, called to pay attention to students' deliberations and reflections concerning their

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field experience, since they can manifest unresolved identity issues, and adapt the support they provide to their students accordingly.

Avgitidou and colleagues (contribution 2) focused on early childhood student teachers and a particular area of their professional identity—their beliefs concerning children's participation in educational decisions. The authors described how teacher educators' intervention changed student teachers' goals from achieving specific learning outcomes to the promotion of children's democratic and active participation in their own education.

Changing entrenched, teacher-centered educational beliefs was also the focus of the next paper, authored by Schur and Guberman (contribution 3). It showed how a professional development program facilitated by a teacher educator resulted in a conceptual change in teachers' role, from a teacher-centered transmissive view into a student-centered dialogical approach. This change involved teachers' positive feelings of rediscovering the interest and enjoyment in teaching and in their relationships with the students.

The last paper in this section, authored by Jefferson and colleagues (contribution 4) claimed that self-efficacy, good relations with students and colleagues, and reliance upon technology to deal with bureaucratic requirements help experienced teachers feel comfort in their role and maintain their enthusiasm for and commitment to teaching. The authors concluded that these identity-supporting strategies can be explicitly taught to beginning teachers.

2.2. Providing Opportunities for Professional Learning to Student and Cooperating Teachers

The “third space” in teacher education is a learning environment where higher education-based teacher educators, collaborating teachers, and student teachers collaborate in co-constructing knowledge about teaching. The third space provides opportunities to reflect upon the practice and analyze it with respect to relevant theories, thus closing the gap between theory and practice [4]. The second section of this Special Issue includes four papers that deal with the third space and its affordances:

5. Westbroek, H.; de Vries, B.; Kaal, A.; McDonnell, M. Bridging Theory and Practice: Using Goal Systems to Spark Professional Dialogue and Develop Personal Theories. *Educ. Sci.* **2024**, *14*, 458. <https://doi.org/10.3390/educsci14050458>
6. Batista, P.; Graça, A.; Moura, A.; Ribeiro-Silva, E.; Estriga, L. Building Bridges in Teacher Education to Enhance Teachers for Students' Diversity in Physical Education. *Educ. Sci.* **2024**, *14*, 1045. <https://doi.org/10.3390/educsci14101045>
7. Raberger, J.; Gkaravelas, K.; Froehlich, D.E. Empowering Educators: The Impact of Reverse Mentoring on Developing Scientific Mindset and Research Skills. *Educ. Sci.* **2024**, *14*, 993. <https://doi.org/10.3390/educsci14090993>
8. Baker, K.M.; Stickney, K.W.; Sachs, D.D. STEM Cooperating Teachers' Professional Growth: The Positive Impacts of a Year-Long Clinical Residency Collaboration. *Educ. Sci.* **2024**, *14*, 899. <https://doi.org/10.3390/educsci14080899>

Westbroek and colleagues (contribution 5) described a representation tool through which student teachers' understanding of the goal-means relationships in their practice can be increased, as well as their reliance upon theoretical notions, while reflecting on practice. They believed this tool can contribute to the development of a shared language among higher education- and school-based teacher educators, thus improving pre-service teacher education.

The next two papers explored both student and cooperating teachers' learning. Batista and colleagues (contribution 6) utilized participatory action research to promote inclusion among student and cooperating teachers in physical education. Raberger and colleagues (contribution 7) used reverse mentoring projects in which beginning teachers mentored cooperating teachers to enhance mutual learning. Interestingly, both studies found stronger effects on cooperating rather than on student teachers.

Finally, Baker and colleagues (contribution 8) studied the effects of supervising student teachers on STEM cooperating teachers. They found that cooperating teachers learned new teaching strategies and became more reflective after supervising student teachers.

Their communication skills improved, and they became more interested in becoming teacher leaders.

2.3. Curricula Building

The third section of this Special Issue is devoted to teacher educators' curricula building role. It includes two papers that both address timely issues that require professionals' attention:

9. Cabral, S.; Mata, L.; Peixoto, F. Preparing Pre-Service Teachers for Family Engagement: Insights from the Initial Teacher Education Syllabus. *Educ. Sci.* **2024**, *14*, 674. <https://doi.org/10.3390/educsci14060674>
10. Fisher, Y.; Shatz-Opppenheimer, O.; Arviv Elyashiv, R. The Effect of COVID-19 on a Short-Term Teacher-Education Program: The Israeli Case. *Educ. Sci.* **2024**, *14*, 958. <https://doi.org/10.3390/educsci14090958>

Cabral and colleagues (contribution 9) analyzed teacher education syllabi and found that too few addresses family involvement and participation in education. Considering the importance of school–family collaboration for students' socio-emotional and cognitive development [5], this oversight needs to be rectified.

Fisher and colleagues (contribution 10) examined an alternative online short-term teacher certification program from the coordinators' perspectives. The program was devised during the COVID-19 pandemic, but due to the global teacher shortage and the need to recruit teachers fast, this study may have wide implications. The authors (re-)emphasize that high-quality teacher education preparation relies on candidate teachers' academic quality and motivation to teach, teacher educators' qualifications, and supervised "hands-on" field experience.

2.4. Teacher Educators' Professional Learning and Development

During the last three decades, the interest in higher education-based teacher educators' professionalism increased, as it became clear that the quality of teacher educators' work affects teachers' quality and, ultimately, the quality of education that school students receive [6]. The four papers of the fourth and concluding section of this Special Issue address teacher educators' professionalism:

11. Dittrich, A.-K.; Eloff, I.; Boon, W.; Weinberg, L.; Rabani Nia, M.; Mathabathe, K.C.; Agostini, E. Assessing the Professionalism of Teacher Educators in Relation to Sustainability: Developing the Teacher Education and Sustainability Scale (TESS). *Educ. Sci.* **2024**, *14*, 1000. <https://doi.org/10.3390/educsci14091000>
12. Avgitidou, S.; Karadimitriou, K.; Ampartzaki, M.; Sidiropoulou, C.; Kampeza, M. University Teaching as a Site for Professional Learning of Teacher Educators: The Role of Collaborative Inquiry and Reflection within a Professional Learning Community. *Educ. Sci.* **2024**, *14*, 207. <https://doi.org/10.3390/educsci14020207>
13. Aharonian, N.; Schatz Opppenheimer, O. 'If You Do Not Write, You Dry Up': Tensions in Teacher Educator Research and Academic Writing. *Educ. Sci.* **2024**, *14*, 972. <https://doi.org/10.3390/educsci14090972>
14. Castro Superfine, A.; Olanoff, D.; Welder, R.M.; Prasad, P.V. A Review of Research on Mathematics Teacher Educator Knowledge: Mapping the Terrain. *Educ. Sci.* **2024**, *14*, 810. <https://doi.org/10.3390/educsci14080810>

Dittrich and colleagues (contribution 11) developed a questionnaire to assess teacher educators' knowledge, attitudes, and actions in relation to sustainability. This questionnaire, which was developed with AI assistance and tested in Australia and South Africa, is a first step towards mapping teacher educators' professional learning needs and devising study programs in this area.

The next two papers deal with teacher educators' inquiry-based professional learning. Avgitidou and colleagues (contribution 12) explored the positive impact of collaborative inquiry and reflection in a teacher educators' professional learning community on their

professional knowledge construction and practices. In contrast, Aharonian and Schatz Oppenheimer (contribution 13) found that the heavy workload characteristic of teacher education colleges interferes with research and academic writing and that the advancement of teacher education institutions may come at the price of attaining teacher educators' individual goals. Finally, Castro Superfine and colleagues (contribution 14) conducted an extensive literature review of the nature of math teacher educators' knowledge.

3. Conclusions

The studies in this Special Issue portray teacher educators' "researcherly dispositions" [7], i.e., how they engage with research, apply findings to their practice, and participate in producing knowledge through research. They highlighted the importance of teacher educators and students of teaching being both research-literate as users and as consumers of research in an increasingly research-based teacher education context, as argued by Smith [8]. The articles specifically showed how teacher educators intertwine research into the following four areas: supporting teachers' professional identities, building a "third space" for student and experienced teachers' learning, building curricula to address contemporary needs, and improving their own practice. The authors implicitly viewed research and teaching as complementary pursuits, with teacher educators committed to improving both for the benefit of their students and society, rather than merely meeting externally enforced standards [9,10].

However, similar to other findings [11,12], the scale of all of the studies in this Special Issue is small, as they were all performed by small teams of teacher educators, with no evidence of institutional support in choosing research foci, forming research teams or implementing findings at the institutional level. The involvement of teacher education institutions' leadership in promoting evidence-informed practices is notably missing. Nevertheless, by systematically connecting these small-scale studies, a more comprehensive understanding of how teacher educators can integrate research into their practice and develop research-based teacher education may be achieved [13]. Ultimately, this Special Issue contributes to this endeavor in the field of teacher education.

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Article

Beginning Teachers Navigating Identity Development Transitions: Identity Motives and Commitment to Teaching

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Abstract: Beginning teachers (preservice and novice) must develop a resilient professional identity, yet high early attrition rates indicate the need for additional support in this process. Many attrition studies focus on external factors; few address teacher identity. According to developmental psychologists, identity commitments are concretized in a stepwise process, first by tentatively making them, and then by evaluating them. Most preservice and novice teachers are in a transitional stage, as they explore whether tentative commitments fit their sense of self. Our research tests the proposition that such exploration is often focused on determining whether a teaching career will satisfy their *identity motives*. We interviewed and collected self-reported written stories from 154 interns and novice teachers. Participants discussed their career choice in an initial interview and in a questionnaire focusing on recent, identity-relevant significant events administered at three points in time over a year. These career choice and written, field-based significant event stories underwent content analysis for the presence of identity motives, guided by a codebook developed for this research. This paper describes two central and innovative findings. First, identity motives are, indeed, present and highly salient in teachers' career deliberations. Secondly, we found that beginning teachers express motives differentially, vary in the salience they accord the motives, and explore motives differently according to situational context. This differentiation in focus may indicate important shifting priorities and challenges as participants navigate the transition to the field. Taken together, these findings suggest that understanding and addressing identity motives in teacher development may enable more personalized and responsive tools that support teacher retention.

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Keywords: teacher attrition; teacher education; professional identity; identity motives

1. Introduction

Early-career teacher (ECT) attrition is a perennial issue that troubles teacher trainers and policymakers alike and is a crisis that results in extensive turnover, instability, and wasted investment on the part of students, institutions, and educational systems [1,2]. Such a crisis is not unique to the world of education. Early career attrition has become an international concern in myriad fields, including the sciences, technology, engineering, math (STEM), and business sectors, with similar implications [3,4]. Many studies addressing attrition both within and outside the field of education focus on external factors such as work conditions, salaries and so on [5–7]. An alternative perspective chooses to focus on internal, psychological factors, such as personality traits, emotions, and resilience [8,9]. Such studies are mostly in retrospect, studying those who left. Given that the entry into a career is most often a developmental task that takes place during the transition from adolescence to adulthood, we join those who have studied professional identity from a developmental perspective [10]. By prospectively focusing on the identity formation processes typical of transitions, we aim to assess beginning teachers' strengthening or weakening commitment, as it unfolds.

Developmental psychology maintains that personal identity develops through iterative processes of identity exploration leading to adult commitment. Similarly, such

processes are applied to multiple identity domains, including professional identity [11]. This paper suggests the proposition that what beginning teachers are exploring is the extent to which a “teacher” identity will be able to satisfy what have recently been termed identity motives [12,13]. Identity motives drive people to adopt—or reject—identities based on the extent to which they are seen to be able satisfy “certain ways of seeing oneself” [13] (p. 406). Identifying and exemplifying the presence of these various identity motives in beginning teachers’ identity deliberations may help explain attrition and may have implications for teacher training. In this paper, we use the term “beginning teachers” to include both preservice trainees and novice teachers in their first years of teaching.

2. Literature Review

2.1. *Early Career Teacher Attrition*

Teaching is a complex, multifaceted profession that requires not only deep knowledge of subject matter, pedagogy, human development, and context, but also a strong, resilient, professional identity to sustain the teacher through a productive career. The high turnover rate among teachers within their first five years, with 31% leaving in Israel [14] and over 44% in the United States [15], seems to call into question the strength of teachers’ professional identity. Similar trends are seen globally [16–19]. This turnover incurs significant costs in pedagogy, educational continuity, and replacement efforts, exacerbating a documented global teacher shortage [20,21]. Indeed, Kelchtermans [22] maintains that “as an educational issue teacher attrition and retention refers to the need to prevent good teachers from leaving the job for the wrong reasons” (p. 965).

Many studies on the reasons for teacher attrition have focused on environmental and contextual factors, such as work conditions, preparation and induction, relationships, and school culture [15,19,23]. Fernet and colleagues have sought to define mechanisms of behavioral motivations—controlled or autonomous motivation, and the scale from intrinsic to external regulation—as they relate to the abovementioned elements as well as others, such as burnout, psychological health, attitude, and classroom behaviors [24–26]. Carmel and Badash [14] maintain that “[a]ttrition is also a process related to identity making and development in the workplace” (p. 150), although here relating to a teacher’s social and group identity rather than personal identity.

Despite being underexplored, researchers have long acknowledged the need to understand teacher identity development in both personal and professional contexts [27]. Rodgers and Scott [28] called for empirical studies to shed light on the psychological identity shift that novice teachers experience, and for research partnerships between teacher educators and developmental psychologists, and some work has been carried out in this vein [29–31]. The current research seeks to promote another level of understanding, by considering the identity development stage of many preservice and novice teachers and analyzing the role of identity motives as they explore their career choice and current experiences.

2.2. *Identity Development of Early-Career Teachers*

The literature about the professional identity development of early-career teachers is plentiful and rich [32–38]. However, as Beijgaard et al. [39] note, the multiplicity of definitions, disciplines, research methods, and perspectives makes it difficult to systematically characterize teacher identity. As will be explained, the current study seeks to provide one possible avenue that can help resolve such disparities. Nevertheless, there is currently a consensus that “[p]rofessional identity is both personally and contextually shaped, that is, if we understand the professional knowledge and skills that are important to the profession to be as part of context” [39] (p. 766). Thus, the work of building a professional identity involves consciously integrating one’s inner life with the knowledge, content, and practice of teaching within the proper context [40–42].

Many studies have sought to ascertain how this goal may be achieved. Within Rodgers and Scott’s [28] psychological shift noted above, they propose “that teachers should work toward an awareness of their identity and the contexts, relationships, and emotions that

shape them, and (re)claim the authority of their own voice” (p. 733). Examining a similar negotiated space, Garner and Kaplan [30] focus on the interconnectedness between teacher learning and teacher identity development. The interplay between building personal and professional identities has been plumbed in teachers’ stories to live by, or identity narratives, about the negotiation between personal identity and professional context [32,39,43]. Leeferink et al. [44] examine identity development in the context of the workplace, and what happens in this space when personal identity is aligned or in conflict with professional identity. In each of these examples, a type of shift occurs as a result of the negotiation between the internal world of the teacher and the external context of the classroom and school.

Recently, researchers have worked to identify characteristics, themes, and concerns of early-career teacher identity [38,43,45]. Skills and knowledge related to content, pedagogy, and classroom management understandably occupy novice teachers to the point where they become relevant to identity formation, for better or for worse [35,46]. Mommers et al. [46] found that success in these areas within the classroom as well as participation in school-wide initiatives build confidence, facilitating a positive teacher identity that carries over into relationships and other aspects of school life. Not surprisingly, they also found that exhaustion and stress from the magnitude of the job are detrimental to professional identity. Reflecting on failure in the classroom offers valuable insights into teacher beliefs and identity [42]. The teachers in Lutovac and Flores’ [42] study viewed their failures either as an opportunity to learn, grow, and change, or, conversely, as proof of their unsuitability for this career. Moreover, relationships with students, colleagues, and administrators often reveal similarities and differences in values, beliefs, and approaches that influence professional identity [37,46]. In summary, beginning teacher identity is a deeply personal journey impacted both by the teacher’s characteristics, beliefs, values, and life experiences and by the classroom and school in which they teach, which may either strengthen or weaken it [35,38].

The current study builds upon this conception of identity construction from the perspective of developmental psychology. We agree with Schaefer and Clandinin [43] who found that “[beginning teachers] were questioning their personal and professional identities, . . . but also an attention to how who they were as teachers was entwined with who they were as people” (p. 57). This questioning is an integral and necessary part of the identity development of emerging adults, according to developmental psychology. Utilizing current theories of identity development can provide an established theoretical and empirical framework for understanding Rodgers and Scott’s [28] psychological shift that occurs in the negotiated space between the internal life of the teacher and the external context. Furthermore, motivated identity construction theory suggests a plausible mechanism for how this psychological shift occurs during identity formation. Hence, the current study explores the space where this shift occurs through identity development and motivational processes.

2.3. Identity Development from an Eriksonian Perspective of Developmental Psychology

Most identity research in developmental psychology today rests on the seminal work of Erikson’s [47,48] life-span theory of psychosocial development. Erikson posited that identity development is a crucial developmental task that takes place as adolescents mature to adulthood and need to take on the responsibility of adult roles in stewarding and caring for the next generation. Erikson posited that a meaningful productive adulthood is predicated on constructing a relatively integrated and coherent identity based on a review and reconfiguration of past childhood identifications, in a way that provides an invigorating sense of personal sameness and historical continuity, which can then imbue future adult life with purpose, direction, and fidelity to chosen roles [49]. The occupational domain is one pivotal arena in which identity is formed, as work roles are a fundamental source of adult meaning [10].

A half-century of empirical research in developmental psychology [50–52] largely implicates the processes of exploration leading to adult commitments as the fundamental pillars behind identity development. Exploration is defined as actively examining alter-

natives to make commitments and also as an impetus for changing the strength of those commitments [53,54]. Commitment has been defined as “the degree of personal investment the individual expressed in a course of action or belief” [51] (pp. 33–34). Building on these concepts, researchers today refer to more nuanced identity development processes [52,55–59], that further define and extend these two basic concepts of exploration and commitment. Recent, process-oriented theories hypothesize that there are iterative cycles of exploration and commitment, in which one makes an identity commitment and then either reconsiders one’s commitment, or otherwise checks for its continued suitability [50,55–57]. It is this transition from exploration to commitment that we wish to elucidate in this paper, as it is relevant to the critical mass of beginning teachers around the world as they choose their career for the long term.

Interestingly, much of the empirical research on exploration has focused on who is likely to explore, how well they explore, and whether individuals are exploring or have explored, but not on what happens in the exploration process itself that eventually culminates in commitment [60–63]. Measures in various identity process questionnaires assess the actions respondents take in exploring (i.e., thinking, considering, talking, or self-examining), but not the criteria applied to the contents of the identities explored (U-MICS; DIDS) [57,64]. Various theories propose criteria that people weigh during the exploration process [61,65–67]. Our current research focuses on the theory of Vignoles [12] whose concept of identity motives (e.g., meaning, efficacy, belonging) suggests that “people will typically desire and strive for forms of identity that satisfy these motives, whereas they will typically dislike and try to avoid those that frustrate them” [13] (p. 405). Thus, a potential identity might be adopted to the extent that an individual perceives it as being able to satisfy an important motive, or discarded, if not.

2.4. Identity Motives

One innovation of the current research is to examine whether Vignoles’ [13] identity motives function as standards against which individuals measure the fit between their lives and the contents of their chosen professional identity. If so, we might be able to understand why a certain identity is deemed suitable or not. Such a function has not previously been tested with respect to exploration in depth and identification with commitment. However, the nature of identity motives provides adequate reasons to do so.

Motivated identity construction theory (MICT) presents six identity motives (self-esteem, continuity, distinctiveness, meaning, efficacy and belonging) which underlie how people want to see themselves or how they perceive their identity [12]. According to Vignoles [12],

“The theory predicts that people in all societies will be motivated not only to see themselves in a positive light (the self-esteem motive), but also to believe that their identities are continuous over time despite significant life changes (the continuity motive), that they are distinguished from other people (the distinctiveness motive), that their lives are meaningful (the meaning motive), that they are competent and capable of influencing their environments (the efficacy motive), and that they are included and accepted by others (the belonging motive).” (p. 412).

MICT researchers theorize that people express the relative importance (perceived centrality) of identity elements associated with satisfied identity motives in their lives, as well as emotional satisfaction with their identity, and, ultimately, they would act on it (identity enactment) [12,13].

MICT was developed from motives originating across the diverse field of motivation and, as such, are not unique to the field of identity [12,13]. Moreover, many types of motivation have been studied in relation to myriad contexts, including those of typical identity domains such as career, interpersonal, and societal relationships [24,68,69]. The current study, however, places identity motives at the center, examining the impact of the entire framework on professional identity. Some studies have centered on just one or a few identity motives [70,71], while others have investigated all of the motives together [72,73],

often addressing general, personal, or group identity. Manzi et al. [74] examined the extent to which an individual's identity motives were satisfied by the organization's identity; and Sonpar et al. [75] researched the relevance of former to current roles after a career transition, respectively. Both studies explore group identity in depth. The current study takes a different path, exploring the satisfaction or frustration of identity motives in the inner world of beginning teachers on an individual basis, as they evaluate their career commitments.

The function of identity motives as standards by which a person gauges the fit between her identity and her commitments may provide unique insight into professional identity development. MICT may help to determine the extent to which an individual identifies with the chosen commitment of teaching as a career; in other words, the extent to which experiences in teaching satisfy an individual's identity motives may increase the strength of the commitment and, thus, contribute to teacher retention. Furthermore, identity motives may help us to understand what happens to teacher identity when identity-relevant issues arise. Identity issues—with their concomitant negative emotions and struggles—trigger dissonance between one's identity and the reality of the moment and can call commitments into question [76]. If we understand which identity motive is threatened, we might be able to uncover the nature of the identity conflict as well as the ensuing response (i.e., increase or decrease in commitment).

3. The Current Study and Research Questions

This paper focuses on the presence of identity motives in the discourse of beginning teachers, through interviews about choosing their career and through reflections on recent, identity-relevant, significant events related to teaching assessed via questionnaires. Each individual explored different personally valued identity motives; however, we suggest that this exploration helped them to ascertain how much their teacher identity allowed them to feel that their identity motives would ultimately be satisfied. To study these issues, we asked the following research questions:

- i. To what extent are identity motives salient in beginning teachers' identity deliberations, and how are they represented?
- ii. How do teachers articulate their identity motives when discussing their career choice versus when discussing current, identity-related field experiences?

This qualitative research study will allow us to exemplify and specify the role of identity motives of teachers vis-à-vis the identity transition that these teachers are experiencing [77].

4. Methods

4.1. Research Design

The current paper presents the qualitative data and findings from a larger study. A semistructured interview about career choice initiated the research. Subsequently, participants were asked to write about significant, identity-relevant field experiences at three different times over a year. The methodology of collecting career choice stories and identity-relevant stories from the field was chosen in order to examine multiple experiences of each participant, which were analyzed on a per-story basis—as opposed to per-person. This methodology allowed us to better assess the salience of identity motives in career choice and in immediate field experiences across the sample population.

4.2. Participants

The sample comprised 154 student interns and licensed teachers with 1–3 years of classroom teaching experience (78.6% female, 20.8% male, 0.6% not indicated), ages 21–35 ($M = 27.2$, $SD = 3.4$) in Israel. Students and teachers were from a variety of ethnic and religious backgrounds, including Jewish (90.3%), as well as Muslim, Christian, and Druze (9.7%).

The parameters of the current study required that participants fulfill certain demographics regarding age, commitment to the field, and experience. First, we asked for participants between the ages of 20 and 35 at the beginning of their teaching career. Secondly, we sought participants who had already made a commitment to the field by completing an

internship (a required step before earning a teaching license) or by currently working as a licensed classroom teacher. Finally, it was important that licensed classroom teachers have no more than three years of experience, so that we could hear their identity evaluation deliberations regarding their commitment to remaining in the field before reaching the five-year mark. Those who did not meet these requirements were not accepted to the study.

We wanted the sample to represent the entire range of beginning teachers (i.e., from preservice to licensed novice teachers) entering the profession. We did not expect significant differences in the contents of their exploration; as expected, our comparisons show only very slight differences between the groups, both in terms of age and in terms of status (preservice vs. novice teachers).

Participants were recruited from 35 universities, colleges, and other institutes for teacher training, as well as from schools, area-wide workshops for novice teachers, and young adult centers throughout Israel. All research participants taught in educational frameworks associated with the Ministry of Education from preschool through high school. The educational frameworks included mainstream, special education, and at-risk populations.

4.3. Data Collection

4.3.1. Preliminary Interview

A 45 min semistructured interview was conducted with teaching interns and novice teachers focused on their career choice from a broad lifespan perspective. They were asked to share two stories: one about a meaningful event or period of time in their lives after which they were certain that they had chosen the right career for themselves as a teacher, and another event or period when they were conflicted or uncertain about their career path either in teaching or in another profession they had previously considered. Follow-up questions were asked and, at times, additional stories were requested. The career choice stories provided a window into a person's identity motives and professional identity during this decision-making process, before being tested in real time in the field (see Interview Protocol in Supplementary Materials S1).

4.3.2. Recent Event Questionnaire

This questionnaire was a mixed methods instrument which requested participants to provide qualitative data in the form of a written narrative regarding a significant, professional identity-relevant experience from the recent past, as well as to answer quantitative Likert-format items about this event. Modeled after micro-level commitment dynamics questionnaires [78], it was developed to capture beginning teachers' immediate identity deliberations in the field for the current paper and, within the context of the larger research study, to provide a more complete picture of the relationship between identity motives, exploration, and identification with commitment. Furthermore, by helping teachers to focus on and analyze a specific event, this questionnaire made it possible to examine the here and now of lived-life, cumulative experiences that contribute to identity development [79].

The questionnaire was administered in three waves. Participants were asked to write about a recent significant event that impacted their professional identity. They were asked open questions about their experiences (such as "What made this event significant for you?" and "How did you respond to this event?") and their professional identity ("How did this event impact how you see yourself as an education student or teacher?"). In addition, there were closed items that measured satisfaction of identity motives as well as exploration and commitment levels with respect to real-time experiences; however, these data were not addressed in this paper (see Supplementary Materials S2 for Prompts for Written Stories).

4.4. Procedure

Ethical approval was received by the researchers' university. All participants were provided with a written explanation of the research, process, and expectations, and provided informed consent.

Participants provided demographic information and were then invited to a synchronous, online interview. Each semistructured interview lasted between 30 and 70 min. Immediately following the interview, participants were sent an in-depth, quantitative background questionnaire, the data of which are not included in this paper.

Participants were later asked to complete three “recent significant event” questionnaires, each emailed approximately one month after the previous one was submitted.

A final quantitative questionnaire was sent one month after the last “recent significant event” questionnaire was completed. The data from the final questionnaire are not part of this paper.

4.5. Data Analysis

Content analysis of all the preliminary interviews was performed independently by two or three researchers out of a pool of four, utilizing the codebook described in the next section. Written stories were analyzed by one or two researchers. Reliability for all coding will be addressed below.

Codebook

To create the codebook, an analysis of 35 pilot interviews was performed, assessing for the presence of the six original identity motives of Vignoles et al. [12,13]. This analysis revealed the need to adapt Vignoles’ original model for the sample population of teachers and for the educational context. The motive of self-esteem was eliminated, as it seemed to point to other more specific motivations, and two new motives were added, resulting in seven identity motives.

In the pilot interviews, we identified the new possible identity motives of authenticity and orientation. First, we noticed that participants often spoke about the need to maintain a deep, inner connection to themselves and to remain true to themselves, their values, and their convictions. These types of statements were in keeping with Stets and Burke’s [80] discussion of authenticity and coherence as a self-motive that is often subsumed in self-esteem. In the context of both the pilot and subsequent interviews, we found authenticity helpful in characterizing how teachers wished to see themselves. Secondly, we noted that some teachers in the pilot interviews spoke about their identity as orienting them or providing an ideology or worldview that helped them to understand themselves, their place in the world, and the important elements in life. King [81] connects these types of statements to identity exploration. Thus, we chose to add the orientation motive to the model.

Ultimately, the codebook was developed as a guide for coding subsequent interviews. Within the codebook, these seven final identity motives were further defined and explained with sample quotes from the pilot interviews. During the coding process, subsequent revisions to the codebook were made to clarify definitions and to provide additional examples for coders.

Interviews were provided to the coders in video and transcription formats. Coders familiarized themselves with each interview via one or both formats. Within each interview, coders searched for evidence of each motive. Motives were coded both when they appeared positively or negatively, as when a participant expressed frustration or doubt whether teaching would facilitate the satisfaction of the motive. Space was provided on the cover sheet of the codebook to list examples of motives from the interviews.

When coding was completed, each of the seven identity motives in the interviews was given a score on a scale from 0 to 3 for both explicitness of the motive and centrality of the motive throughout the interview. An explicitness score of 0 indicated that the motive was not found at all anywhere in the interview, with 3 indicating that it was fully explicit in many statements throughout. A centrality score of 0 meant that the motive was not central at all, while a score of 3 indicated that it was very central to the interviewee’s story, as evidenced by many examples. Scores were recorded on the cover sheet to the codebook (note: the codebook is available upon request).

Following the interrater reliability procedures outlined by Syed and Nelson [82], one of the researchers who was also part of the coding team trained each of the three additional coders by thoroughly explaining the research, research questions, and relevant concepts, with special emphasis on the concept of identity motives, and by reviewing examples. Five interviews were then coded and scored by the researcher-coder and each coder, who met subsequently to compare the coding and scores and clarify discrepancies. This process was repeated up to two additional times with each coder. The coders then continued to analyze the interviews.

Ratings of 1, 2, and 3 for both explicitness and centrality were considered to indicate that the identity motive was present and salient. A rating of 0 in either explicitness or centrality meant that the motive was not present.

On this basis, the intercorrelation coefficient (ICC) for three coders was calculated each time that 10 interview analyses were completed, until we reached 70 interviews (46% of the total number of interviews) and little change in the ICC was noted. The final ICC was 0.67 for one group of three coders and 0.70 for the second group (SPSS, Package 28, 2-way random effects model, average measurement, absolute agreement definition).

The written, self-reported recent significant events were analyzed and coded simply for the presence of each of the seven identity motives. Because these events were usually recorded in very few sentences, detailed analysis was not possible. Only one score was given per motive: 0 if there was no evidence of the motive, and 1 if the motive did seem to be present. All of the written events were coded by one “Gold Standard/Master Coder” [82]. Per Syed and Nelson’s [82] procedure, a second coder rated 30% of these events to check reliability. The ICC for two raters (SPSS, version 28, 2-way mixed effects model, average measurement, absolute agreement definition) was 0.75.

5. Results

The goals of this stage of the research are to examine if and how beginning teachers evaluate the suitability of their career choice by assessing the extent to which teaching will be able to satisfy their identity motives. Two findings are presented. First, we find that all identity motives were ubiquitous and relevant in career choice (preliminary interviews) and in current field experiences (written recent significant events). To illustrate this finding, we exemplify each of the seven identity motives in the lives of preservice and novice teachers through their oral and written career stories. Secondly, we find that beginning teachers express motives differentially, vary in the salience they accord the motives, and explore motives differently according to situational context, which we will also demonstrate.

5.1. *The Salience of Identity Motives in Career Choice and Field Experiences*

The present study confirms that identity motives were both easily identifiable and very salient in novice teachers’ verbal and written career stories. Based on content analysis using the codebook, each interview mentioned up to five out of seven possible identity motives which were given ratings of explicitness and centrality of 1, 2, or 3. As detailed above, any motive that received a rating of 0 either for explicitness or centrality was not included for the participant. Furthermore, one to three identity motives were present in each of the self-reported, written, identity-relevant, real-time experiences. Again, presence was determined by the coder as being evident in the written story (one score only). In both sets of qualitative data, teachers revealed different combinations of motives with varying degrees of explicitness and centrality in their reflections. Table 1 below indicates the frequency each motive was mentioned in the interviews and in the self-reported, written, identity-relevant events. It should be noted that 154 participants were interviewed, and the results of those interviews are included in the table. Of those 154, 25 left the study after the interview but before completing additional questionnaires. The remaining 129 provided one, two, or three written events during the intermediate waves of data collection. Participants who did not provide three written events either have not yet completed their last questionnaires, declined to write about an event, or left the study.

Table 1. Presence of identity motives in career decision interviews and in self-reported, written, identity-relevant events (percentage of N, in descending order according to salience in interviews).

Identity Motive	Percentage of Interviews in Which Identity Motive Is Both Explicit and Central (N = 154)	Percentage of Written Events in Which Identity Motive Is Present (340 = N)
Meaningfulness	92%	66%
Efficacy	65%	75%
Continuity	62%	1%
Belonging	55%	44%
Authenticity	51%	56%
Distinctiveness	21%	14%
Orientation	16%	12%

As can be seen in Table 1, we found that teachers spoke and wrote about identity motives quite often regarding career choice and current field experiences, with meaningfulness mentioned at least once in 92% of the interviews and 66% in written stories, efficacy and continuity mentioned in 65% and 62% of the interviews, respectively, and 75% and 1% in written stories, belonging and authenticity, hovering around 50%, orientation (16% and 12%), and distinctiveness (21% and 14%). Thus, we see that in reporting identity deliberations pertaining to both career choice and field experiences, meaningfulness, efficacy, belonging, and authenticity were the most salient motives cited. Continuity appeared to be important in career choice but almost nonexistent with regards to in-field experiences.

To demonstrate how the salience of the seven identity motives is represented in teachers' identity deliberations, we will now present passages from interviews and written recent events. Please note that the quotes provided below were coded within the interview or the written event as explained above and were chosen according to the following criteria: (a) If the quote was taken from an interview, the identity motive which it exemplifies was rated as 2 or 3 for both explicitness and centrality. (b) Each excerpt from a recent significant event was representative of the identity motive indicated and chosen for the clear presence of the motive as determined by the coders.

5.1.1.1. Meaningfulness

The meaningfulness motive was the most prevalent motive among preservice and novice teachers, evident in 92% of the interviews and 66% of the written significant events. Most participants expressed meaningfulness as the desire to have an impact on their students and/or to effect change in their society. For example, both Khaled and Rivi were among those who saw themselves as agents of change. Khaled initiated processes of change with his students. Khaled is a student intern. He shares his experiences in his school:

“I’ve recently been given the role of a homeroom teacher. Now . . . I feel that I am going in the right direction: I speak with the students, I guide them to the right path. . . [I ask] how they look at their lives, what are they thinking? How should they live? They’re young, and I’m guiding them. . .”

When a group of girls began to misbehave more frequently, Khaled took them aside and spent time speaking with them. As he related,

“I felt like I changed their entire direction in life. They were problematic at first, but after we met and after the short talk I had with them, they started getting along better with the teachers, with the other students, their grades improved a bit, and personally, within themselves, they became a bit more content, they started changing . . . what’s inside, what’s within them. They started with a good heart and began to think more positively about their future, what they want to do with their lives. They didn’t know how to answer that question before, but

now they could. They knew where they wanted to go in life, and all this came from a short conversation. I sat with them for an hour, a whole lesson. . . I felt at that moment that I was truly in the right place.”

Khaled was able to see the changes in his students as a result of his investment in time; their behavior and learning improved, and they began to develop a vision for the future. With the increased assurance that teaching could satisfy his need for meaningfulness, he felt that he was in the right career.

Rivi is a student intern and special education teacher. As she told us,

“I really love guiding them through all the processes, especially behavior modification, where I invest everything I have. . . because I really feel I just want to create change and lead them to a much better place. Specifically, children that many people shy away from, even other teachers who are a bit more experienced than me take a step back from them because they are very complex with many outbursts. Others prefer not to deal with it. This is exactly where I see myself working.”

Rivi provided additional details about how she defined her role:

“In special education, the class has six students. . . I just want to try to find in each student what they are best at or what they need the most help with . . . and try to raise them up, give them that push from behind so they can keep running on their own. That’s what I call helping. . . I believe that an adult or a teacher or someone the child loves, not just someone who is there, a significant figure for the child who comes, believes in them, and pushes them will give them a lot. I want to try to be that person.”

Rivi works with her students to improve their daily lives—as well as the lives of their families. Change will come in the form of decreased frustration, improved behavior, and a calmer home life for the families. Her work as a classroom teacher provides her with a sense of satisfaction that she is meaningful to her students and families.

5.1.2. Continuity

Continuity can be considered from two possible angles: the first, as Erikson’s concept of sameness and continuity, i.e., the belief that one’s identity is continuous and connected in meaningful ways across time despite significant changes in one’s life; or, secondly, as the integration of the different roles in one’s life [13,31]. These angles were presented as salient to exploration in 60% of the interviews but only in 1% of the recent events.

For example, both Tali and Yael used autobiographical reasoning to explain their choice of teaching as a continuation of their childhood. Tali, an elementary school teacher, explains how her experience with a significant teacher from her own childhood shapes her current identity. She strives to give her own students exactly what she received from her teacher.

“There is always a hope that the children will grow up and remember you as a significant teacher for them. Now, what do I do to make that happen? . . . for me, it’s very, very important to include everyone, to love them, hug them, and to give each child their own place. So I think [my teacher] did that well. I remember receiving a lot of love from her. She showered us with love. And I take that very much to heart. I take that with me now to [my class]. She. . . placed me on the path I’m on and made me who I am, and she did a good job.”

Yael, a kindergarten teacher, recalls that she naturally gravitated towards the world of children and education early in life:

“So, when did I decide to become a kindergarten teacher? First of all, since I was a little girl, I have always loved children, I loved engaging with children and doing activities with them. Ever since elementary school, I used to run summer

camps for kids a year or two younger than me during summer break. I was always involved with other children. . . . After that, I would babysit children, then I worked at a daycare. . . . While volunteering . . . I spent two years in kindergartens, saw the work of the teacher, worked closely with her, and spent more hours in the kindergarten. . . . then I worked a bit more as an assistant . . . until I completely decided that's it. And I am happy I came to this profession, after this journey. . . ."

Here, Yael's connection and experience with children from an early age led her to explore the field and its inner workings until she made her decision to become a teacher. She sees herself as continuing who she has always been—as a child, teenager, volunteer, employee, student, and now as a teacher. The fact that this is experienced as continuous gives her confidence in her commitment.

5.1.3. Authenticity

The identity motive of authenticity is the sense of deep inner connection to "who I really am" [80] as many teachers stated. The individual senses that their choice in career reflects an inner truth; that they are not an imposter in the role that they have chosen. Many people expressed this motive in a strong desire to maintain integrity and loyalty to an inner image of self despite challenges. This motive was present in 51% of the interviews and 56% in students' and teachers' self-reported written, significant events.

Omer, a student intern, teaches in a high school. She initially resisted becoming a teacher, because she felt the system failed her and she did not want to conform to her teachers' ideas of a socially acceptable profession. Ultimately, she discovered that she liked teaching and creating safe spaces for her students "to be whoever they are". Omer was driven by the identity motives of both authenticity and continuity. Continuity was manifested in her aspiration to support her students, to compensate for what she did not have in school. However, she also describes being compelled to find peace with herself and to maintain integrity between her values and actions. This adherence to authenticity characterized her identity as a teacher. She describes telling her students, "I bring who I am, so you bring who you are. And I'll help you".

Omer paints a picture of a classroom informed by her own sense of integrity and honesty:

"I teach very true to myself. The same morals that I run my life with, I run the class with. Honesty and integrity are so important to me, which is why I tell the students if I'm having a [difficult] day. 'I don't have [extra] energy to police you.' . . . I don't believe in being [short-tempered] with them and them having no understanding [of my situation]. . . ."

As she expressed many times during the interview, Omer places a high value on integrity as a cornerstone of the classroom relationships: "I think that's the only way to build an honest relationship in which I can teach, and they can come to me". Her understanding that she can be authentic allows her to feel comfortable with her identity as a teacher.

Molly is a special education teacher. Like Omer, she feels strongly about bringing her true self to the classroom and succeeds in doing so with her students. Molly did not grow up thinking that she wanted to be a teacher, but she was always involved in educational leadership roles. In elementary school she helped teachers and other students in younger grades. She was a youth group counselor, a student council representative, and more. It was important to Molly to help others and to maintain the values that her parents taught her. She frequently expressed in her interview the drive to uphold her integrity, to be honest, and to bring herself fully to class. Here, in a recent, significant event, Molly discusses a conflict that arose for her as she sought to maintain her integrity:

"I had my first observation lesson, . . . and I chose not to put on a fake show but to truly show how I conduct a daily lesson. So, there wasn't some game I invented, but a complete lesson from start to finish, which included all kinds of strategies. . . . For the principal, it wasn't enough. She said that theatrics were

missing, it was too quiet and calm, it was pleasant, but she expected a ‘wow’ factor. This disappointed me because I presented myself in the most honest way and didn’t try to impress with something out of the ordinary. . .”

Molly’s need to be authentic and the principal’s expectations generated conflict. She wanted the principal to see the depth of what she gave to her students and how much the children enjoyed her lesson, without theatrics that in her opinion would have been inappropriate. As Molly stated:

“And this is who I am. . . I felt a bit of disappointment and confusion. How to play the game? I didn’t come to play. I came to teach, to educate, to listen. It’s true that I can improve, and I’m always open to criticism, but I felt that the criticism was focused on the trivial and not on the central issue. . . I’m very true to myself but still feel that the principal doesn’t know what I give and how much. Maybe my lessons are boring in her eyes, but I know that the children really enjoy and love them. And that’s what’s important! However, it also made me reconsider my future in education.”

Molly needed to remain true to herself in her teaching and struggled with “playing the game”. Her identity deliberation was whether teaching would enable her to express authenticity. The ability to bring herself to the profession and express who she is would lead to the sense that the career fits; otherwise, perhaps the career is unsuitable.

5.1.4. Orientation

The identity motive of orientation indicates the need for an identity that provides a compass that enables an understanding of who one is or what is important in this world [81]. This motive is less prevalent and was mentioned in 16% and 12% of interviews and written events, respectively. Zohar is a religious studies teacher in an all-girls high school. He discusses his orientation motive in terms of mission. When he sought advice about whether he should pursue teaching as a career, he came to several realizations:

“I need the work with the students. I need the mission. I need the interaction. . . In the process, it really made me feel like [my] feeling is correct. It’s not just a feeling, and I went for it. . . I feel that being a teacher has an additional mission. It’s truly a primary mission to build the world, the future, to build our next generation. This mission at school really spreads across several areas. It encompasses the child’s domain, a mission for the child that I want to educate to grow up . . . with values and character and good manners. . . . We have a wide variety in class, and that’s the great mission: to shape the next generation and also to help here and now, both the family and the child.”

Shaked, an elementary school student intern, also speaks in terms of her mission in the world as she reflects on moments when she realizes that teaching is the right career for her.

“ . . . I feel that every time I go to [my class], it’s a mission. . . . [Teaching] is not an easy profession, really not easy. Today every [class] is full of children, and you really need to know the way to reach each child. This mission—in essence, I can say that for example, I work in a school that is far away [from where I live]. I travel 45 min [each way]. But I wake up every day with the feeling that I am doing what I love, that I have found the profession that is exactly right for me, that this is my role in the world.”

We see that for both Zohar and Shaked, their chosen careers in teaching “orient” them in the world. They express this orientation in terms of a mission that perhaps overlaps meaningfulness but goes well beyond it; while there are certainly elements of contributing to others and doing something important, their use of the word “mission” contains a vision and type of compass to orient them. For Zohar, being a teacher imbues him with a mission to inculcate values in his students; Shaked’s mission is to reach every child. We see from

their reflections that the teaching profession orients both Zohar and Shaked, providing them with purpose and direction in the world.

5.1.5. Distinctiveness

The identity motive of distinctiveness has been defined as “the degree of perceived difference between oneself and others in personal characteristics” [83] (p. 153). People who ascribe to this motive often make statements about the need to feel unique or that they bring skills, talents, or qualities that others do not have. Rania, an English teacher, considered a career as a pharmacist but rejected that career. In her words,

“I would have been like the others [in this field], there is nothing there that I can see myself doing. Routine, going to work and coming back, going and coming back, like the others. ... There is nothing there for me. ... Because I want to create change, for the students, for myself, not just like the others, just going, giving medications, and going back home. Routine, it’s a routine.”

In choosing teaching as her profession, she knew that she would develop relationships with her students, unlike with customers in a pharmacy. Rania sought to be a significant figure that her students will never forget:

“In teaching, over the years, I will have a personality with presence. ... I will stand in front of a class, not in an office, work with the students in the classroom, I will have a presence. Charisma. Someone who stands in front of the class and teaches year after year, I love that. ... In school, they will see me, and they won’t forget me. Maybe the students will love my class and learn. ... maybe I’ll make games with the material in the lesson, so they will remember me, and not just the material, but the values and the education too.”

While Rania’s drive to have a presence in her students’ lives sounds very similar to the meaningfulness identity motive, it is her emphasis on charisma, being an unforgettable, influential teacher, and the insistence on following a different path than others that caused us to acknowledge her distinctiveness.

Yoav is an intern in a junior high school. The son of educators, he says that he swore that he would never become a teacher but discovered that this was a path that could integrate his various interests and strengths. During the interview Yoav noted the differences between himself and the other teachers in the school, and he explained:

“So, uniqueness is ... something that took me time to agree to acknowledge. Especially when I understand that there’s something special here, that I’m bringing something new. ... The principal said it’s the ability to see the students ... as they are. But not just to accept them or agree to accept differences, but really as they are. Not trying to change their lives from what they want to be. ... But truly helping them grow into the life that’s good for them, not for me or the establishment or anything like that. This seems to me to be the key point, because part of it is that I’m a very honest person. ... And part of that is also allowing myself, as I said, to send weird songs or speak in a more relaxed language.”

Yoav also says that it is his youthfulness, the fun, humor, and creativity he brings to his lessons, and his willingness to discuss sensitive topics. He constantly searches for innovative ways to help his students learn, such as through two-minute podcasts of all the material for a matriculation exam. Finally, he says,

“It’s also the ability to touch people, the ability to talk to them eye-to-eye, to get close to them. To be the teacher ... that the most challenging students feel comfortable with. They will turn to me even if they have a grudge against the entire staff, they will see me as a friend. That seems to me to be the uniqueness.”

Despite his initial reticence to label his distinctiveness, it is clear that this is one of the motives that drives his identity, perhaps alongside authenticity; now that he has come to recognize it, he uses it to connect with his students and to help them succeed.

5.1.6. Belonging

The identity motive of belonging “refers to the need to maintain or enhance feelings of closeness to, or acceptance by, other people, whether in dyadic relationships or within in-groups” [12] (p. 310) and “. . . that they are included and accepted by others. . .” [13] (p. 412). Marwa and Sarah both expressed the identity motive of belonging, Marwa in her field experiences and Sarah in her interview.

Marwa is a student intern who teaches English. Her internship was fraught with many difficulties, and she often felt that she struggled alone. She describes one of her experiences as follows:

“A conversation with the school counselor after an incident with one of the students provided me with emotional support. From the beginning of my work at the school, I felt lost and alone, unable to stabilize myself. When an incident occurred, and I found support from the counselor, I calmed down. . . . I felt that I was not alone and that I had someone to turn to and share my difficulties. As an English teacher, it didn’t really help me (~the pedagogical aspect), but there was emotional support at that moment when I wanted to run away. After I talked to the counselor, I calmed down and started thinking differently.”

Marwa mentioned the desire to run away often in her interview. The challenges she faced seemed to evoke feelings of embarrassment and helplessness, with no place to turn. As with many interns and novice teachers who participated in the research, Marwa’s motive for belonging intensified with the difficulties she experienced, and the support was critical to her feeling able to return to her duties.

Sarah was already well into her internship, teaching English in a high school. While we noted that her successes satisfied her sense of efficacy, her identity motive of belonging was also salient. Her negative experiences with the teaching staff and administration already caused her to reconsider her position as a teacher in the school.

“I grew up in a place that was more family-like, . . . where you see smiles in the hallway, not a huge institution where no one knows anyone. The atmosphere is very important to me. . . . The atmosphere in the staff room is important to me. I want someone to talk to in the teachers’ room, to have conversations beyond just teaching. Saying hello in the hallway, these are such small things, but I miss them a lot today.”

Sarah focused on her sense of belonging in one of her self-reported, significant events, which demonstrated its importance to her:

“Finally, they spoke to me in the teachers’ lounge. Until now, they hadn’t really talked to me, and suddenly one day, several teachers spoke to me. It was really nice and gave me a sense that I am not alone because I really missed the social aspect. I felt completely alone in the system. The veteran teachers are more cliquish and don’t talk to the newcomers. I was very pleasantly surprised when they approached me; it was significant for me. I was surprised and very happy. I felt that I wasn’t alone for a moment and that I had company. It gave me hope that maybe things will be good socially as well, which is very important to me.”

For Sarah, Marwa, and the other 45–50% of research participants who indicated this identity motive as being salient to their commitment evaluation process, having their sense of belonging validated can make a tremendous difference in their experience.

5.1.7. Efficacy

Vignoles [13] defines efficacy as believing “that they are competent and capable of influencing their environments. . . .” (p. 412). Sixty-five percent of the interviews and 75% of the written recent significant events mentioned this motive. We will first give an example of what the identity motive of efficacy looks like in one teacher’s life as reported in the interview; then we provide examples of efficacy from a different teacher’s significant events.

David comes to teaching from a different field which did not afford him the human interactions that he values. He studied in a retraining program and is currently a student intern in a junior high school. In our interview, his identity motives centered around both belonging and efficacy. He felt a sense of belonging to the staff and was well supported by other teachers. He wanted to create a connection with his students and an atmosphere of belonging for them. On the other hand, David stated that he enjoyed setting challenges for himself and then meeting them, and teaching provides such a challenge. He emphasized that the large classes proved to be daunting, and he felt conflicted between his desire to succeed and to do what the system requires of him and his goal to create community in the classroom. David expressed his uncertainty and anxiety about succeeding in his position and this conflict between the needs of the student and those of the system.

"I manage to cope. There are situations where I sometimes hesitate a bit, like I get startled, I freeze sometimes, there are situations where I kind of shy away. ... From the size, the quantity, the load, from not being sure yet, ... there's a lot of hesitation. Are you doing what the system wants? Are you doing what the student wants? There's always this balance, what the system demands on the one hand, and on the other hand, how do I create a good connection with the student? What's more important? ... there are always dilemmas. ... It's always questions and doubts, in places where you have to constantly evaluate yourself in various situations, and the situations keep changing because there are many students, many questions. ... It's very dynamic, the first year is very dynamic, it's not routine yet. ..., you're constantly learning."

David expresses what many interns might feel: that the learning curve is steep, that success is not a given, and that the experience is stressful. As he progressed through the year, his written significant events continued to highlight efficacy as his identity challenge, focusing on successful interventions with students and positive feedback from students and from his supervisor. In David's words,

"The event that influenced me was the observation lesson I conducted as part of the summative evaluation process of my internship year. It was positive and helped me understand that I am in the right place. [I chose this event] because I now know I will successfully complete the internship. There were concerns and preparations for the observation lesson: how to construct it correctly and accurately for the students. [This event] helped me to understand that I am doing my job well and that I am capable and able to meet the requirements of the internship year."

With his self-definition as someone who takes on challenges and works hard to meet them, we were able to understand that David is motivated to see himself as efficacious; furthermore, we could trace this motive from the interview through all three recent significant events.

Safa is a teaching intern in a junior high school in the south. She emphasized to us that she is driven to be an excellent teacher. In one of her recent significant events, she described a difficult situation in which students in her class began to argue and throw objects at each other. Safa related her experience as well as her reflections and actions in the aftermath of the incident:

"At that moment, I didn't know how to stop and calm the students down. This incident made me think a thousand times about whether I should teach ... It made me reconsider how I could calm the students and start observing how other teachers handle such situations. I took advantage of my training period to learn from these experiences. I felt that I might not be suited to continue as a teacher because if this happened, worse things could occur, and I don't have the strategies to manage the classroom effectively or to respond quickly in such situations."

In real time, Safa's experience was frightening and highlighted for her how much she still must learn. Following the incident, in keeping with her desire to be an effective and excellent teacher, she analyzed the situation and sought advice. Her identity motive of efficacy compelled her to learn more about classroom management so that she could handle similar situations in the future; otherwise, she might have quit.

To summarize, the examples provided demonstrate the prominent place of identity motives in the career choice and evaluation stories of preservice and novice teachers. Below, we will show how identity motives vary from person to person and how they serve different purposes in the lives of these teachers.

5.2. Differentiation in Identity Motives

In addition to the clear presence and importance of identity motives in beginning teachers' reflections on their careers, we also observed variations in how often these motives were expressed in different situational contexts, as seen in Table 1. First of all, while all of the teachers discussed some motives, none referenced them all. Secondly, when multiple motives were mentioned, some were more salient and explicit than others.

In addition, there appeared to be differences related to the situational context in which motives were mentioned. Compared to the interviews on career choice, there was a considerable change in the relative frequency of identity motives mentioned in deliberations about recent significant events. Continuity was minimally present, evidenced by a decrease from 62% in the interviews to only 1% when reflecting on recent events. Meaningfulness, while still important to many in their written events, decreased from 92% to 66% from their mentions in interviews. Conversely, efficacy increased to 75% and authenticity increased slightly in salience to 56%. Belonging, distinctiveness, and orientation decreased. Two examples of this phenomenon are given below:

- In his interview, Avi's identity motives were meaningfulness, which received the highest ratings of 3 for explicitness and 3 for centrality, and distinctiveness, which was rated between 1 and 2 for both parameters. Efficacy did not appear here. In all three written, significant events, efficacy was clearly present, along with meaningfulness and distinctiveness. Other motives were present, but in only one or two events.
- When Hadas spoke about her career choice in her interview, she referred to the identity motives of meaningfulness, belonging, and efficacy, all at low to medium levels of explicitness and centrality. However, in her written field experiences, authenticity—which was not present in her interview—and efficacy appeared in three events, and meaningfulness appeared in just one event.

Thus, through these two examples, we see how the salience of identity motives in professional identity explorations may differ according to the situational context. We delve into this phenomenon in Section 6.

5.3. Summary of Results

These results support both research questions and affirm that teachers frequently and naturally referenced identity motives in discussing their career choice and in reflecting on how significant field events impacted their identity. Not all motives were represented in all interviews or significant events; however, every teacher indicated at least one or usually more identity motives. Differences were evident in the relative emphasis accorded to particular motives, in general; moreover, this relative emphasis appeared to be dependent on the situational context in which they were revealed. In the next section, we will discuss possible interpretations and implications of these findings.

6. Discussion

6.1. Beginning Teacher Identity

This research study provided an opportunity to examine the professional identity development of preservice and novice teachers at the intersection of "the personal and the contextual", in Beijaard et al.'s words [39] (p. 766), through examining the contents of their

identity deliberations. Galliher et al. [84] advocate for studying the contents of identity in context. They maintain that “a critical component of the study of identity content is examination of the lived experiences of the individuals we are seeking to understand” (p. 2016). In the current study, we discovered a richness in preservice and novice teachers’ identity deliberations regarding their initial and real-time experiences in the field. Other researchers discovered many of the same comments and themes in their qualitative studies: efficacy and agency in the classroom [46]; relationships and a sense of belonging to the school community [37]; a sense of meaning, passion, and mission for the profession [35,38]. Moreover, there is considerable overlap between the stories from our research and others regarding the conditions under which teachers function, from compensation to workload, to conflict with the system [38,46]. We found, as did these researchers, that successes or challenges in all of these areas impact teacher identity development.

In the current study, we have laid the foundation to claim that MICT—through identity motives’ salience—may be a good candidate for a comprehensive framework with which to better understand the contents of teachers’ evaluation of their initial professional identity commitments. The existence of such a comprehensive framework may enable us to demonstrate different purposes and phases of decision making with regard to career commitment and identity. The sheer volume of references to identity motives appears to attest to beginning teachers’ desire to both build and validate their identity through their professional identity commitments. We suggest that the apparent satisfaction or frustration of those identity motives is at the heart of their evaluation of the suitability of the teaching profession as an identity to adopt and commit to. As we will discuss below, knowledge of identity motives may provide the individual and the mentor with a powerful tool for exploring identity, increasing self-understanding, and for coping with the particular challenges that each initiate needs to deal with.

Moreover, as Rodgers and Scott [28] recommended, this study demonstrates how a developmental psychology lens adds to our understanding of the identity transitions that preservice and novice teachers experience simultaneously with their induction into teaching. The beginning teachers in our study often asked themselves if teaching was the right career, in some cases expressing doubt, and in other cases affirming their career choice. Likewise, Schaefer and Clandinin [43] noted very similar identity questions. Challenges and even some successes in the classroom are often destabilizing; an understanding of identity development and motives can bolster the support required to help beginning teachers make sense of their experiences. The numerous, rich descriptions of their identity stories afforded the opportunity to both generalize the results across the entire group and to specify the individual’s journey [77].

6.2. Possible Interpretations of Differentiation of Identity Motives

Our study found that there was a range of identity motives that individual teachers deemed relevant to their own career development stories. Each teacher emphasized a different constellation of motives. Moreover, these motives appear in varying strengths and in multiple situational contexts. This finding is supported by Vignoles et al. [85], who state that “one cannot simply assume that all six motives identified by Vignoles et al. will be equally relevant here or that they will all function in the same way as each other” (p. 1167). Therefore, we sought to explain the differences from a variety of angles.

First, it must be mentioned that the difference in questions and situational contexts in which those questions were asked may have impacted the variation in identity motives. Even a short interview creates the possibility of openness and expansion, not to mention the ability to ask for clarification and to check that a statement was understood properly. The written questionnaire that captured significant events, by contrast, was often completed on participants’ cellphones, frequently resulting in very short and succinct answers. It is reasonable to expect that the differences in expression and detail would create a gap in the results. Furthermore, some identity motives were easier to identify in the written stories than others. Continuity, orientation, and distinctiveness usually required more probing

and questioning in interviews, which was not possible in the written events. The other identity motives required less sensitivity in expression and were more readily apparent. Nonetheless, it was possible to identify identity motives in both modes of data collection.

Setting aside these limitations in the data collection, there are two more principled explanations for the differentiation in the roles of identity motives. We may, first of all, attribute the differences to two different stages of identity development described in the Dual Cycle Model [55–57] which includes an initial commitment-making cycle and a subsequent commitment-evaluation cycle. It may be that the motives deliberated while discussing choosing a career (the focus of the interviews) are related to the initial commitment making phase, whereas real-time, here-and-now, classroom, and school experiences (the focus of the recent, significant event questionnaire) capture the later evaluation of the initial commitments. A second related, but slightly different, way of viewing the various roles is through the extension of Vignoles et al.'s [12,13] Motivated Identity Construction Theory. They maintain that the motives of meaningfulness, continuity, distinctiveness, and self-esteem (in the original model) are involved in a commitment definition context while belonging and efficacy are relevant to a commitment enactment context. Thus, in the career choice stories in interviews, per the Dual Cycle Model, perhaps young adults are exploring their initial commitment to the teaching profession by enrolling in a teacher training program. Conversely, per Vignoles, it is possible that the interview addresses a broad context of defining their identities. According to both theories, the prominence of meaningfulness, for example, could certainly point to a stage in which they searched for a career that would allow them to be meaningful by making a difference in people's lives and in society. The continuity motive at this stage is important as it is involved in broadly integrating the various aspects of their lives from childhood to the future or their multiple talents and experiences into a cohesive and whole identity.

The second stage in identity development according to the Dual Cycle Model is commitment evaluation. In Vignoles' MICT framework, this stage is similar to a context of identity enactment, where identities need to be performed. It is possible that real-time, classroom, and school experiences might be understood as commitment–evaluation or identity enactment. The transitions that both theories describe from commitment making to evaluation or enactment might explain the increase in efficacy and authenticity and a still-significant level of belonging in the field experience deliberations.

Efficacy and authenticity in teacher identity have been examined in other studies [86,87]. Interestingly, Golubtchik [86] noted in her findings that students entered her study somewhat overconfident about their abilities in the classroom, which might also explain the rise in efficacy motive in the current study. Furthermore, regarding authenticity, we frequently noted statements by teachers—in the face of both successes and challenges in the field—that it was vital for them to maintain their sense of integrity and to bring who they were and what they believed to their class and to their school. In the field experiences, it appeared to be slightly more important to many teachers to be authentic and competent in their career. Golubtchik [86] found that for those who reported a negative event, the inability to be themselves (authentic) or to see themselves as competent and capable (efficacious) in their work environment caused many to question staying in this career. Previous studies have shown the need to feel authentic and efficacious in the field [86,87]. By examining three dimensions of integrity in teachers—personal integrity, professional integrity, and the integrity of teaching—Santoro [87] claimed that “if teaching was a primary way to express the self and its moral commitments, . . . [v]iolating these core commitments does not simply mean living with an unsettled feeling or a sense of regret, but a threat to one's identity” (p. 581). Golubtchik [86] connects teaching, self-efficacy, stress, and job satisfaction, noting that adequate preparation has the potential to stem the tide of attrition.

Both Luyckx et al.'s [55–57] and Vignoles' [12,13,85] theories may explain these situations well. In the Dual Cycle Model, evaluating commitment via exploration (i.e., through field experiences) comes to an unsatisfactory conclusion, resulting in a negative evaluation and a lower commitment to the profession. In MICT, teachers discover that they are unable

to enact and satisfy their identity motives, a situation which also results in looking at other, more satisfactory career options.

The differentiation in roles and situational contexts of identity motives in the current study allows us to better understand the range and impact of identity-relevant experiences on novice teachers. In the next section, we will discuss how the salience and differentiation of identity motives can be utilized in the field.

6.3. Implications for Teacher Attrition and Retention with Respect to Teacher Education and Induction

The salience of identity motives brings with it several implications in the realm of teacher education and induction. First of all, it is critical to recognize that beginning teachers are at an identity crossroads and have not fully committed to this career. As such, they naturally explore, commit, and then evaluate their identity commitment [55–57]. As we lament early career teacher attrition, attributing it to conditions such as salary, education system demands, burnout, and other factors [24,88], it may be helpful to remember that identity issues are also at play. Teacher training institutions, mentors, and pedagogic advisors can help their students and their beginning teachers to navigate challenges by acknowledging the developmental stage that many are in. Moreover, equipping teachers with knowledge of their own identity development stage provides them with something solid to build on. Mentors can encourage exploration and provide opportunities to reflect on questions such as “Is this the right career for me?” “Does teaching suit my identity, or how I wish to see myself?” It is reasonable to expect that the answer may be negative; however, Kelchtermans [22] emphasizes that “when valuable teachers leave teaching as the result of a negative choice (choosing to get away from the particular working conditions in the school or in education as an institution), this does mean an educational loss and those losses are to be avoided” [22] (p. 965).

Bringing identity motives into this discussion provides teacher trainers with another tool for identity exploration. While most people are not cognizant of their identity motives, opportunities for reflecting on these motives in writing, interviews, and discussions might help early career teachers to become more aware of another level of motivation that they most likely have not considered. Many participants gave feedback at the end of the research process indicating that the interview and the questionnaires helped them to gauge their progress and to reflect on whether this career is a good fit for them. Their reactions suggest that the research tools we used might form the basis of an identity exploration toolkit.

Furthermore, awareness of identity motives can help early career teachers to understand the impact that challenges and crises have on them. Two people with different identity motives may face the same event, and for one person, the challenge may result in a frustrated identity motive, whereas for the other person, it might confirm that they are in the right profession. Therefore, if we help our beginning teachers to understand what motive is frustrated, we may be able to assist them in working through their identity-relevant issues. For example, what may appear as a personality conflict with other school personnel, or as a case of “not being seen or valued”, may actually be a frustrated identity motive. Knowledge of one’s identity motives may help the teacher to differentiate between an educational setting that is not a good match and a career that is not right. Finally, according to a considerable number of reported events, young teachers appeared to require more support from inside the school with their identity motives of belonging and efficacy. Often, these motives were not part of the constellation of motives from their interviews, yet they became much more important in the field. Auletto [89] confirms this need for collegiality and support in the school. The presence or absence of a friendly, caring colleague or a bit of sympathy and support during classroom management struggles can go a long way towards helping the teacher navigate the early years of teaching and satisfy their identity motives.

6.4. Limitations of the Study

While the development and use of the codebook was critical to carrying out this research, it should still be considered a work in progress. It is not completely in line with Vignoles' original model, and we may wish to reconsider the self-esteem motive. A second limitation was mentioned above concerning the interview and recent significant event questionnaire. Differences in the content and use of these two tools may have led research participants to the differentiation noted.

6.5. Future Directions

There are several possibilities for future directions. First, in parallel with the current qualitative study, we are conducting a quantitative study on whether and which identity motives impact novice teachers' commitment to classroom teaching. The results of the quantitative study will complete the picture of identity motives as a framework for understanding the identity transition from exploration to commitment. In addition, more research is needed to understand if the relative frequency of identity motives is different for other careers.

Supplementary Materials: The following supporting information can be downloaded at: <https://www.mdpi.com/article/10.3390/educsci14111170/s1>, S1. Interview Protocol at the Start of the Study. S2. Prompts for Written Stories in the Recent Significant Event Questionnaire.

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Article

Pre-Service Teachers' Beliefs about Children's Participation and Possibilities for Their Transformation during Initial Teacher Education

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Abstract: Pedagogy emphasises children's participation in education as a child's right and a prerequisite for learning and democratic education. However, studies show that participatory practices are not dominant in early childhood education (ECE). This calls for focused interventions during initial teacher education (ITE) to rectify this shortfall. This study examined pre-service teachers' beliefs about children's participation, exploring the effects of a targeted intervention during ITE in transforming pre-service teachers' beliefs about a participatory paradigm in ECE. Pre-service teachers from three universities completed an open-ended questionnaire, both prior to and following the intervention, as well as a self-rating scale with open- and closed-ended questions post-intervention. The results displayed the variety of pre-service teachers' beliefs, revealing the possibilities for their transformation after the intervention. The shifts observed in the pre-service teachers' thinking after the intervention showed a shift in terms of the meaning of participation, their recognition of children's abilities and rights, their ability to criticise the controlling role of the teacher, and their awareness of strategies to enhance co-decision-making processes in ECE. This study provides teacher educators with an understanding of the content of and ways to design interventions to foster participatory pedagogies in ECE during ITE.

Keywords: children's participation; early childhood education; pre-service teachers; beliefs

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1. Introduction

The need for children to actively participate in the educational process has been demonstrated in studies that connect the perception of children as social actors and capable agents [1–3], the right of children to participate in decision-making [4,5], and socio-constructivist learning theories [6]. In addition, children's participation is related to the aims of developing initiative, negotiation, democratic attitudes, and skills from an early age [7], as well as the need to “redeem democracy in early childhood education” [8] (p. 25). The definition of children's participation has varied, ranging from children simply being listened to or consulted to children actively affecting their educational experience by collectively making decisions with other children and adults [9–11].

In the preceding two decades, numerous studies have investigated teachers' beliefs about children's participation [12–22]. However, far fewer studies have explored pre-service ECE teachers' beliefs about children's participation [23], and even fewer have explored the effects of initial teacher education (ITE) on changing these beliefs [24,25].

The exploration of beliefs is important because these concepts and ideas may influence the opportunities that prospective teachers will offer in terms of children's participation in education. Specifically, the research by Avgitidou, Pnevmatikos, and Likomitrou [26] illustrated that pre-service teachers predominantly adopt a romantic or deficient view of childhood, perceiving children as either being happy, playful, and lively or immature and incapable of critical thinking, respectively. Similarly, these educators believe that children can only make decisions about simple issues and only under the guidance of adults, limiting children's opportunities to participate as capable and autonomous individuals. While this study may not comprehensively represent the views of all pre-service teachers, it is important to note that the images of children held by educators are closely connected to classroom practices and affect the implementation of children's right to participation [27].

Investigations into teachers' beliefs about children's participation have also revealed that the ways that ECE teachers give meaning to participation influence the varied manner in which they perceive children's participation and evaluate their practices as participatory [16]. Even in studies that have reported structural limitations to enhancing children's participation in ECE, such as large numbers of children in classrooms, structured curricula, and standardised assessment procedures, teachers' beliefs have been reported to be among the key factors influencing the opportunities of children to realise participatory practices [28]. The studies above show that it is worth exploring pre-service teachers' beliefs about children's participation, especially given the limited amount of relevant research. Furthermore, it is important to study these beliefs, which determine pre-service teachers' ways of understanding their observations in the classroom, as well as the educational actions they will implement. It is also crucial for teacher educators to be aware of the content and scope of pre-service teachers' beliefs so that they can intervene purposefully during pre-service teachers' education, aiming at their transformation. Beyond exploring pre-service teachers' beliefs, more studies are needed to examine whether a systematic intervention during ITE can create opportunities for a change in beliefs regarding children's participation in ECE.

Therefore, the aim of this study was twofold: to investigate pre-service teachers' beliefs about children's participation in ECE and to determine the results of a targeted intervention during their ITE that aimed to transform these for the benefit of children's opportunities to participate in the educational process.

Our research questions were as follows:

1. What are pre-service teachers' beliefs about children's participation in ECE?
2. What kind of possible changes/shifts do we observe in pre-service teachers' beliefs about children's participation after implementing a targeted intervention in the context of their ITE?
3. What kind of changes/shifts do pre-service teachers identify in their beliefs at the end of the intervention, and how do the teachers justify them?

2. The Content of Beliefs about Children's Participation in ECE

Johansson and Sandberg [23] investigated how in-service and pre-service Swedish ECE teachers perceive the concepts of participation and learning, as well as the relationship between them. They found that teachers, both in-service and pre-service, define learning and participation in a similar way: participation means being part of a group, being involved (mostly referred to by prospective teachers), listening to others, and influencing (mostly referred to by ECE teachers). When the participants were asked to describe a participatory situation, many of them indicated that participation means any purposeful activity. Most referred to play, while fewer referenced to aesthetics and circle time.

While there have been findings regarding pre-service teachers' meaning of participation, we lack more detailed information about how teachers think regarding the necessity of children's participation, what difficulties they perceive related to children's participation, and their knowledge of strategies to enhance children's participation. Teacher educators require this information in order to develop an improved and more complete understanding

of the beliefs of teachers. Based on the limited number of studies on pre-service teachers, we present an analysis of studies into teachers' beliefs about children's participation.

Regarding the meaning of participation, ECE teachers have referred to varying meanings of children's participation: children's free choice of activities, teachers listening to children's opinions regarding educational processes and making joint decisions with children [12], teachers encouraging children to make their own decisions, teachers creating conditions for children to make independent choices, teachers listening to children and understanding their way of thinking, and children's sense of belonging to a group [13,20]. Moreover, other studies have referred to ECE teachers' beliefs about participation as a child's individual choice, children making decisions in terms of their self-determination [29,30], and children simply taking part in activities [18,22]. Based on Shier's model of child participation [10], we observed that some of the beliefs found in the studies above refer to low levels of participation, such as merely referring to children's response to activities introduced by the teachers; others consider median levels of participation, such as teachers listening to children's opinions; and some beliefs refer to higher levels of participation, such as creating opportunities for children to co-shape their educational process or make independent decisions and choices. Further research has illustrated that, in some cases, ECE teachers' beliefs about children's participation can be complex, messy, and dependent upon the teachers' resources and knowledge, as well as upon contextual features [21].

Fewer studies have described ECE teachers' specific examples of children's participation. These primarily focus on children-led decisions during play [23], teachers providing guidance and explanations to enhance children's participation in activities or tasks [18], teachers discussing issues that concern children [23], children being involved in decisions about rule formation [12], and children being involved in evaluations of their work, as well as choosing stories or songs [18].

ECE teachers' assessments of the necessity of children's participation relate to whether children are perceived as being able to make their own decisions and whether their participation is viewed as beneficial to school improvement [12]. Other reasons regarding the necessity of children's participation relate to making children's learning easier and assisting in the development of socio-emotional skills [12,15], as well as motivating children [12].

Regarding ECE teachers' perceived difficulties in relation to children's participation, most of the studies revealed issues relating to structural factors, such as a lack of staff resources, space, and equipment; managerial workload; and a lack of professional competency and relevant knowledge [12,15,19,20]. The studies also showed that teachers relate children's difficulties to individual factors related to the child, such as their family or social background, their abilities, or their readiness for participation [12,15,19–21]. Fewer studies have shown that ECE teachers are aware of their own role in affecting children's participation. A teacher's role in affecting children's participation might be related to their wish to keep control over children's activities, the provision of few or no opportunities for children to participate, or the lack of a warm and supportive relationship with children [12,18–21].

Finally, studies on ECE teachers' beliefs about the strategies adopted to enhance children's participation have shown that these techniques include asking children questions, involving children in role play, listening to the child without criticism [12], recognising children's meaning-making abilities during participatory practices [31], displaying a positive response to children's ideas [12,13,18,32], encouraging and actively creating opportunities for dialogue and decision-making, and involving children in the co-design of activities and processes [13,15,16,18,20,23,31,32].

3. Supporting Pre-Service and In-Service ECE Teachers in Transforming Their Beliefs about Children's Participation

As mentioned above, few studies have examined the effects of ITE on pre-service teachers' beliefs about children's participation, with only one study comparing pre-service teachers' initial beliefs with those held post-intervention. Specifically, in her intervention with pre-service teachers during work-integrated learning (WIL), Shaik [25] included an

introduction to Shier's model of participation [10], an examination of differences among participatory and transmissive educational practices, a discussion of the developmental theories stressing children as active agents, and an analysis of the relationships between the beliefs and practices of teachers. While her research results showed positive changes in the willingness of pre-service teachers to listen to children, they also emphasised barriers, including the aim of teachers achieving their learning outcomes, the large number of children in classes, the structured ECE curriculum, and the use of transmissive pedagogies by the ECE teachers acting as mentors during WIL.

Araujo's study is also relevant since it showed that pre-service teachers' discourse about young children often changed following their practicum, shifting towards a greater identification of children as subjects with rights and agency who are thus capable of acting upon the world and who are motivated to experiment and learn [24]. The use of socio-constructivist pedagogical approaches in pre-service teachers' experimentation and reflection, as well as the close collaboration among university professors, mentors, and student teachers within a participatory paradigm, were among the reasons referred to by Araujo [24] to explain this shift in the student teachers' beliefs about children before and after the practicum.

The reconceptualisation of a child's image is a key issue in research on teacher education that aims to support the recognition of children's right to participate and, at the same time, motivate changes in teacher practices [33,34]. In addition, the prerequisite mentioned in other studies for the participatory transformation of educational beliefs and practices was the ability to recognise both children's perspectives and the influence of teachers' actions on their participation [35]. Further, teachers' achievement of self-awareness and their support within a reflective and dialogical framework [36] were reported as enhancing factors transforming their practice into a participatory one.

4. Context of the Current Study

This study was organised based on a collaboration among teacher educators in three different university ECE departments within the X program (not named for the purposes of anonymity). This program aimed to disseminate scientific knowledge about how to enhance the opportunities for children's participation in decision-making by creating appropriate materials for teachers and pre-service teachers and testing them on a pilot basis during ITE (a 4-year B.Ed). The intervention in the three ECE departments had specific aims and a common basis, content, and methodology, as well as a duration of one semester, running from September 2021 to January 2022. The research was conducted during the teaching of undergraduate courses on early childhood education pedagogy and teaching practice. The aims and content of the intervention concerned the depiction of the necessity of children's participation as a right, a prerequisite for learning, and a democratic practice. The courses also included a presentation of different meanings, types, and levels of children's participation using various theories and models, such as Shier's model. The educational process was initially organised on the basis of reflective questions, in which pre-service teachers were invited to discuss their personal theories and knowledge based on the presentation of theoretical frameworks, videos, and examples from practice. The pre-service teachers also worked within groups to identify the type of children's participation in educational scenarios, analyse influencing factors, and propose alternative actions. For example, the pre-service teachers were asked to work in groups to identify the type of children's participation in scenarios, evaluate the actions of the ECE teacher, explain how these affected children's participation levels, and advance alternative strategies.

The course activities gave opportunities to the pre-service teachers to reconceptualise their image of children, recognise children's perspectives, and discuss the different ways in which they participate and the feasibility of their involvement in ECE. Moreover, various strategies to enhance children's participation in ECE, namely Reggio Emilia, the Mosaic approach, and children-as-researchers, were presented and analysed with the use of examples. In addition, the pre-service teachers became familiar with the research and reflective

tools that were created for the needs of the program. The research tools identified specific indicators and procedures for recording children's and teachers' actions, e.g., during play or during a teacher-directed activity, in relation to fostering or hindering factors affecting children's participation. The reflective tools also included scenarios and questions that would assist the pre-service teachers in identifying their beliefs and reflecting upon them.

In two out of the three university courses in which the intervention took place, pre-service teachers in their second year of studies had the opportunity to observe how children participated in an ECE classroom. In the third case, concerning students in their third year of studies, relevant examples were utilised to relate theory to practice. The educational materials were uploaded to the course's digital platform following each lesson. At the end of the intervention, the pre-service teachers were asked to reflect upon their initial beliefs and detect changes in them.

The study therefore evolved in three phases: (a) at the beginning of the semester, an initial exploration of the pre-service teachers' views regarding children's participation was carried out using a questionnaire at the individual level; (b) a series of courses followed with an emphasis on frameworks and models that enhance children's participation; and (c) exploration of the pre-service teachers' views was repeated at the end of the semester together, with an investigation into their self-beliefs about possible changes that occurred in their understanding of children's participation to obtain information about the effects of the intervention.

5. Materials and Methods

5.1. Participants

The participants in the present study were second- and third-year pre-service teachers from three different Greek departments of early childhood education, namely the University of Patras (UPatras), the Democritus University of Thrace (DUTH), and the University of Western Macedonia—Greece (UoWM). Since participation in the study was optional, the number of participants who completed the research tools used for the study varied. Specifically, 90 pre-service teachers completed the 1st questionnaire at the beginning of the course (37 from Upatras, 16 from DUTH, and 37 from UoWM), and 79 completed the 1st questionnaire at the end of the course (22 from Upatras, 35 from DUTH, and 22 from UoWM). Lastly, 68 pre-service teachers from all universities completed the 2nd questionnaire.

5.2. Data Collection Methods and Procedure

The pre-service teachers were informed about the purpose of the study and the anonymous and voluntary completion of two questionnaires and providing their consent prior to their online completion. The questionnaires were created by the researchers. The questions in the first questionnaire were formulated to detect what pre-service teachers meant by participation and their knowledge regarding the necessity of fostering and strategies to foster children's participation in the educational setting (first research question). The second questionnaire aimed to record the pre-service teachers' beliefs about the possible changes that occurred in their understanding of children's participation at the end of the semester and explain the reasons for these changes (third research question). The 1st questionnaire included five open-ended questions, one description (example of participation), and two close-ended questions. Specifically, the pre-service teachers were asked to describe their beliefs about the meaning of children's participation (What does children's participation in the educational process mean for you? How does it become evident?), provide a relevant example (Give an example of children's participation), explain the necessity of children's participation (Do you consider children's participation necessary? Why yes/no?), describe their knowledge of teachers' strategies to enhance children's participation (How can a teacher support children's participation?), and outline possible difficulties encountered during its enhancement (Do you think there are difficulties in achieving children's participation? If yes, what are the reasons for these difficulties?). The 1st question-

naire was completed at both the beginning and end of the intervention to detect possible shifts in the pre-service teachers' meanings regarding children's participation (second research question).

The 2nd questionnaire was designed to collect data about the pre-service teachers' beliefs regarding the effects of the intervention. It included two open-ended questions asking the pre-service teachers to describe any possible changes they detected in their beliefs about children's participation at the end of the intervention and to explain the reasons for these changes. Both questionnaires were approved by the research ethics committee of the university responsible for the study prior to their distribution to the pre-service teachers, and they were completed online using LimeSurvey, which ensured their anonymity.

5.3. Data Analysis

The responses to the open-ended questions in the first and second questionnaires were analysed based on an inductive process of gradual data reduction and via continuous comparison of the pre-service teachers' written responses [37]. Specifically, each response to an open-ended question was first coded to describe the various meanings entailed in the text. A comparison of these codes and an exploration of their similarity produced conceptual categories for each question analysed. For example, the pre-service teachers' responses regarding the meaning of participation were coded as "children answer teacher's questions", "children follow teacher's guidelines", "children listen to the teacher", "children respond positively to the activities designed by the teacher", and "children taking part in everything that the teacher decides for the whole day", constituting the conceptual category "children responding to the educational process". The correspondence of the pre-service teachers' responses to the categories produced in each open-ended question was assessed by two researchers, and the intercoder agreement percentage varied between 86.10 and 97.80, with the mean intercoder agreement being 93.80. Disagreements were discussed until 100% agreement was reached. The percentages of the pre-service teachers' responses in these categories were calculated based on the total number of references made by all the pre-service teachers for each question and were not based on the number of participants since one participant's response could include references to various different categories. Measuring the frequency of references to the different analytical categories prior to and following the teaching intervention allowed us to detect shifts in the pre-service teachers' beliefs (second research question).

Data are displayed using time-ordered meta-matrices to compare the pre-service teachers' beliefs about children's participation prior to and at the end of the intervention and to show possible shifts in the content of their beliefs. The categories were then clustered into groups, providing meaning to the shifts observed in the pre-service teachers' beliefs after the intervention. This helped us to move to higher levels of abstraction regarding these shifts. For example, the meanings given by the pre-service teachers to children's participation were divided into three clusters: a cluster of categories referring to children's basic responses to the teacher's actions, a further cluster that referred to children expressing their opinion, and, lastly, a cluster of categories that referred to children's active roles in decision-making processes.

The results of the comparison among the pre-service teachers' responses prior to and following the intervention indicate the effectiveness of the teaching intervention. An evaluation of the intervention's effectiveness was also produced based on the results from the pre-service teachers' beliefs regarding the types of and reasons for the changes they detected in their understanding of children's participation.

6. Results

The pre-service teachers' meanings of participation varied widely (Table 1). Some of the pre-service teachers could not provide a clear answer on the meaning of children's participation (category 1). However, this difficulty was reduced following the intervention.

The presentation of participation as being children’s mere response to teachers’ actions and the planned educational process (category 2) was lowered to half after the intervention, while the percentage of references to children’s interactions with the teacher and among themselves (categories 5 and 6) increased from 16.5% to 24.5%. Lastly, children’s participation in decision-making processes (categories 7 and 8) was mentioned twice as frequently at the end of the intervention.

Table 1. Pre-service teachers’ definitions of children’s participation.

Categories	Before	After
1. General response without a clear reference to the form of children’s participation (e.g., children view pictures, children draw, children’s smiles).	34 (14.35%)	18 (7.4%)
2. Children responding to the educational process (e.g., doing what the teacher asks of them or performing the activities planned by the teacher).	65 (27.4%)	36 (14.75%)
3. Children expressing their opinions or asking questions.	56 (23.6%)	51 (20.9%)
4. Teacher adapting to children’s needs, interests, and abilities (e.g., drawing ideas from their interests or formulating the lesson based on their needs and wishes).	12 (5.1%)	14 (5.75%)
5. Interactions between teacher and children (e.g., interacting with the teacher while conducting an activity or strong cooperation with the teacher in certain activities, such as music).	17 (7.2%)	22 (9%)
6. Interactions among children (e.g., to interact with their peers or be able to collaborate with other children).	22 (9.3%)	38 (15.55%)
7. Participation in decision-making without a clear result of their participation in the final decision (e.g., children taking initiative, thinking critically, or suggesting activities).	24 (10.1%)	35 (14.35%)
8. Participation in decision-making with a clear influence in the final decision (e.g., children choosing what book to read or how to play).	7 (2.95%)	30 (12.3%)
Total	237 (100%)	244 (100%)

The examples provided by the pre-service teachers enable the development of a clearer understanding of their definitions of children’s participation (Table 2). The frequency of examples showing children’s mere responses to the teacher’s actions (categories 4 and 5) lowered after the intervention, while the frequency of examples referring to children freely voicing their opinion doubled (category 8). The percentage of references in the categories that revealed children’s active roles in decision-making and in shaping the educational process (9, 10) increased after the intervention (from 8.2% to 25%).

Table 2. Pre-service teachers’ examples of children’s participation.

Categories	Before	After
1. Reference to children’s activities without a clear form of participation (e.g., when all children participate in circle time).	12 (10.9%)	8 (7.4%)
2. Pleasant and joyful/ non-boring activities (i.e., teaching via fun activities so children are not bored but instead participate).	8 (7.3%)	4 (3.7%)
3. Teacher explaining, guiding, and encouraging children to participate (e.g., the teacher explaining the rules of a game or guiding children to understand the plot of a story).	12 (10.9%)	11 (10.2%)
4. Teacher asking questions (e.g., what they know or what they think) or children asking questions.	19 (17.3%)	9 (8.3%)
5. Teacher asking children to perform a task (e.g., to imitate an animal, draw, or construct something).	7 (6.3%)	3 (2.8%)
6. Teacher discussing the children’s concerns with them (e.g., something that bothers them).	2 (1.8%)	2 (1.85%)
7. Co-operative activities (e.g., children collaborating during play or presenting their group work).	9 (8.2%)	3 (2.8%)
8. Children expressing themselves freely and speaking their opinions.	13 (11.8%)	27 (25%)
9. The teacher taking initiative but the children shaping the process (e.g., the teacher asking the children what they want to do and the children deciding after expressing their opinions and reaching a conclusion).	5 (4.6%)	12 (11.1%)
10. Children voting, choosing, or co-deciding (e.g., teacher recording children’s ideas and children deciding the theme of an activity or about the materials to use).	4 (3.6%)	15 (13.9%)
11. Free play or play as a means of participation.	17 (15.5%)	13 (12%)
12. Children taking on responsibility for the ECE program (e.g., one group being responsible for tidying after play and another being responsible for assisting children in preparing for recess).	2 (1.8%)	1 (0.95%)
Total	110 (100%)	108 (100%)

Regarding the necessity of children’s participation (Table 3), changes were observed after the intervention concerning the instrumental value of children’s participation (category 6); thus, fewer pre-service teachers related children’s participation to the achievement of specific results (from 21.7% to 11.7%). We observed a slight increase in the number of references justifying the need for participation based on children’s rights (category 4), while an increasing number of students related child participation to their view of children as capable agents (category 5, from 2.6% to 10.8%). However, it is worth noting that the number of responses without clear reasoning for the necessity of participation (category 1) doubled after the intervention.

Table 3. Pre-service teachers’ reasoning for the necessity of children’s participation.

Categories (Participation is Necessary as/for. . .)	Before	After
1. General response without clear reasoning for the necessity.	6 (5.2%)	12 (10.8%)
2. Presupposition for learning (emphasis on children’s interaction, pleasure, and joy).	9 (7.8%)	7 (6.3%)
3. Facilitating learning (i.e., supporting children’s interests and active learning and thus accomplishing competencies and learning aims).	38 (33.1%)	39 (35.1%)
4. Children’s right (and adults’ obligation).	10 (8.7%)	12 (10.8%)
5. Children’s ability to participate (children seen as capable).	3 (2.6%)	12 (10.8%)
6. Achieving results (to achieve future success in school or to develop competencies).	25 (21.7%)	13 (11.7%)
7. Enhancing the teacher’s awareness (helping the teacher learn more about the children).	6 (5.2%)	6 (5.5%)
8. Indication of a good teacher (i.e., an activity with children presupposes their participation being conducted in the right way).	7 (6.1%)	3 (2.7%)
9. Preparation for citizenship (i.e., to be active citizens and to develop competencies to enable participation in public issues later on).	8 (7%)	5 (4.5%)
10. Children’s needs (i.e., children need to participate to express themselves and be involved in a group).	3 (2.6%)	2 (1.8%)
Total	115 (100%)	111 (100%)

The pre-service teachers’ descriptions of strategies to enhance children’s participation varied and can be divided into four main clusters (Table 4). The first cluster of categories (categories 2, 3, 4, and 5) emphasises teacher control, with the educator playing a key role in choosing the appropriate methods, planning a pleasant environment, explaining to/ guiding children, and enabling their participation. The second cluster (categories 6 and 7) refers to the teachers’ personal characteristics (personality and professional adequacy) necessary to enhance children’s participation. Category 8 refers to structural factors, such as space and materials, as presuppositions to enhance children’s participation. The third cluster of categories (categories 9, 10, 11, 12, and 13) highlights the supportive role of the teacher in creating opportunities for children’s participation based on a trusting relationship and respect for children’s needs in the exploration of prior knowledge and the encouragement of co-decision processes in the classroom. The percentages of the pre-service teachers’ responses were lower in cluster one (from a total of 34.7% to 24.3%), in cluster two (from 8.85% to 4%), and in category 8 (from 8.3% to 2%), showing a shift away from the dominant role of the teacher in making decisions and the contextual restrictions set by the space and materials. Conversely, the increase in the percentages of responses in the third cluster (from 44% to 59.8%) demonstrated the gain in the pre-service teachers’ awareness of strategies that provide more opportunities for children’s active participation. Lastly, co-operation with parents and the teachers’ use of observation and reflection received the fewest references, both before and after the intervention.

Table 4. Pre-service teachers' description of strategies to enhance children's participation.

Categories	Before	After
1. General response without a clear reference to strategies (e.g., teachers should choose the right approach).	4 (1.85%)	15 (7.4%)
2. Teacher using appropriate methods for learning (e.g., play, inquiry, or experimentation).	26 (12%)	21 (10.4%)
3. Teacher creating pleasant, interesting, and appealing learning environments/activities.	34 (15.8%)	20 (9.9%)
4. Teacher explaining things well and giving correct guidance to children.	10 (4.6%)	3 (1.5%)
5. Teacher allowing/accepting children's ideas (i.e., teacher is open, accepting, and flexible during activities with children; teacher lets children express their ideas).	5 (2.3%)	5 (2.5%)
6. Characteristics of the teacher's personality (e.g., patient, friendly, sensitive, and loving with a good disposition towards children).	15 (7%)	6 (3%)
7. Scientific and professional adequacy (i.e., teacher has the necessary knowledge and support to design participatory practices).	4 (1.85%)	2 (1%)
8. Structural presuppositions: space and materials (i.e., suitability of space and ample materials for use are required to enhance children's participation).	18 (8.3%)	4 (2%)
9. Teacher supporting communication, familiarity, and trusting relationships with children (i.e., teacher understands their concerns, difficulties, and fears, and children feel free to express themselves without restriction).	32 (14.8%)	40 (19.9%)
10. Teacher supporting/encouraging/creating opportunities for interactions with children (i.e., teacher asks for children's opinions and encourages discussions among children).	33 (15.3%)	32 (15.9%)
11. Teacher respecting children's needs/characteristics and the value of each child (e.g., teacher encourages children to speak about their wishes and concerns and offers opportunities to choose between activities).	19 (8.8%)	35 (17.5%)
12. Exploration of children's prior knowledge.	3 (1.4%)	4 (2%)
13. Teacher designing activities after a co-decision with children about their content or process.	8 (3.7%)	9 (4.5%)
14. Co-operation with parents.	4 (1.85%)	3 (1.5%)
15. Observation and reflection.	1 (0.45%)	2 (1%)
Total	216 (100%)	201 (100%)

Regarding the pre-service teachers' beliefs about the difficulties in achieving children's participation (Table 5), we observed that, after the intervention, they no longer focused so much on children's personal characteristics and family background (categories 3 and 4) or on various structural difficulties beyond the teachers' control (category 2). Thus, references

to these categories decreased from 61.1% to 34.8%. On the other hand, the pre-service teachers' recognition of the controlling and non-supportive role of the teacher as the main explanatory factor for children's difficulties with participation (categories 5, 6, 7, and 8) increased from 31.7% to 60%.

Table 5. Pre-service teachers' beliefs about obstacles to children's participation.

Categories	Before	After
1. General response with no clear reference to obstacles.	4 (3.2%)	5 (4.3%)
2. Structural difficulties (e.g., when proposals regarding the curriculum are imposed, or the institutional framework of kindergarten).	24 (19%)	14 (12.2%)
3. Children's characteristics (e.g., shy or introverted children or children's origin).	37 (29.4%)	17 (14.8%)
4. Family /social environment (e.g., parents' perceptions or educational and financial status).	16 (12.7%)	9 (7.8%)
5. The teacher not supporting children's participation (e.g., the teacher feels that they should transmit knowledge to children; the teacher does not trust the children's abilities).	9 (7.1%)	20 (17.4%)
6. Teacher's actions not achieving children's participation (e.g., the teacher's actions do not interest the children).	18 (14.3%)	19 (16.5%)
7. Teacher making decisions about/controlling the activities (e.g., teacher imposes activities without asking or listening to the children; teacher acts as an authority and decides the course of the educational process).	8 (6.3%)	21 (18.3%)
8. Lack of positive/supportive relationship among the teacher and children (e.g., when children are afraid of criticism from the teacher or other children).	5 (4%)	9 (7.8%)
9. Lack of appropriate teacher education (i.e., the teacher has not been educated in the right way).	5 (4%)	1 (0.9%)
Total	126 (100%)	115 (100%)

The pre-service teachers described and justified the changes they observed in their beliefs regarding children's participation in different ways, generating data of interest. Several stated that they did not know what children's participation meant and that they gained this knowledge through their participation in the course. Pre-service teacher (PST) 38 said, "Before this course, I did not know what children's participation in the educational process meant and why it is important. After the course, I understood this, as well as how it can become possible". Also, PST 42 stated, "Before, children's participation was unspecified, while now the criteria which show children's participation and the role of the teacher are more specific and understandable".

Other pre-service teachers explained that they acquired a new understanding of what children's participation is and why it is necessary, as well as a better knowledge of its different forms and ways to enhance it. PST 25 said, "I understood that participation does not only mean children participating in the classroom's activities but also taking initiatives, making decisions, and freely expressing their opinions. Myself, as a teacher,

should make sure that a positive climate exists in the classroom and that I allow margins for children's freedom".

It is significant that most of the pre-service teachers stated that they changed their views, philosophy, and perspectives concerning children's participation. This statement signified, in many cases, a change in beliefs about the role of children and children's abilities, as well as the role of the teacher in the educational process. PST 2 said, "The role of children changed. It became central and protagonist. I understand that it is the children who should make decisions about what to do. The activities should concern the children and be meaningful to them". PST 7 noted, "I changed my beliefs because my horizons were expanded concerning children's participation and I started to see things in a different way", while PST 10 said, "I changed my belief about the extent to which children could help during the educational process. I now know that children can contribute to a great extent". PST 14 added, "Before, I thought that all was due to children's personality and dispositions. Now, I believe that participation is related to the teacher's beliefs and the way she designs activities".

These statements verify the transformations observed in pre-service teachers' ways of thinking about children's participation. Thus, shifts in their beliefs about the meaning of participation were accompanied by shifts in their ideas concerning children's abilities and their role in decision-making processes. At the same time, shifts occurred in their beliefs regarding their ability to criticise the teacher's controlling role and to recognise the need for teachers to support and enhance children's participation. Furthermore, the pre-service teachers' statements verified that the content and processes applied during the course interventions were effective under certain circumstances at promoting the transformation of beliefs.

7. Discussion

Initial teacher education (ITE) is essential for ensuring effective educational processes given that teachers are educated to respond to the multiple roles required by the complexity of the social and economic conditions in which we live. In a contemporary sense, ITE is of fundamental importance for two reasons. On the one hand, there is a strong belief in the academic community that the quality of educational provision is related to teacher education [38,39]. Conversely, teachers face challenges such as children being marginalised by the education system [40] and other factors (e.g., migration, climate change, political uncertainty), which have turned scholars' and policy makers' attention to the role that education systems can play in addressing and overcoming these issues [39]. Children's inclusion in society, as well as the promotion of democratic, active, and aware citizens, presuppose supportive and educated teachers on the matter of children's participation in decision making processes. Particularly, the rights of the child are becoming a critical topic for academics, governments, and organisations, as ECE is acknowledged to be crucial for learning and development [41].

Therefore, pre-service teachers' views were examined in the current study in order to highlight educators' perception of children's participation. Regarding the first research question concerning the content of pre-service teachers' beliefs about children's participation, our study showed a variety of views. Many of these opinions were also mentioned in previous studies examining ECE teachers' beliefs about children's participation. The outcomes of these studies on strategies for enhancing participation are similar to our results, e.g., teachers' positive responses to children's ideas (categories 9, 10, 15, and 29), teachers' encouragement and active creation of opportunities for dialogue and decision-making, and children's participation in the co-design and co-formation of activities and processes (categories 10, 12, 13, 15, and 28). Other beliefs, such as the importance of the teacher's personality in enhancing children's participation or the significance of teachers' ineffective actions as a stated difficulty in achieving participation, only emerged from our study. This can likely be explained by the fact that other studies have examined in-service, and not pre-service, teachers' beliefs. Overall, the present study adds to the body of research by

offering an extensive list of categories that depict pre-service teachers' beliefs along several axes (meaning, necessity, difficulties, and strategies), thus providing a more holistic understanding of beliefs concerning children's participation.

Concerning the second research question, our study proceeded through the process of grouping the categories of pre-service teachers' beliefs into clusters to illustrate the kind of shifts observed in them after a systematic intervention during ITE. Specifically, the pre-service teachers' meaning of participation shifted from referring to children as merely responding to teachers' guidelines to including them in interactive educational processes and, further, in decision-making processes. This result was verified by the answers given by pre-service teachers following the intervention, which showed a decrease in the frequency of references to specific teacher practices, such as questioning children or asking them to perform specific tasks, and an increase in the frequency of references to children's free expression and their participation in shaping the educational process.

Regarding the necessity of children's participation, the pre-service teachers shifted from perceiving its instrumental value in terms of achieving specific learning and developmental outcomes to viewing children as capable agents and participation as one of their rights. Thus, our study confirmed the findings from prior research about the importance of viewing children as capable agents [24,33,34] and the necessity of moving away from an emphasis on the achievement of specific results [25] to promoting participatory practices in ECE.

Furthermore, our study illustrated that the pre-service teachers' initial reasoning for the lack of children's participation (difficulties) was based on the individual characteristics attributed to children and teachers (e.g., children are shy or introverted or/and teacher lacks patience and sensitivity) and on structural constraints, such as an imposed curriculum. These findings are consistent with those of previous research [12,15,19–21,32]. However, this reasoning shifted after the intervention since the pre-service teachers recognised a teacher's controlling and non-supportive role as one of the main obstacles to children's participation.

Additionally, our research revealed that the pre-service teachers' beliefs about the strategies for enhancing participation shifted from those emphasising teacher control, the teacher's personal characteristics, and structural constraints to those relating to specific strategies, such as supporting, encouraging, and creating opportunities in a safe and interactive context, as well as building a trusting relationship with children, respecting the value of each child, and actively fostering children's participation in the decision-making process.

Regarding the third research question, the pre-service teachers' self-ratings of their gained knowledge after the intervention and their justifications of the change in their beliefs verified the idea that these shifts were related not only to greater knowledge of specific strategies and actions to support children's participation but also to a repositioning regarding the meaning of participation, children's abilities, and teachers' roles in the educational process. This repositioning altered not only their expectations of children and teachers but also their beliefs about the potential possibilities of children's participation in ECE.

Overall, the clustering of categories into meaningful themes that described pre-service teachers' shifts in their beliefs about participation and a qualitative analysis of the pre-service teachers' reasoning for the change in their beliefs provided an explanatory framework for what needs to be supported during ITE and by which means. The clarification of the meanings of children's participation, a critical awareness of the controlling role of the teacher, a repositioning regarding children's abilities and rights, the downgrading of individual factors as explanatory of children's lack of participation, and the counterbalance of specific teaching strategies and structural constraints regarding children's participation exemplify the shifts that need to be fostered according to theoretical and practical reflection.

In this study, the anonymous completion of the questionnaires by the pre-service teachers was a limiting parameter, preventing the learning paths of each participant from being closely examined. However, this fact did not negatively affect the present research

since, as mentioned initially, the main purpose of this study was to examine the range and content of pre-service teachers' beliefs regarding children's participation, as well as the possible shifts that could be achieved in the students' initial views after a specifically targeted intervention during their ITE.

Overall, the learning experiences of young children in ECE are directly related to the choices that their teachers make. Teachers' choices, however, are significantly affected by their knowledge, attitudes, values, and understanding of children's rights [16,27], as well as previous experiences, among which their ITE plays an important role. The necessity of including children's rights and participatory practices in ITE courses is therefore important [42].

The results of the current research also showed how important it is to probe pre-service teachers' ideas in order to identify their perceptions and work on their reconstruction systematically. Any changes take time: as such, time and resources need to be invested into enriching ITE curricula in universities by providing multiple opportunities for pre-service teachers to familiarise themselves with and engage in children's rights and participatory educational practices. Linking courses more closely to pre-service teachers' reflection processes and feedback on the implementation of theory into action can potentially facilitate learning during ITE.

Our suggestions for future research include closer study of the learning paths that result in a transformation in pre-service teachers' thinking in relation to the actions applied during the teaching intervention. In addition, an examination of the relationships among the observed shifts in pre-service teachers' beliefs about children's participation and their teaching practice, using data from implementations within real classroom settings, would be an interesting research theme relating pre-service teachers' beliefs and practices. Pre-service teachers' practicums, included in ITE, can therefore constitute a fruitful field for relevant research.

To conclude, we found that, after a systematic intervention, pre-service teachers may experience shifts in their knowledge and thinking about children's participation. This conclusion is highly encouraging, as the results of other interventions with teachers have shown that, despite the undeniable benefits of the interventions, the entrenched traditional views of teachers on the issue are difficult to change [34]. This study therefore has implications for teacher educators regarding the content (meaning, necessity, difficulties, and strategies) and processes (opportunities for pre-service teachers to reconsider their prior beliefs; use of theoretical, research, and reflective tools to assist with developing an in-depth understanding of the levels and reasons for children's participation; analysis of examples from practice; etc.) for supporting pre-service teachers' understanding of children's participation. An awareness of the orientation of possible shifts in pre-service teachers' thinking about children's participation and of the factors affecting potential change can guide the actions of teacher educators during ITE.

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Institutional Review Board Statement: This study was conducted in accordance with the Declaration of Helsinki and approved by the ethics committee of the Aristotle University of Thessaloniki (protocol code: 170755; date of approval: 9 July 2021).

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Data Availability Statement: The data presented in this study are available from the corresponding author upon request. The data are not publicly available due to our commitment to store them in a private computer at the university (for ethical reasons).

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Article

Conceptual Change of ‘Teaching’ among Experienced Teachers after Studying Attentive Teaching

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Abstract: One of the obstacles preventing change of teaching methods in schools is teachers’ traditional conceptualizations of ‘teaching’ as transmissive and teacher-centered. The aim of this study was to track changes in experienced teachers’ concept of ‘teaching’, following their exposure to attentive teaching. This is a dialogical method in which the learners represent their concepts in drawings and written explanations, and discuss them with their teacher and peers. Method: This was a multiple-case study. The participants were three teachers who attended an attentive teaching professional development course. They drew ‘teaching’ in the first, sixth, and the last, fifteenth, session, and provided explanations of their drawings. Findings: At the start of the course, they described teaching as a unidirectional process of transmitting knowledge. In the middle, they became more aware of the students as individuals who should be listened to. By the end of the course, teaching was portrayed as multi-directional (and enjoyable), so that all the participants, including the teacher, teach and learn from each other. Conclusions: This study shows that by studying, experiencing, and implementing attentive teaching, it is possible to change experienced teachers’ traditional beliefs without directly challenging them, and that drawings can track the changes’ trajectory.

Keywords: attentive teaching; conceptual change; teachers; teachers’ beliefs; teaching and learning; visual representations

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1. Introduction

In Israel and worldwide, educational systems have reached the conclusion that in order to prepare students for the future, the traditional teaching approach in which learners have to acquire a given body of knowledge, is no longer sufficient. Since knowledge is changing and developing, teachers are required to foster independent learners who possess diverse learning strategies, use higher-order thinking patterns and are capable of collaborative learning with their peers. Therefore, teachers have to familiarize themselves with advanced teaching methods and implement them as part of their professional identity [1]. The problem is that the teachers themselves had often studied in traditional teacher education programs and conceptualized optimal teaching and learning according to how they were taught. These conceptualizations and beliefs concerning teaching tend to be impervious to change, even after teachers participate in teacher education programs that promote advanced teaching methods [2–4]. The aim of this study was to track changes in the concept of ‘teaching’ among experienced and leading teachers, after they were exposed to attentive teaching, a teaching method derived from social constructivism. First, we provided a brief explanation of social constructivism and attentive teaching, followed by a description of teachers’ conceptualizations of ‘teaching’, and the challenges involved in changing them.

2. Social Constructivism

Social constructivism is today one of the leading approaches in teaching and learning. It developed from the teachings of Piaget [5], Dewey [6], Bruner [7], Vygotsky [8], Gardner [9], Feuerstein et al. [10], and others. According to this approach, learning is a process of construction in which learners' conceptualizations change when they link new knowledge to their previous knowledge. The learners acquired their previous knowledge in formal learning frameworks, or in informal settings through their daily experiences. The process of conceptual construction is an active one that requires cognitive effort because their previous conceptualizations may not be appropriate for their new knowledge and experiences. In such cases, the learners will have to reshape their previous conceptualizations, and not merely expand them by adding new facts. The term social constructivism emphasizes that the learning and conceptualization processes do not take place only in the learners' individual cognitive system, but they are also rooted in the social-cultural context. The language, conceptualizations, tangible world, and experiences that children and adults are exposed to, and the mediating dialog that organizes the world, were shaped throughout history by the culture they are living in [8].

Social constructivism describes learning processes and their influencing factors in general terms, but is not in itself a specific teaching method. Nevertheless, it is linked to student-focused methods, since they are the ones who have to construct the new conceptualizations. The teachers' role is to assist the learners in acquiring new knowledge and forming conceptualizations that fit accepted knowledge within their culture. The learned concepts will also be used by the students in extra-school activities and will form the basis for additional learning and future changes. Therefore, the teachers' role also includes helping the students acquire learning and cognitive skills that will help them acquire new knowledge and change existing conceptualizations in the future [1]. Several teaching methods are associated with social constructivism, including exposure to experiences that undermine previous "intuitive" perceptions, that do not fit the accepted knowledge in the culture; mediation; presentation of challenging assignments that require higher-order thinking skills; and actively involving students in discussions in which they raise ideas and critically examine them [11,12]. Teaching methods associated with social constructivism were found to lead to meaningful learning and a deeper understanding of the subject matter [1,13].

3. Basic Concepts of Attentive Teaching

Attentive teaching [14,15] is a teaching method derived from social constructivism. Concepts are learnt through dialog between learners and the teacher, as well as among the learners themselves, as opposed to a unidirectional presentation of the learnt matter by the teacher. The basic unit of attentive teaching is the mediated interaction. Vygotsky [8] described the mediation process as a dialog between an experienced adult and a learner that enables the learner to reach new understanding that is closer to the accepted understanding in society. Feuerstein et al. [10] emphasized that teachers' positive and supportive attitude is important in order to enable learners achieve cognitive change.

Interactive classroom mediation. In attentive teaching, the process of mediating between how the concept is understood by each of the learners, and how it is commonly understood in the culture of the learners occurs during the lesson in which the teacher addresses each and every learner. The mediation begins with the learners representing what they understand of the learned subject through a multi-modal text, i.e., a combination of a visual representation (illustration) and written explanation. They then present their outputs to their classmates and teacher who listen and comment as a discussion develops. The teacher's role in the dialog is to enable all the learners to individually express their knowledge and strong points, the world they come from, their unique point of view about the learned subject, as well as their doubts and questions. In this unfolding dialog, all the learners are required to be active, deepen their thinking process, and respond to their peers in a critical, yet respectful manner. In this way, the learners become partners in the teaching.

Each learner listens intently to their peers and makes serious comments, making them more aware of the importance of their personal expression and their contribution to the learning [16]. The teachers are active participants in the dialog. They adapt their teaching methods to the individual needs of each learner, and of the entire class, and keep track of the personal and unique developmental processes of the learners. With the teacher's help, the entire class forms a shared understanding of the learned subject. This shared understanding draws all of them closer to the learned concepts, as they are accepted and understood in the culture. Vygotsky [8] terms these as "scientific concepts". The unique individual concepts of the learners come together to form the basic principles common to the entire class. Thanks to the learners, the learned subjects become connected to worlds and fields that differ from those of the teacher, and thus the teacher's understanding is also expanded and refreshed [15].

The goal of attentive teaching is to enable students to experience conceptual change through a series of mediated interactions. We present two kinds of such series: dynamic learning and the thinking journey.

Dynamic learning—is a change observed in the learners' conceptualizations over time [14,15]. Attentive teaching attributes great importance to exposing the learners' intuitive conceptualizations before they begin their study of the learned matter, and to tracking how the conceptualizations change over time. The process of conceptual change is a very demanding one since learners construct concepts over time and they have become solidly entrenched [17]. When learners are exposed to scientific concepts (including concepts from the world of Humanities and Social Sciences) in formal learning frameworks, they tend to interpret them according to the intuitive concepts they formed during informal learning [8]. This process is sometimes called "mistaken conceptions" or "alternative conceptions" [18]. The learning is usually gradual, so the intuitive insights are not immediately replaced by scientific insights, but rather, unstable, intermediary concepts are formed until a new equilibrium of understanding is reached [19,20]. In attentive teaching, the visual representations of the learners' conceptualizations enable the teachers to observe the conceptualization processes in real-time during the lesson as a link is formed between the learners' world and their conceptual perception. Over the course of several lessons, the conceptual change in the classroom and in specific learners can be observed. Attentive teaching is implemented in diverse content worlds, beyond the world of scientific concepts. Each individual's unique concept is of great interest, and not only those parts that are connected to the accepted understanding of the concept in the culture, but also the parts that are connected to the worlds of the students [14].

Thinking Journey—is a process of conceptualization based on understanding the concept or learned subject in different contexts and from unexpected points of view [15,21–24]. According to Marton et al. [25], varied experiences over time are required to understand challenging subjects. Each of these experiences creates a connection between the learners and a different aspect and point of view about the learned subject. These observations create a "space of learning". The accumulation of the different points of view invites learners to make comparisons, to emphasize the similarities and differences between the different sightings of the learned subject and enables them to create a broad and coherent perception of the learned subject.

Carey [17] claimed that a space of learning is not enough for creating conceptual change. She stated this change can only occur through observing the familiar environment from a new and unfamiliar point of view. By changing their point of view, learners become aware of the limitations of the existing concept and of the need to expand it so that it becomes appropriate for additional contexts. The thinking journey method provides learners with opportunities to observe the world from different points of view to those they are accustomed to, thus implementing the insights of both Carey [17] and Marton et al. [25]. The teachers' task is to choose those points of view for the learners that will help them reach conceptual change by comparing the regular and familiar contexts with those chosen by the teachers.

Uncertainty processes in learning—are the emotional processes the learners undergo as they experience change. These emotions range from curiosity to feeling uncomfortable. When experienced in the right measure, the motivation to learn increases. In attentive teaching, uncertainty processes derive from the need to deal with leaving behind what is familiar, and with the need to change oneself, i.e., to do things they have not done previously and to connect these experiences with a new field of knowledge and to unfamiliar contexts [15]. The emotional component is an inseparable part of the entire learning process because when there is no emotional investment, the learning does not yield structural or intellectual change [26].

4. Using Multi-Modal Texts to Study Learners' Conceptualizations

Tracking learners' conceptualizations and how they change is a challenge. When asked to represent their conceptualizations orally or in writing, learners tend to regurgitate texts they have previously read or heard without really understanding them [27]. One of the ways to discover learners' concepts is through their drawings. This method is common in science teaching [28–30].

In attentive teaching, this method is expanded to be used in all subjects, at all ages. Drawings enable learners to express their unique point of view on the learned matter. The many advantages of presenting knowledge through drawings include: (1) Drawings are suitable tools for expressing conceptualizations. In a drawing, learners have to choose the elements they feel are the most important and to organize the overall relationships between these elements in an efficient way, while using the entire paper as an organizing tool and size the elements as an expression of their relative importance. (2) When preparing a drawing, the learners are required to be active and involved; to choose key elements, to decide how they should be presented, to clarify vague points, and to give reasons for the decisions they made. Verbal information that is passively repeated by rote is insufficient for producing a drawing. (3) A drawing is a communication tool. The fact that the drawing explicitly represents concepts makes it a comfortable springboard for critical examination and dialog about the clarity and coherency of the presented contents, and the extent to which they are compatible with the accepted perceptions. (4) A drawing is a learning tool. Since many pieces of information are organized in a clear and concise manner, it encourages questions to be asked, conclusions to be drawn and conceptual change. (5) In a drawing, the learners can personally express what they have learned. They link the learned matter with their personal worlds. Even in the classroom setting, the learners express their unique point of view in their drawings [15,31,32].

However, a drawing alone cannot shoulder the burden of transmitting meaning because the observers may not fully understand how the various elements in it should be interpreted and the specific relationships that exist between the different elements. Therefore, it is often necessary to combine visual images with written or verbal language. The resultant text is multi-modal, since different modes (in this case, images and written language) jointly convey a single communicative message [33,34]. When teachers examine the drawings and listen to the verbal explanations, they are able to understand the individual and distinct way that the learners understand the learned subject. The teachers can then adapt their teaching to meet the learners' needs precisely [15]. The very fact of asking the learners to draw a picture ensures that the teachers have to think about the key concepts that the learners should be learning. Repeating the drawing and explanation task throughout the teaching of the learned subject enables teachers to track the learners' conceptual changes. In attentive teaching, teachers methodically and widely track learners' conceptual change (dynamic learning).

5. Teachers' Conceptualizations of 'Teaching'

Teachers' perceptions about teaching and learning are important since they influence their targets, practices, and self-evaluation (but in a complex, rather than direct and simple manner). These perceptions also influence teachers' engagement in professional learn-

ing opportunities [35]. The perceptions are generally divided into two basic categories: traditional versus constructivist. According to traditional perceptions, the teaching process is a unidirectional process of transmitting knowledge from teachers to students, in which students play a minimal role, confined mainly to obedience, listening, and practice exercises. The main responsibility for teaching and learning is placed on the teachers' shoulders. In contrast, according to the constructivist approach, students are at the center of the learning process [35]. In reality, however, researchers often find that teachers have mixed beliefs; some of which are more closely aligned with the traditional, teacher-centered approach, whereas others are more student-centered. 'Mixtures' of different beliefs are prevalent among teachers with different amounts of experience, before, during, and after participation in intervention programs [36].

Traditional perceptions of teaching are difficult to change, even when intervention programs take place over long periods of time [2,3,37]. This could be explained by the fact that as students, teachers had only been exposed to traditional teaching methods and built their successful teaching careers within such systems. Social and cultural factors are also involved [2,37–39]; teachers' beliefs are less likely to change when they are long-held and connected to other ones that teachers espouse [4,35,36].

Girardet [4] conducted a literature review in order to find characteristics of intervention programs that enhance change in teachers' traditional conceptualizations. She described four factors: (1) reflecting upon and challenging teachers' prior beliefs, (2) studying alternative practices, (3) learning by doing, (4) collaborative learning with colleagues. Attentive teaching incorporates critical reflection and discussion among colleagues as an integral part of the method. The intervention program described below included experiencing attentive teaching as the program's method of teaching, and implementing it (learning by doing), thus incorporating all four factors. However, until now, the impact of attentive teaching on teachers' conceptualizations has never been empirically tested in areas other than the natural sciences.

Identifying teachers' conceptualizations of teaching and conceptual change processes is a persistent challenge since teachers are often unaware of them and cannot describe them verbally. One of the methods that attempts to overcome this challenge is asking teachers to draw what good teachers do and to add verbal explanations. In addition to the above-mentioned advantages of drawings in presenting concepts, they also bring to the surface the implicit and emotional aspects of teachers' beliefs, enabling them to express their opinions in their own unique ways. Verbal explanations help researchers understand the meanings teachers ascribe to their drawings and complement the meanings the drawings convey [40,41]. Drawings that convey transmissive conceptualizations of good teaching often focus on teachers in a traditional school environment. Students, if they appear at all, are relatively passive, or are all engaged in the same activity [40]. Teachers who adopt traditional attitudes convey mixed feelings in the texts they produce [41]. In contrast, drawings that convey student-centered conceptualizations depict active students in a central position. The students may collaborate with each other or engage in different activities. The teacher, if portrayed, is in the same area as the students and engaged in the same activities [40]. The emotional tone of the drawings tends to be positive [41].

Most of the studies that track changes in teachers' beliefs evaluate them along the student- versus teacher-centered dichotomy, based on two measurement points, in different frameworks such as before and after teacher education studies, gaining teaching experience or participation in an intervention program. Therefore, a more nuanced study that tracks changes in teachers' beliefs over time is needed [35,36].

In order to address both these gaps, this study aimed to understand how experienced teachers' concept of teaching changed after studying, experiencing, and implementing attentive teaching, by examining their drawings of 'teaching' in the beginning, middle, and end points of the course.

6. The Context of the Study

The current study was conducted as part of a 60 academic hour (15 meetings) professional in-service training course held in 2022 for female teachers at an ultra-Orthodox girls' seminary. The participants had many years of experience in frontal teaching of Jewish studies to large classes (approximately 45 students per class) in traditional frameworks. The training course had three goals: to present them with the attentive teaching method in an experiential manner, to bring about a change in traditional perspectives on teaching and learning, and to enable the participants to apply the principles of attentive teaching in their classes. During each meeting, there was a mediated interaction. The participants drew their conceptualization of the subject discussed in that particular meeting, added a written explanation to their drawing, and presented their individual point of view to the other participants. Each participant was asked to give her opinion on her peers' outputs, and about the subject being discussed. The discussion was respectful and attentive so that a shared understanding of the subject was formed. The first and main section of the course was 'dynamic learning' about the concept 'teaching'. At the beginning (1st meeting), middle (6th meeting), and end of the course (15th meeting), the participants drew a picture and added a written text to explain how they understood this concept. This enabled us to track changes in this concept. The first section of meetings in the in-service training course (meetings 2–5) was a 'thinking journey' that observed 'dialog' and 'listening' from different points of view. The second meeting dealt with 'listening'. Working in pairs, each participant was asked to relate an experience, and then to listen to her partner's experience. They were then asked to draw two pictures with a written explanation. The first portrayed them as a listener and the second as a narrator. The third meeting focused on classroom dialog, inspired by a well-known poem "Two Elements" by Israeli poet Zelda that describes a conversation between a flame and a cypress tree. The poem can be viewed as a metaphor for communication difficulties in the classroom that is open to different interpretations concerning the teacher's role in bridging over them. The fourth lesson was about dialog with a challenging student, presenting various examples about how to relate to students who do not keep to the 'straight and narrow' path, how to see their strong points, and to find opportunities to let them show these points. In the fifth meeting, they discussed their experience as learners: inspirational teachers who successfully formed meaningful relationships with them. They described impressive teachers who were able to reach them and leave their mark. Whereas in the discussion about challenging students, the dialog focused on empowering such students, when the participants were discussing their own personal experience, the focus was more on the image of the teacher. Which teacher actually left her mark? How did she function? And, under what circumstances did she manage to reach the students? A discussion evolved about the personal example that teachers set in their behavior, and in how they related to the learners. The various points of view about teachers' behavior and about different aspects on teacher/student dialog, as well as ways of forming an attentive dialog all formed a thinking journey about listening processes in the classroom.

The ensuing meetings used dynamic learning to track change processes in understanding a Talmudic text. The participants learnt how to prepare lesson plans using the principles of attentive teaching, and applied them in their own classrooms as well as in the in-service training course. Some of the lessons were taught by the lecturer, and others by the participants. The participants taught lessons about Jewish festivals, history, Bible, Talmud, and science and shared what they learnt about the subject with their peers and the lecturer. For example, one participant chose to teach "The Binding of Isaac" which was part of the 11th grade syllabus. In the spirit of attentive teaching, she asked the learners to imagine themselves being tested as if they were Abraham who was being tested by God. One of her students, who was vision impaired (borderline blindness), wrote a poem in which she described her feelings. She wrote an imaginary discussion with God, full of respect and faith, about her condition. The mediated interaction about a "test" helped

the teacher and students to get to know each other better and to link their world with the concepts being studied in an experiential manner, and not just in an abstract form.

7. Method

This was a multiple-case study that strives to understand a small number of cases within their real-life contexts [42]. The participants were three of eight female Jewish-studies teachers who attended an attentive teaching in-service training course. Their ages ranged from 35 to 55, and their years of teaching experience ranged from 10 to 35 years. We asked the course participants to draw ‘teaching’ and add written explanations of their drawings during the first, sixth, and final (15th) meetings, so that we could track the changes in their conceptualizations of ‘teaching’. After we received permission from the institutional research ethics committee, and after the in-service training had ended, we contacted the course participants and asked their permission to study the materials they produced during the course. They all gave permission, but here we present data from only three of them. The three participants were randomly selected. We limited the number to three believing it was small enough to allow us to provide detailed descriptions of the data analysis, and large enough to show the similarities, that were in fact shared by all eight participants. The participants’ names were anonymized to protect their privacy.

The materials we analyzed were drawings and written texts describing the participants’ conceptualizations of teaching at three time points: the start, middle, and end of the course. During the analysis, we referred to each drawing and accompanying written text as a multi-modal text [34], and examined the following aspects: what metaphors did the participants use, and how did they position the teachers’ and students’ respective roles and relationships? [43]. Was the teacher presented and what was the size of the teacher’s image in relation to other images and the whole drawing? Large size images convey importance [44] and are associated with teacher-centered views [40]. What were the teachers doing? Lecturing, explaining, and exemplifying are characteristic of transmissive conceptualizations, whereas in student-centered drawings the teacher (if he or she are presented), is engaging in the same activity as the students [40]. Teachers’ actions were identified based on the images as well as on the explanatory texts. Did the teachers occupy the same space as their students, or were they separated from each other? Separation is an additional element that is associated with traditional views [40]. Were the teachers and the students connected by lines or arrows? The arrows’ direction symbolizes the flow of influence and power [44]. As for the students, we asked whether they were represented, and what they were doing. Teacher-centered views often result in the omission of students or them being portrayed as passive, listening and looking, or engaging in the same activities [40]. How was the learning environment portrayed? Rows of desks, blackboards, and teachers’ podium are associated with transmissive teaching [40]. Finally, we examined the facial expressions of the depicted characters and looked for emotions conveying expressions within the explanatory texts [41]. The study’s two authors analyzed the drawings separately and then compared their analyses and reached agreement, in order to increase the reliability of the study.

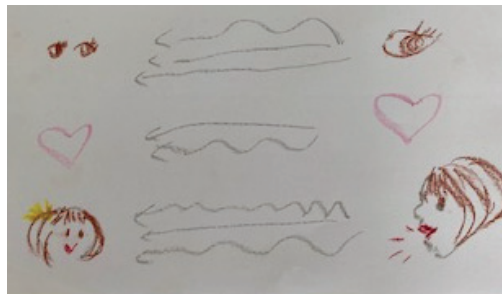
8. Findings

In this section, we analyzed each drawing and written explanation, and uncovered the personal journey each participant of the in-service training course underwent. We then discussed the themes common to all the participants.

8.1. Miriam

Miriam taught Jewish studies in upper grades. She was very interested in the role of women in Jewish society and in educating her students to fulfill this role. She demonstrated the traditional perception of teaching, as seen in Figure 1 when she drew her conceptualization of teaching at the start of the process. The right side of her drawing shows the teacher’s eye, heart, and speech, and the left side shows the student’s eyes, heart, and understanding

(in the shape of a mental flash of understanding). The arrows point in the direction from teacher to student, representing a unidirectional flow from teacher to student [44]. The teacher transmits knowledge, shapes (a term that appears twice in her written text) gives, observes, perceives, talks, is responsible and ultimately successfully reaches her students' hearts. For Miriam, transmitting knowledge is the teacher's responsibility. As opposed to the teacher, the student in the written text demonstrates opposition, bitterness and anger. To mitigate the impression in the text of a "conflict", the drawing shows a smiling learner, and a connection between the hearts and the flash of understanding, all conveying positive emotions [41]. There was no representation of the class as a group, and no evidence of changes that the teacher experiences as a result of her teaching.



Text: In my view, teaching is a wondrous interaction between teacher and student ... with the ability to impart knowledge, and especially to shape. To shape a path, trust, values, the soul... I believe that true teaching occurs along the path between what the teacher gives and what the student receives... it is the teacher who is responsible for creating this path. For me, the process is: observation and perception which lead to speech that creates a flash [of understanding] ... for me this is an experience that should be observed, even during the lesson. ...how I perceive the student ... that I see that she sometimes is opposed, is bitter or angry. Do I manage to find the way to her heart? At the end of the day, I am imparting knowledge. It is important for me to transmit as much as possible ...

Figure 1. Miriam at the start of the course.

At the sixth meeting, Miriam produced a second drawing in which she expresses the transition from the teacher's point of view to that of the learner. The student's figure is large and positioned at the center of the drawing, whereas the dotted lines that fall on the student's notebook represent the information the teacher provides [40]. Miriam is now concerned about the gap between what she is trying to transmit to what the student writes in her notebook. As opposed to the first drawing in which Miriam identifies with the need to "transmit" as much knowledge as possible to her students, in the second drawing Miriam expresses her discomfort with the system that forces her to reach goals in a given time frame. She exhibits relative change in that she now wishes to see each student as a unique individual, rather than having a goal of "shaping" them, in which no distinction is made between each individual. She also notes the contradiction between her wish to form a personal connection with each of her students and the judgmental approach that characterizes traditional teaching methods, and even criticizes the system she works in. The concept of teaching has changed for her, from a process in which the teacher is responsible for shaping an object to showing an interest in the student as an individual and giving up on "covering material" and being judgmental.

Miriam produced the third drawing after she had completed the 15-meeting course. She represents herself and her students as connected vessels who create understanding. The drawing does not only show the individual student, but also the entire class. The interactions are multi-directional in the connected vessels. The liquid in each of the test tubes (that represent the partners in the learning process) influence and are influenced by the other test tubes. All the students learn, as does the teacher who is represented by a slightly taller vessel than the ones representing the students. Engagement in the same activity as the students is typical of the student-centered approach, as is the depiction of the learning environment devoid of objects that are associated with traditional schools [40]. In the accompanying explanatory text, learning is a never-ending process. Instead of 'material' and 'values' that the teacher has to transmit within a given time, there is continuous learning. The teacher needs the students, and she herself is refilled because of them. She 'fills' and 'is filled', and without them she 'dries up'. The explanatory text expresses a calm, using positive words such as 'benefit', 'plentifulness', and 'developing' instead of mentioning opposition that forms obstacles. In both Figures 2 and 3 the image and written text are mutually reinforcing and complementary.



Text: I feel I am going through a process. I drew one student, not a whole class. To see each student for what she is. I hope that my words go beyond what she writes in her folder. The gap between a homeroom teacher and a subject teacher. The door and clock represent the requirements of the system. I have difficulty with the critical comments and the judgmental attitude.

Figure 2. Miriam half-way through the course.

Miriam is aware of the process she underwent and sums it up:

I myself experienced a process of patience and tolerance. I learned how to listen. To listen from a very real place. The person opposite me can teach me something new. I can learn from my students. They can teach me new things. They have what to say to me. I went through a personal process of listening and empowerment. My drawings, my thoughts and my insights are significant. A dynamic has been set in place, a surprising and enriching dialog is developing thanks to each person's involvement. And each person is part of this human process.

At the end of the in-service training course, Miriam's concept of teaching is now of a shared process of shaping understanding. It is a multi-directional process in which the students' role is no less than that of the teacher. They are all enriched from the joint learning, in a pleasant class atmosphere. At the start of the process, Miriam was very concerned about the need to cover all the study material, in the middle she criticized this need, and in the final text she did not even mention it.



Text: I am going through a process—like connected vessels. All the lights that are connected to me, and all the vessels close to me benefit from this plentifulness and from this process. It is automatic. The more vessels there are, the better it is for all. In the drawing it is completely schematic and is also limited in the quantity of water. In practice—it is never-ending. When I develop, I have an influence on all those who are influenced by me. It is frightening to think that this is boundless. Frightening to think how quickly I dry up again and have to get wet again in order to be filled up again and to fill others up again.

Figure 3. Miriam at the end the course.

8.2. Sara

Sara was an elementary school principal, as well as a Jewish studies teacher. Figure 4 depicts how Sara perceived the concept of teacher at the start of the in-service training course. It shows a parachute propelling the students high up into infinity. The students and teacher are not represented in the drawing; however, the explanatory text makes it clear that the teacher is responsible for the teaching: “It is impossible to describe the extent to which teaching has the power to develop, give tools, enable, guide, have far-reaching consequences for learners”. All these verbs describe the teacher, with the students having a passive role. The text also clarifies the meaning of the visual metaphor where the students are passive passengers carried by the wind. “Ways of connecting with each student and ensuring that no one is left behind are limitless—and one should never give up. You should always look for that extra teaching method, they one you haven’t yet tried”. According to the text, the teacher is looking for ways and means. She is charged with reaching each student and ensuring that no one is left behind. Like Miriam, Sara says that the responsibility lies with the teacher. Like Miriam, Sara also gently alludes to her moments of frustration where the teacher has to try and find new ways and not to give up [41].



Text: ... I thought that the phrase “the sky is the limit” could be an overall saying that encompasses everything that is included in teaching. Improving one’s teaching practice, and the ability to have an influence through teaching is limitless. There is no end to what can be learned about teaching and from it. And as a student, one cannot begin to describe the extent to which teaching can give tools, can enable, direct, and have far-reaching consequences for students. Also, ways of connecting with each student and ensuring that no one is left behind are limitless—and one should never give up. You should always look for that extra teaching method, the one you haven’t yet tried. In my drawing, the sky represents infinity, and the parachute flying up high is influenced by the wind, air etc.

Figure 4. Sara at the start of the course.

Figure 5 was drawn by Sara at the end of the process. The students are represented as colored pencils. Each one has her individual character and unique abilities to contribute to her peers and to the teacher. The written part of Sara’s multi-modal text shows she believes that knowledge is a joint outcome shared by all. By listening to her students, the teacher is no less enriched than her students from the joint learning. Each student has her unique knowledge, and together, they form the wisdom of the crowd which we all benefit from. “And now we learnt about ‘Attentive’ [Teaching] and we learned: Pay attention, to something else, an additional, different, similar, close meaning. Someone is out there saying something that no one else has said!!! Amazing!” The exclamation marks and the word ‘amazing’ indicate excitement, which is very different from the sense of frustration that was gently mentioned at the start of the process. Like Miriam, at the end of the process Sara also viewed learning as a shared process in which all are mutually enriched. Both teachers experienced a similar change from the beginning to the end of the process. Sara did not participate in the sixth meeting, so we do not have any information on what she experienced in the middle of the process.



Text: Individuals each perceive and interpret every “objective” event or idea in different ways. No one idea is identical to a second one. They may be similar, close, or they may be the opposite or complementary. Yet, each idea is unique and emphasizes a message, insight or a specific statement. And it is an experience—to feel the difference in perception. Until now, we learnt that every concept has a lexical, scientific explanation which is considered a uniform, precise definition. And now we learnt about ‘Attentive’ [Teaching] and we learned: Pay attention, to something else, an additional, different, similar, close meaning. Someone is out there saying something that no one else has said. Amazing. What do I take away from this? The intensity of the wisdom of the crowd that I see even in a classroom of young students and the intensity of the knowledge that can emanate from the class! Listen to the students. They can teach all of us. “From all who taught me have I gained understanding, but from my students—more than from all of them”

Figure 5. Sara at the end the course.

8.3. Rebecca

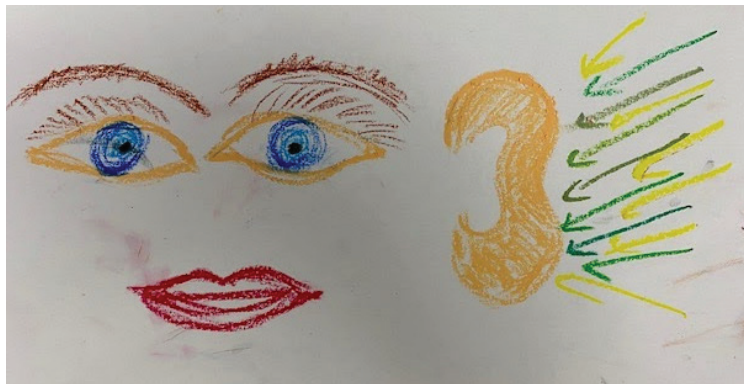
Rebecca taught junior-high students with learning difficulties, as well as Jewish studies in mainstream classes. Figure 6 was drawn by Rebecca at the start of the in-service training course. The teacher is represented as a lifeguard, positioned at the center of high waves, and the students are invisible [40]. Like her two peers, Rebecca’s first drawing presents the teacher as having sole responsibility for teaching, and the students (who are “drowning”) are shown as passive people who need to be rescued. The arrows are directed to the drowning students in a top-down manner [44]. The emotional atmosphere is ambivalent. On the one hand, teaching leads to a sense of pressure and distress, yet on the other hand, it is therapeutic and soothing.

Midway through the course, Rebecca produced Figure 7, in which the teaching was once again at the center of the teaching process. However, the direction of the information flow had changed. The focus is the teacher who listens, and who sees her students. Knowledge transmission (as represented by the mouth) is in second place. The written text emphasizes that the teacher keeps silent and concentrates on listening. As opposed to Figure 6, in which the teacher is represented as the “lifeguard” whose actions are vital and justified, the explanatory text to Figure 7 shows that the teacher has to be completely frank and open-minded.



Text: The teacher is the person who calms others, a savior, the responsible adult. Teaching can cause distress and overflow, just like water but it can also be soothing. Learning is something therapeutic.

Figure 6. Rebecca at the start of the course.



Text: Teaching—a large ear and big and beautiful eyes, and a mouth, that is important, but smaller and shut. The teacher hears much more beyond [what is spoken]. It is multi-tonal and moving. One can only see and listen if one is really sincere.

Figure 7. Rebecca half-way through the course.

Rebecca produced Figure 8 at the end of the in-service training that shows a train. Each wagon represents a different component of teaching: The first—question marks; the second—to see each and every student and to learn from them; the third—the ripple effect, to see the good and to pass it on; the fourth—to believe in the process. When the teacher is free and available to listen, the student is free and available to learn. In her explanation, Rebecca notes three important elements: teaching is a long-term process. Teaching and learning are conducted in a group—that enriches, expands, and contributes to the participants' understanding in various fields. The teacher learns from her students and undergoes a change process. The 'savior's' sense of confidence was replaced by question marks that drive the process, and with a sense of humility. The emotional atmosphere improved. Like Miriam and Sara, Rebecca was also excited by the process she underwent, and especially by the understanding that she could learn a lot from her students. Rebecca used the same Talmudic phrase, as did Sara: "From all who taught me have I gained understanding, but from my students—more than from all of them" (Ethics of the Fathers, 4:1) which demonstrates the classroom process and how the 'new' concept of teaching is connected to the world of the teachers who participated in the in-serving training course.



Text: I feel that the process is the title of the story. At the beginning, I did not really understand what was happening. There were a lot of question marks? Over time, I felt which direction it was taking and to what depths and places one can reach with “Attentive” [Teaching].

I am taking the following [ideas] to my teaching practice:

To see each and every student and to learn from the learners “from my students—more than from all of them”, a sense of humility and trust in their inner being. To believe in the truth found in every person, and to show her the good, without criticizing. A good eye that impacts on the good going forward. When the teacher is available to listen, the student has an opportunity to learn.

I had an additional learning experience: a huge amount of enrichment from the diverse group of participants, this was such a special and enriching group. There were depths of thought, millions of emotions, understandings, frankness, sympathy, intelligence. To learn from the learners who were in the class with me.

Figure 8. Rebecca at the end of the course.

9. Discussion

The three sets of drawings show that each of the teachers had her own unique world of images about the concept of teaching. At the start of the process, a teacher talking to a student, a parachute that “propels the students up to the sky” and a lifeguard who prevents her students from drowning. In the middle of the process, two individuals are learning, one is studying from a text and the other uses all her senses. At the end of the process, connected vessels, a box of colors, and a train. Despite their diversity, the three teachers underwent a shared process. At the start of the course, teaching was conceptualized as a unidirectional process that is the sole responsibility of the teacher. The students react to the teacher and their reactions are sometimes frustrating. The teacher has to get the students to understand what she is trying to teach and overcome her sense of frustration with their lack of understanding or their opposition. By the middle of the process, the teachers had become more aware of the students as individuals who need to be listened to carefully. The teachers were now interested in the students themselves, and did not only view them as objects of their teaching practice. This is a challenging process involving criticism of the system they are part of. At the end of the process, the teachers’ drawings referred to the entire class. They were interested in their students and were amazed by their knowledge. The teaching and learning process had become multi-directional so that all the participants, including the teacher, teach and learn from each other. The teachers became humbler, yet although their status may have seemingly been ‘lowered’, the atmosphere had become more positive and optimistic. The teachers were aware of the process they underwent and were very excited by it. They all pointed out the original ideas that their students provide. “What am I taking from it? The strength of the wisdom of the crowd, even when the students are young. What strength of knowledge can sprout in the classroom! Listen to the students; they all have something to teach us”. Sara and Rebecca also quoted from *Ethics of the Fathers*: “From all who taught me have I gained understanding, but from my students—more than from all of them”. The participants were used to teaching in large classes, and practice frontal teaching. They discovered that using the attentive teaching method, they could facilitate mediated constructivist learning processes, even in large

classes. They presented the lessons they taught and their students' outputs to their peers in the in-service training course about attentive teaching. The complementary texts to their drawings at the end of the process expressed their excitement about the method.

In four meetings, the participants had experiential discussions about various aspects of listening. They came to understand that when teaching, they only partially listened to their students, because they focused on 'transmitting' content knowledge. The meetings about listening were mediated interactions with active involvement of the teachers. They created multi-modal texts (consisting of drawings, written, and verbal language) to express their feelings about the concepts that were discussed in the meeting: listening; Zelda's poem "Two elements"; interactions with a challenging student; and an inspirational teacher. As a result of these mediated interactions, the teachers represented their students in a new way. They now became interested in each one's unique voice.

The second section of the in-service training course dealt with the construction of dynamic learning and thinking journey in units consisting of several learning meetings, as well as with analysis of conceptual change through drawings. As the teachers learnt about attentive teaching, they also experienced the various aspects of this method personally, since this was the teaching method used during this course. They were exposed to their peers' ideas and creativity and thus got to know their peers better and appreciate them more. Furthermore, they implemented the method in their own classrooms. At the end of the in-service training course, the participants' conceptualization of teaching had changed, and they recognized the students' contribution to their peers' learning, as well as to the teachers' learning. In previous studies, we examined attentive teaching's ability to generate change in natural science conceptualizations among schoolchildren and adult learners: weight and gravitation [23,24], the day–night concept [22], the planet Earth [14,21], and social-ecological systems [45]. In this study, we dealt with the conceptualization of 'teaching' among experienced teachers, Jewish studies teachers, who implemented attentive teaching in their classes—in subjects unrelated to the natural sciences. Therefore, the practical implication is that attentive teaching can be integrated into different disciplinary school subjects and teacher education contexts to bring about conceptual change in collaborative and enjoyable manner.

Our findings are similar to those presented in other studies that were successful in changing teachers' beliefs. Like the (student) teachers who participated in those studies, the experienced teachers in our in-service program started the process as teacher- and content-centered teachers engaging in transmissive practices. Similar to other successful intervention studies, we found that the combination of reflecting upon current practice, studying an alternative practice, learning by doing, and collaborative learning with colleagues could achieve significant changes in teachers' beliefs and actions [4]. At the end of the process, the participants adopted a social constructivist, student-centered approach, and expressed positive feelings about teaching [41,46,47].

There are also differences between those studies' findings and ours. Fives and her colleagues [35] (p. 250) pointed out that the tradition of dichotomizing teachers' beliefs into teacher- versus student- centered may be too broad to capture nuances and change over time. In our study, we measured teachers' beliefs three times during the professional development course and found out that the participants' change process occurred in three-phases. At first, the teachers held traditional views about teaching. Half-way through the course, they adopted student-centered views aligned with constructivism. The final phase that took place at the end of the course involved both teachers and students learning from each other, in line with social constructivism. In contrast with Yung-Chi [41], the positive emotions the teachers expressed were related to the discovery of the students as a source of knowledge and inspiration, and not merely from adopting student-centered practices. We hope that more studies that employ multiple assessments of teachers' beliefs longitudinally will enhance our theoretical understanding of the trajectories of change in teachers' beliefs.

In recent decades, interest in teachers' wellbeing has increased [48]. It has been established that teachers' wellbeing is related to their relationships with their

students [48,49]. It is possible that in our study, teachers' focusing on their students and particularly implementing Attentive Teaching during the second half of the course resulted in them gaining a higher level of appreciation for their students and learning from them. These effects may have improved the relationships between teachers and students even more, and as a result, teachers' well-being may have improved. It is also possible that learning from students makes a unique contribution to teachers' wellbeing. This possibility has theoretical, as well as practical significance and deserves further research.

Undermining learners' 'intuitive' concepts is often a part of constructivist ways of teaching [11,12]. This is accomplished by exposing students to experiences that raise cognitive conflicts, since they are incongruent with students' intuitions, but can be explained with the accepted cultural concepts and theories. Such practices do not lead to an immediate replacement of intuitive insights with culturally accepted ones, but rather to the formation of intermediate concepts that are positioned between the culturally accepted concepts and the initial ones the learners had prior to learning [19]. These are not stable, fixed concepts; the learners feel that their insights are not yet coherent and try to change them so that they are all in agreement [19,20]. Research on change in teachers' beliefs also found that teachers may have a mixture of beliefs, some of which are student-centered and others which are teacher-centered, and that these could be found before, during, and following interventions [4,35]. Instead of challenging learners' conceptualizations [11,12], attentive teaching provides them with mediated interactions that accentuate multiple aspects of the focal concept and enrich it (thinking Journey). As a result of participating in the course, the participants did not construct intermediate incoherent concepts [19,20], but rather coherent and richer ones that are more appropriate for actual teaching practice. Half-way through the process, the participants' conceptualizations were in line with constructivism and at the end of the process, with social constructivism. Both changes took place in a manner that respects and builds on the participants' prior conceptualizations. Enriching, rather than replacing, participants' prior ideas might explain how we achieved change, even though the teachers in our study belong to traditional communities, in which teacher- and content-centered forms of teaching are well entrenched and interconnected with other values. Such circumstances impeded change in other studies [4]. The teachers connected the new ways of teaching that the attentive teaching course introduced with aspects of their heritage, such as the Talmudic verse two of them cited. This finding suggests that a respectful approach towards learners' previous intuitions may be a better strategy for inducing change than creating cognitive conflicts, particularly while working in traditional contexts. Although this is not a novel understanding, it is both theoretically and practically significant given that creating cognitive conflicts is still a common constructivist practice [50,51].

Finally, we used drawings and their written explanations to track changes in the participants' conceptualizations of 'teaching'. This method was successfully applied in previous studies, either to document teachers' beliefs or to track changes from teacher-centered to student-centered beliefs [40,41,46]. By using the same technique, we were able to observe a three-phase change process. However, more studies are needed to discover additional indicators of different phases of change processes.

10. Conclusions

In this study, we aimed to find how experienced teachers' concept of teaching changed after studying, experiencing, and implementing attentive teaching, by examining their drawings of 'teaching' at the beginning, middle, and end points of the course. We found that at the start of the course, the participants were teacher- and content-centered using transmissive practices. Half-way through the course, they adopted student-centered views aligned with constructivism. By the end of the course, they believed that teaching was a multi-directional and enjoyable process that involved teachers and students leaning from each other. These beliefs are aligned with social constructivism. The change process took place even though the participants belonged to traditional communities, in which transmissive, teacher-centered practices are well entrenched and interconnected with other

beliefs, circumstances that are associated with resistance to change. Finally, the three phases of this change process were documented and identified through multi-modal texts consisting of drawings and written explanations.

Our findings suggest that attentive teaching is a practical method that can change experienced teachers' conceptualization of 'teaching' and contribute to their wellbeing. From a more general perspective, our findings suggest that extending and building on previous conceptualizations may be a better strategy for inducing change, rather than challenging these conceptualizations, particularly in traditional contexts that are resistant to change.

Our findings also point out three potential theoretical contributions that require additional research: (1) Identifying the three phases in changing teachers' beliefs about teaching, instead of the teacher- versus student-centered dichotomy. The third phase is associated with social constructivism. (2) The contribution that learning from students makes to teachers' wellbeing. (3) Using drawings and their explanations for nuanced and protracted documentation of teachers' beliefs and the changes they undergo over time. The study's limitations are its small scale and unique group of participants. Future studies will explore whether our findings can be replicated in additional cohorts, and follow these three directions of research.

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Article

Comfort in the Role: The Core of Positive Veteran Teachers

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Abstract: Teacher career trajectory studies have identified a small group of positive veteran teachers who have maintained an ongoing enthusiasm for and commitment to teaching. Research into teacher career trajectory frameworks suggests that comfort in the role remains a core tenet in supporting their sense of professional identity. While studies have identified this, there is little research into the subtleties of this tenet and how this helps these positive veteran teachers remain committed to teaching. This article reports on the qualitative findings about comfort in the role in sustaining positive veteran teachers' commitment to teaching. Further, the article points to key support measures accessed by these teachers to maintain this commitment. The ability to identify what comprises comfort in the role may encourage curriculum organisations and executive school leadership to retain and capitalise on the skills of their positive veteran teachers. This research seeks to examine an important teacher education perspective that provides valuable examples for beginning and early career teachers of practical mechanisms for positive coping mechanisms and maintaining comfort in the role in the longer term in a dynamic and demanding profession.

Keywords: teachers; positive veteran teachers; comfort in the role

1. Introduction

While considerable research attention has been devoted to early career teachers and their attrition rates, globally, it is estimated that there will be a shortage of 44 million teachers in 2030 [1]. As such, teacher retention has been and continues to be an acute and pressing issue in education policy as well as in research; little attention has been paid to veteran teachers—especially those who remain positive towards teaching—and the characteristics that sustain them. Consequently, schools may be potentially under-utilising good teachers. The purpose of this study was to develop insights into the characteristics of positive veteran teachers and how comfort in the role sustains them in their commitment to teaching. Teacher retention continues to be an acute issue in education policy as well as in research [1–3].

It is important to note that female teachers represent 72% of the teaching workforce in Australia [4], which underscores the need for further focused research on this demographic. Feminist theories, which are integral to this diverse theoretical framework, emphasise critical power analysis and often prioritize addressing social injustice, serving as a significant motivator for research efforts [5]. Considering the role of feminist perspectives within posthumanism and the aim to not only describe but also envision the potential future developments of research [6], it is crucial to examine both current and future studies by questioning who or what is afforded the opportunity for development and transformation in professional settings [7].

Veteran teachers have been broadly defined by a combination of years of teaching and/or life experience, and there is considerable flexibility in the definition. Drawing upon both the Latin etymology of the word 'veteran' (2019), meaning a person of long experience, and incorporating the wide range of respected researchers cited throughout this article, for

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the purpose of this research, the term ‘veteran teacher’ is used to refer to a teacher over the age of 40, or who has had 20 or more years teaching experience.

In examining the professional lives of teachers, four central frameworks have identified a cohort of veteran teachers who have maintained their commitment to the profession [8–13]. All four sought to examine the professional life phases of teachers from that of pre-service through to retirement. Over time, other researchers have sought to identify characteristics associated with various periods of their teaching experience [14]. While career trajectory studies identify groups of committed veteran teachers, it is useful to further examine the shared characteristics of this group. Day and Gu [12] reported commitment in veteran teachers as an outward expression of motivated teachers who believe they can make a difference. They report that their positive emotions of joy and pleasure are sustained and stored as fuel for times that challenge their resilience. The literature suggests four broad, dynamic dimensions associated with teacher commitment shared by positive veteran teachers. These researcher-derived labels of convenience are reflective of the multi-faceted and dynamic characteristics of this cohort, and the focus of this article is that of positive veteran teachers and comfort in the role.

The knowledge derived from this study may then be employed for school leadership to better support all veteran teachers and potentially re-engage their disengaged or disenfranchised colleagues. It also acts as a valuable source of practical strategies for beginning or early career teachers.

1.1. Comfort in the Role across Teacher Career Trajectory Studies

Comfort in the role relates to a sense of agency or being comfortable and in control of the classroom [8] and, while many factors impact negatively on the enthusiasm of teachers in their later careers, research has consistently identified a small cohort of veteran teachers who remain enthusiastic about and committed to the profession despite its challenges [11,12,14,15]. Comfort in the role facilitates these teachers’ sense of self efficacy, commitment, and enthusiasm/internal motivation. Huberman [16] reported that veteran teachers typically no longer felt the need to prove themselves to others and thus required or sought less support or affirmation. Carrillo and Flores [17] concurred with this finding in their analytic review, suggesting that positive veteran teachers reported a high degree of confidence in their teaching skills. A more recent mixed-methods study conducted by Chiong et al. [2] affirmed perceived professional mastery as an important factor in enabling veteran teachers to stay committed to the profession.

This paper also identifies a need for a greater body of exploratory research in a post-COVID-19 era as to how these teachers have maintained their commitment to teaching. In addition, greater research attention could be given to these mechanisms of comfort in the role that are employed by these positive veteran teachers to effectively support their younger, less experienced colleagues.

This study augments the understanding of this cohort by identifying and exploring comfort in the role of positive teachers drawn from four key teacher career trajectory studies [10–13,16]. Teacher career trajectory studies have been a popular and enduring research topic and have revealed that teachers progress through various stages of commitment throughout their professional lives [9,10,13,16,18–20]. Much of this research has focused on particular phases of teaching or teaching cohorts, specifically early career teachers [12,14,15].

Although middle-aged, experienced teachers often become demotivated, some teachers remain enthusiastic and committed. Four key studies that differed in structure from linear to dynamic or transformative [9–12,14,16], all identified comfort in the role as important to positive veteran teachers across the later career stages.

1.2. Comfort in the Role in Wider Literature

Huberman [9] characterised teachers of 20–30 years of experience as having “the perception of confidence, effectiveness and serenity” (p. 353). Day and Gu [11] reported a

strong sense of agency and professional competency as leading characteristics identified among committed veteran teachers. Similarly, Fessler and Christensen [10] identified the career wind-down phase as one that positive veteran teachers perceive as a pleasant and enjoyable period of their teaching. Steffy and Wolfe [13] quantified comfort in the role as achieving certain expectations benchmarked against national certifications.

There appears to be a consensus that positive veteran teachers generally feel comfortable in their roles. However, Fessler and Christensen [10] asserted that although veteran teachers often feel a strong sense of efficacy or comfort in their classroom role, they still require external affirmation of their effectiveness. Steffy and Wolfe [13] stated that while veteran teachers have a strong sense of agency and self-efficacy, they still need to engage in transformative reflection to enable them to maintain agency and efficiency. In contrast, Huberman [16] reported that veteran teachers typically no longer felt the need to prove themselves to others and thus required or sought less support or affirmation. Finally, Day and Gu [8,9] noted that over the course of their teaching careers, most positive veteran teachers perceived themselves as becoming more effective but cautioned that those in challenging teaching contexts were at risk of reduced effectiveness and commitment. Additionally, they warned that age and experience is not always an indicator of teacher effectiveness; however, resilient teachers were more effective and positive about their role. Traditionally, the role of teachers has been to support and nurture students on their learning journey [18]. In describing veteran teachers, they asserted, “Rather than fighting off difficult challenges, they should be beacons of hope and optimism for all” ([12] p. 455). Broader challenges within a school context often include increased administrative duties or reporting responsibilities [20–24].

The wider literature has confirmed comfort in the role as common among positive veteran teachers. Positive veteran teachers felt the following: (1) comfortable in their abilities as teachers and (2) as though they were making a difference to their students. Comfort in their abilities as teachers was noted by Howard and Johnson [25], who reported that personal agency, competence, and achievement were protective factors for resilient teachers. Carrillo and Flores [17] concurred with this finding in their analytic review, suggesting that positive veteran teachers reported a high degree of confidence in their teaching skills. A more recent mixed-methods study conducted by Chiong et al. [2] affirmed perceived professional mastery as an important factor in enabling veteran teachers to stay committed to the profession.

Comfort in the role also emerged in relation to the impact that positive veteran teachers had on their students. Comfort in the role manifested itself as a sense of satisfaction watching their students achieve, as well as developing positive relationships with their students. McIntyre [26] commented, “The boundaries between home and school are reconceptualised as notions of belonging, and school, colleagues and pupils take on the role of extended family” (p. 61). Others [22,25,27] reported that the positive veteran teachers described deep respect for their students, coupled with satisfaction about watching their students learn. A broadly similar perspective was noted by Palmer [28] who observed, “Good teaching is an act of hospitality towards the young, and hospitality is always an act that benefits the host even more than the guest” (p. 51). This view is supported by Thorburn [29], who noted that the veteran teachers’ hardiness and comfort in the role sustained their interest in teaching while also juggling family responsibilities. Correspondingly, Fransson and Frelin [24] and Gu [30] reported constructive relationships between teacher and student in the form of positive feedback from both parties playing a central role for committed veteran teachers in maintaining their commitment to teaching.

In contrast, Acker [31] emphasised a slightly different perspective on comfort in the role, noting differences in the career trajectories between men and women. She reported that the differing nature of trajectories might see women enjoying comfort in the role more than men, because they may have engaged in work–life demands in alternate ways throughout their careers. Women are historically more likely to have taken time out of the workforce than men, and these career breaks may have enabled them to resume with a

new sense of commitment. It is evident that much of the literature supports comfort in the role as an appropriate label of convenience to describe the efficacy and agency of positive veteran teachers. This article sought to identify, for positive veteran teachers, how comfort in the role has played a part in sustaining their ongoing commitment to teaching.

2. Materials and Methods

Having identified the association between comfort in the role and positive veteran teachers, this study set out to examine the question of how comfort in the role sustained this cohort's commitment to and enthusiasm for teaching. In seeking to add to what is known, an ontological perspective of critical reality was selected. This allowed for the addition of depth and breadth of knowledge about this cohort while allowing for a degree of researcher interpretation and situated context. A post-positivist epistemology facilitated the etic and emic contexts of this research and enhanced understanding of the participants within this study. The combination of a critical reality ontology and post-positivist epistemology facilitated the use of both quantitative and qualitative approaches. While there are several definitions combining both elements to create a mixed-methods approach, ref. [32] developed a definition that results from, "many years of reviewing mixed-methods articles and determining how researchers use both quantitative and qualitative approaches in their studies" (p. 55).

This aligns with the clear gap in the knowledge identified by van der Want, Schellings, and Mommers [33] who noted that further research into how veteran teachers maintain their comfort in the role is needed, stating "further research should, instead of a focus on situations, include a broader perspective on how experienced teachers maintain their positive professional identity" (p. 818). A post-positivist approach recognises the researcher is actively involved in shaping and developing research, and the multiple and potentially subjective nature of the research findings [34]. The use of a survey questionnaire method would enable me to gather the relevant data from an etic perspective. The nature of these questions implies an emic role, that is, anything performed from within the culture, and required interviews with positive veteran teachers.

The study was conducted in Western Australia, a state comprising one-third of the continent of Australia, with a population of approximately 2.6 million people. Despite its size, its arid outback means the population is largely situated in the southwest of the state. While most of the population is situated in the southwest, the study attempted to reach as many teachers across the state as possible. This included city-based, rural, and remote veteran teachers across primary, secondary, and K–12 schools. Drawn from the literature review, the selection criteria comprised the following: (i) teachers over 40 years of age or (ii) teachers with 20 or more years of teaching experience. Twenty years was selected as a working compromise based upon the tenure and age as described in the literature review. A purposive sample was used, chosen from those schools willing to participate and with the consideration of maximising the representativeness of positive veteran teachers. In education, questionnaires represent a standard form of data collection. In addition to obtaining a broad picture from a large research cohort, they also facilitated the gathering of a large amount of data in a statistical format [35]. Providing a sample is large enough, it allows for comparability and generalisability across a variety of settings. In this study, a survey was useful for identifying the shared characteristics of positive veteran Western Australian teachers. The questionnaire was designed to address the 'what' surrounding research question one, while the interviews were designed to explore the 'how' surrounding social support. The purpose of the questionnaire was to identify whether the hypothesised constructs of experimentation, challenge acceptance, leadership, and comfort in the role, as drawn from the wider literature, were a valid way of identifying positive veteran teachers. In addition, the questionnaire sought demographic information on where positive veteran teachers were located in Western Australia, their gender, age, and school types, that is, primary or secondary or both.

After gaining Institutional ethics approval (19,732) participants in this research project were selected from a wider study identifying positive veteran teachers and the role of social support in sustaining their commitment to teaching. This project's participants were all identified as positive teachers who had worked in a variety of sectors with decades of teaching experience ranging from schools with one to twenty or more years' teaching experience.

The first stage was quantitative in the form of a questionnaire designed to identify positive veteran teachers in Western Australia. The second stage was qualitative in the form of semi-structured interviews designed to explore the emergent aspects of comfort in the role. While positive veteran teachers took part in the study from certain education sectors, an additional limiting factor on sampling was the challenge of obtaining ethics approval for state schools despite the rigorous efforts in liaising with them. The survey instrument contained four sections and comprised 16 items relating to the four proposed constructs of experimentation, challenge acceptance, leadership, and comfort in the role. The final version of the survey was placed online for six weeks. Participants who volunteered to take part were sent an email link to the online survey instrument.

After gaining institutional ethics approval, we identified five participants who had scored highly in the quantitative survey data. We then held an in-depth qualitative interview with the five participants, which lasted up to 100 min.

This small, non-random, purposive sample [36] facilitated what Patton [37] described as an "information rich" approach, "Studying information-rich cases yields insights and in-depth understanding" (p. 264). Participants were selected based upon a diverse range of professional experience across school types in line with a purposive approach. Rowley [38] claimed the most common form of interview is semi-structured. These can contain varying numbers of questions, and the order of these can also be adapted to suit the needs of the participant. The overarching research questions were developed to identify what I wanted to understand, while the interview questions were designed to gain these understandings [38]. A range of interview questions was designed to elicit insightful responses as opposed to simply, "a mechanical conversation of the research questions" [39]. Following the guidelines presented by [39], the interview protocol comprised 16 questions divided into four sections of varied length, and it could be adapted based on participant responses. The full version of these is provided in Appendix A.

A profile of each participant is provided and includes details of their gender and current role in education. Each participant has been provided with a pseudonym and their schools have been de-identified.

Participant titles are as follows:

Matthew (aged 64) is a highly experienced Humanities and Social Sciences (HASS) teacher at a rural high school who has taught locally and internationally. He has undertaken a range of roles within schools, always seeking a lattice based rather than vertical approach to leadership. During his career, he has taught across all year groups in secondary school and has enjoyed a variety of leadership roles including the head of department, as well as working as a director of administration and finance within a school. He has also engaged in further study, completing a Master of Education degree. In his final years of teaching, Matthew is working both as a HASS teacher and a senior mentor, supporting students as they leave school. He is responsible for maintaining contact with students after graduation and supporting their transitions into further study, trade, or apprenticeship pathways. This leadership role was created for him in conjunction with his principal. Matthew had worked with his school leadership in managing his retirement plan, and transition arrangements had been put in place to enable him to move to part-time work before eventually leaving the school. Matthew reported positively on the social support provided by his colleagues, describing his relationships with them as providing him with comfort in his role.

Deanne (aged 52) is a kindergarten teacher at an independent kindergarten to Year 12 (K-12) school. She is a mature-aged entrant to the teaching profession; she had a lifelong desire to become a teacher but wanted to undertake other career challenges first. Deanne has taught the same kindergarten year level for nine years. In addition to her classroom

role, she had taken on responsibility for the whole school in establishing leadership habits for both staff and students. Using the model of Covey (2004) in *Seven Habits of Highly Effective People*, she has trained fellow staff members in implementing the program in their classrooms, as well as liaising with school parents about it. Deanne was contemplating the opportunity to engage in further study at the end of 2019.

Deanne reports having a strong rapport with her colleagues and values their support in school. She team-teaches with her support assistants whom she referred to as 'co-educators' and is in continuous communication with them throughout the school day via iPad updates about the engagement and progression of her students. Deanne commented that her school is a faith-based school with overlaps between the school and faith community. As a result, she often sees her students and colleagues outside school hours. However, she had consciously decided to keep her personal and professional life as separate as possible in order to sustain her commitment to her teaching practice. Deanne stated that she had sometimes deliberately avoided social events in order to maintain boundaries for herself as a teacher and as a community citizen.

Lisa (aged 53) is Head of Career Development and Vocational Educational Training at an independent secondary school. She also works as a career counsellor and with the heads of year on their pastoral care programs. Lisa has worked at a variety of schools across Australia, commencing in Canberra and then Perth. After two decades of working in primary schools, she moved into a secondary school role with a focus on literacy, numeracy, and life skills. She also studied at several points throughout her career to gain qualifications in career development and transition management. Lisa has remained in the secondary sector for nearly a decade and currently occupies a leadership role working closely with other staff to support students in subject and career choices.

Lisa valued the social support available within her school, especially from her colleagues, and she actively sought to work with colleagues in similar roles at nearby schools. She noted the importance of social support from the leadership group, which enabled her to implement curriculum changes when necessary. Lisa noted that, in her previous school, a lack of leadership support had resulted in her seeking a new school in order to maintain her commitment to the profession. She reported her current leadership provided her with autonomy and passive support, and her subsequent enjoyment and enthusiasm for her role which has facilitated her sense of comfort in the role.

Anna (aged 65) is Head of Library at an independent K-12 school. She initially trained and commenced as a primary school teacher before subsequently working two roles as a classroom teacher and teacher librarian. She initially trained and commenced as a primary school teacher before subsequently working two roles as a classroom teacher and teacher librarian. During this time, Anna studied and qualified as a teacher librarian. Anna moved from primary into secondary school and occupied a head of library role at two schools prior to her current role. Anna stated that having been in teaching for 45 years, she continued to find teaching a joy. She has also enjoyed roles with the Western Australian Library Association and was the former president of the Australian School Library Association. She appreciated the opportunities teaching and her volunteer roles had given her for professional development and travel and had attended conferences across Australia and in Singapore.

Anna reported that collegiality was important to her maintaining a positive capacity in her role. Departmental issues with colleagues in recent years had been difficult and affected her. Challenges with a couple of colleagues had made her question her teaching ability. However, relevant professional development at the time had rekindled her passion.

Josie (aged 53) is a year six teacher at an independent K-12 international school and is also the year co-ordinator of student leadership and primary school community service. Josie began her career in the Catholic sector but moved to the independent sector and has worked at both rural and urban schools in Western Australia. Josie had undertaken several leadership roles in addition to her classroom teaching throughout her career, including coordinator of community service and student leadership.

Josie valued the social support of colleagues and outlined a deep commitment to team-teaching which provided considerable comfort in the role. She consciously maintained positive working relationships with colleagues in both teaching and administration. Josie had left her previous school after an internal promotion application had turned into what she described as a “critical moment”. Rather than become disenchanted, she moved schools and applied for a new leadership position.

2.1. Instrument

Semi-structured interviews allow the researcher to gain an insight into the lived daily world from the perspective of the participant. As Pietkiewicz and Smith [40] reported, they enable the researcher, “to elicit detailed and first-person accounts of experience and phenomena under investigation” (p. 365) while simultaneously remaining free from preconception or opinion. The immediacy of this medium also allows participants to propose their own answers and clarify or qualify the statements they are making. This study used semi-structured, individual, face-to-face interviews to provide understandings about positive veteran teachers and further insight into comfort in the role. In drawing on Alvesson’s [41] localist approach, this study is grounded in the understanding that the researcher remains open to new and unforeseen phenomena rather than imposing ready-made frameworks or categories. “The semi-structured interview involves prepared questioning guided by identified themes in a consistent and systematic manner interposed with probes designed to elicit more elaborate responses” ([42] p. 246).

The interviews for this research were initially designed and constructed using the five stages of interviewing developed by Kvale and Brinkmann as follows [43]: (i) thematising, (ii) designing, (iii) interviewing, (iv) transcribing, and (v) analysing. This drew on the dual role as interviewer, as that of both a miner seeking information and a traveller who remains curious and open to discovery. This facilitated a heuristic structured process which was simultaneously open to the diversity of human experience and complexity.

The interview included questions designed to maintain the direction and focus of the inquiry while retaining a conversational tone. Castillo-Mantoya [44] suggested using the following four types of questions: “(1) introductory questions, (2) transition questions, (3) key questions and (4) closing questions” (p. 822). This section pertains to those questions related to comfort in the role as contained in these four question types. The introductory question was designed to elicit general information from participants in relation to their journey through teaching and eased each participant into the interview process. It asked them to describe their journey to their current role in the school. The following transition questions were designed to elicit understandings in relation to the shared characteristics identified in the literature. The second question focused on their leadership roles, while the third focused on their perception of comfort in the role, and the fourth question related to experimentation and challenge acceptance.

2.2. Data Analysis

The reflexive thematic analysis Six-Phase Framework of Braun and Clarke [45] was adopted for this research. These phases were as follows: (1) familiarisation with the data, (2) generation of initial codes, (3) searching for themes, (4) reviewing themes, (5) defining and naming themes, and (6) producing the report. As Nowell, Norris, White, and Moules [46] noted, while Braun and Clarke’s model [45] appeared at the outset as a six phased linear method, “it is actually an iterative and reflective process that develops over time and involves constant moving back and forward between phases” (p. 4). The original research questions were drawn on as an organisational framework through which to categorise the themes and sub-themes emerging from this research. Within the context of this article, the research question asked the following: What are the characteristics of positive Western Australian teachers?

The writing process commenced from the outset in line with recommendations from Braun and Clarke using a phase-based approach. Data were simplified by developing codes based upon these immersions. Phase One required familiarization of the data. Phase Two involved generating initial codes, “full and equal attention to each data item” was given ([45] p. 89). This phase required coding for all potential themes, including as much data as possible. Phase Three was where the initial codes were organised in relation to the overarching characteristics identified in the initial survey. This approach applied to all areas of the research undertaken. For the purpose of this article, only the findings related to the characteristic of comfort in the role are presented below. Figure 1 presents an example of an initial and randomised thematic map of all the initial coded themes in relation to the characteristic of comfort in the role.

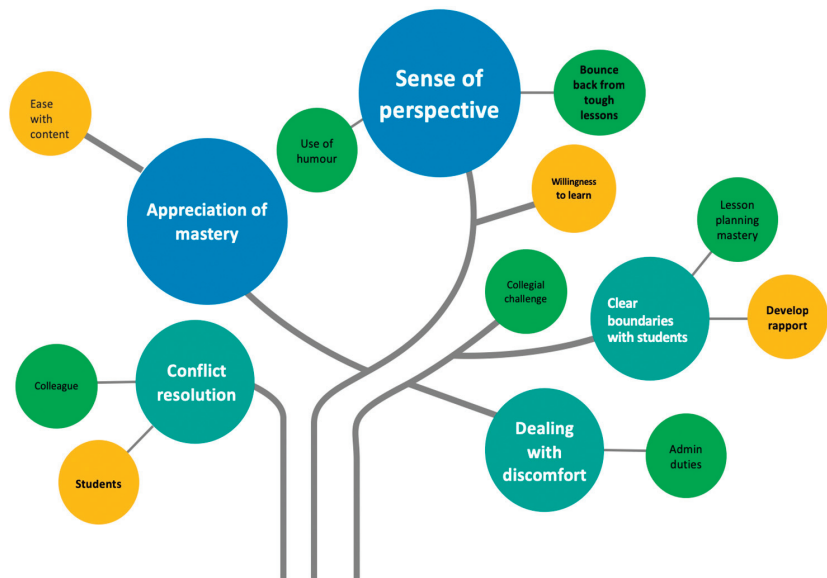


Figure 1. Initial Randomised Thematic Map relating to Comfort in the Role. This infographic visually illustrates these emergent sub themes.

Phase Four involved reviewing themes by reading collated extracts of coded data to check for patterns within them. This required two levels of refinement and review. All extracts were read to check for themes and emerging patterns. The next phase involved considering the whole dataset and checking that the themes were valid in relation to it [45]. This process was carried out again in relation to the characteristics identified in the literature review and then the role of social support inside and outside school, respectively. The “refinement process” ([45] p. 91) is illustrated as an example in relation to comfort in the role in Figure 2. This infographic visually illustrates these emergent sub themes.

Phase Five pertained to reviewing the themes in relation to comfort in the role, where the researchers then considered what ‘story’ was being told by each theme and how these themes added to the narrative in relation to the overarching research question [45]. A further refinement through this process was the emergence of sub-themes that gave structure for more complex themes or showed a hierarchy of meaning. This infographic visually illustrates these emergent sub-themes. That is, some of the emergent themes were deemed to be of more significance than others [45]. A final thematic map in relation to the characteristics of comfort in the role is illustrated in Figure 3. It illustrates the iterative and reflective process that develops over time as a result of the analytical and dynamic movement between phases of analysis.

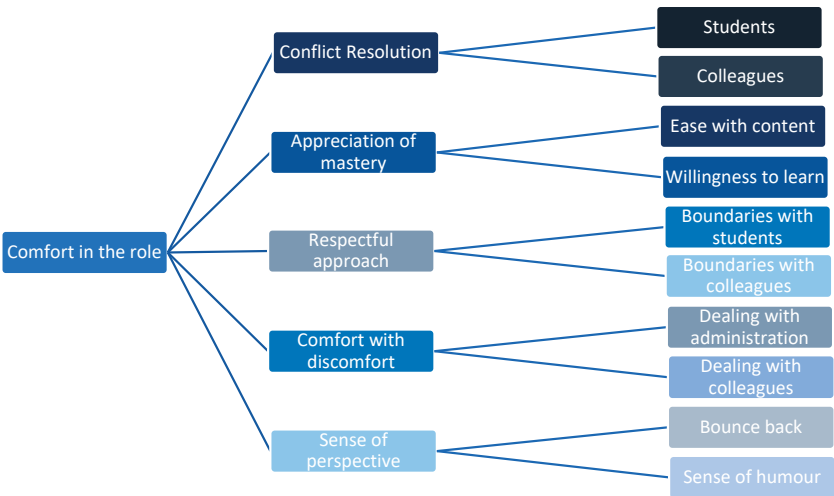


Figure 2. Developed Thematic Map Relating to Comfort in the Role. (Adapted from [45]).

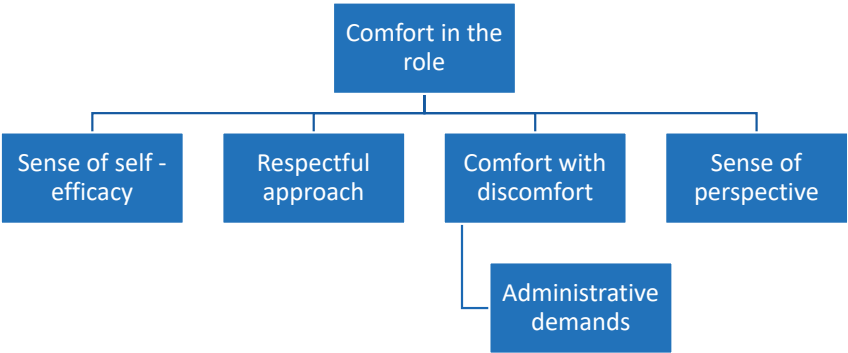


Figure 3. Final Thematic Map of Comfort in the Role.

Phase Six was the final phase of writing up the report for this article. During this phase, extensive use of participant quotations served to highlight the themes that emerged. Nowell et al. [46] noted that this process enables the researcher to go, “beyond a description of the data and convince[ing] the reader of the validity and merit of the analysis” (p. 11). The respondents’ voices and views are foregrounded in this thesis, allowing their unique perspectives primacy [47]. “In light of the enormous value of this highly experienced participants the respondents’ voices and views are foregrounded in results section of the paper, facilitating their unique perspectives primacy not often given to this little researched cohort of educators”.

2.3. Findings on Comfort in the Role

Participants spoke at length about their sense of comfort in the role of teacher. Four themes emerged during coding, as displayed in Figure 3. Findings in relation to each theme are discussed below, beginning with the theme of comfort or discomfort. Each sub-theme will be examined in turn, commencing with the sense of self-efficacy.

3. Results

3.1. Sense of Self-Efficacy

All participants noted in their discussion about a sense of self-efficacy in the teaching role. Participants were comfortable with the content they delivered and had confidence in their teaching abilities. Josie noted that her comfort and efficacy, borne of years of experience, was often something she took for granted and was only highlighted by new teachers watching her in the classroom. She described how pre-service teachers frequently said how impressed they were with what or how she had taught, commenting, *“And I think to myself, ‘Actually I just did that without even thinking.’ And that’s the real pleasure of being so experienced.”*

Similarly, Lisa believed her teaching mastery, coupled with her age, generated high self-efficacy in her ability to carry out her role effectively. Lisa stated, *“I guess since I’ve gotten older I’ve become even more sure of my abilities. I’m definitely not the best thing since sliced bread, but I think I can value myself appropriately.”*

In the same way, Matthew, Deanne, and Anna all reported confidence in their ability to teach effectively and an appreciation for their years of experience. As veteran teachers, their sense of self-efficacy, or confidence in their ability, emerged as a strong theme within comfort in the role.

3.2. Respectful Approach with Colleagues and Students

All participants spoke of being respectful of their relationships with students and colleagues. Anna described working closely with her colleagues and was keen to ensure that she supported them in managing their workloads. She described how she offered practical resources and team-taught with them. This had been a consistent feature of her practice over the years.

Deanne described her respectful relationship with her students in positive terms saying, *“You look for the leader inside all your children, doesn’t have anything to do with academics.”* She later reinforced this, saying, *“I think teaching any year level is amazing. It’s a privilege to teach them all.”* Anna also reported the benefit of respectful relationships with students noting when the relationships were positive, *“You don’t have to tell them a whole lot about your life and the kids just tell you the most amazing, wonderful things.”*

Josie held a similar view with her primary school students, explaining that she worked closely with them to foster their own voices. She was passionate about helping her students be heard by their teachers and peers, commenting:

We’ve got a very big push on student voice within the school, and it includes the house captains. I coach them through the process, and while they’re working out what is in their job descriptions, I help them create what they have to do.

Lisa also reported on the importance of respect for her secondary students, saying, *“Don’t talk to them any other way than you would want your own children spoken to and give them the respect that you would expect that your own children would be given.”* Matthew reflected on how his approach to students was shaped by his positive perception of them. He commented:

I cannot remember, in 42 years of teaching, ever teaching a kid that I thought was a complete waste of space and never going to make anything of their life. I cannot think of one student. I’ve had some really tough classes over the years, but there’s always a spark you can see in a kid.

Matthew also noted that his strong sense of self-efficacy meant his classes were generally enjoyable for him and his students, saying:

I love the fact that there’s a sense of excitement and a buzz when kids find out they’ve got me or when I walk into a classroom. Kids know that something interesting is generally going to happen in lots of ways.

These findings suggested a respectful approach to colleagues and students to be an important aspect of the characteristic of comfort in the role for all participants.

3.3. Comfort with Discomfort

All participants acknowledged a degree of discomfort with some aspects of their profession and discussed varying ways in which they coped with such discomforts. Participants described an increase in administrative duties over recent years while acknowledging they did not always like them. Josie and Deanne adapted to the increase in administration in different ways. Josie reduced her administrative workload by offering to take up other duties for colleagues in exchange for them doing tasks for her. She stated:

Administration is not something that comes naturally to me, and I don't enjoy it. I'm lucky that I have colleagues I've always been partnered up with and I'm upfront. I'll say, "I really don't like doing that part of it. If you do that, I'll do something else".

Deanne explained she had worked closely with school administration to demonstrate how she tracked the development of her students' learning. While her early childhood teaching environment was not a traditional desk and classroom set-up, requirements for monitoring student progress were still the same. Deanne outlined how she managed this, saying:

They understood that this is actually the language that children learn from, and this is what they connect with, how they make sense of their world. I did that through giving them professional development because it's teaching and awareness. It wasn't that they were against it.

Lisa took a philosophical approach, explaining how administrative responsibilities including reporting were a part of the role for teachers, *"It's just part of the job, and you just have to accept that it's part of the job, and it's a professional expectation."*

Matthew perceived increased administrative responsibilities differently and spoke excitedly about how the implementation of SEQTA at his school had provided the opportunity to streamline both his reporting and communications with parents and colleagues. Similarly, Anna used technology to help rationalise her administrative responsibilities. She often presented at middle school conferences and used the features of the Microsoft program OneNote to increase her efficiency in preparing for presentations. All participants unanimously acknowledged an increased number of administrative responsibilities but accepted and described a variety of approaches to adapt and cope.

Deanne explained that while her early childhood classroom did not use worksheets, teachers were required to find other ways to record evidence of student progress. Administrative demands were a key area of discomfort for her. She explained, *"My evidence would be from capturing images, talking to that image and backing it up with kindy guidelines. I'd say that's the worst part of the job is the admin."*

Deanne and her co-educators electronically recorded information in order to simplify this process. She noted it had streamlined communication considerably, and it was a useful coping resource. Josie raised similar concerns about how her administrative duties had increased over time, observing:

The amount of administration is phenomenal. The amount of time you spend face-to-face teaching, versus the time that you are data inputting, or you are replying to emails. A massive difference from when I first started. Teachers don't like doing that.

Josie also worked with colleagues to manage this load. She was honest with them about her dislike and offered to undertake additional teaching duties for them in return for them completing administrative duties for her. Matthew also acknowledged the increase in administrative demands over 40 years of teaching. He humorously described using his age to gain assistance from colleagues, saying,

"And I am very likely to use old age and senility as a wonderful excuse for everything. And it is. I may say, look, I'm sorry, I'm getting old."

Matthew was able to get advice or support from his colleagues in order to complete administrative tasks and commented that once he had been through one cycle of changes to reporting, or a new administrative system, he was more comfortable with using them in subsequent terms or years.

Lisa was uncomfortable with a different part of the job, namely marking, but was pragmatic and reconciled it being part of her workload, saying,

"I love planning curriculum. I love delivering curriculum, and I like being with the kids. But I hate marking. But that's part of the job."

Overall, participants freely acknowledged areas of discomfort in teaching. However, all described coping strategies that mitigated discomfort. It is important to note nuances and discontinuities across the data in terms of the coping mechanisms used by the participants. In each case, participants had sought support from colleagues or school leadership in order to address the issues. The nature of this support ranged from listening to sharing, collaborative exchanges, acceptance, strategic responses, use of technology, or division of tasks to streamline processes.

3.4. Using Strategies to Maintain a Sense of Perspective

While all participants maintained a sense of perspective about their roles as teachers, they used different mechanisms including resilience, humour, self-discipline, as well as a willingness to learn and engage in other opportunities. Matthew noted this was particularly important in his classroom teaching, saying, *"I think that ability to bounce back is a really important one. If I have had a bad lesson, I'll make sure the next one is a beauty."* Josie echoed a similar viewpoint, adding that humour and camaraderie were important in maintaining a sense of perspective, *"There must be humour in my day; otherwise I couldn't do it."* She noted that working with a colleague had enabled her to thoroughly enjoy her year of team-teaching, *"We just had a ball. We just laughed our heads off, and that is a massive key for me."*

In contrast, Deanne maintained her perspective through a clear sense of purpose and focus on why she was a teacher. She commented, *"I'm disciplined and I'm in the habit of planning my life, knowing what I want, where I'm going, how I'm going to get there."* Lisa took a broader view, saying that it was being willing to be a lifelong learner that sustained her. She noted:

I do think that we have to be willing to keep learning. Some of the teachers I've seen that are very resistant to change get unhappy more quickly, whereas I think that we do have to just continue to learn.

Anna also expressed appreciation for the opportunities that teaching had provided her. She noted that even when she had dealt with challenging colleagues describing them as, *"really tricky"*, she had been able to travel to an international conference, and this had enabled her to keep a sense of perspective. She remarked, *"I've had lovely opportunities. I've found something that I really love and I've enjoyed it."* She noted that the experience enabled her to look at things differently after that, and these kinds of opportunities had occurred throughout her career. Teaching had its challenges, but she engaged in opportunities that, in different ways, helped her to retain her sense of perspective and renew her love of the job.

In summary, all participants described an ability to retain a sense of perspective in their profession.

4. Discussion

This paper explored how these positive veteran teachers' sureness of ability, coupled with their capacity for relationship generally, can contribute to the building of a sense of perspective that has sustained them throughout their professional life phases. It has begun to identify the various enablers and inhibitors of their comfort with discomfort, as illustrated through the increased administrative demands, coupled with their capacity to find efficient ways to manage these. These positive veteran teachers' perceptions of how

they maintain comfort in the role are the lens through which we examine their capacity to maintain their commitment to their professional throughout the later years of their career.

The interviews highlighted that all the participants were confident in their teaching abilities and had a strong sense of their professional identity. All reported a sense of agency in the core business of classroom teaching. Not only were participants aware of their abilities in the classroom, but they were also simultaneously appreciative of their capacity to build relationships with their students as a result of years of teaching experience.

Day and Gu [12] reported that all veteran teachers at this stage of their careers should, in theory, be at the height of their expertise and wisdom. Similarly, refs. [29,48] reported that an innate aspect of veteran teachers was a high degree of confidence in their professional mastery. The results of this study corroborate the work of others that positive veteran teachers appreciate their abilities and do have high self-efficacy in their teaching [9–11,13,25].

4.1. Respectful Approach

All participants described the importance of being respectful towards their students, and this included the following: (i) clear boundaries between students and the teacher, (ii) dealing with students as young adults, and (iii) effective conflict resolution. Participants allowed students to have fun in their classroom but maintained clear boundaries based upon mutual respectful relationships that they valued. For example, Matthew described how it could get a bit noisy in his classroom, but it was more important to him that the students enjoyed each other's company. Josie referred to the laughter that echoed continually in her classroom throughout the day, and how this was important for the learning environment for both herself and her students. She attributed this confidence to being in the teaching profession for a long time.

This study appears to indicate that "knowing the ropes" [10] means that these positive veteran teachers are able to facilitate relaxed classroom environments. Deanne was able to communicate with her early childhood class as young adults and Lisa echoed a similar view of respectful communications. Matthew reported an occasion where he had become upset with a student, and he had apologised to the student immediately afterwards. He had explained that a recent bereavement had caused him to react poorly. His respect for his students meant he wanted to explain his actions and resolve the conflict. This behaviour corresponds to Palmer [28], who argued the mutual benefit of respectful relationships for both students and teachers. In reaffirming his relationship with this student, Matthew resumed the positive rapport that he and the student had previously enjoyed. Overall, this study found that participants valued respectful relationships with students. It contrasts somewhat with Steffy and Wolfe [13], who described comfort in the role as a result of veteran teachers meeting certain expectations benchmarked against national certifications. Huberman [16], on the other hand, reported veteran teachers requiring less support or affirmation from students. Rather, this study reflects the findings of Day [11] and Fessler and Christensen [10], who reported that positive veteran teachers appreciated the importance of enjoyable and comfortable classroom settings. Results highlight the mutual benefit enjoyed by the teacher and student as a result of the teacher's experience and adaptive skills in providing positive learning environments. It also highlighted how their strong sense of professional identity enabled them to maintain positive working environments.

4.2. Comfort with Discomfort

The theme of comfort primarily comprised discomfort with administrative demands. Four participants described the administrative aspects of their role that they did not enjoy, and the adaptive coping strategies they employed to overcome this. Josie described how administrative tasks such as marking did not come naturally to her, but she was honest with her colleagues about it. At times, her colleagues would complete the administrative tasks for her, allowing her to focus on engagement between staff and students. Lisa echoed a similar dislike for marking and noted that over 30 years, the pressure to report on student achievement and administrative accountability had increased substantially. However, she

also stated that she was open to new ways to streamline this process. Matthew also noted how administrative tasks had increased substantially over the years and spoke nostalgically of the rolled cassette copier from his early days of teaching. He reported that, while the nature of the administrative demands had changed, he always asked his colleagues or his own children for help with managing those demands effectively. Deanne also lamented the increase in administrative demands but described how she used an iPad to ease and streamline the load.

While the literature has described the negative impact of increased administrative loads on veteran teachers [20–23,49], this study found that, while participants acknowledged the challenge of administration, they employed constructive strategies to cope. This included actively seeking support from colleagues. Studies conducted prior to the digital revolution also acknowledged the demands on teachers in terms of administrative duties and reporting [9–11]. Steffy and Wolfe [13] noted the need for veteran teachers to engage in transformative reflection to maintain their efficiency, and Day and Gu [11] similarly reported on the importance of professional competency. However, the findings here provide contemporary exemplars of the highly adaptive qualities of these positive veteran teachers in dealing with discomfort. It is encouraging to compare the ways these positive veteran teachers adapt and cope with discomfort with Day and Gu's [93] description of them as, "beacons of hope and optimism" (p. 455).

4.3. Sense of Perspective

All participants shared an overarching sense of purpose that enabled them to maintain a positive outlook throughout their careers. Comparison of these findings with other studies has confirmed the sense of agency of positive veteran teachers [9–11,13]. Matthew described his ability to bounce back after a difficult lesson. It was important for him and his students that he reflect and recover from lessons that did not go well. Josie echoed a similar view saying, "*It depends, and sometimes they work really beautifully, and other times you just have to work a bit harder to make them work.*" Lisa discussed how she took all she had learned in her previous school role and used it in her new school position to create something innovative and exciting. In every instance, participants stressed the importance of remaining positive, which they described as crucial to their wellbeing and that of their students. These positive veteran teachers understood that not every lesson they taught would be successful, but they had the ability to bounce back and keep focused on the bigger goal of making a difference for the students. These findings may add to the growing body of evidence that suggests that a sense of perspective is important in sustaining teacher wellbeing over a teaching career.

5. Conclusions

The findings related to the characteristic of comfort in the role were consistent with the literature [10,11,17,29]. This research found that positive veteran teachers were confident in their teaching roles as a result of their years of experience and their ability to contribute to the learning and achievement of their students. In preparing pre-service teachers for the current and future challenges, this study's findings reinforce how positive veteran teachers are enthusiastic and committed to providing a high-quality education to students, embracing rapidly changing technology, and broadly resisting the negative effects of elements of their role. This provides an important example of aspiration for younger and less experienced teachers. During the interviews, four central themes emerged, underpinned by social support in the form of interactions with students and colleagues. Positive veteran teachers in this study appreciated their abilities, had a sense of self-efficacy in their teaching, and enjoyed respectful relationships with their students. They recognised and valued the positive rapport they developed with students; they also had the ability to bounce back or recover from lessons or incidents with students that were not always positive. These coping strategies affirm the wider literature that notes that these effective adaptive strategies are linked to better relationships and work satisfaction [39,50]. Participants acknowledged their

discomfort with increased administrative demands but had employed positive strategies in order to cope. This approach aligns with the wider literature [9,10,13]. Positive coping strategies included working closely with other colleagues or implementing technology-based processes to improve their efficiency in meeting these requirements. This study has examined the positive veteran teachers in Western Australia, and how comfort in the role has enabled them to remain committed to teaching.

These findings have implications for school leaders and policymakers in extending their knowledge and understanding of how positive veteran teachers strategically use comfort in the role to support their professional identities. It is also a valuable example for younger, less experienced teachers of ways to manage the challenge of their role. As the issue of attrition becomes more pressing, these findings may prove a valuable mechanism in mitigating the issue moving forward.

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Appendix A

Still keen and committed: identifying the role of social support as a positive coping strategy for later career teachers. Interview questions

Getting Started

1. Can you describe your journey to your current role here in this school?
2. Can you describe the work you do in your current position?
3. What parts of your job do you most enjoy? Least enjoy?
4. How do you cope/manage changes that are implemented in your school?

Social support—inside work

1. How many colleagues do you typically spend most of your time with in your school?
2. How significant are these social supports to you?
3. Which colleagues provide you with practical support in your role?
4. Can you describe a specific event or period of time where they helped you to cope at work?
5. Who do you turn to for emotional support at school and how significant is this support for you?
6. In what ways is teaching challenging for you?
7. Are there key individuals who support you and how do they do so?

Social support—outside work

1. Can you comment upon the range and nature of social supports outside school that you have in your life?
2. How important are these individuals in maintaining a positive capacity for teaching?
3. Can you identify characteristics of the people outside your workplace who provide you with emotional support in relation to your teaching career?

Finally

1. As you reflect upon your teaching career, what do you think are the positive coping strategies you use that enable you to enjoy your career?
2. What would be your number one piece of advice for early and mid-career teachers to enable them to maintain a positive capacity for teaching?

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Article

Bridging Theory and Practice: Using Goal Systems to Spark Professional Dialogue and Develop Personal Theories

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Abstract: School-based mentors play a key role in the learning processes of student teachers. Ideally, they facilitate student teachers to scrutinize their approaches and underlying assumptions, and link these to theoretical notions. In this study we investigated how three mentors used a goal-system representation (GSR) tool in their mentoring conversations. The GSR tool is essentially a visual reflection of the student teacher's *personal theory* regarding classroom practice. It was developed at our teacher training institute to help our students see the personal relevance of research literature and theory and apply it to their lesson plans, to bridge the gap between educational theory, their vision of good teaching and their educational practice. In three explorative case studies, we show how mentors use the GSR tool and to what extent they support three levels of personal theory development: sharing, investigating and transforming. In all cases, student teachers could relate their practices to theoretical notions, giving access to their mentors for further questioning of their sense-making of the situation. Mentors successfully use these opportunities for personal theory development in various ways. We conclude that the GSR tool functions as a boundary object between theory and practice and between institute-based and school-based teacher education.

Keywords: teacher education; personal theory development; goal-system representation tool; school-based mentoring; professional dialogue

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1. Introduction

Good quality teaching needs both practical experiences and theoretical underpinnings. For this reason, teacher education programs always seek to combine and balance learning *by* doing (practice) with learning *about* doing (theory). Ideally, student teachers productively connect theory with practice and develop their own *personal theory*, the theory they actually work with. Buitink, who refers to this as *practical theory*, states: 'Practical theory is the fairly integrated sum total of experiential knowledge (as a person and as a teacher), academic or theoretical knowledge and knowledge acquired through interaction with others' [1] (p.119). A personal theory develops continuously and is therefore dynamic [2,3].

Making productive connections between theory and practice is not self-evident, however [4]. It ideally requires that student teachers are willing and able to understand and interpret theoretical frameworks and research outcomes and experiment with new perspectives in their classrooms. Such a top-down reference is needed to broaden student teachers' perspectives on 'good teaching' and invite them to look beyond their own experience [5]. For example, at the beginning of their education many student teachers perceive 'building a positive relationship with students by showing interest' as the main contributor to their students' experience of connectedness. Later on, for instance, autonomy supportive teaching [6] may provide them with other options on how to connect with their students. This top-down learning process is generally often accommodated at teacher education institutes. What is challenging, however, is that student teachers tend to conceptualize

theory and practice as opposites and often perceive strong theory as being too abstract and generic [7]. This seems to be caused by a misleading expectation that strong and descriptive theory should be able to prescribe ready-to-use guidelines for practice. From her research, Sjölie concluded that starting a meta-dialogue with student teachers about the relationship between theory and practice is essential to overcome such misleading conceptualizations and to truly develop a personal theory instead.

Besides the ability to critically evaluate research findings and theoretical frameworks and understand their potential, student teachers also need to be able to understand and assess their own practice and personal theory through critical reflection. Such 'bottom-up' learning processes are generally organized in internships. Made explicit, student teachers can scrutinize their approaches, underlying motives and assumptions, also referred to as their 'knowledge in action' or 'tacit knowledge', and link these to theoretical notions [8,9]. This is needed to further the process of dialogue and critical reflection that is essential to their professional development [3,10]. Acquiring such awareness is not an easy feat. It requires a positive and safe environment to ensure an open mindset and room for professional vulnerability [11–13]. Student teachers, therefore, need effective tools to explicate and evaluate the reasoning behind their design and enactment of lessons during their training [14].

In our teacher education program, we have addressed these conceptual and methodological issues in two ways. Firstly, we have organized our curriculum around core practices that steer both theoretical exploration and practical skill learning at the same time [10,15,16]. Secondly, and most important to this article, we have developed a tool that helps our students to bridge the, at times, frustrating gap between educational theory, their vision of good teaching and their educational practice. The tool was originally developed to study implementation processes of innovative teaching practices [17–20]. It invites student teachers to explicate which goals they hope to achieve at different stages of their lessons in a schematic overview or visual 'goal-system representation' (GSR). The goal-system representation is essentially a reflection of the student teachers' personal theory regarding classroom practice [21].

So far, we have explored working with the GSR tool in several contexts of the teacher education program we run. First and foremost, it has been used, for several years now, at our institute as part of a learning trajectory towards a professional investigative attitude (or 'inquiry as stance') [16]. In light of becoming consumers of research and becoming evidence-informed professionals, student teachers individually construct a visual image (GSR) of building blocks that represents how their lessons generally tend to unfold; they then connect the building blocks to corresponding goals. They subsequently read and discuss research literature and theory, based on which they devise potential next steps in their development. Finally, they adapt their GSR based on these ideas (*modular redesign*) [16,22]. In this context, the GSR tool has proved effective in two ways: it helps student teachers see the personal relevance of research literature and theory and apply it to their lesson plans; it has also stimulated group talk and learning to have meaningful professional dialogues with peers [23]. For some students, their GSR has formed the basis for a small-scale action research conducted in their schools [24].

Besides being used at the institute, the GSR tool has also found its way to the schools that our TE institute works with. During the internships, school-based mentors play a key role in the student teachers' development [25,26]. They are expected to help student teachers learn how to connect what they learn from their program courses at the institute with what they do in their classrooms [27]. In the study presented here, we show how the GSR tool functions in the context of the internship, where the focus is more on learning *by* doing.

Given their influential role, we wanted to know how the GSR tool supports school-based mentors in their coaching practices. The goal of our research was to explore if and how the GSR tool supports a professional dialogue of personal theory between student teachers and their mentors.

2. Theoretical Background

Primarily, school-based mentors possess practical knowledge about mentoring and the process of learning how to teach [28]. They are experienced teachers who can be an example to student teachers. At the same time, they are expected to assist student teachers with developing their personal theory by making connections between theoretical frameworks and their teaching experiences, and to help them integrate pedagogical content knowledge into their teaching practice within a dynamic and demanding learning environment [29]. The mentoring task is not an easy one. Mentors often mention how they struggle to bring their students’ underlying assumptions to the surface and to resist teacher students’ longing for immediate bite-sized practical tips and tricks [30,31]. Berry also described mentoring as dominated by tensions between conflicting purposes which mentors learn to master through professional self study [32]. Similar to their students, school-based mentors need support to help their students’ questioning and theorizing about their practical experiences.

Goal-system representations are personal constructs that show how people connect hierarchies of goals to actions in pursuit of tasks [33]. The GSR tool is based on the idea that goals are the most proximate determinant for behavior, mediating at the same time the effects of work context, as well as knowledge and beliefs on practical decision-making [34]. The tool was originally developed for the educational context of studying implementation processes of innovative teaching practices [17,35]. It aims to help student teachers to explicate which goals they hope to achieve at different stages of their lessons in a schematic overview or visual goal-system representation. The GSR tool centers around the following activities (see Table 1 for the questions that are central to the activity): student teachers first identify the building blocks of a representative lesson (i.e., a scenario of how their lessons generally unfold in practice). Then, they describe how they prepare for each lesson component (preparation). Finally, they identify the underlying goals they wish to attain or the underlying beliefs and principles they aspire to with each of the building blocks. These goals may vary from highly practical goals or principle goals, to more abstract identity goals that reflect the kind of teacher they want to be. The relatedness between the three layers is expressed through arrows. This generates a visual overview of representative lesson patterns and connected goals, the GSR that student teachers have developed over time in interaction with their pupils (see Figure 1). They are then asked to evaluate each of the building blocks, preparation steps and goals. Are they satisfied with the way this part of the lesson unfolds? Do they think they succeed in achieving a specific goal? Is there anything they would like to develop? Based on this evaluation the student teachers formulate their own starting points for further professional development.

Table 1. Overview of the guiding questions for constructing a GSR activity.

Creating the WHAT row ('recreating the lesson scenario')	
Step 1	Think of a typical lesson that is representative of your teaching approach
Step 2	What do you first in your lesson? What do you do after that? And after that? Divide the lesson into activities (building blocks) and put them into chronological order. Write each activity on a separate piece of paper to make a row.
Creating the HOW row ('looking at the preparation')	
Step 1	How do you prepare for each activity? Write each action on a separate piece of paper and create a new row underneath.
Step 2	Connect each action (how) with an activity (what) or activities by drawing a line between them.
Creating the WHY row ('looking at the underlying goals')	
Step 1	What do you hope to achieve with each activity? Why do you do it like that? Write down each goal you identify on a new piece of paper. Create a new row above the activities.

Table 1. Cont.

Step 2	Connect these goals by drawing lines between the relevant action (how) or activity (what).
Step 3	Look at your goals. Why do you find these important? Write down each reason or higher goal on a separate piece of paper and create a top row of higher order goals
Step 4	Connect the higher order goals with the other relevant goals, building blocks or preparation by drawing lines between them.

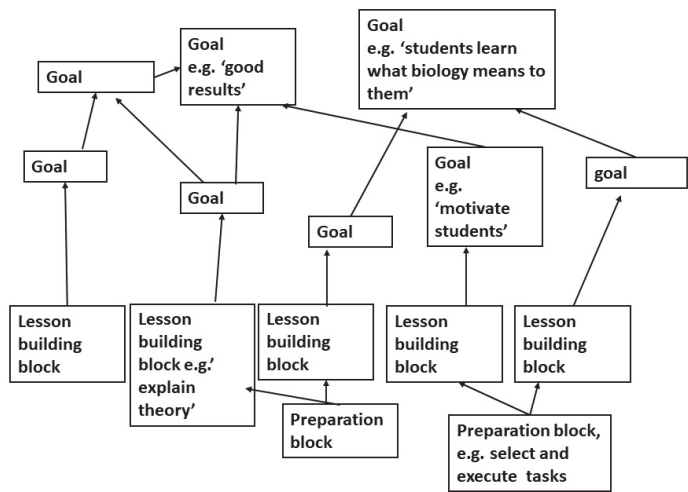


Figure 1. A GSR shows an hierarchical structure of means–ends relationships. A representative lesson is visualized as a sequence of lesson building blocks (e.g., ‘explain theory’). Below the building blocks, the preparation blocks show how the student teacher prepares for the lesson (e.g., ‘select and execute tasks’). Above the building blocks, underlying goals are represented such as practical goals, principle goals and/or identity goals.

The GSR tool assists student teachers in recognizing the detailed goal–means relationships that underlie their developing practice and that are inherent to their lesson designs. Such goal–means relations integrate specific parts of a teacher’s personal theory [35]. Besides the focus on goal–means relations, the GSR tool pictures a complete representative lesson and how it unfolds in practice to work with in coaching sessions, instead of working with very specific instances of in-class experiences (e.g., a classroom-management situation or an instruction) which then tend to be discussed decontextualized. These building blocks are meaningful units of analysis that are relatively easy to identify [33], while at the same time the student teacher is able to keep a holistic view of the lesson, affording an understanding of the interconnectedness of different goals and means. Furthermore, it provides an immediate visual overview of the student teacher’s rationale behind the sequence of building blocks in terms of perceived goal achievement, a part of personal theory which often proves difficult to tap into.

Finally, the GSR tool places the (development of) personal theory explicitly in the practical work context. It builds on recent theories of how people make decisions about tasks in complex practices and therefore integrates vision and personal theories about teaching and learning with perceptions of practical constraints and affordances of the classroom context [36]; all these factors may translate as goals that need to be achieved [37].

In sum, the idea behind the GSR tool is that it helps student teachers to explicate and visualize ideals and assumptions, to identify successful and less successful realizations of their goals in practice and to help them think about possible adjustments that might work in their specific context. We anticipated that the GSR tool would support school-based

mentors in having professional dialogues with their students on the level of patterns in their thinking and acting, so that students are invited to develop their personal theory. Based on previous experience with GSR at our institute, we expected students to develop their personal theories on three levels of development: a better and explicit understanding of their own goal–means relations (level 1), a more thorough awareness of the theoretical notions that may explain or underly these goal–means relations (level 2) and a more transformative use of theory in professional dialogues about these goal–means relations to foresee and hypothesize potential new practices (level 3).

In line with these expectations this research set out to find answers to the following research questions. To what extent do the data reflect the following:

1. A better and explicit understanding of the student teacher, with respect to their own goal–means relations (level 1)?
2. A more thorough awareness of the theoretical notions that may explain or underly these goal–means relations (level 2)?
3. A more transformative use of theory in professional dialogues about these goal–means relations to foresee and hypothesize potential new practices (level 3)?

3. Methods

This study concerned a small-scale qualitative and explorative study into how three school-based mentors used the GSR tool in their mentoring conversations. In this study, we compared and contrasted cases to identify themes that helped characterize the mentoring conversations that emerged in terms of level of development of personal theory.

3.1. Context and Cases

We present three cases in which school-based mentors coach their student teachers using the GSR tool. The mentors involved in this study work at the same school in a rural area of the Netherlands. At the school, general professional development activities are organized for all the student teachers in the school. Constructing and discussing a GSR amongst peers is a standard professional development group activity in this program. Up until this study, the GSR tool had not been part of mentoring conversations, however. This means that all three mentors were familiar with the tool, but they had not worked with it themselves in their one-to-one mentoring practices.

The mentors serve as daily mentors to student teachers and play a key role in their development by inviting reflection on their practice and by assessing their practice. Despite their efforts, all three mentors find it challenging to help their student teachers uncover patterns in their thinking and actions to help them develop a personal theory. On entering this study, the mentors formulated their own learning objectives for working with the GSR tool. Overall, they expected the GSR tool to facilitate the improvements they sought in conversations with their students.

Case 1: Mentor1 (M1) is an English teacher, in her first year as a mentor. She wants to practice with an inquiry-based approach to coaching. The student teacher (ST1) is in the first year of a 4-year teacher education program to become a teacher in lower secondary school in pre-vocational higher and pre-academic education. She is in the first phase of her internship. Her GSR pertains to lower secondary school pre-academic education.

Case 2: Mentor2 (M2) is a Dutch language teacher who has been a mentor for 6 years. She was curious about how the GSR tool would help guide the conversation towards the student's personal theory and what outcomes it would produce. The student teacher (ST2) is an experienced primary teacher who is in her third year of a 4-year second career teacher education program to become a teacher in lower secondary school in pre-vocational higher and pre-academic education. Her GSR pertains to lower secondary school pre-vocational education.

Case 3: Mentor3 (M3) is a physical education teacher who is in his first year as a mentor. He wants to practice adopting an open attitude and asking open-ended questions to invite the student to think and openly express her thoughts. The student teacher (ST3) is

in her last year of a 4-year teacher education program to become a lower secondary school teacher to students in pre-vocational education. Her GSR pertains to vocational training class; she prepares her students for the job market.

3.2. Data Collection

For each case, the following data were collected:

1. GSRs and mentor notes: the GSRs made by the student teachers were collected and digitalized as well as the mentors' notes about the GSRs of their students in preparation for their mentoring conversations;
2. Video recordings and transcripts: the mentor–student teacher conversations were videorecorded (case 1: 19'; case2: 16'; case3: 15') and all relevant parts of the recordings were transcribed;
3. Reflections of student teachers: the student teachers were asked to reflect on creating the GSR and on the mentoring conversations. Written reflections of ST2 and ST3 were collected in the week after the mentoring conversation took place (digital, Google Form). They were asked to score three short statements on the perceived usefulness of the GSR in the mentoring situation (1–5, certainly not–definitely) and to explain their scores. ST1 reflected briefly with her mentor on the mentor conversation at the end of the conversation in response to an open question (audio).
4. Reflections of mentors: M2's written reflection was collected the week after the conversation took place (digital, Word doc). She was asked to score 3 short statements on the usefulness of the GSR tool (1–4, certainly not–definitely) and to explain her scores. M1 and M3 reflected on the conversation and their mentoring practices when they analyzed the videotapes of each other's conversation. They discussed this with the researchers (author 1, 3 and 4), who made notes (researchers notes). M3 additionally made notes in a log he kept. In the analysis, we examined how the mentors perceived the GSR as either facilitating or hindering the reflection process of their student teachers.

3.3. Data Analysis

The question to what extent the GSR tool supports a professional dialogue between student teachers and their mentors in terms of level of development of personal theory is an explorative question. The data were analyzed as follows. First, the videotapes of the conversations were watched and analyzed in relation to the GSR of the student teachers and the respective results of the mentors' analysis. At least two researchers discussed a case. Based on these discussions, the three levels of development of personal theories were established. In this first round, the primary focus was on the extent to which the mentors' questions about the student teachers' GSR sparked a dialogue reflecting instances of level 1, 2 or 3 development of the student teachers' personal theory. In this explorative study we were merely interested in finding indications of the levels of personal theory development in these conversations. Through an iterative process of data analyses, indicative themes were located and defined in the conversations and essential parts of the conversations that illustrate such themes were identified by the first author [38]. The student teachers' reflections were analyzed to see whether or not they matched the findings in the conversations. Finally, the mentors' reflections provided information about how they experienced using the GSR tool. All authors checked the consistency of the analyses.

4. Results

In this section the three cases are presented. For each case we show the GSR and represent the conversation that took place between the student and the mentor with two fragments which illustrate specific turns in the conversation and indicate the levels of development of personal theory.

4.1. Case 1: How the Urge to ‘Control’ Shapes Practice (Level 2)

M1 interprets ST1’s GSR (see Figure 2), based on the GSR and on M1’s experience with the student, as follows: it reveals a pattern of control elements, that could very well point towards ST1’s insecurities about her professional functioning. M1 feels that it is important that ST1 becomes aware of this pattern, and how her personal insecurities influence her practice, potentially impeding a focus on what her students need. M1 decides to take this as a topic for their mentoring conversation. She always starts with something positive as it is her deep-felt belief that this is important for a safe learning environment. She uses the GSR to point at positive aspects of the student teacher’s personal theory. For example, in view of ST1’s developmental phase (at the start of the TE program), her personal theory is already rather elaborate. The following conversation ensued (Fragment 1).

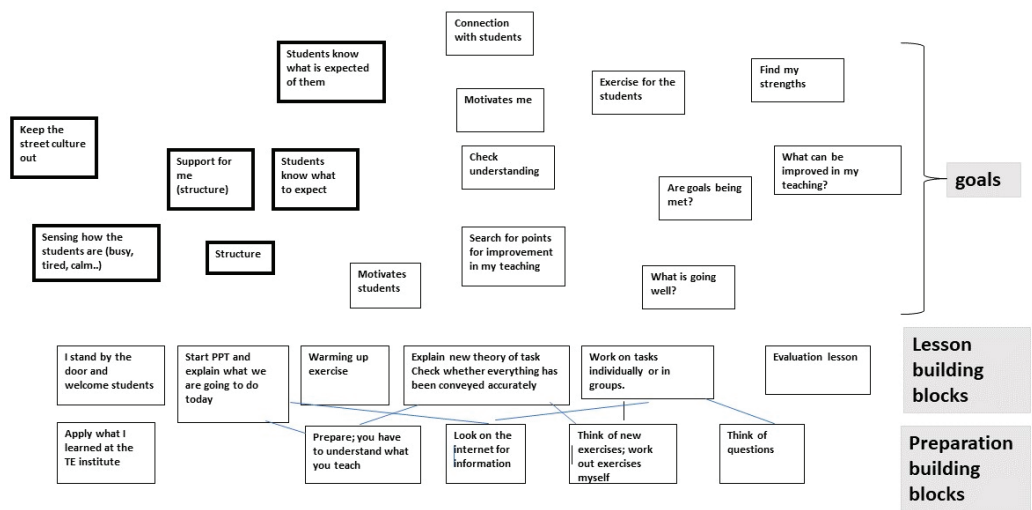


Figure 2. The GSR contains many goals pertaining to ‘teacher control’ (bold). Many building blocks are not yet connected to goals.

Fragment 1 [emphasizing positive aspects reveal perfectionism; level 1?]:

M1: Well, I’ve studied it [points at GSR] a bit and formulated some questions. What I actually liked is that you immediately dig deep.

ST1: Really? (surprised)

M1: Yes, quite. Well, you might be able to go even deeper, but for a first-year, your analysis is quite in-depth.

ST1: Okay (a bit bewildered), I actually found it quite superficial.

M1: Why did you find it superficial?

ST1: Because I really have the feeling that I can dig deeper into the material. But, of course, I haven’t covered everything yet at the institute.

M1: Do you find that challenging?

ST1: What?

M1: Find it challenging to go that extra layer deeper.

ST1: Yes.

M1: Well, I think, [reads aloud from the GSR] ‘it motivates me’; ‘it motivates the students’; ‘building a relationship with the students’, that you already go quite in-depth into why you do it this way. Of course, you can still think about it further.

ST1: Yes.

M1: I notice that you really want to do everything perfectly. Do you recognize that yourself?

ST1: I am extremely? perfectionistic, yes [laughs] and very strict with myself.

Fragment 1 reveals ST1's perfectionistic nature and an awareness of or felt need for input from the institute (theory feeds practice). M1 highlights ST1's focus on her students' motivation and shows her how she relates her practice to theoretical underpinnings. Next, M1 continues the conversation by pointing out many structural and control elements in the student teacher's GSR and mentions that she generally often sees this in student teachers' development. The specific 'why is that important to you' inquiry from M1's first utterance prompts a reflective professional dialogue about control goals (Fragment 2).

Fragment 2 [control goals as a pattern; (level 2):

- M1: So, what I hear as well, you mentioned being perfectionistic, [reads aloud from the GSR] 'keeping street culture out', and what I also see is [reads aloud] 'what is going well, support, structure'. I see these things a lot. Apparently, structure and control are important to you. Do you also know why this is so important for you?
- ST1: For me?
- M1: For you, yes
- ST1: Um, I don't know, I think it has a bit to do with myself. I am really a control freak in everything I do.
- M1: smiles
- ST1: I just really want to have control because, if I do not have control, then. . . I was. . .let's say, hurt quite a bit outside of school, things in the past.
- M1: Yes
- ST1: So I am afraid—yeah, they won't hurt me here, I think—but if I just have control, then I do what I do, and no one can hurt me.
- M1: At least you've done what is right?
- ST1: Yes, yes
- M1: Because you're afraid of being hurt
- ST1: Yes, I cannot deal with that very well [*laughs shyly*]
- M1: Yes, but it's good that you know that about yourself.

Fragment 2 shows ST1 starting to realize how her practice is influenced by an urge for control. She also reflects on this urge by being open about negative emotions that may cause this search for control. M1 does not inquire any further into the potential effect this may have on ST1's students. M1 focuses the rest of the conversation on how ST1 herself may deal with her perfectionism and need for control, as this is clearly rather emotional to her. For example, ST1 could try to focus on what went well, even small things (cf. learning from success) [13].

In response to M2's question about how ST1 feels about the outcome of the conversation, that her perfectionism is central to her practice, ST1 responds that it does not really surprise her. ST1 states: 'I knew this about myself'. In her reflections, M1 was very pleased with how the GSR helped her to quickly get to the core of ST1's learning need. Furthermore, it made her realize how important it is to create a safe environment for this type of mentoring conversation.

To conclude, in this case the GSR tool made visible how ST1's practice was shaped by goals revealing a personal need for control, which triggered a professional dialogue around this emotional urge. Although the mentor did not include a general reference to this in the conversation, the dialogue did lead to the important insight that a teacher's emotional state is of influence on teaching practice and consequently the learning processes of students. We categorized this labeling of goals as a 'level 2' awareness.

4.2. Case 2 about the Importance of Explicating Implicit Routines (Level 1) and Underlying Beliefs (Level 20)

ST2 is an experienced primary teacher who is educated to become a teacher in secondary education; however, her GSR is not very elaborate (see Figure 3). M2 wonders what ST2's professional vision is, and why higher identity goals are lacking in ST2's GSR (see Figure 3). M2 wonders why ST2 considers certain goals important, and whether ST2 sees relations between certain goals? The mentor notices in the student teacher's GSR that

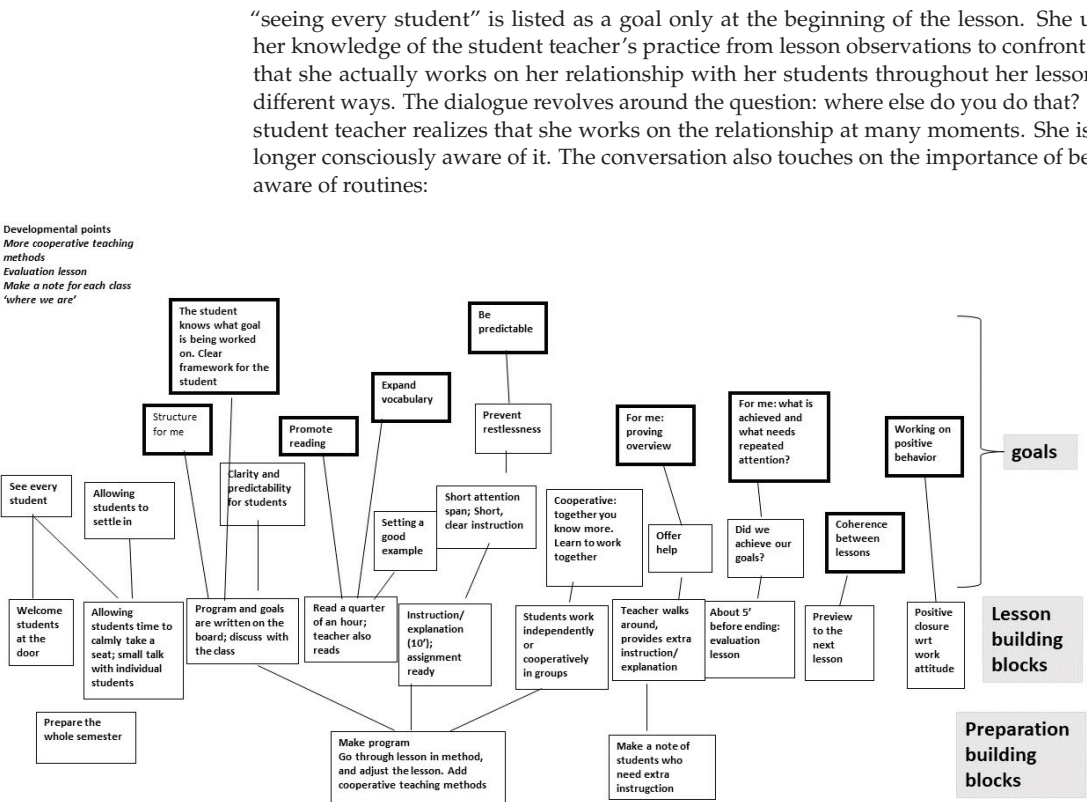


Figure 3. The GSR of student teacher 2, who is a second career teacher. Her GSR is not very elaborate and contains rather instrumental goals that pertain to structure and instrumental learning outcomes (bold) and no higher identity goals that pertain to ‘what type of teacher I want to be’.

Fragment 1 [explicate implicit routine goals; level 1]:

M2: I find it so nice that this comes out. Because what was on my mind when I saw the picture of your lesson, and now I’m going to grab mine [grabs GSR]. For example, I see here in your GSR ‘seeing every student’ under relationship, and then I think, hey, I think you do that not only by standing at the door and giving students time to settle, but you do that much more often in your lesson.

ST2: Yes.

M2: But I don’t see it [in the GSR picture].

ST2: No, no. It happens naturally.

M2: So basically, you’re saying it happens naturally.

ST2: It’s almost like stating the obvious, that you see a student.

M2: Yes, for you it’s stating the obvious. But someone who sees this [points at GSR] and doesn’t know you, what might they think then?

ST2: Yes, yes. They might think that everything is very [gestures delimited parts] this is it.

M2: Yes, I think someone who doesn’t know you might think, oh, does she only think to work on the relationship here, while I’ve seen your lessons and I know that you work on the relationship at many moments. So basically, I would like to ask you, could you consider on which other moments you also work on the relationship, and could you make those connections? And I’ve noticed that with several post-its, that you work on it at many more moments but that you’re not consciously aware of it anymore

ST2: Yes, I even found that in mentoring interns, where with some you'd say, 'yes, they have that so naturally in their interactions with students.' And then with others, I sometimes found it quite difficult to offer guidance like, 'try it this way or that way.'

M2: And how important is it for an intern, in this case, you being my intern, how important is it for someone who is learning to be aware of that?

ST2: Yes, um, it is important that you also know it.

Next, similar to case 1, the specific 'why is that important to you' inquiry in the first utterance of M2 prompts a reflective professional dialogue that helps ST2 connect seeing every student to creating a safe environment for learning.

Fragment 2 [explicate underlying beliefs; level 2]

M2: And then I become curious. From which standpoint do you set certain goals? For example, 'seeing every student', now that comes from your belief that safety is important. But there's something there again, Why is that important?

ST2: Because I think that if you feel safe, that's when you start to learn. Because that's how it works for me too.

M2: Okay.

ST2: And of course, I'm new here in the team. I feel very safe here, So then I can also move forward. If that's not the case, I think it's very unpleasant.

M2: So you're saying safety is important for students to learn. You're also saying safety is important for myself to work well.

ST2: Yes, yes.

ST2's written reflections show instances of level 1 and 2 development of her personal theory. She evaluates creating the GSR as positive. ST2 explained the working of the GSR tool in the mentoring conversation as follows: 'We mainly discovered that I do many things unconsciously because of my extensive teaching experience. Through our conversation, we did eventually delve into my motives. It's a great tool to sharpen again what I consider important during teaching'.

In her written reflections, M2 scores working with the GSR as very positive. The main reason is that the GSR gave her an overview of ST2's not very elaborate beliefs underlying her practice, and that it helped her to ask about this. She stated: 'I could clearly see that underlying beliefs and vision were completely absent, but the student had indeed thought about them in the past (as revealed in the conversation), but was no longer consciously aware of them'.

To conclude, this case shows how routines can be 'hidden' and implicit, and not show up in a GSR. M2 used her knowledge of ST2 to make her aware of routines, that all connect to her goal that students are seen. The case also showed how a GSR invites the mentor to ask 'why is that important for you?', prompting the student teacher to reflect on more general beliefs about 'good teaching' (level 2).

4.3. Case 3 about Central Beliefs and Implicit Higher Identity Goals

It strikes M3 that ST3 places 'relation' and 'structure' at the center of her GSR (Figure 4). M3 is curious how this manifests in ST3's practice, how she thinks about the relationship between 'relation' and 'structure', and why she considers these goals important? M3 also wants to know more about ST3's goal 'outside school', what it means and why she thinks it is important. He intended to ask open questions, to explore with ST3 her personal theory. M3 asks ST3 to reflect on constructing her GSR and what she learned about herself as a teacher. This way ST3 becomes aware of goals that are central to her practice:

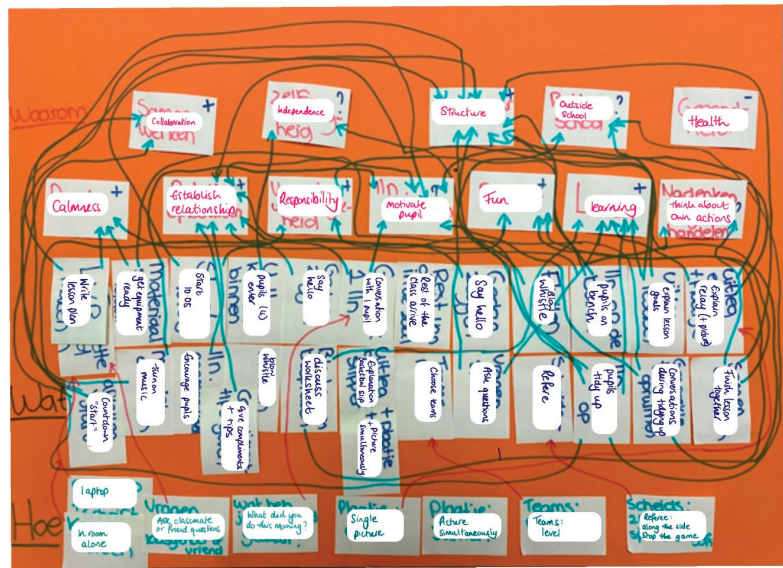


Figure 4. A fourth-year student teacher in physical education has created a GSR in which structure and relationships are central.

Fragment 1 [awareness of central goals that shape practice; level 1]:

M3: My first question is how did you like it, making your GSR?

ST3: Eeh, it makes you aware of what you do, or do the most. What you consider important. All those lines and a lot of lines going to one thing. And less [*lines*] to another thing. Well, the many lines that is what I evidently find important. Yeah, I found that out through this.

M3: Without delving too deeply into it [*pointing to GSR*], based on what you see here now. What has stuck with you, like, oh yes, that really stayed with me?

ST3: Yes, well, actually what I find really important. If I may mention that... Structure, because there are a lot of threads leading to that. Apparently, I incorporate that a lot in my lessons. Well, I didn't know that. Or perhaps unconsciously, yes, but.

M3: You have now made that more conscious for yourself

ST3: Yes

M3: And did this already lead to any changes?

ST3: Yes, you also handle it more consciously, like, 'Oh, there I go again.' Like, see I am putting them [*the students*] back on the bench again.

Furthermore, in this case, the specific 'why is that important to you' inquiry in the first utterance of M3 prompts a reflective professional dialogue about ST3's personal theory: structure is prerequisite to learning. You build up a lesson from there.

Fragment 2 [connecting central goals to theoretical notions, level 2]:

M3: Yes, it also stood out to me when I looked at it. My question is, why is structure important to you?

ST3: Uhm, I think it brings more calm, I guess. Um, yes, structure ensures that students know what to expect. Yes, I think building upon the lesson from there. Yes, you obviously start with it at the beginning of the school year, like 'this is what happens in the lesson'.

M3: Yes, and that building upon continues when there's a good structure in

ST3: Yes

M3: Can we then say that structure is a kind of tool for you?

ST3: Yes

M3: So, that's actually quite an insightful observation. So, that structure is actually a 'prerequisite for teaching for me'

ST3: Yes exactly

[a similar dialogue around ST3's central goal 'reflection' unfolds]

After ST3 and M3 have identified that structure and relationships are crucial for ST3, M3 further explores another goal in ST3's GSR: '(pupils apply what they learn) outside school'. Now, the specific 'why is that important to you' inquiry also prompts a reflective professional dialogue about ST3's vision regarding the purposes of the subject she teaches, and her theoretical notions of the formative aspect of physical education.

Fragment 3 [identity goals: who do I want to be as a physics education teacher? Level 2].

M3: You indicate you don't have much idea about the pupils outside school.

ST3: Yes that's true

M3: You have placed it in your GSR as important. Can you describe the ideal situation outside school? And the second question: what is your role in this?

ST3: What I see as an ideal situation, is that they (the pupils) do something in the lesson and then they go and do it with their friends when they leave school. Actually, especially that, that they take something from the PE lesson which they can also do at home or with friends. What was your second question?

M3: What is your role in this?

ST3: mm I don't really know, that's why I've drawn a question mark. How can I, really. . . . Show them that they can do it (at home or with friends).

M3: Yes, but if I refer back to my first question, why is it so important that the pupils take something from your lesson which they can do in their own time?

ST3: eerrrr that's about exercising for your whole life.

M3: Really? Is that something important to you?

ST3: Yes, yes. It would be nice if they could do something in the lesson and think oh that was really cool. And then you speak to them later and they say oh yeah that's what we did in that lesson

M3: And what more does it mean to you exercising for life, what do you hope to achieve with it?

ST3: Yeah that they move and exercise!

M3: Yes, and why?

ST3: Because it's good for you, it's healthy!

M3: Yes, yes so you want to create healthy people in the world.

ST3: Yes

M3: And apart from being healthy, are there any other things? Apart from health?

ST3: Well, yes, it's also about how you treat each other, taken others into consideration. How you deal with winning and losing.

M3: Yes exactly. All those skills, you hope because you teach that during the lessons, that they take that away from the lessons, because it's good for them.

ST3: Yes, and that's its not just in the PE lesson.

The conversation now turns to ST3 being unsure about these formative goals. She does not know whether she achieves these goals in her lessons. She plans to make it the focus of her action research project that she needs to do for the institute.

In her reflections, ST3 states that she has experienced creating the GSR as very positive; she assessed the mentoring conversation very much as an inquiring professional dialogue that provided her with a lot of self-insight. She explained: *'Because of the GSR, we could have a more purposeful conversation, whereas normally it's more general, like "how was the class?" That's very open-ended, but now we were consistently pulling out specific segments from the lesson. There were many questions asked and M3 didn't fill in much himself. I had to think for myself.'*

M3 looks back positively on the GSR tool and how it helped to focus the mentoring conversation about the teacher ST3 wants to be [logbook]. M3 wrote: *'When I think back to the conversation, I am quite satisfied. When I first saw her GSR I found her goals quite superficial. Of*

course I adapted my questions to meet her learning needs. My expectation though was that if I asked the correct questions the overlying goals would become apparent. At the end of the conversation ST3 explained that she would like to be remembered as the teacher who 'saw the pupils for who they are'. By using the GS she has now got something to help her in achieving this goal. She can now see where she needs to make adjustments'.

To conclude, case 3 illustrates—similar to cases 1 and 2—how the GSR tool stimulates inquiry into patterns and motives. In this case, it leads to ST3's awareness of central goals that shape her practices, and of what she considers the formative learning objectives of her subject (e.g., dealing with winning and losing; level 2). She also realizes that she does not know how she achieves these formative learning objectives. Hence, the dialogue about her GSR seems to trigger the awareness of a need for further information to underpin her practices in order to be able to develop practice. This indicates a starting point for the level 3 development of her personal theory.

5. Discussion

The GSR tool helps articulate implicit knowledge regarding both teaching practice (lesson building blocks) and preparation, as well as underlying pedagogical motives (as goal hierarchies), thus making it shareable, investigable and transformational.

The shareable level (level 1) implies explicating and understanding goal-means connections as part of the student teacher's personal theory. The GSR tool initiated professional dialogue on this level in all three cases.

The investigable level (level 2) implies that goal-means relationships are explicitly questioned, elaborated, and connected to general theoretical concepts. All three cases showed instances of this level, although they made connections to more general concepts. The transformational level (level 3) pertains to hypothesizing about possible new actions, and why such actions might lead to new learning processes and learning experiences. Theory is used in the professional dialogue to bring up ideas about possible new practices. This level of development of the student teacher's personal theory was not yet apparent in the three cases.

We aim to conclude by offering reflections on our findings. Given the exploratory nature of this study, it is crucial to approach interpretations and generalizations of the results with caution. Therefore, we also propose directions for future research.

Overall, we can conclude that within the internship context, the GSR tool can facilitate a professional dialogue between school-based mentors and their student teachers regarding the latter's personal theories. By doing so, the GSR tool addressed in these three cases a persisting challenge in teacher education: how to help student teachers to bridge the theory with their practical experiences. As noted by Sjölie [7], student teachers often have unrealistic expectations of educational theories, expecting them to provide prescriptive solutions for their practices rather than descriptive insights. Through the use of the GSR tool, the student teacher begins to grasp and experience that both theory and practice only exist through the eye of the beholder. Following from that, it starts to become clear that every theory needs contextualization. This insight puts the student teacher in control of the theory, taking away their feeling of being controlled by practice only and misled by the theories. Exploring such shifts in the attitudes of student teachers toward theory was not within the scope of this study and should be a focus of future research. Furthermore, mentors typically are not engaged daily with the theory behind the practice and do not operate in a research-based environment. They seem to be in need of further support, next to the GSR tool, to help them question and deepen the underlying theoretical issues. This finding is in line with a recent survey on school-based teacher educators' professional development needs showing their need for support on research-related aspects of their work [39]. Future research should focus on this type of support.

Besides contributing to a more realistic expectation of theory in practice, the data highlight the critical role of professional dialogue in utilizing the GSR tool. It is in the interaction between the student and the mentor that perceptions, underlying motivations

and theoretical notions become apparent. The dialogue could be viewed as taking place between the student teachers' inner selves and the explication of their performances and motives in the GSR tool. Next, the interaction takes place between two (or more) people: a new and an experienced teacher, the mentee and mentor. Both interactions contribute to explicating the implicit and making it shareable and negotiable, and providing food for thought and transformation. Viewing the GSR tool through the lens of its dialogical effect aligns with a hermeneutic view on teaching and learning as inherently enactivistic, which states that cognitive growth does not occur in the individual's mind but in the shared interaction between people and between peoples and their cultural tools [40,41]. To strengthen the function of the GSR tool, the quality of the dialogue that emerges from it while being used is crucial for enlarging its potential in developing personal theory with (student) teachers.

To conclude, the GSR tool has functioned as a tool for sparking a professional dialogue about personal theories of teachers in the context of pre-service teacher education, professional development of teachers and now mentoring practices as well. This demonstrates that the GSR tool has the potential to function as a boundary object [42] between learning at the institute and at the workplace, and, as such, contribute to the development of a shared language, a shared idea of how theory can serve practice, and a collective professional dialogue between all teacher educators involved in pre-service teacher education. This conclusion aligns with extensive research on the role of reflection in teacher education, which has pointed out the necessity of including theory in the process of reflection, in addition to intrapersonal matters, and the importance of the quality of the dialogue [43]. As the research on reflection shows, both matters are not easy to fulfill and often lack behind, leading to unsatisfying reflective loops [44]. The GSR tool can help reflection to become double-looped or even triple-looped [45].

Building on these case studies, we continue exploring if and how the GSR tool can support both students and their mentors to spark their professional dialogues about practice with helpful theory.

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Article

Building Bridges in Teacher Education to Enhance Teachers for Students' Diversity in Physical Education

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Abstract: Following the UNESCO guidelines for Quality Physical Education, this participatory action research study aimed to explore the potential of a Community of Practice (CoP) to empower both schoolteacher educators and preservice teachers (PSTs) to become practitioners–researchers in order to achieve inclusive practices in Physical Education (PE). This study involved a partnership between a university in North Portugal and four cooperating schools. CoP participants were six teacher educators and four cooperating teachers (CTs) who work with twelve PSTs in the schools where they developed their teaching practices. Data collection included focus groups with CoP members and PSTs, CoP meetings, and school placement meetings. A thematic inductive–deductive analysis revealed that CTs were actively engaged in the CoP, achieving mutual involvement and a shared repertoire, and making friendships beyond the CoP. Becoming practitioners–researchers made CTs more critical of their teaching and supervisory roles. Supporting PSTs to be practitioners–researchers was challenging, mostly due to PSTs' lack of content knowledge, which made it difficult to identify the students' problems in engaging with the proposed activities and how to solve them. Both CTs and PSTs highlighted the value of the CoP in gaining confidence and knowledge to improve their teaching to become more inclusive.

Keywords: communities of practice; PETE programmes; practitioner–researcher; inclusion

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1. Introduction

Nowadays, one of the main challenges that teachers face in schools is student diversity. The sustainability of inclusive practices depends on adopting a positive attitude towards diversity, valuing and belief in social learning, and gaining confidence and competence to ensure access, participation, and achievement for all students [1–3]. Teachers need to experience the benefits of inclusive practices through training, school support, and university collaboration through in-service and preservice inclusion-oriented programmes [4–8]. Despite the efforts of pedagogy and didactic courses to change PE towards meaningful participation and learning, preservice teachers (PSTs) remain unprepared to solve problems of marginalisation, exclusion, and underachievement [9–11].

The investment in teacher preparation for inclusive education is a high-priority endeavour for our research team. Historically, our concerns encompassed the following: (a) opportunity to participate in PE activities; (b) the pedagogical content knowledge of PE teachers to make content teachable and accessible to all their students; (c) the student-centred games-based pedagogy with a focus on inclusion and collaborative learning; and

(d) the development of professional competence, the usefulness of reflective practices, and (re)construction of professional identity in the context of initial teacher education. The research team is interested in changing teaching practices towards student-centred approaches with inclusive purposes [12]. To achieve this, the plan intends to invest in the transformational power of CoP and the use of action research [4,13,14], both framed on a theory of action to empower PST professional development [15]. The teacher educators who are part of the research team are required to highlight the importance of PSTs becoming practitioners–researchers as a process for driving their own growth. For this, it is necessary to use collaboration to encourage PSTs to take risks with their teaching and to promote a broad view of potential collaborators, namely the students as partners in action research.

For Zeichner et al. [16], the detachment between universities and schools is a barrier to democratic teacher education. Dialogue with schools renders the opportunity for reciprocal learning. Oates and Bignell [17] notice that the partnership between schools and universities is not new but needs to go further, i.e., move away from joint school–university collaborations where the university is the lead and the schools are the research contexts, and from models of collaboration between schools supported by university facilitators. What is often missing is partnerships in which all participants—teachers and university researchers—are seen as experts, facilitators, and critical friends on an equal footing. This more balanced approach is essential for truly integrating theory, research, and practice in the classroom [18] and needs to be studied and addressed in PETE programmes.

Preparing teachers for an inclusive education requires meaningful relationships between schools, universities, and student teachers, constructed upon the commitment to take care of all students' learning [5,6,8,13,19]. The literature (e.g., refs. [9,11,20]) highlights that there is huge evidence of problems of presence (access), participation, and achievement in PE classes. Gender, skill level, and additional educational needs, fused with race and social status, impart considerable percentages of students at risk of marginalisation, alienation, and underachievement. There is limited research on how PE teacher preparation addresses these issues.

University and schools need to mind the communicational gap [16,19], working together to change PSTs' perspectives and practices from the highly dominant teacher-centred, multi-activity, sports skills approaches, restrained by their apprenticeship of observation and their need to control students' behaviour, towards a student-centred PE curriculum, pedagogy, and assessment, attending to student diversity and inclusion barriers [4,6]. It is, therefore, necessary to make the school–university partnership more dialogical and collaborative, giving space to the co-construction of knowledge [21]. This implies designing teacher education within the profession and reinforcing identities and practices [22,23], which must be informed by research [24]. In this collaborative endeavour, teacher educators, i.e., “all those who actively facilitate the (formal) learning of student teachers and teachers” [25] (p.8), need to work together in favour of a movement to reconfigure the school–university partnership. This reconfiguration can be supported by the creation of CoP characterised by constructive collaborative work between the various training stakeholders, ideally extending the triad of schoolteacher educators, university teacher educators, and students in initial training to other schoolteachers [21]. Teacher educators and PSTs should reflect together to identify and understand the demands of teaching and the school; the challenges of education and teaching about teaching; and the problems of teaching from different angles to empower teachers (future and in-service) with the knowledge and competencies that will enable them to respond to the demands of teaching and the school [26]. The authors believe in collaborative CoP practices involved in the research of one's practice as the path that can support the professional development of teachers in initial and ongoing education.

This paper will focus on partnerships as collaborative arrangements between schools and universities, extending beyond merely supporting student–teacher education in practical, preservice settings. The aim is to explore the potential of the CoPs (that include PSTs, teacher educators from schools and universities) to empower both schoolteacher

educators and PST as practitioners–researchers towards inclusive practices in Physical Education. This study addresses the following research questions: (1) How do teacher educators achieve mutual involvement, share a repertoire, and undertake joint activities within the CoP? (2) To what extent does the affective and instrumental commitment among the CoP participants allow them to be positioned as practitioners–researchers? (3) What challenges does the CoP face in supporting PSTs to enact inclusive practices?

1.1. Theoretical Framework

1.1.1. Fostering Teacher Development through Communities of Practice

CoP can be understood as “groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis” [27] (p.4).

CoP is rooted in the situational learning perspective, which argues that participants must engage in social practices [28]. Wenger [29] also supports this perspective, highlighting that learning is a social phenomenon that occurs daily through individuals’ experiences and participation in similar groups, such as communities or organisations.

The effectiveness of a CoP depends on creating spaces for sharing, requiring participants to (i) engage in mutual involvement—participants get involved in actions by negotiating meanings; (ii) undertake jointly—a collective process of negotiation that reflects the complexity of mutual involvement, generating relationships of reciprocal responsibility between participants; and (iii) share a repertoire—a repertoire of words, routines, symbols, gestures, or other elements produced and adopted by the community in its practices [29]. Practices within the community play a crucial role, as learning is intrinsically linked to a sense of belonging since being part of a CoP tends to cultivate a sense of security and privilege in its members [27,30]. These collaborative spaces can be powerful in teacher education by involving educators from both schools and universities in supporting teacher candidates, especially during their school placements.

Parker et al. [31] and Lee et al. [32], in their literature reviews, emphasise the significant value of CoPs for teachers’ continuous professional development, noting that learning communities in PE, whether physical or virtual, are highly effective in fostering professional growth. Parker et al. [31] underlines that successful facilitation strategies require creating a safe learning environment with a shared commitment, ensuring that teachers are not merely replicating others’ ideas, which is essential for practice change [33]. Lee et al. [32] highlights the need for affective, instrumental, and moral commitment to build a cohesive and socially regulated community, addressing challenges faced by teachers and schools through collaborative activity to improve educational processes. The instrumental commitment tends to be the most prevalent, driven by the perceived benefits of knowledge capital and social connections, and the moral appears to be the most important to maintain the CoP.

Smith and Sela [34] emphasised the importance of teacher support in helping PSTs overcome difficulties during school placements, particularly in dealing with challenges and unfamiliar teaching [35]. Listening, participating, and interacting with other PSTs aids their learning and fosters the growth of the COP [4,36]. Additionally, PSTs value research collaboration and mentor support for developing their research skills [37]. It is important to ensure that the interaction is a two-way process, promoting the professional development of both teachers and PSTs [36,38,39].

1.1.2. Enhancing Teacher Professional Development through Practitioner Research

In recent decades, the ideas of the teacher as a researcher of practice and the teacher who engages in research have been gaining ground [40]. Cordingley [41] highlights an important differentiation between professionals (of teaching) who use research and those who conduct research, stating that “Their entry point is improving teaching and enhancing learning and that is where their priority stays. They see themselves as engaging with research but not in it” (p. 85).

Research into one's professional practice involves engaging in research-based learning [42,43]. This entails professionals systematically researching topics related to their professional domains to generate useful knowledge that can be mobilised in practical settings [42,44].

Recent literature reviews by Jones et al. [45], Bacak and Byker [46], and Brooks [47] all point out interfaces between the practitioner–researcher and teachers' professional development. Jones et al. [45] emphasise the idea that translational research is a democratic process, where teachers critically develop and use research to support their classroom practices. They stress the need for a collaborative relationship between teachers and researchers, where teachers are active, namely as leaders, rather than passive participants. It is necessary to build a culture of trust and equality between teachers and researchers and to be genuinely committed to learning from and supporting each other.

Brooks [48] also stresses the importance of dialogue between teachers and academia for the co-construction of knowledge. Bacak and Byker [46] add that preparing future teachers for research-based teaching is essential in the collaboration between schools and universities. The authors used the theoretical lens developed by Banchi and Bell [49] to structure the research-based teaching process. This framework considers the amount of information and guidance provided to the student and integrates the voices of both teachers and students. The highlighted strategies include action research projects and community-based research learning. Action research projects aim to place students in the role of teachers by investigating real problems in classroom practice. On the other hand, community-based research learning involves students engaging with communities to facilitate experiential learning [46].

It is therefore important to recognise the fluid nature of research in the education of future teachers and to adopt a dynamic approach to prepare them for this challenge. Professional development should be viewed as a continuum process that spans from initial education to ongoing training [36]. This approach puts the responsibility for their professional development and engagement with research on teachers and PSTs.

Strengthening horizontal and democratic collaboration between schools and universities, especially in school placements, underpinned by research into practice, emerges as a way forward to improve teachers' professional development.

2. Methodology

This study is part of a broader project based upon the assumption that the social roots of knowledge and practice become more powerful when produced through collaborative action [13,14]. This is a participatory action research study framed upon the scaffold of a CoP to support PSTs in their school placement to design and implement PE inclusive practices in team games and fitness education. PSTs were challenged to engage in practitioner research, attempting to develop a deeper understanding of their practice contexts and to build their own capacity to deal with students' diversity. This approach is a fundamental tool to develop tailored designs focused on all students' full participation and learning by enacting in all students a sense of belonging, equity, and motivation for a meaningful, pleasurable, and healthy lifestyle. In methodological terms, the participatory action research aimed to support PSTs' professional development concerning the characteristics of a practitioner–researcher, aiming to generate new knowledge, skills and perspectives, practices, and student outcomes within the framework of Quality Physical Education and inclusive practices.

2.1. Participants and Study Context

The participants of this study are part of a CoP constituted by four cooperating teachers (CTs) from schools (two men and two women) whose ages ranged between 51 and 66 years old and three teacher educators (TEs) from the university (two women and one man) whose ages ranged between 52 and 65 years old. TEs have considerable teaching experience (more than 25 years) and research production around teacher education, educational research, curriculum development, sport pedagogy, and PE-specific didactics such as team sports.

CTs have great experience in mentoring PSTs (one with 24 years, two with 13 years, and the other with 6 years) and in teaching PE (more than 25 years). CTs work in different regions (urban, interior, and coastal) and deal with different student characteristics (such as those with a low socioeconomic background).

The CoP constituted by the CTs has been running for four years now, facilitated by the principal researcher (supervisor of the faculty) who has been collaborating with them in supporting the PSTs. The broader project was created based on this CoP and PSTs deficit curricular areas identified by these schoolteachers. This focus on the supervision of PSTs to include all students happened firstly through a focus on physical fitness and later on invasion games.

Based on this, 12 PSTs (5 women and 7 men, age ranges between 22 and 31 years old) were invited to take part in this project as a result of their placement being in these CTs schools—convenient sampling. The PSTs voluntarily accepted to participate after being familiar with the project aims, as well as being given the option to not participate or to withdraw at any point from the study. The involved PSTs are part of a two-year master’s degree programme from a Portuguese public university, and only one had previous experience in PE teaching. The first year of the programme takes place at the university, while the second takes place mostly at a school (only Mondays at the university). PSTs are distributed in groups of 3–4 in each school and teach schoolteacher’s classes, one full-time and the other one shared across the PSTs. Besides teaching responsibilities, they also have management responsibilities (e.g., organise some event) and have to conduct a study of their own. To qualify as a teacher, PSTs will have to show evidence of quality in these three areas by writing a school placement report that captures their school experience and by presenting and defending this document publicly at the university.

All students (approximately 252) from the CT classes, where PSTs conduct their teaching practice, participated (12 classes; approximately 21 students per class). The classes have a mix of genders, with some having more boys than girls. The students also differ in motor skill level, behaviour, and motivation for practice. Three classes include students with special educational needs, specifically in terms of cognition. Before they join the study, school directors had to sign an agreement for the study to take place, and then students and their guardians/parents had to sign a consent form where they agreed with the study and their participation. No personal information was collected about the students. Data from PSTs and CoP were anonymised using pseudonyms. The study was approved by the local Ethics Committee of the university where the PSTs were pursuing their master’s degree (reference number 24-2023)

2.2. Study Design

The study took place in the academic year 2022/23, from October to June (Table 1), and involved a partnership between a university from the North Porto region and four cooperating schools. In each school, a PE CT worked with three PSTs for year-long school placements (SPs), developing their teaching practice in the CT classes. The CoP met weekly on Mondays (first two months), and then every three/four weeks.

Table 1. Phases of the study.

Phase 1 (September and October)	Diagnosing students’ diversity and preparing PSTs for researching their practice for inclusion. The main aim of this phase is to diagnose students’ diversity and empower PSTs to become practitioners–researchers, having as a starting point the establishments and understanding and acknowledging student diversity within the classes they teach.
Phase 2 (October and November)	Organisation of seminars at the university to discuss inclusive practices in PE: • One about Quality PE; • One about invasion games in an inclusive perspective: basketball, European handball, and soccer; • Two about fitness education—wellness education model [50] principles; implementation strategies in a self-regulatory perspective.

Table 1. Cont.

Phase 3 (November to May)	Process of PSTs (re)designing and teaching inclusive practices was scaffolded by the CoP (TE specific didactics from the university supported the process) in two main areas of the PE Portuguese curriculum—fitness education and team sports. Redesigning the process involves (a) making decisions on what strategies are most likely to address student diversity, (b) answering their learning needs, (c) optimizing access, participation, and inclusion, (d) observing and reflecting on the outcomes of the tried strategies, and their implications for the process.
Phase 4 (May and June)	Post-intervention: Two CoP meetings to evaluate the value and meaning of the experience, including PST practices, student outcomes, difficulties, challenges, and achievements.

2.3. Data Collection

Data collection comprised focus groups with the CoP (two) and with the PST (two), as well as CoP meetings (17) and school placement meetings (15) along the school year.

2.4. Community of Practice Focus Group

One focus group took place in the first stage of phase 3 (February) and the other at the end of phase 4 (June). All CoP members were involved, with the principal researcher acting as a facilitator. Each focus group lasted, on average, 90 min. Both of the focus groups explored themes such as the challenges and difficulties of the PSTs to address inclusive practices and the benefits of participating in the CoP. Examples of questions used include: (i) what are the main difficulties that PSTs face to include all students in their classes?; (ii) how do they try to overcome the obstacles?; (iii) what is the significance of being part of this group of TE?; and (iv) what have you learned during these months of working collaboratively? The recorded focus groups were transcribed verbatim and passed to the CoP members who read and approved the accuracy of the transcripts.

2.5. PSTs Focus Group

All PSTs participated in two focus groups: one in phase two (February) and one in phase four (June). The principal investigator facilitated the two focus groups that lasted, on average, 70 min. The main aim was to capture the experiences along the school placement in researching their practices to answer to students’ diversity. It consists of questions like (i) how much value did you ascribe to your research practices? and (ii) how did you attempt to solve the problems of the access, participation, and achievement of your students in fitness education and team games? Focus groups were recorded, transcribed verbatim, and sent to PSTs who read and approved the accuracy of the transcripts.

2.6. Community of Practices Meetings

Throughout the study, regular CoP meetings were held in accordance with the aims of each study phase. In these meetings, reflections focused on the challenges and difficulties of supporting the practices of the PSTs during their placement and exploring possible ways to overcome them. These meetings took place at the university on Mondays, with one or more TEs facilitating according to the theme under discussion. For example, when the theme was physical fitness, one of the CTs who specialised in that area served as the facilitator. Each session lasted, on average, 70 min. Sessions were recorded and transcribed verbatim.

2.7. School Placement Meetings

Throughout the study, there were 15 meetings held to support PSTs in implementing inclusive practices. Discussions in these meetings revolved around faced challenges, difficulties, and discoveries, aiming to improve and gain understanding on how and what to address moving forward. These meetings mostly happened at the school placements with the group of PSTs, the CT, and the supervisor from the university. Others happened at the university with the PSTs and the teacher educator specialist in a specific didactic. Each meeting lasted, on average, 60 min. Meetings were recorded and transcribed verbatim.

3. Data Analysis

A thematic inductive–deductive analysis procedure was employed across all data, keeping in mind the aim of the study and the theoretical framework and following the data from focus groups and meetings. Data analysis followed a three-component flow process: data condensation, data display, and conclusion drawing [51], with the researcher moving between these components. So, the analysis began with the establishment of students' diversity and PSTs' preparation for researching their practice for inclusion. The ongoing analysis informed the design of the CoP sessions, the school placement meetings, and the focus groups. Data were constantly triangulated across the different sources for a more comprehensive understanding of the CoP dynamics and PST practices. Data from different sources were read and examined incident by incident, highlighting the relevant extracts. These were then coded independently by two researchers. These initial codes were compared and discussed until an agreement was reached on what codes would be kept. After that decision, codes were refined and merged by proximity. For example, PST lack of knowledge, difficulty in observing and adapting team games, difficulty in engaging students in physical fitness, difficulty in finding solutions to the problems faced in practice, and the challenges and difficulties faced in supporting PSTs towards becoming practitioners–researchers.

The final triangulation of the data from different sources resulted in the following themes: (i) fostering professional learning through community engagement; (ii) nurturing community and friendship beyond the CoP; (iii) questioning and transforming understandings and practices towards inclusiveness; (iv) reconfiguring the mentoring process; and (v) challenges and difficulties in supporting PSTs to act as practitioners–researchers.

4. Results

4.1. Fostering Professional Learning through Community Engagement

The data show that through open and democratic dialogue, the teacher educator gradually became more engaged in CoP activities, deconstructing previous understandings and constructing new perspectives. This process led to a shared repertoire, particularly regarding how to address student diversity in PE classes.

The ongoing interaction among the CTs within the CoP encouraged them to question and reflect upon their understandings and practices. This process fostered the cultivation of a deeper sense of self-awareness and critical thinking, enabling them to not only recognise but also express their weaknesses and areas for improvement. They leverage their collective knowledge and experience to enhance their professional development.

The following quotations illustrate the powerful role of peer interactions in reshaping both practical skills and conceptual understanding, denoting how engagement within the community fosters development:

(...) the discussions have been very rich. I am determined to transform my weakness area 'Football' into a strength. (CoP, Session 10)

The interaction and exchange between us have allowed me to analyse the situations I experience in a different way (...). I can even say that I have changed my conceptual references. (CoP, Session 15)

Additionally, the increased openness to dialogue and different perspectives was highlighted by the CTs as a significant achievement. This dialogue encourages questioning and transformation of their practices while fostering a culture of continuous improvement and innovation of community members. This achievement can be observed in the quotations below that emphasize how engagement in this professional learning community fosters growth by exposing them to diverse perspectives, enhancing empathy and understanding:

Getting out of my usual working environment and into contact with other realities has allowed me to understand different perspectives and to improve and empathise with other perspectives. (CoP, FG 2)

Ah! I really like these things, I really want to reflect (...) I really like to hear different opinions from other people, and I think I learn a lot from that, from different ways of being a teacher. When I come here to CoP, I hear things that I try out and then, if I am successful and I find that it works for me, I adopt it; otherwise, I would not have had the experience. (CoP, Session 10)

The dialogue on CoP over the last few months has been very productive, inspiring me to better practices. (CoP, FG 2)

Professional development appears to be a relevant outcome that was perceived by the CTs to extend beyond the CoP space and its participants, enriching other teachers through the interactions they established with them. These interactions facilitated the dissemination of new ideas and approaches, enhancing the professional development of a broader group of teachers and underlining the value of the CoP not only as a space for individual development but also as a stimulus for institutional growth and collaboration, as we can observe in the words of the CTs:

At least in my personal experience, the work that is done here with the PSTs with classes in years where I am not the only teacher, so it is also interesting that what I take away from here does not just stay with me, does not it? So, it's not only passed on to the PSTs but also on to other colleagues in the school, specifically the person I usually work with (...). This is a big challenge that the faculty has to take on, which is to make sure that the education of the PSTs is not just limited to the cooperating teacher, that it involves the whole PE group, because that is a great asset, is not it? (CoP, FG 2)

4.2. Nurturing Community and Friendship beyond the CoP

The commitment of the teacher educators to the CoP goes beyond instrumental reasons. It is an affective commitment that has allowed them to build a socially cohesive community. The culture built within the community fostered a strong sense of belonging among the CTs, arising from a mutual sense of security that encouraged open sharing and collective reflection. In this supportive environment, the CTs were able to discuss not only professional issues but also personal ones. The trust and friendship developed over the time facilitated deeper relationships, making it easier for individuals to share their experiences, challenges, and insights. As a result, the community progressed into a space where both professional and personal growth were fostered, strengthening the bonds among members and enhancing their overall well-being.

As can be observed in the pursual quotations, the sense of security and support allowed the CTs to share their insecurities, problems, and concerns and to construct a sense of security that allowed them to be more comfortable in their personal life at school:

I have developed bonds of friendship that transcend purely professional relationships (...) in these moments we discuss very diverse topics (sometimes linked to our personal lives), helping us to put our work into perspective. (CoP, FG 2)

I feel that I belong to a group that inspires me to better practice and provides support not only for the professional problems and dilemmas I face in my daily work at school but also for personal ones. (CoP, FG 2)

4.3. Questioning and Transforming Understandings and Practices towards Inclusiveness

Exposure to different perspectives and understandings within the CoP proved instrumental in guiding CTs towards other teaching practices. Engaging with various successful practices enabled PSTs to critically examine and reflect on their practices, encouraging them to reconfigure their approaches to teaching. This was particularly evident in their adoption of new strategies for planning and organising lessons. The main change they highlighted was a shift in their approach to planning the fitness area, which now focuses more on individual student goals while still considering the overall group dynamic.

Today I can say that PSTs and I think differently about physical fitness. Planning is annualised and it is no longer a one-off exercise. We also try to involve the pupils in regulating their physical fitness according to individual goals, without forgetting to promote group work. (CoP, Meeting 14)

(...) then, from the point of view of physical fitness, I completely changed the way I worked; it was a radical change in my existence. (...) you can see it, you can follow it, in fact I think I was a bit lost in physical fitness because I did not identify myself with this thing of just doing tests and getting results, not that, no, but I also did not know how to plan it and I think these conversations we had around physical fitness and these exchanges between CTs gave me the confidence to change. (CoP, FG 2)

Another relevant change was the way CTs began to look at inclusion. Recognising its effectiveness in practice, they started to adopt different strategies to ensure that all students could access, participate in, and benefit from the activities. The CTs specifically noted that they are much more motivated and secure to adopt inclusive strategies, such as forming heterogeneous groups, where the more skilled students could support those with lower skill levels and include students with additional needs in the regular activities of the class.

The way I organise the lessons has changed. I have adopted a more integrated approach, putting students with higher levels of performance to work with students with lower levels of performance. (SP, Meeting 6)

I needed to see that the inclusion of the special needs' pupil worked. My initial resistance was broken by the visibility of the student successfully playing with others. Working with the PSTs deconstructed the way I thought about including this type of student in class. (SP, Meeting 10)

I have become more critical about what I am doing especially about the instruments I am using. I feel the need to adapt them to students of needs. (SP, Meeting 12)

I have more motivation to innovate and to include more inclusive strategies. (CoP, FG 2)

I lacked some tools that I managed to acquire and that made it easier for me, or at least I feel more able to do it due to the opportunity of listening colleagues experience. (SP, Meeting 8)

One CT even says that the project completely changed his view of PE. He realised that mixing students into groups is not enough for true inclusion, and the use of tools for self and peer assessment is very important to a meaningful inclusion. All the CTs felt that in the future, they will continue to question their own practices.

I really do not think that the way I work in PE today has anything to do with the way I worked in physical fitness or team sports three or four years ago. I do not think the difference has been that great in terms of principles, for me it has always been a principle that pupils have to be together... What has this project brought me? It has helped me, it has given me the tools [steps to follow to make the students more autonomous and sheets for self and peer assessment], to be able to do this inclusion, it is a bit like what I said before: for inclusion is not enough mixing and work in groups, is not enough for the children work in group to be included (...). (CoP, FG 2)

I think I have already changed my work (...) I have felt better able to apply a set of strategies that we have discussed in meetings, and, in the future, I know I will continue to learn from these exchanges and questionings. (CoP, FG 2)

4.4. Reconfiguring the Mentoring Process

The CoP faced several challenges in supporting the PSTs in embracing inclusive teaching practices. One of these obstacles was their own attitudes towards diversity,

coupled with their limited knowledge of inclusive strategies. Moreover, changing the mentors' usual approach of guiding the PSTs posed a challenge.

The changes in perspectives in PE and its teaching, along with the enhancement of reflection and pedagogical resources to address student diversity, influenced CTs' understandings of their supervisor role. The CTs felt that they improved their knowledge and capacity to support PSTs in addressing strategies that engage students in the teaching–learning process, namely using assessment for learning, specifically with the implementation of self- and peer assessment.

I have developed greater individual criticality and improved ability to adapt teaching strategies to the diversity of students. I feel more prepared and motivated to implement student-centred teaching strategies. (CoP, Session 10)

(...) I managed to get the PST to understand that this was not the most appropriate way to structure the handball teaching unit. ... now I feel more confident in guiding. ... I have learnt a lot about team handball. ... the game should be the basis of the whole process. I used to think that, but I did not have the confidence to guide the planning on this basis. (CoP, Session 9)

I think I have already changed my work with the PSTs (...) I felt better able to apply a number of strategies that we discussed in the meetings, and I know that I will continue to learn from these exchanges in the future. (CoP, Session 7)

Now we are beginning to see a shift in guidance towards more student-centred practices (...). The concern to engage students in processes of self- and peer-assessment is already a reality in most of the guidance in the different placement centres. (SP, Meeting 12)

4.5. Challenges and Approaches to Support PSTs towards Becoming Practitioners–Researchers

The main difficulties expressed by the CT to engage PSTs in research were their lack of content knowledge that compromised their capacity to observe and decide what to change and adapt to attend to students' needs, specifically in the curricular areas of physical fitness and invasion games:

They did not have enough knowledge to meet the demands of the games and students' skills needs, so is difficulty for them to question their practice. (CoP, FG 1)

(...) In the meeting after the class, a PST said: I found observing and detecting issues during game play very difficult at first. (CoP, FG2)

(...) I realized that the game was not working well, but I did not know what to do [lack of content knowledge]. (PST, FG 1)

Another difficulty that I had in team games was in adapting game rules and action boundaries to accommodate gender and physical characteristics, which impact play interaction. (PS, FG 2)

In the fitness area, I found difficult to maintain students' motivation for practice because I need to work continuously and involve students in regulating their fitness work to meet individual goals and I did not know how to do it. I need a lot of support. (PST, FG 2)

Another challenge, and at the same time a strategy used by the CTs, was the deconstruction of the PSTs' previous perspectives, namely the use of constraints in game instruction, through reflection and analysis of successful experiences, which the CTs had access to in the CoP meetings:

At the time, I did not think much about using the constraints in the game and maybe I chose to play shorter games. And now I have this realization that using the constraints is useful for the game and to combat the problems we had, and I think that's very much the case. (SP, Meeting 15)

Encouraging reflection through questioning was a tool that the CTs learnt within the CoP and which they began to use to encourage the PSTs to analyse their practices, as can be observed in the following example:

CT question: Do you think your positioning in terms of the observation process was the right one? Was it the most appropriate for what you wanted to observe?

PST answer: In the evaluation, yes, but perhaps I could have positioned myself more in the middle of the field. (SP, Meeting, 11)

5. Discussion

The CTs throughout the year reinforced engagement in CoP dynamics. This engagement was visible in the sharing of thoughts, practices, and doubts, along with negotiating meanings and understandings. At the end of the school year, it was visible that the TEs shared a repertoire, namely concerning strategies to deal with students' diversity, such as working with heterogeneous groups and attending to individual students' abilities and necessities. As stated by Wenger [29], the effectiveness of a CoP depends on engaging in mutual involvement, undertaking jointly, and sharing a repertoire; these were perceptible among the TEs of this CoP. On a previous study of a CoP with CTs, Batista [4] reports the relation between the deep involvement among the participants in formal and informal activities and the community's success. This engagement and environment created by the CTs were visible in the name of the WhatsApp group they created, entitled "Science with Conscience", which was meant to be used regularly to exchange ideas, problems, and successful strategies in PE classes.

The shared facilitation process stimulated within the CoP underlines Parker et al.'s [31] point of view that the facilitation process needs to create a safe learning environment to ensure that teachers are not simply replicating the ideas of others. In this community, the CTs felt free to share their ideas and listen to the ideas of others. They recognise that this environment allowed them to reconfigure their perspectives about the inclusion of students with additional educational needs and also how the fitness area and invasion games could be planned to motivate and accommodate all students regardless of their characteristics (e.g., competence levels, gender, personal goals, social behaviour). The CT's commitment was both instrumental and moral, and as defended by Lee et al. [32], both types of commitment are necessary to build a cohesive and regulated community.

Another important factor of the effectiveness of a CoP is the sense of belonging, as a result of the cultivation of a sense of security and privilege in its members [27,30]. The sense of belonging in this project was extended beyond the CoP, as the TE began to consider the CoP members as friends and shared not only professional but also personal issues between them. We believe that the previously established foundation of the CoP and the involvement of the CTs in the dynamics of the CoP were factors that contributed to the deep engagement of the members [4,24]. The nurturing of collaborative work appears to be linked to the stability of the members throughout the different phases of community development.

In terms of professional development, besides the specific issues related to planning and teaching fitness education and team games, the CTs recognised that their participation in the CoP has enabled them to take a more critical approach to their PE teaching and reported substantial changes in their perspectives on mentoring PSTs. They highlighted the importance of questioning practices, particularly problems of inclusion, which became a central concern when guiding the PSTs' teaching practices. The alignment between curriculum, pedagogy, and assessment advocated by Penney et al. [7] was one of the outcomes. The PSTs began to use self- and peer assessment to improve students' participation in their learning. Moura et al. [12] also emphasise the importance of involving students in assessment practices as a way of improving their confidence and motivation to learn.

The visibility of successful strategies for the inclusion of students, specifically those with additional educational needs, motivated the CTs to incorporate these strategies into their practices. This awareness helped them to recognize situations of exclusion and

encourages reflection and the search for solutions. These findings are in line with the perspectives of Borko et al. [44] and Cochran-Smith and Lytle [42], who emphasise that systematic research on professional domains by practitioners–researchers generates useful knowledge that can be mobilised into practice. The effective mobilisation of this knowledge is often enhanced as it results from collaborative processes [45]. Brooks [48] also highlights the importance of dialogue between CTs and TEs from both schools and universities as it promotes changes in CTs’ conceptions and practices by demonstrating effectiveness in PE. MacPhail and Lawson [6] defended the need for experiential evidence of inclusive practices through training, school support, and university collaboration to achieve teaching transformations towards more inclusive practices. In this particular project, CTs expressed openness to listening to others’ ideas and felt confident and motivated to continuously question their practices to better accommodate student diversity.

The biggest challenge the CTs faced was the poor content knowledge of some PSTs. This knowledge gap hindered the PSTs’ abilities to identify problems and find solutions. However, the practicum group and the support of the CoP were very important in promoting reflection and encouraging the search for complementary resources, such as in the literature. These efforts enabled them to find solutions to the challenges of creating more inclusive teaching environments, ensuring that all students could access, participate in, and benefit from their lessons.

It was clear that the professional development of the CTs went beyond improving their own teaching and extended to other PE teachers in the school. The CTs began to mentor the PSTs by encouraging them to problematise their practice in order to improve not only their teaching but also their way of being teachers.

6. Conclusions

The CoP was revealed to be an effective space for the professional development of schoolteachers (in this project the CTs), transforming their teaching and the way they mentor PSTs. The CTs felt privileged to be part of the CoP, developing a sense of belonging that extended beyond the CoP. They have begun to see CoP members as friends with whom they can discuss both professional and personal issues.

Creating a safe space where CTs can freely exchange their perspectives and practices fostered their commitment to the CoP and helped to develop a common repertoire of strategies for addressing student diversity in PE.

CTs have begun to appreciate the value of questioning practices, especially concerning problems of inclusion, and they encourage and support PSTs to do the same using the strategies learned in the CoP.

The main challenge they faced in supporting PSTs as practitioners–researchers was the PSTs’ lack of content knowledge.

Establishing communities that are supported by practice-based research appears to be a promising strategy for enhancing teachers’ professional development across the continuum of initial and in-service education. For this, PETE programmes should encourage collaboration between university teachers and CTs in schools, where both are viewed as experts, facilitators, and critical friends, and should expand this collaboration to include other schoolteachers. To ensure the success of CoPs as learning communities for both PSTs and teachers in practice, these spaces must be decentralised and democratic. This configuration will help members enhance their impact and renew their desire to learn within an environment characterised by a culture of trust, respect, and mutual support. Moreover, PETE programmes need to address students’ diversities as a key topic across all subjects and adopt student-centred methodologies to develop their capacity to question and reflect on the impact of their teaching. This will prepare future teachers to be practitioners–researchers.

This study’s limitations included a lack of control over contextual variables in each school that could have positively or negatively influenced the teaching process.

For future studies, we recommend pursuing this kind of collaboration with schools and expanding the CoP to include other PE schoolteachers to support them in adopting inclusive practices. Adopting longitudinal designs with close collaboration between teachers (from school and university) and preservice teachers in their school placement could consolidate ways of thinking, planning, and teaching based on the necessity of adapting to students' diversities.

Furthermore, involving the entire school in taking responsibility for the educational process of future teachers, not just the CTs, and changing teaching perspectives on inclusion are two factors that future research needs to embrace.

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Article

Empowering Educators: The Impact of Reverse Mentoring on Developing Scientific Mindset and Research Skills

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Abstract: The integration of educational research into teaching practice is an important component in fostering the professional development of educators. Recognizing mentoring activities as an effective method for fostering such research-driven teaching practice, this study set out to explore the effectiveness of reverse mentoring in cultivating a scientific mindset and enhancing research skills among school-based teacher educators. The defining feature of reverse mentoring is the reversal of the mentor and mentee roles, with student teachers mentoring school-based teacher educators. These school-based teacher educators here represent in-service teachers who teach in schools on a daily basis while simultaneously supporting the training of future teachers. Through a semi-structured interview study, nine reverse mentoring projects implemented in Austria and Greece were analyzed. The findings highlight the importance of the thematic focus of the reverse mentoring projects, motivations for participation, insights into collaboration dynamics, learning outcomes, and suggestions for process improvement. Learning outcomes are reported in new teaching methods, content knowledge, and improved collaboration capabilities. A framework categorizing reverse mentoring collaboration into basic, guided, and deep levels is discussed. Suggestions for further research are provided to validate and expand upon the findings of this study.

Keywords: reverse mentoring; mentoring; educational research; research skills; scientific mindset; teacher education; professional development

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1. Introduction

An important aspect of professional teaching is the ability to incorporate educational research into practice [1]. This integration not only allows teaching to be informed and guided by empirical research findings but also empowers teachers to conduct practitioner research to foster continuous improvement in their practice [2,3]. Existing research underscores the critical role of a scientific mindset and research skills [4,5]. Building upon the definitions of inquiry and scientific habits of mind [6,7], in this paper, we define a scientific mindset as a holistic way of thinking grounded in scientific principles and methods. Research skills encompass specific skills and knowledge for engaging and applying research in a particular field [8,9].

Importantly, these mindsets and skillsets are not only relevant for the teachers but also for teacher educators, who need to model research behaviors. Here, we are focused on teachers' research in the classroom; hence, we zero in on school-based teacher educators. School-based teacher educators are more senior teachers that act as mentors to student teachers and newly qualified teachers [10]. We will refer to them as school-based teacher educators but note the dual role of these educators in teaching school pupils and mentoring student teachers. Interestingly, mentoring for teachers has been implemented worldwide and has been well researched, too. Unfortunately, although previous research has recognized the potential power of partnerships to bridge the gap between theory and practice

(e.g., [11–13]), research has mostly been executed in a rather one-sided fashion, focusing on the learning of students or new teachers (e.g., [14]). There is a growing yet still limited body of research exploring the potential for professional development of the mentors themselves (e.g., [15]). These mentoring interactions are important aspects of social capital [16] and informal learning that have been shown to improve a variety of competencies in other fields [16,17].

It is essential to recognize that mentoring programs, if done right, are not one-way streets. School-based teacher educators also benefit from engaging in professional learning communities (e.g., [18–20]). The concept of reverse mentoring shows that school-based teacher educators, who typically act as mentors, also have the potential to learn from their mentees [21]. While this approach could be a highly productive pathway to shape school-based teacher educators' scientific mindset and research skills, as we will argue for more fully below, research about reverse mentoring in teacher education is scarce and focused on a very narrow set of applications, such as digital education (see below).

In this study we set out to investigate the usefulness of reverse mentoring to promote a scientific mindset and research skills among school-based teacher educators. Specifically, we seek to understand the role of participating in a research-based reverse-mentoring program for the development of school-based teacher educators' scientific mindset and research skills. To investigate this question, we first review existing literature about reverse mentoring and the role of a scientific mindset in professional educational practice. We then present the setup of a reverse-mentoring program in the context of practitioner research and the data of nine school-based teacher educators who have participated.

2. Background

In this section, all components of the research question—scientific mindset, research skills, and reverse mentoring—are explained in more detail.

2.1. Scientific Mindset and Research Skills for Teachers

A scientific mindset broadly refers to a way of thinking that includes scientific and inquiry habits of mind. These habits of mind are defined as a set of dispositions required for cognitive tasks that are practiced, refined, or repeated across contexts and situations [22]. Key features of scientific habits of mind are skepticism, rationality, objectivity, curiosity, open-mindedness, suspension of belief, and mistrust of arguments from authority [6]. For teachers, in particular, skills that enable them to systematically inquire, reflect, and research their everyday teaching practices are essential for understanding the dynamic and complex nature of their school environments and improving educational practices [4]. An inquiry habit of mind for teachers involves valuing deep understanding, reserving judgment while tolerating ambiguity, and considering various perspectives to ask increasingly focused questions [7]. Supporting a teaching culture that fosters inquiry, and thereby scientific mindsets among teachers, promotes collaboration and dialogue [23].

While a scientific mindset supports the application of scientific principles in understanding and approaching the world, research skills are required to conduct and build upon research within a particular field. Specifically, they encompass a range of skills, including the ability to search for informative literature, collect and analyze data, evaluate findings, and communicate results effectively to inform practice and guide decision-making [8,9,24]. Research skills are proven to be more effectively developed when the learning experience is engaging and interactive, such as in action research settings or inquiry-based learning experiences [25–27].

In the context of researching one's own practice, Smith [28,29] emphasizes the need for guidance and suggests a specific mentoring process structured around the stages of the research cycle—planning, acting, observing, and reflecting—to help educators navigate and benefit from their research endeavors. Eraldemir-Tuyan [30] highlights that mentoring strategies must be adapted to the specific individual needs of the mentee to effectively enhance research capabilities. Békés [31] notes that research engagement mentoring could

be a mutually beneficial learning activity for both the mentor and mentee. Building on this idea of mutual learning, the concept of reverse mentoring offers a fresh perspective on how mentoring can be effectively applied to foster a scientific mindset and research skills.

2.2. Reverse Mentoring

Traditional mentoring is about the interaction between a mentor and a mentee with the main goal of learning but rather organized in one-way knowledge flow from the experienced to the less experienced [32,33]. In contrast, it is a legitimate goal in education to equalize the transfer of knowledge for both sides. Hence, reverse mentoring could be the route.

In reverse mentoring, as pointed out by Murphy [21], less experienced individuals (e.g., student teachers) act as reverse mentors and are paired with more experienced reverse mentees (e.g., school-based teacher educators). However, for this to be reconciled, it is necessary that the new reverse mentors possess specialized knowledge to share with their overall more experienced colleagues during this reversed mentoring process [21]. Applied to teacher education, school-based teacher educators participating in reverse mentoring possess a wealth of extensive pedagogical knowledge and experience, which is of great value to the student teachers. In contrast, student teachers are novices in the field of teaching, yet they may offer insights into current trends in the field, informed by their experiences at university [34]. Through the reversal of roles, traditional hierarchical structures, which may appear in traditional mentoring, are challenged, and student teachers become empowered [35].

In the present study, we will refer to the student teachers who assume the role of mentors in the reverse mentoring process as “reverse mentors”. Similarly, the school-based teacher educators who assume the role of mentees will be referred to as “reverse mentees”. To summarize, Figure 1 shows how knowledge is intentionally directed in reverse mentoring as opposed to the traditional one-way flow of knowledge.

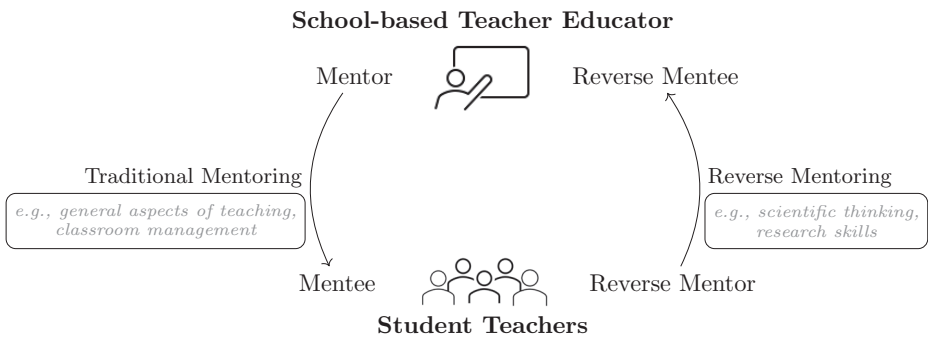


Figure 1. The primary flow of knowledge in traditional forms of mentoring is from the school-based teacher educator (mentor) to the student teacher (mentee). In reverse mentoring, the knowledge flow is reversed, with the student teacher (reverse mentor) guiding the school-based teacher educator (reverse mentee).

2.3. Implementation of Reverse Mentoring in Teacher Education

To date, there have been few studies that have examined reverse mentoring in the context of initial teacher education. Of these, the majority have focused on the learning of digital literacy. The underlying belief is that younger individuals have more experience with modern technology, having grown up with it and can therefore, as digital natives, easily teach these skills to older individuals. A multitude of small-scale case studies can be found in the literature, wherein student teachers impart new digital skills to school-based teacher educators, while simultaneously enhancing their own pedagogical skills as a result of this collaboration (e.g., [36–42]). However, Bertram et al. [43] examined in

a quasi-experimental intervention study with comparison groups, explicitly, the efficacy of reverse mentoring between school-based teacher educators and student teachers in enhancing technopedagogical knowledge. The results indicated that reverse mentoring is no more effective than any other collaborative intervention in this context for learning and professional development. Nevertheless, the study demonstrated that student teachers successfully can take over the role of a competent reverse mentor.

Other examples include cross-generational reverse mentoring to overcome stereotypes, advance learning leadership, and promote inclusion (e.g., [44–49]). An example of how reverse mentoring can be implemented in the teaching practicum can be found in [50], where school-based teacher educators were given the opportunity to learn directly from student teachers about English language teaching techniques. Through this process, the participating school-based teacher educators gained an increased awareness of the development of their teaching practice and demonstrated a deeper understanding of the need to use a variety of teaching strategies [51].

These exemplary cases found in the literature vaguely indicate the effectiveness of reverse mentoring in various areas of the educational landscape.

3. Methods

3.1. Participants

We took a qualitative approach to further explore the role of reverse mentoring for school-based educators’ development of a scientific mindset and research skills. We recruited nine participants from a research-based mentoring program implemented at several European universities [52,53]. Within this program, school-based teacher educators work with student teachers on impact-focused practitioner research projects to jointly develop research skills (and achieve a direct impact on whatever the project itself is about, see Table 1).

Table 1. Topics for the reverse mentoring projects.

Educator	Research Question	Cluster	Focus	Country
ID1	How effective is AI as a teaching method?	Evaluating and Adapting Teaching Materials/Methods	subject-specific (German language class) and content-specific (Selected Books/Literature)	Austria
ID2	To what extent does the current subject textbook meet the needs of learners?	Evaluating and Adapting Teaching Materials/Methods	subject-specific (Orthodox Religion) and not-content-specific (Language barriers)	Austria
ID3	What teaching methods are effective in addressing the different abilities of students in school?	Managing Diverse Learner Needs	subject-specific (English language class) and content-specific (Food)	Austria
ID4	What strategies can be used to address students’ knowledge gaps in school?	Managing Diverse Learner Needs	subject-specific (Mathematics) and content-specific (Language barriers in percentage calculations)	Austria
ID5	What practical strategies can be effectively implemented in managing classrooms with pupils from refugee or migrant backgrounds to reduce instances of school violence?	Classroom Management and Behavioral Problems	not-subject-specific, not-content-specific	Greece
ID6	What strategies can address classroom heterogeneity resulting from the disinterest of pupils who do not require the subject for nationwide examinations?	Managing Diverse Learner Needs	subject-specific (Chemistry), not-content-specific (Heterogeneity)	Greece

Table 1. Cont.

Educator	Research Question	Cluster	Focus	Country
ID7	How can pupils raise awareness about the local smog threat and effectively engage the local community in addressing this issue?	Alternative Teaching Methods	not-subject-specific (Community-based Learning; interdisciplinary), content-specific (Environmental awareness, Smog)	Greece
ID8	What are the key pedagogical principles of the flipped classroom model, and how can it be effectively planned and implemented?	Alternative Teaching Methods	subject-specific (Language class), not-content-specific (Flipped Classroom)	Greece
ID9	What alternative teaching methods can be used to improve the academic integration and performance of Roma pupils?	Managing Diverse Learner Needs	not-subject-specific, not-content-specific	Greece

The research questions are directly linked to the learning needs of school-based teacher educators and have been thoroughly developed and shaped together with focus through the reverse mentoring process.

In the reverse mentoring project, student teachers worked in groups of around four to five student teachers to mentor the school-based teacher educators. They were supported throughout this process by university-based teacher educators who initiated and oversaw the entire project. To enhance communication and ensure effective collaboration, each group designated a spokesperson to serve as the primary communication link between the reverse mentoring group and the school-based teacher educator. The research projects were carefully structured around the research cycle, with pre-defined milestones guiding each phase. These milestones included developing the research framework, planning data collection and interventions, carrying out analysis and evaluation, and finally, dissemination and reflection. Each milestone was accompanied by specific tasks and instructions designed to help achieve the objectives, with brief feedback provided at each stage to ensure progress and alignment with project goals.

3.2. Instruments

Before conducting the interviews, an interview guide was created to ensure a thorough exploration of the school-based teacher educators’ learning experiences through reverse mentoring with student teachers. The open-ended questions addressed the motivation of school-based teacher educators for participation, existing attitudes towards educational research, collaboration dynamics with the student teachers, and key factors for successful implementation of reverse mentoring. The interviews were conducted in German (Author 1) or Greek (Author 2) during online meetings (Austria) and in-person meetings (Greece). The interviews were recorded and transcribed verbatim.

3.3. Analysis

We analyzed the data using qualitative content analysis [54]. The analysis was implemented in two major phases. First, the primary coder, in close collaboration with a second coder, established an inductive category system (see Table 2) based on the first four interviews that were conducted. In a second phase of data analysis, a third coder deductively applied the category system to the rest of the data; this coding was subsequently discussed with the primary coder. Furthermore, important utterances not covered by the category system were discussed, but no new code or category was necessary. Therefore, theoretical saturation was assumed.

Table 2. Description of Categories.

Category		Description of Category
C1	School-based Teacher Educator Profile/Scientific Attitudes/Motivation for Participation	Information about the participating school-based teacher educators, including their professional background, and their attitudes towards educational research. It also explores the reasons why the school-based teacher educators chose to participate in the reverse mentoring project, which could include their motivations, challenges they face, and their goals for participating.
C2	Collaboration with Student Teachers/Learning Interactions	Focuses on the dynamics of the interactions between the school-based teacher educator and student teachers during the reverse mentoring project. It looks at how often they interacted, the nature of the interactions, and the overall quality and effectiveness of their collaboration.
C3	School-based Teacher Educators Learning Experience	Instances where school-based teacher educator reflect on their own learning and professional development as a result of participating in the reverse mentoring project. This includes any new knowledge, or skills acquired, changes in teaching practice, and solutions implemented in their teaching.
C4	Feedback	Feedback from the school-based teacher educator on their experience of the reverse mentoring project. It highlights what was successful, what could be improved, and suggestions for future projects.

4. Results

The interviews with school-based teacher educators revealed several key insights into the challenges and successes encountered in reverse mentoring projects between school-based teacher educators and student teachers. These insights are organized into five main themes: the thematic focus of the reverse mentoring projects, motivations for participation, insights into the reverse mentoring process, learning outcomes, and suggestions for process improvement.

4.1. Thematic Focus of the Reverse Mentoring Projects

First, school-based teacher educators had to determine a mentoring opportunity. These mentoring opportunities were directly identified by the school-based teacher educators and were linked to specific needs or uncertainty regarding how to handle complex situations (see Table 1). Thematically, the topics were linked to the wish for more innovation, including the integration of new technologies, the exploration of differentiated teaching methods, and the creation of community-based learning environments. Additionally, an emphasis on inclusion motivated participation, particularly in creating supportive learning environment for diverse groups of pupils and addressing school violence to foster a beneficial learning environment for all. The submitted topics for the reverse mentoring projects varied not only in subject matter but also in focus. For example, not all topics were subject or content-specific nor did they all include specific and actionable research questions.

Several school-based teacher educators reported that initial attempts to address the challenge had failed, and that the reverse mentoring program was one of their last hopes for a solution (Reverse Mentees ID2, ID5, and ID9).

4.2. Motivations for Participation

The motivations for participation varied among school-based teacher educators, though all sought external input to improve their teaching practice. Reverse mentees ID2, ID4, ID5, and ID9 were uncertain about the appropriate courses of action and sought guidance. ID1 and ID2 aimed to enhance their credibility and objectivity in evaluating teaching materials and methods. Meanwhile, the reverse mentees ID3, ID6, ID7, and ID8 were

looking for practical suggestions and were keen to learn and stimulate critical/reflective thinking through this collaborative endeavor. Numerous reverse mentees (ID1, ID3, ID4, and ID8) noted that time constraints were a significant factor in their ability to address their identified challenge independently. One participant expressed this in the following way:

My biggest challenge was time management. I could have found the solutions myself, and often did, but it required a lot of time. I had hoped to receive materials and a well-developed teaching concept tailored to my class, which would not require too much effort on my part. ID3

It is notable that although the reverse mentoring projects were explicitly communicated as opportunities for school-based educators to receive support in educational research engagement, only ID1 expressed motivation related to an interest in educational research. Overall, a few reverse mentees (ID1, ID2, and ID4) reflected on their participation as a method to enhance credibility and objectivity and to avoid bias in self-research.

4.3. Insights into the Reverse Mentoring Process

Reverse mentoring begins by pairing student teachers with school-based teacher educators but reverses the traditional mentoring flow of knowledge from the student teachers to the school-based teacher educators (see Figure 1). The guiding principle for adopting the reverse mentoring approach was that research into one's own teaching practice should not be an individual matter. With this in mind, the reverse mentors (student teacher group) and the reverse mentee (school-based teacher educator) were assigned to carry out practitioner research projects, addressing challenges identified by the school-based teacher educator beforehand.

Most projects followed an iterative process of refining ideas and exchanging information through online meetings (ID1, ID2, ID3, ID4, ID5, ID7, ID8, and ID9). Key activities in the working phase included brainstorming and collaborative decision-making, which were reported in various projects (ID1, ID2, ID3, ID4, and ID9). A structured working process involving regular updates, discussion on project development, and maintaining transparency with clear communication and process documentation was reported in a range of projects (ID1, ID2, ID3, ID4, ID5, ID7, ID8, and ID9). The reverse mentors developed solutions, materials, and interventions in all projects, while minimal reverse mentee involvement, limited to data provision, was noted in some projects (ID2, ID4, ID6, and ID8).

Challenges such as unclear goals (ID1 and ID4), time loss (ID1), incomplete project work (ID4), and poor/little communication (ID1 and ID6) were identified. On the contrary, mutual experience-sharing between reverse mentors and reverse mentee was also mentioned in a few projects (ID3, ID4, and ID7). Direct interaction of student teachers with classroom pupils was reported as part of the research project (ID1 and ID7) as the use of additional literature by school-based teacher educators to enhance their knowledge, indicating that they were also open to learning (ID1 and ID2).

Interestingly, one reverse mentee (ID1) was mentored by two groups of student teachers working on the same research question with differing success. The reverse mentee attributed the difference to communication:

Working with the first group was highly successful due to their proactive communication and detailed involvement from the outset, resulting in a smooth process. In contrast, the second group failed to make proper contact and attempted to deviate from the agreed topic, resulting in a lack of communication and, ultimately, minimal output with no measurement. ID1

4.4. Efficiency of Reverse Mentoring for Professional Development/Learning Outcomes

Several learning outcomes reported by the reverse mentees interviewed suggest that reverse mentoring is effective for professionalization. Key outcomes include new teaching methods (ID3), enhanced content knowledge (ID1, ID4, and ID5), realizations about pupils' working styles (ID1 and ID4), the ability to carry out similar projects independently

(ID3), an increased scientific view of teaching (ID1), enhanced knowledge about research methodologies (ID1), improved networking and collaboration capabilities (ID2, ID3, ID4, and ID7), enhanced social skills (ID1), and know-how about the effective integration of external projects into everyday teaching practice (ID1). The comment below illustrates the learning progress in scientific mindset:

But what it has done is it has made my view of teaching a bit more scientific again. Instead of just saying: "Let's do some exercises", it's now more about understanding the underlying reasons: "Why am I doing this? What is my goal? How is it scientifically grounded?". Also, I've become more inclined to seek specialized literature when I hit a roadblock. So, my perspective changed a lot. My joy in analyzing and questioning things has also increased. Additionally, my mindset has evolved to prioritize thinking first, then acting. ID1

And another reverse mentee commented:

It was enjoyable to exchange ideas with like-minded individuals who shared their experiences with me. I found this informal setting very pleasant because I learn best through dialogue. As a result, I was able to gain a lot from the experience. ID3

However, while the reverse mentees from Austria appeared to have greater learning experiences, the school-based teacher educators from Greece (ID5, ID6, ID7, ID8, and ID9) noted insufficient time to implement new ideas, especially as projects ended before intervention plans could be evaluated due to summer break. To enhance learning, the school-based teacher educator expressed a desire for additional literature references (ID1 and ID2). Additionally, one reverse mentee reflected in the interview on the reasons for the low level of involvement in the project:

The learning opportunity was limited because the students were working behind the scenes and only using me as a link to get the raw pupils' data for analysis. ID4

While the reverse mentoring project fostered collaboration between school-based teacher educator and student teachers, the level of classroom pupil involvement was also addressed in the interviews, as some research projects conducted through the reverse mentoring process were directly linked to classroom pupils. In Project ID7, reverse mentors directly worked with pupils and exchanged ideas for the community-learning project via online meetings. In Project ID1, reverse mentors collaborated with pupils to measure the effectiveness of using artificial intelligence for text comprehension in German language lessons.

Feedback from pupils played a crucial role in the school-based teacher educators' view of the project's success. One school-based teacher educator highlighted the positive impact of pupil feedback:

The best moment was the feedback from the pupils. This: 'We've finally done something really new. That was something really exciting. We were able to try out something that really has to do with the reality of our everyday lives.' Where I thought to myself: 'It's actually nice that a scientific project is being received so positively by young people. Where I thought to myself: 'The call to do more of this actually fits.' ID1

In contrast, reverse mentee ID4 noted a lack of enthusiasm from pupils:

The worst moment had to do with the pupils. I announced in the classes that we were taking part in the project and they just weren't interested at all. They just said: 'Do you have to do that? Does it count for the grade?' Eh, that's just the usual. Just pupils, annoying. Not very motivated. ID4

4.5. Suggestions for Improvement

In the interviews, school-based teacher educators provided positive feedback and recommendations for improving the reverse mentoring approach. All found the participation beneficial and expressed a desire to repeat it or recommend it to others. One

reverse mentee undertook a similar project independently after participating in the reverse mentoring project:

Actually, I carried out something similar the following year. I took a similar project, extended its duration, and incorporated peer learning. I'm confident that the use of this peer learning teaching method was influenced by my participation in the project, so I wouldn't have had it without it. It really brought about a change in my perspective. ID3

To maximize the learning outcomes, the school-based teacher educators expressed the need for more information about administrative matters and overall objectives from the university course facilitators (ID1, ID4, ID6, ID8, and ID9). They also suggested more in-person meetings instead of online-meetings (ID4, ID6, ID8, and ID9). To improve communication and accountability, some reverse mentees suggested that all meetings with student teachers should be planned in advance:

Perhaps the only improvement would be to communicate the joint appointments earlier or coordinate them so that everyone actually has time. ID3

5. Discussion

The current study highlights the potential of reverse mentoring as a strategy to foster the development of a scientific mindset and research skills among school-based teacher educators. This approach leverages the strengths of both student teachers and school-based teacher educators, facilitating a bidirectional flow of knowledge and promoting professional growth. The insights gathered from the qualitative data provide several key points for consideration.

5.1. Engagement and Motivation of School-Based Teacher Educators

To participate effectively in reverse mentoring, school-based teacher educators first need to identify a mentoring opportunity that ideally presents a challenge for them. Our findings suggest that, in most cases, these school-based teacher educators initially attempted to address these challenges on their own but encountered difficulties that required additional support. In other cases, participation in reverse mentoring was driven by a desire to gain external input and save time. The mention of participation to outsource research work points to a significant barrier that teachers face—lack of time [55]. As the demands of teaching seem to leave no time to fully explore or deal with complex and innovative situations, the role of seeking external input becomes particularly important, especially with the increased capacity to share expertise to reduce workload, embrace innovation and find the appropriate course of action [56].

In addition, clarity about the goals and tasks of reverse mentoring influences its success. Our study suggests that a reflective approach on the part of the reverse mentee and a willingness to step out of one's comfort zone are fundamental to participation. The project should be viewed not only as a project that advances teaching but rather as a learning experience in its own right. In some cases, external pressures, such as the urgent need to address significant educational challenges (as seen in ID5 and ID9), also drive the commitment to participate in reverse mentoring programs. School-based teacher educators who voluntarily participate in reverse mentoring tend to have personal characteristics that support effective collaboration, such as a willingness to collaborate and an appreciation of the benefits of teamwork [57].

5.2. Role and Participation of Student Teachers

Student teachers are empowered to choose the challenges that interest them most and to work collaboratively in groups, supported by university-based teacher educators and scaffolding materials. This support structure provides clarity about their roles in the project while allowing them autonomy to choose activities that contribute to learning. The emphasis on collaboration is further reinforced by structured communication, with roles such as group spokespersons helping to ensure effective interaction with school-based

educators. Furthermore, involving student teachers in a collaborative inquiry approach has been shown to have significant benefits for their learning too [58].

5.3. Effectiveness of Reverse Mentoring

The study’s findings indicate that reverse mentoring can be an effective tool for professional development, aligning with previous research on the benefits of collaborative approaches [57,59]. The school-based teacher educators reported a variety of positive outcomes, including the adoption of new teaching methods, enhanced content knowledge, and a more scientific approach to teaching. These findings suggest that reverse mentoring fosters an environment that encourages continuous improvement. However, we were also able to identify differences in the learning outcomes of the participating reverse mentees.

Several variables could have an impact on various reverse mentees’ learning. We believe that the motivations for participating in the project, as well as the expected outcomes of the mentoring process, will have an influence on work attitudes and levels of engagement. A key factor that emerged from the interviews was the importance of communication and collaboration. Reverse mentees displayed varying levels of engagement, with some taking a more active role in the project, while others were more passive. To classify the level of engagement, we propose a framework based on the main findings presented above (see Table 3) to conceptualize the depth of collaboration. While previous research has already identified factors and barriers for facilitating deep collaboration [57], we present this framework to guide future research in analyzing the collaboration dynamics within reverse mentoring processes.

Reverse mentoring collaborations are categorized into basic, guided, and deep levels. We assume that participation at a basic level is extrinsically rewarding, where reverse mentees seek service from reverse mentors. In contrast, deeper participation is intrinsically satisfying, providing a sense of accomplishment. As the interviewed school-based teacher educators emphasized the importance of communication as a critical factor, we believe that communication moderates the progression from the basic level to the guided level and finally to the deep level of reverse mentoring.

Table 3. Possible levels of reverse mentoring collaborations.

	Basic	Guided	Deep
Goal of the Reverse Mentoring Process	Address the practical needs of reverse mentees while reverse mentors develop basic skills and understanding.	Enhance learning for both reverse mentors and reverse mentees through structured collaboration and the application of knowledge in real-world contexts.	Create a community of practice that emphasizes continuous improvement and reflective practice that benefits both reverse mentors and reverse mentees.
Interaction and Communication	Minimal and task-focused, with communication occurring only when needed.	Structured, regular with scheduled meetings and purposeful communication to provide feedback and foster understanding.	Structured, regular and ongoing, with open, ongoing, and reflective communication that facilitates deep collaboration and mutual growth.
Characteristics of the Reverse Mentoring Process	Reverse mentors independently develop a service or resource (e.g., research-based teaching materials, strategies) for the reverse mentees.	Reverse mentors develop a service or resource with active involvement from reverse mentees, who provide ongoing feedback and participate in discussions.	Both parties engage in continuous feedback, reflection, and collaborative development of materials, practitioner research projects.

Table 3. Cont.

	Basic	Guided	Deep
Reverse Mentors Learning Outcomes	Development of basic communication skills, initial exposure to new perspectives, and the application of general concepts to practice.	Enhanced critical thinking, problem-solving, and collaboration skills. Improved ability to apply knowledge to real-world situations.	Leadership and empowerment, improved communication and collaboration, deepened understanding of educational practices, and preparedness for future roles.
Reverse Mentees Learning Outcomes	Initial openness to new perspectives. Beginning to engage in reflective practice.	Improved practices through exposure to fresh perspectives. Building trust and improving communication with reverse mentors. Enhanced problem-solving through collaboration with reverse mentors.	Professional growth as school-based teacher educators. Strengthened capacity to serve as role models. Promoting a culture of continuous learning and reflective practice within the educational community.

5.4. Challenges and Areas for Improvement

Despite the positive findings, several challenging factors for school-based teacher educators were identified in the interviews. This is consistent with evidence from previous studies [55]. Time constraints were a notable issue, particularly for educators in Greece, who noted that they had insufficient time to implement new ideas. As the start and end of the school year varies greatly from country to country and time management is often difficult when working with school-based teacher educators, we suggest that the objectives of the reverse mentoring project be scaled to the time available.

Additionally, we also found that effective communication was highlighted as a critical factor for success. Projects that experienced poor communication often resulted in less successful outcomes, underscoring the importance of structured communication plans and clearly defined project goals. Ensuring regular updates, clear documentation, and ongoing feedback can help mitigate these issues and enhance the overall effectiveness of reverse mentoring programs.

5.5. Future Research

The exploratory nature of this study led to several areas for further research. Future studies could focus on identifying which authentic research tasks are most effective in fostering a learning environment that nurtures the development of research skills and dispositions through reverse mentoring. This also begs the question whether the school-based educators do ask the most productive questions to begin with. A larger-scale, quantitative approach could help here to identify general patterns and inform the definitions of the projects. Additionally, quantitative methods could examine how differences in project implementation influence outcomes, especially given the noted differences between Austria and Greece in this study. Moreover, the parameters influencing the level of collaboration (see Table 3) of school-based teacher educators in the reverse mentoring process could also be explored, calling for relational approaches [60]. Identifying these parameters will be crucial for determining the ideal learning opportunities, ensuring that school-based teacher educators can actively engage in the process.

While improving scientific mindset and research skills is critical for school-based teacher educators, these skills may not automatically transfer from reverse mentoring to daily teaching practice [58]. Future research could explore the types and duration of ongoing support and development necessary to ensure that the benefits of reverse mentoring are fully realized in everyday practice. Additionally, examining the long-term impacts of reverse mentoring on teaching practices towards classroom pupils as well

as towards student teachers would provide valuable insights into how these skills are sustained and effectively applied over time.

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Article

STEM Cooperating Teachers' Professional Growth: The Positive Impacts of a Year-Long Clinical Residency Collaboration

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Abstract: Teacher residency programs integrate coursework with clinical practice in a year-long residency in which pre-service teachers work under the guidance of a cooperating teacher who has demonstrated excellence in teaching and mentoring. The purpose of this study was to examine the reasons for serving as a cooperating teacher and investigate how clinical residency pre-service teachers promote growth in the professional practice of cooperating teachers as teachers and teacher leaders. In this longitudinal qualitative study, we gathered data through semi-structured interviews and responses to survey questions over a five-year period. Ten STEM cooperating teachers (six female and four male) with 7 to 18 years of full-time teaching experience in biology, chemistry, or mathematics participated. A thematic analysis was used to analyze the interview transcripts and survey responses. The primary motivation for serving as a cooperating teacher was the desire to share experiences and support new teachers. Cooperating teachers described the following benefits: increased self-reflection and continuing reflective practice; meaningful collaboration with pre-service teachers; learned new teaching strategies to enrich their own teaching practice; improved communication skills; and the impetus to become teacher leaders. These findings support that clinical residency teaching programs are beneficial for STEM cooperating teachers and promote their professional growth.

Keywords: cooperating teacher; teacher educator; pre-service teachers; professional development; benefits to mentors

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1. Introduction

To prepare high-quality teachers for the 21st century, especially in high-need schools, the National Council for Accreditation of Teacher Education Blue Ribbon Panel on Clinical Preparation and Partnerships for Improved Student Learning [1] advocates that teacher education programs center on clinical practice. One of the defining principles of excellent teacher residency programs is the effective integration of education theory and classroom practice in a year-long residency led by an expert teacher [2]. This sustained clinical practice allows pre-service teachers (PSTs) to authentically practice teaching strategies while being supported by effective mentors [3]. Moreover, rich partnerships between schools, districts, and universities are critical to the preparation of high-quality teachers that are retained in the profession [4,5].

Urban teacher residency models integrate coursework with classroom practice in a year-long, co-teaching residency in which a pre-service teacher works under the guidance of a cooperating teacher (CT) in a partnering high-need school district [6] followed by two years of mentoring support [7–9]. A cooperating teacher is a teacher educator who hosts a pre-service teacher in their classroom to provide consistent mentorship by modeling instructional strategies and guiding pre-service teachers as they learn to teach and manage the classroom. The University of Indianapolis clinical residency teacher preparation program [10] was conducted in three urban, high-need districts and included one year of full-time, intensive coursework, theory, and clinical practice, to prepare pre-service teachers

with undergraduate degrees in science, technology, engineering, and mathematics (STEM) for a master of arts in teaching (MAT) and licensure to teach secondary STEM coursework. The education pedagogy and STEM content, based on project-based learning (PBL) [11], were heavily front-loaded, which allowed the pre-service teachers to immediately practice and apply what they were learning in their classrooms. After completing the MAT requirements, program graduates received two years of university-provided mentoring by a content area expert to support them in their initial teaching positions. This support involved regular contact via in-person observations along with workshops and conversations around pedagogy, content, successes, and challenges [12]. The year-long clinical residency also facilitated development of mentor–mentee trust, collaboration skills, and long-lasting relationships, which gave program graduates a jump start into teaching. They performed as second-year teachers during their first year of practice and many program graduates also quickly progressed into leadership roles in their schools and professional societies due to the strength of their preparation [13].

Strong cooperating teachers are critical to teacher education and the success of a teacher preparation program as they support and guide pre-service teachers into the teaching profession [14]. Prior data indicate that effective mentors are fully collaborative, systematically transition control of the classroom to the PST, advocate for personal relationships, and share feedback [15]. They are coaches that intentionally support the ongoing development of a PST [16,17]. Pre-service teachers who learn to teach with instructionally effective cooperating teachers are more instructionally effective themselves [18] and have a higher rate of retention in the profession [19]. In addition, effective CTs are fully engaged with the teacher education process beyond the level of curriculum: providing targeted instructional support and classroom management strategies; integrating PSTs into professional and extracurricular school life; and communicating with school- and university-based program leaders [10].

In the University of Indianapolis program [10], school faculty worked with administrators to identify cooperating teachers who demonstrated teaching excellence in their content area and an ability to effectively mentor a pre-service teacher. The CT oriented the pre-service teacher to the school, provided copies of textbooks and curriculum guides, communicated school policies and emergency procedures, introduced the pre-service teacher to technology and resource personnel, and shared the classroom management plan and established routine. With their support, the pre-service teacher progressed over several months to full responsibility for the classroom, including following individualized education plans, designing student assessments, keeping records, completing forms, and communicating with families. The CT observed lessons and provided frequent formal and informal instructional support and feedback, completed a midterm and final evaluation of the PST, and remained in regular contact with program administrators regarding the pre-service teacher's progress in the program. The positive experience, multiple layers of support, and good communication with program administrators prompted multiple CTs to host subsequent pre-service teachers.

Studies suggest that there are benefits to being a cooperating teacher; for example, as a result of mentoring pre-service teachers, CTs improve their overall collaboration and co-teaching skills [6]. Moreover, through co-teaching, PSTs encourage CTs to revise existing curriculum, collaboratively design new curriculum, and develop new instructional strategies and pedagogical practices [20,21]. Being a CT promotes their own metacognition about their teaching [22] and they are more reflective on their own teaching practices since they have to explain their rationale for doing what they do in the classroom to the PSTs [23]. Clinical residency teaching programs are mutually beneficial for pre-service teachers and cooperating teachers in that reciprocal learning occurs [24]. Furthermore, mentoring a clinical residency pre-service teacher is positively associated with an increase in teacher effectiveness for the cooperating teacher [25]. Additionally, CTs view candidates as colleagues, allowing them to not only share the instructional and administrative load, but also reducing isolation and providing emotional support when dealing with the challenges

of teaching. All of this extra support in the classroom leads to a more rewarding teaching experience [23].

This study aimed to examine the motivations for serving as a STEM cooperating teacher and how pre-service teachers, in a year-long clinical residency program, promote growth in the professional practice of STEM cooperating teachers as teachers and teacher leaders. Our findings provide additional evidence of the benefits of serving as a cooperating teacher in a clinical residency teaching program.

2. Materials and Methods

2.1. Participants and Data Collection

The participants consisted of ten cooperating teachers (six female and four male) with a range of 7 to 18 years of full-time teaching experience. Our participants (eight high school teachers and two middle school teachers) were recruited from five different high-need schools (four high schools and one middle school) in three partnering school districts associated with our clinical residency program. Of the ten cooperating teachers, seven taught biology, two taught mathematics, and one taught chemistry. The cooperating teachers mentored between 1 and 6 pre-service teachers enrolled in a year-long clinical residency program throughout their teaching careers.

A longitudinal qualitative study was conducted to investigate the long-term impacts of clinical residency pre-service teachers on the professional practice of cooperating teachers as teachers and teacher leaders. Qualitative data were gathered by two methods: (1) semi-structured interviews and (2) survey questions over a period of five years (2018–2022). Informed consent was obtained from each participant prior to data collection. The semi-structured interviews, led by an external evaluator at the end of each clinical residency year, were conducted in-person, by telephone, or virtually via Zoom and lasted between 20 and 40 min. Surveys, containing the same questions used in the interviews, were conducted annually, by the external evaluator, for two additional years following the interview in order to investigate long-term impacts. Cooperating teachers that mentored one pre-service teacher during this study participated for three consecutive years ($n = 5$), whereas those that mentored more than one participated for up to five consecutive years ($n = 5$). The external evaluator generated transcripts from the interviews and compiled survey responses for each participant. The following open-ended questions were used in both the interviews and surveys to evaluate the motivations for serving as a cooperating teacher and how pre-service teachers in a year-long clinical residency program promote growth in the professional practice of cooperating teachers:

1. What made you interested in becoming a cooperating teacher (CT)?
2. What might you say to another teacher who was considering becoming a CT?
3. Describe the ways that your experience as a CT influenced you as a teacher.
4. Describe any specific instructional practices that you learned about from your pre-service teacher (PST).
5. Describe which of those instructional practices you have continued to implement in your own teaching after your PST's clinical residency with you.
6. Describe the ways that your experience as a CT influenced you as a teacher leader.
7. Describe any teacher leadership activities that you may have engaged in or led in the past year.

2.2. Data Analysis

This study utilized a thematic analysis [26–28] to analyze the interview transcripts and survey responses. We used an inductive, bottom-up approach in which the codes and themes were derived by the content of our data. Following the thematic analysis protocol by Braun and Clarke [26], we familiarized ourselves with the data by reading the transcripts, taking notes and making initial observations, generating initial codes, and searching for potential themes. After defining our codes, one transcript was coded at a time. The coding process was carried out by two researchers separately and subsequently

discussed until a consensus was reached. The themes that emerged from the analysis of CT outcomes were the following: (a) desire to share their experiences and support new teachers; (b) increased self-reflection and continuing reflective practice; (c) meaningful collaboration with pre-service teachers; (d) learned new teaching strategies to enrich their own teaching practice; (e) improved communication skills; and f) impetus to become teacher leaders.

2.3. Ethical Considerations

In each case, confidentiality and purpose were shared at the beginning of each interview and survey. The participants were informed that participation was voluntary, that individual responses would be confidential, and that the interview and survey results would be used as part of the clinical residency program evaluation and to inform the national conversation on teacher education programs regarding the impact of pre-service on the cooperating teachers' professional practice. Informed consent was obtained from each participant prior to data collection. The external evaluator assigned each participant a code (CT 1—CT 10) to maintain confidentiality and anonymity. Our study protocol was reviewed by our university's IRB in accordance with the US Department of Health and Human Services (DHHS) and Office for Human Research Protections (OHRP) regulations, specifically 45 CFR 46.104. Based on these criteria, this study was exempt from IRB review.

3. Results

3.1. Reasons for Being a Cooperating Teacher

Under this theme, we wanted to determine the reasons and motivations for agreeing to serve as a cooperating teacher.

The prominent reason for serving as a cooperating teacher was the desire to contribute to the profession and help train high-quality beginning teachers ($n = 9$). Interestingly, the motivations for CTs remained stable pre- and post-pandemic. Some cooperating teachers had participated in a year-long clinical residency program as part of their own pre-service teaching experience and felt that they had a big head start their first year as a result. CTs wanted to share their experiences and support new teachers since they had benefited from help and support throughout their teaching careers; many cooperating teachers stated verbatim that they wanted to "pay it forward" ($n = 6$):

There really are two main factors. One is I feel like there is an obligation to some degree on the part of people who are current teachers to try to do our best to offer whatever we can to people who are becoming teachers. You know, it's that saying, pay it forward. My student teaching was incredibly important, I mean the time in the classroom was good, but also the learning theory and the university setting was good, but the time interacting with students, being there having to do things myself and figure things out and perform. That was so incredibly important to me, learning how to teach, so I feel like that only happens if people are willing to be mentor teachers. (CT 4)

When asked what they would say to another teacher who was considering serving as a cooperating teacher, the CTs indicated that they would share that in addition to giving back to the profession by training the next generation of teachers, there are also personal benefits including the opportunity to co-teach with a potential future colleague, time to focus on developing their own lessons, and visiting coworkers' classrooms to observe additional instructional practices ($n = 9$). As a result, it allowed them to grow as a teacher themselves:

I would just say it feels so good to know that you're making an impact on training a new teacher. And you're helping that person become a teacher. Teaching in and of itself is definitely a calling and so you have to have a part in helping other people pursue their calling and that is really important. Selfishly, a highlight is that you can be out of the class for a little bit of time when they take over in January! It's pretty nice because you can actually get some other work done. That's not why I chose to do it, but it was a nice little part of the process. And,

actually it's not even just time to do work, but I spent time getting into other people's classrooms, my coworkers, who I never get to see teach. I don't get to see the awesome ideas that they have, or the way that they organize their classes because I'm always teaching myself. And so, having that opportunity was really, really awesome. But in some ways, I think that helps us grow as teachers, too, to get out and see other teachers. You get to see and know what they're doing. (CT 2)

3.2. Self-Reflection

Under this theme, we determined that mentoring a pre-service teacher impacted a CT's self-reflection and continuing reflective practice.

Every CT surveyed ($n = 10$) noted a greater ability to reflect on their own lessons and teaching practices due to mentoring pre-service teachers. They stated that taking the extra time to explain their rationale to another educator was challenging. However, the thoughtful and intentional communication of teaching rationales to their PST allowed them to better understand and improve their own instructional practice, which also benefited their students. One CT elaborated:

I think that becoming a CT allows you to reflect and hone some of your best practices. It allows you the chance to communicate what works well in that content area and that it is a great opportunity to have an inward reflection on your leadership and your ability as a teacher within your content area. And to have a better understanding of how all the pieces come together to hopefully provide the best education for our kids. (CT 8)

CTs also reflected on how mentoring a pre-service teacher improved their self confidence in their own profession and ability to communicate with others ($n = 3$). This validated their own role as a teacher and teacher leader, and helped them assess their personal growth. One CT stated:

[Mentoring] boosted my confidence a lot more. I'm a very self-reflective person, and I'm sort of always down on myself, like, how can I improve? What can I do better? But when you see a brand-new teacher coming in and the mistakes that they're making because they don't know yet, it helped me see how much I had grown even in 5 years. It definitely boosted my confidence. It helped me realize, oh, I really have come a long way in these 5 or 6 years. I did not anticipate that it was going to really help me as a teacher like when I agreed to do it. But it really did benefit me, not only with the confidence, but also just knowing how to communicate with other teachers a little bit better. (CT 2)

3.3. Promotes Collaboration

Under this theme, we determined that the partnership between CTs and pre-service teachers resulted in meaningful collaboration.

The CTs appreciated having a built-in colleague, which allowed for co-designing and co-planning lessons with pre-service teachers ($n = 9$). CTs indicated that one challenge of collaborating and supervising PSTs was that it is time-intensive. However, they felt that the positives of co-teaching outweighed any negatives. CTs indicated that PSTs provided encouragement and support regarding their own teaching. Students also benefited from the collaboration as it allowed for time to assist struggling students and offer additional instructional support:

I tried to look at [my PST] as a colleague—I guess I am the mentor, but in the fall, I taught, we always co-developed, talked through plans, [they] always had suggestions, as time went on he had more input. I gave more input at the beginning of his teaching and scaled that down. Encouraged him to try new things. [They] chimed in when I was teaching, we both helped the kids. More like co-teaching throughout. Just having those discussions together and trying to

have someone else there on a daily basis as a thought partner, and there's also something about it all for you as the mentor. There's always that little extra you do when there's another colleague in the room with you. You feel like you have to up your game a little bit, so I feel like there's a little bit of that as well. (CT 4)

Cooperating teachers also indicated that serving in this role led them to continue a culture of collaboration ($n = 5$) and that they utilized the learned co-teaching strategies with other teachers. These results support that working with PSTs led to long-term impacts on the professional practice of CTs:

I learned many cooperative teaching techniques and how to utilize them effectively in my classroom. I use some of the co-teaching strategies with Special Education teachers in my classroom along with other paraprofessionals to make sure they're included in the instruction. (CT 3)

3.4. Teaching Strategies

Within this theme, we determined that cooperating teachers learned from the pre-service teachers and implemented new teaching strategies to enrich their own teaching practice. Cooperating teachers commented that since pre-service teachers were modeling lessons that promote student engagement, it allowed them to keep up with best practices and also it provided a refresher for forgotten strategies ($n = 9$). CTs were inspired by their PSTs to revise their own curriculum to include more active learning and real-world connections.

Cooperating teachers also mentioned specific learning strategies and lessons that they planned to implement in their own classrooms including new labs and project-based learning:

[PST] did a whole PBL unit on infectious disease [covering a] brand new standard [on] bacteria [and] viruses. She spearheaded the unit to teach them and I would like to use that unit in the future. [Another] strategy that I am 100% stealing and using forever—I had never heard of “word of the day”—embedding vocabulary into the day. I've done word walls, flash cards, and other things. I loved how she did this—word posted on board, had to write it down and the definition, and the word was related to the lesson that day, usually content (like force), sometimes it was about teamwork (like persistence). It was always an important word but not always content. Then she referenced the word throughout the unit days prior [and] had kids talk about it again. Such an easy way to embed vocabulary every day. It was fantastic. Later in the lesson they would already understand the word! (CT 2)

Cooperating teachers also indicated that they have continued to implement the pre-service teachers' strategies in their own teaching ($n = 7$). These results demonstrate that working with PSTs led to long-term impacts on the teaching practices of CTs:

There are quite a few things that I have kept over the years. I have continued using an exit ticket that allows me to assess both student confidence level and whether they actually got the problem correct. Another [strategy I use] is to let students self-segregate during work time depending on how much help they think they will need. Students who are confident can go ahead and get started, while students who need more help will be grouped together so that I can work with them all at once rather than just one at a time. (CT 4)

Cooperating teachers indicated that mentoring pre-service teachers, particularly during the COVID-19 pandemic, enabled them to learn new technology tools and teaching strategies from their PSTs to engage students both in-person and in a virtual classroom ($n = 7$). For example, one PST used digital bulletin boards that allowed students to post and save all types of content including videos, images, text, and websites. Furthermore, CTs said that after observing their PSTs, they now contemplate how to teach the curriculum in multiple ways and are more willing to consider student learning preferences. CTs com-

mented that post-pandemic students do not want online assignments and instead prefer hands-on labs and activities. As one CT noted:

Working with [the PST] was phenomenal, she was always prepared. She had to do virtual, hybrid, in person and she adapted and did really well and it prepared her for next year. For me, now if I have a sub I have tons of stuff! It was a challenge but we have to take a step back and see the growth that we all made—veteran teachers too—we’ve opened our eyes about how we teach curriculum in different ways. (CT 3)

3.5. Enhanced Communication

Under this theme, we determined that CTs had developed enhanced communication skills as a result of hosting a PST.

CTs felt that serving as a mentor improved their ability to give feedback to colleagues, PSTs, and students ($n = 7$). CTs specifically highlighted their growth in providing feedback to others with different styles and communicating with stakeholders at all levels: classroom-, department-, and building-wide. One CT stated:

I think I’m more willing to have discussions and talk about things, and I always find something new through others and ideas for what my students might like better. I think having that practice being a [PST] myself and then having two [PSTs], where we had that open communication, of sharing ideas, I think, especially influenced me. I’m a lot more open to go to any staff meetings, department meetings, team meetings in our building and say, Hey, I found this and our kids really like it, you may want to try it, or have we found something else that the students really like? It’s just open communication and sharing. We have a couple of new teachers teaching [content] in my school, and I’m always checking up on them, [saying] Hey, do you know what we’re doing for [lab]? Do you need help? Because of my [PSTs], I’m more open to discussing and having ideas exchanged with my staff members. (CT 1)

CTs also noted that they kept in touch with the pre-service teachers after the clinical residency was complete, either as their new in-school colleague or as an external collaborator outside their school/district. CTs said that they maintain both social and professional ongoing relationships with former pre-service teachers and that they considered them trusted colleagues ($n = 9$). While they found it easier to maintain connections with those that were hired at their schools, they also shared information and resources electronically via texting, emails, and shared drives with former pre-service teachers in other schools to build a professional network. One CT stated:

[PST] works in our district and is in the building right next door. We just saw each other at the textbook adoption meeting. We email back and forth, sometimes asking for a resource or lab. With all my [PSTs], I tell them, it’s like you’re one of my kids, even though you’re out of my house. You’re always welcome back and you’re always welcome to call, or text, or whatever the case is. You know I want you to have that sense that you can still lean on me when you need it. (CT 3)

3.6. Leadership

In this theme, we explored ways in which the cooperating teacher’s experience in mentoring pre-service teachers continued to influence them as a teacher leader. A recurring theme was that the process of mentoring pre-service teachers helped CTs develop mentoring skills for other roles. Cooperating teachers stated that they were more comfortable in teacher leader roles at the department and school level as a result of hosting a PST ($n = 8$), which allowed them to develop a rich new skill set including coaching, completing evaluations, and communicating best practices. They also began mentoring new teachers and became better problem solvers as a direct result of hosting a PST. One CT stated:

Being a CT allowed me to develop my teacher leader skills and abilities. It helped me learn ways to articulate best practices to new teachers and the best types of questions to ask to facilitate reflection. It also helped me identify common “student-teaching” mistakes so I can help mentor new teachers in my department. The experience of being a CT helped instill more confidence in me to lead other science teachers. In addition, since my [PST’s] personality was very different than mine, my experience with being her CT has helped me learn better ways to interact with different types of individuals. The more experience you get with leading other teachers the more the school wants you to do it, but also, the more you realize yeah, I can do that. I’m confident with doing that. I have that ability. And so, you take on more responsibility. (CT 2)

Cooperating teachers in this study also specifically noted that mentoring a pre-service teacher motivated them to become school leaders in curriculum development, knowledge sharing, and community building ($n = 5$). One CT linked their leadership to current, state-wide educational reform:

Those of us who have experienced [PBL from our PST] can be a mentor at our school. [PBL] was brought by my [PSTs]; as a CT, I saw it done somewhat successfully. Our school has started PBL this year, so those who have experienced it can be a mentor at our school. [Our state] now has the [new] pathways to graduation [which includes required inquiry-based components such as] PBL. Those of us who have done [PBL] can be mentors. And throughout the year it’s just been momentum to get that going, and when people have questions they come to me or to [the PST], and I think having us there is really, really helpful for the whole school, the whole department. [It was] definitely helpful to have me and [the PST] in the school to help teachers while they are actually doing it. (CT 7)

4. Discussion

In this study, we examined the motivations for teacher educators serving as cooperating teachers and the ways in which mentoring a pre-service teacher, in a year-long clinical residency, positively influenced and benefited the professional practice of cooperating teachers. This novel, five-year study addresses the gaps in knowledge by assessing the long-term impacts of hosting a pre-service teacher. We found that mentoring pre-service teachers had a significant positive impact on CTs and promoted long-term sustained growth in their professional practice in multiple domains including self-reflection, collaboration, teaching strategies, communication, and leadership abilities.

The primary reason for serving as a cooperating teacher was their intrinsic motivation and desire to share their expertise and support new teachers. They were thankful for the mentors who had helped, encouraged, and supported them throughout their teaching careers and as a result, they wanted to “pay it forward”. CTs reflected on their own experiences as pre-service teachers and indicated that they did not want others to be just thrown into the classroom; they had a strong desire to provide a support system for new teachers. The drive to share knowledge and encourage new teachers supports past research from Russell and Russell [29]. CTs also felt that they had an obligation to the profession to help the future generation of teachers learn how to teach and become a teacher. Some CTs had participated in a year-long clinical residency program as part of their own pre-service teaching and knew how beneficial it was to have an entire year of student teaching experience, which allowed them to experience the day-to-day practices of an educator, and they wanted to provide the same opportunity for others. The desire to contribute to the profession and help ensure better-quality beginning teachers agrees with previous findings [21,23,24,29,30].

When participants were asked what they would share with another teacher who was considering becoming a cooperating teacher, they indicated that serving as a cooperating teacher helped them grow as teachers too. It provided the opportunity to co-teach

and collaborate with potential future colleagues. In addition, it gave cooperating teachers more time to develop their own lessons or spend time in colleagues' classrooms to observe different teaching methods and styles. This research affirms the previous findings [29,30] that describe the motivation to serve as a cooperating teacher to benefit one's own professional development.

Most of the CTs remarked that they had to more deeply understand their own profession to be able to teach someone else how to do it. The process of mentoring a pre-service teacher provided them with an opportunity to reflect on their own practices and helped them grow as a teacher and provided some life lessons and encouragement as they navigated their own careers. Mentoring gave them insight into the teaching profession, as they learned to see things from the pre-service teacher's perspective, how to evaluate whether a lesson worked or did not work, and how to better articulate the teaching process. One CT also noted that mentoring helped them better understand how all requisite components needed to come together to provide the best possible educational experience for the students.

Mentoring also contributed positively to the CTs' identities as reflective, adaptive, life-long learners. The CTs experienced a renewal in their own attitudes, approaches, and teaching practices as a direct consequence of mentoring pre-service teachers. These findings corroborate the literature, which indicates that mentoring a pre-service teacher has a positive impact on a cooperating teacher's self-reflection [22,23,31,32].

The added benefit of a year-long clinical residency program is that it provides additional time for cooperating teachers and pre-service teachers to establish and build a strong working relationship. This partnership between CTs and pre-service teachers resulted in meaningful collaboration. CTs appreciated having a "thought partner" or built-in colleague with whom to co-design and co-plan lessons. Over time, pre-service teachers moved from mentee to colleague and provided more input and suggestions on lessons implemented in the classroom. Co-teaching also created the opportunity to provide extra support to students who were struggling in the classroom and enabled both the teacher and pre-service teacher to work with students in small groups. The benefit of extra support in the classroom enabled the cooperating teacher to share instructional planning. Students needing additional academic support also benefitted, as observed in other recent studies [6,23]. Cooperating teachers also indicated that serving in this role has led to a continued culture of collaboration in that they are more willing to have people observe their teaching and engage in conversations about teaching methods with other colleagues. Furthermore, CTs continue to use the co-teaching strategies with their special education teachers and other paraprofessionals so that everyone is included in instruction, which broadens the impact. The benefits of co-teaching to promote the professional development of cooperating teachers aligns with previous findings [6,20,21].

The ability to enrich their own teaching practice and learn new teaching strategies was another benefit for cooperating teachers hosting pre-service teachers. CTs commented that because pre-service teachers modeled lessons that promote student engagement, it allowed them to keep up with best practices and it also provided a refresher for forgotten strategies. Since CTs mentored pre-service teachers during the COVID-19 pandemic, they also learned new technology tools and strategies to engage students in a virtual classroom. Shields et al. [33] also found that pre-service teachers were more proficient with technology tools and taught their classroom mentor teachers how to utilize technology effectively. CTs indicated that they planned to implement specific lessons and strategies, used by pre-service teachers, in their own classrooms. These included new labs designed by pre-service teachers, which provided real-world context for students on topics such as cell division and evolution. CTs mentioned that they planned to revise their curriculum to include more student engagement and had more ideas for labs as a result of working with their pre-service teachers. These findings align with previous research indicating that cooperating teachers learn from their pre-service teachers and it promotes instructional changes in their own teaching [20–22]. Furthermore, veteran CTs stated that they have

continued to implement the PSTs' strategies in their own teaching, such as using an exit ticket strategy to assess student learning and allowing students to self-segregate during work time based on their confidence of understanding, enabling the teacher to focus on helping students who need more help.

Project-based learning (PBL) was a key component of our year-long clinical residency program. Our pre-service teachers engaged in PBL as part of their coursework, and they were required to design and implement a PBL unit (over a four- to six-week period) in their classroom. Multiple CTs commented that they planned to use their pre-service teacher's PBL unit in their own teaching. In an effort to improve instruction in STEM, our state (Indiana) is requiring that 100% of K-12 teachers be trained in problem/project/inquiry-based approaches to learning by 2025 [34]. As a result, some of our partnering school districts have adopted PBL as part of their curriculum. Since the CTs had invaluable PBL experience, due to mentoring pre-service teachers, they were not only able to effectively implement PBL in their own classrooms, but they were also able to facilitate implementation by other teachers in their district. In fact, CTs stated that their acquired teaching strategies from pre-service teachers also included learning how to facilitate learning for adults.

The cooperating teachers in this study commented that serving as a CT enhanced their communication with colleagues, pre-service teachers, and students, leading to more fruitful relationships and collaborations. They interacted with more patience at staff and team meetings and were more analytical and open-minded in regard to problem solving. They cited improved professionalism and clarity in their communications with both teachers and pre-service teachers, stating that mentoring made them more verbally reflective and more able to clearly state the rationale of their methods. The experience of mentoring also taught them to use coaching language and to provide constructive feedback to promote growth in the pre-service teacher and other new teachers in the building. Mentoring also impacted their communications with the students in their classroom. After observing their pre-service teacher's interactions with students, they learned new ways to approach students in a more respectful manner and were more cognizant that everyone's approach to learning can be different.

The positive mentoring relationships and successful residencies resulted in several pre-service teachers being hired at the building where they carried out their clinical training. This facilitated easy collaboration and sharing of ideas, content, and lessons between CTs and their former pre-service teachers. However, even for those pre-service teachers that were hired by other schools/districts, CTs' responses indicate that they regularly and consistently engaged in communication with their former pre-service teachers, keeping up by social media and continuing to collaborate even with those outside their district. This reduced the sense of professional isolation [35,36] as the CTs built a network of like-minded teachers via long-term relationships that cut across years and districts, in essence, creating an informal professional learning community [37].

Serving as a cooperating teacher can positively impact a teacher's career by validating their experience in teaching and curriculum design, which can open the door to leadership opportunities [38]. Other studies have shown that the experience of coaching directly impacts a teacher's professional development [39]. Moreover, fostering teacher-to-teacher contact helps encourage the development of teacher leaders [40]. In this study, cooperating teachers made significant gains in mentoring and leadership skills as a direct result of hosting pre-service teachers. Being a CT contributed to their willingness to take on other teacher leader roles due to becoming more confident in their abilities. Hosting the pre-service teacher made a direct impact on how they could translate their learning to their colleagues as they could explain the strengths and challenges of a lesson to other teachers and use coaching language to provide constructive feedback. Outside of direct teaching applications, CTs also expressed that they were encouraged to serve in more impactful roles in their schools. Their successful mentoring of emerging teachers made them more willing to share ideas at team meetings and more likely to check up on new teachers. Their newly learned communication strategies also encouraged them to step into formal

and informal mentoring roles within their school. Overall, being a CT contributed to their engagement in the community as a peer mentor, instructional coach, and leader in curriculum development. Moreover, the program's emphasis on project-based learning also provided an opportunity for CTs to become leaders in PBL curriculum development. Serving as a cooperating teacher even prompted one CT to pursue a master's degree in curriculum and instruction.

In conclusion, several themes emerged in this study, which support and expand upon previous research on teacher education and the benefits to teacher educators serving as cooperating teachers. All cooperating teachers interviewed expressed a strong desire to share their experiences to support new teachers and "pay it forward". The cooperating teachers indicated that the most common benefits of mentoring pre-service teachers were increased reflection on their own practices while articulating instructional strategies to new teachers; meaningful collaboration with pre-service teachers and building a long-lasting social and professional network; the acquisition of new teaching strategies to enrich their own teaching practices; development of effective communication skills for successful collaborative processes; and an inclination to move into teacher leadership roles, such as formal and informal peer mentoring, instructional coaching, or leading curriculum development. The findings from this multi-year study demonstrate that hosting a pre-service teacher in a year-long clinical residency positively and sustainably impacts a cooperating teacher. Cooperating teachers play a critical role in teacher education and this mutually beneficial relationship enriches their growth and professional practice as teacher educators and teacher leaders.

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Article

Preparing Pre-Service Teachers for Family Engagement: Insights from the Initial Teacher Education Syllabus

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Abstract: Family involvement and participation in education (FIPE) profoundly impacts the quality of students' academic and social development. Initial teacher education contribution in fostering attitudes, skills, and strategies for effective FIPE is therefore unquestionable. We aimed to find out to what extent Portuguese pre-service teachers are prepared to engage families. A document analysis was conducted to establish explicit information regarding FIPE within initial teacher education syllabi. Out of 621 syllabi across 36 master's courses from 25 institutions, only 98 included some information on FIPE. A mere 12 syllabi, from seven institutions, exclusively addressed family-school relationships. Our study covered over 87% of the master's courses and syllabi, exposing inconsistencies in their educational aims, content, and recommended literature. These findings highlight discrepancies within the initial teacher education syllabi and underscore the need for the enhanced training of pre-service teachers in FIPE. It is crucial to promote more in-depth and explicit syllabi to promote effective family engagement and enrich initial teacher education programs.

Keywords: family involvement and participation in education; initial teacher education; pre-service teachers; syllabi

1. Introduction

Family involvement and participation in education (FIPE), or the participation of significant caregivers in ways that promote academic and social wellbeing in their children's educational process, is grounded in Bronfenbrenner's ecological systems theory [1–3]. The seminal work by Coleman et al. [3] triggered a growing discussion in the social sciences by drawing attention to the importance of families in children's education. From this, the field of educational research over the last 58 years has focused on gathering evidence about the influence of different factors on students' motivation to learn, including family factors. What has historically been seen as a family responsibility is now being looked at in a different way: how can schools and educators engage with all students' families at an early stage to maximise their academic success [4]?

Recently, the crucial role of both the school and the family in students' learning has been seen as consensual. The question about what is more important for students' learning (i.e., the school or the family) no longer arises. The results are "consistent, positive and convincing: families have a major influence on their children's achievement in school and through life" [5] (p. 7). Home and school systems can, and should, work together and be successful in sustaining connections to improve students' learning and achievement.

The worldwide focus on FIPE has increased, and it has been seen as fundamental to the educational success and wellbeing of students, families, and teachers [6–9]. Researchers are highlighting the contribution of initial teacher education (ITE) to the development of skills, strategies, attitudes, perceptions, and dispositions that encourage FIPE. FIPE's positive impacts are supported by evidence, which demand careful attention to how pre-service teachers are achieving the best knowledge to build and sustain trusting relationships with families and to promote their involvement (e.g., [3,10–13]).

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Global research has shown that these competencies that encourage FIPE are frequently inconsistent in initial teacher education [14–18]. There is evidence that initial teacher education programmes pay little attention to preparing pre-service teachers to form these relationships [11,19–22]. Particularly in Europe, research addressing how pre-service teachers are prepared to work with families is scarce [21,23,24], and there is even less focus on early childhood educators' master's degrees [19]. Using document analysis, this paper addresses how future early childhood educators are prepared to engage families in their practice by analysing the content of their master's degree syllabi.

1.1. Conceptual and Theoretical Frameworks

FIPE is described as professionals and families collaborating to enhance children's potential in social, emotional, behavioural, and academic domains [1,25]. It is a multidimensional construct suffering from a variety of perceptions, definitions, and designations to describe the same school–family dynamics: this proliferation of terms and definitions in scientific, political, and common-sense discourses may represent one of the biggest obstacles to investigating FIPE [8,26,27].

To guide our research, we drew on Epstein's overlapping spheres of influence theory. The external model of this theory identified three main contexts that influence children's learning and development: family, school, and the community. It acknowledges a distinction between the practices they carry out independently and together, and that children benefit from the collaboration of adults who encourage their development and learning [28,29]. "The internal model shows where and how complex and essential interpersonal relations and patterns of influence occur between individuals at home, at school, and in the community" [29] (p. 8). Epstein's theory of overlapping spheres of influence has been a consistent reference, enhanced and applied in a range of cultural contexts, with several years of existence and acceptance. It is a research-based framework that clearly identifies types and specific involvement practices, as well as the challenges and the benefits for children, families, and teachers of well-designed and well-implemented practices. Our need to define FIPE is due to the main goal of characterising initial teacher education courses to promote it. We believe that Epstein's [29] framework structure and dynamic will allow for a more rigorous and quality approach to this issue. Therefore, from now on, we will refer to FIPE, keeping in mind all possible relationships that can be generated between families and schools that support children's development and learning [1,2,8,10,30,31].

1.2. Benefits and Challenges of FIPE

FIPE's well-known impact has been highlighted since the 1960s, alongside its benefits, which have been widely referenced and disseminated in the literature. Positive effects refer to the quality of students' development and learning, improved behaviour, and decreased school absenteeism; some authors associate the quality of involvement with students' educational and behavioural success [3,8,32]. Some recent findings highlight that FIPE benefits are not only for children, but also for families, who feel socially valued, and for teachers, who report greater professional satisfaction [8,11,33,34].

It is important that teachers set out on their profession knowing that establishing strong partnerships with families is a fundamental part of their role [26]. Fostering this kind of environment improves the success and significance of students' learning. The role of families in supporting their children's educational progression throughout school also increases [19]. The evidence that FIPE is a central element for the educational success and wellbeing of students, families, and teachers is unquestionable. With the goal of encouraging trusting and effective relationships between early childhood educators and families, it is crucial to develop such knowledge, skills, and attitudes in initial teacher education intentionally [10–12,26,35].

Some studies on pre-service teachers' training have revealed a gap between the importance of FIPE and the attention that initial teacher education is giving to it [36–39]. Despite increased attention to this topic in initial teacher education, most newly trained teachers feel

unprepared to work with their students' families since FIPE is not adequately addressed in initial teacher education in ways that prepare them to promote it [40–42]. Sarmiento [43,44] and Silva [45] have already warned that Portuguese initial teacher education may not be approaching FIPE consistently, with few optional syllabi intentionally addressing this topic. As far as we are aware, no recent research on FIPE has been carried out in Portugal following the 1999 Bologna Declaration and the subsequent reform of higher education, particularly in initial teacher education master's degrees, characterising the educational aims, learning outcomes, contents, recommended bibliography, and organisational aspects.

1.3. FIPE and Initial Teacher Education: The Portuguese Case

In the 1980s, there was a significant advance in the participation of families in schools in Portugal, Law 46/86 referring to the participation of all those involved in the educational process [46] (p. 3068). Until then, FIPE was barely present in Portuguese legislation: families' responsibility was to send their children to school daily and to meet the teachers when invited [47]. Over the years, legislation has recognised families' right to participate in their children's school life and given them more and more responsibilities [44,47]. For instance, Decree Law n° 240/2001, concerning teachers' professional profile, was a fundamental guiding framework stating that the teacher "collaborates with all actors in the educational process, fostering the creation and development of mutual respect relationships between teachers, students, parents and non-teaching staff" [48] (p. 5571).

In Portugal today, to work as an early childhood educator, after a three-year degree in basic education, individuals must complete one of two master's degrees: early childhood education or early childhood and primary school education. Decree Law n° 79/2014 approves the professional qualification for teaching and defines the European Credit Transfer Accumulation System (each corresponding to up to 30 working hours): 90 for educators and 120 for educators/primary school teachers. These credits are distributed through their training components: teaching; general education; specific didactics; cultural, social, and ethical; and initiation to professional practice or internship [49]. Both master's degrees include between 39 and 48 credits for internship and a minimum of six credits for general education, which covers the common knowledge, skills, and attitudes required for all teachers to perform their role [49], the ideal setting for pre-service teachers to learn and experience FIPE [26].

The Portuguese government already considers FIPE in specific legislation [46,48]; however, this does not guarantee that it is translated into educational aims and learning outcomes, content, or recommended bibliographies in initial teacher education curricula. For instance, although the legislation exists, there might not be enough monitoring to ensure FIPE is indeed addressed in these degrees. Moreover, constraints to which pre-service teachers are open, in addition to the absence of explicit training, include the limited opportunities to interact with families during their internship [50]. As Epstein and Sheldon [4] (p. 203) state, "The policy tells educators to engage families but does not specify how to meet these requirements". The lack of in-depth reflection on this topic means that family engagement practices are mostly the result of the pedagogical vision and individual interpretation [26,51]. Based on research that has been conducted so far, even though it does not inform us how pre-service teachers are taught this topic in their classes, we may conclude that although FIPE is a concern for initial teacher education, and despite the government's acknowledgement of this problem, initial teacher education institutions and governments are usually unable to solve it.

1.4. Current Study

The main goal of this research is to determine whether and how Portuguese initial teacher education for early childhood educators handles FIPE. Recent research shows that initial teacher education rarely addresses the interpersonal aspects of the teaching profession, where FIPE is included, despite evidence of their positive impact [18,42,52]. Walker [18] even states that initial teacher education may be limiting the quantity, scope,

and quality of teaching and consequent learning about FIPE. So, future early childhood educators finish their courses without feeling confident about promoting and effectively supporting this core competence, with no formal education in this area [11,27]. Therefore, despite recognising its importance, many early childhood educators find implementing and maintaining this involvement challenging [53].

The OECD [54–56] confirms how crucial working with families is to support children's performance in school and beyond, reinforcing the importance of highlighting families' engagement in curriculum frameworks, which is underscored in many countries. The literature review has exposed that family involvement benefits are studied, their significance acknowledged, the implementation challenges noted, the curriculum held accountable, and the gap continues.

Across Europe, research has found that FIPE is hard to cover in initial teacher education curricula. A study involving seven European countries (Belgium, England, Finland, The Netherlands, Norway, Spain, and Switzerland) examined initial teacher education frameworks, searching for their capacity to either facilitate or hinder this crucial learning [39]. Alongside the importance that governments and institutions attribute to FIPE, the results clearly show that none of these cross-nation studies offer a satisfying perspective addressing this issue [13,24,38,39,50,57–59]. Besides the advances in policy, enhancing initial teacher education courses and fostering the creation of a shared vision on FIPE seems to be quite pertinent. Consequently, we sought to determine to what extent the curricula and their syllabi included explicit and consistent information about FIPE, uncovering the Portuguese reality.

1.5. Research Questions

FIPE positively affects the social, behavioural, and academic aspects of students, and these skills must be intentionally developed in initial teacher education. To determine whether our national initial teacher education frameworks enable or constrain future early childhood educators' effective training for family engagement, we sought to characterise their training through a document analysis. In this study, our central questions were as follows: How are early childhood educators being prepared for FIPE in Portugal? What can be found in the curriculum regarding FIPE?

- a. Which syllabi include explicit information about FIPE?
- b. What are their main subjects, mandatory nature, and European Credit Transfer Accumulation System?
- c. What are their educational aims, learning outcomes, content, and recommended bibliographies?
- d. Is there consistency between all these elements?

2. Materials and Methods

For data analysis, we conducted a syllabi content analysis, which can be defined as a systematic process of searching and organising information to enhance understanding and communicate findings to others [60]. Our analysis followed a dialectical process combining deductive and inductive approaches. We began with a provisional "start list" of codes derived from our theoretical framework [29], and our research questions "How are early childhood educators being prepared for Family Involvement in Preschool Education (FIPE) in Portugal?" and "What can be found in the curriculum regarding FIPE?" This deductive approach was supplemented by inductive coding as new themes emerged from reading the syllabi [61,62]. This qualitative approach also involved some quantification of data, enabling us to examine and interpret textual content beyond mere statistical significance. During the process, the codes were continuously revised, modified, deleted, and expanded to incorporate new codes [62,63]. This method allowed us to manage a large volume of textual data efficiently and leveraged the strengths of both deductive and inductive approaches, providing a comprehensive understanding of the content, contributing to the existing literature, and corroborating previous research.

We examined the syllabi to identify covered topics using keyword searches (e.g., partnership, family, involvement, participation, and communication). During the initial coding, additional codes emerged (e.g., syllabi typology, stakeholders' roles, family intervention, strategies, and programs). After the coding, we organised categories and sub-categories based on the relationships between the codes (e.g., type of subject/educational area; character—optional/mandatory; ECTS; goals; contents; and main recommended bibliography). These codes were then refined to generate themes, which we used to answer our research questions. The validity of the identified categories and themes was continuously tested by the research team members to ensure they accurately reflected the data [64].

2.1. Data and Procedures

First, we identified all the institutions responsible for delivering the early childhood educators master's degrees: early childhood education and early childhood and primary school education registered in the General Directorate of Higher Education in January 2021. This approach revealed 29 institutions, 41 courses (15 for educators and 26 for educators and primary school teachers), and 706 syllabi listed in *Diário da República* (Portugal's official gazette which publishes a wide range of acts: constitutional laws, international conventions, and their ratification notices, among other legal acts, including the study plans of academic degrees). Then, we searched all the institutional websites to collect the syllabi content. When it was not available online, we contacted the course coordinators and solicited access to the syllabus. Our final data consisted of 86.2% of the institutions ($n = 25$), 36 courses, and 621 syllabi. Information from four institutions was not available, which accounts for the difference between the early 706 and the 621 we ended up with, but most of the Portuguese territory (Azores, Madeira, north, Centre, Lisbon metropolitan area, and south) was represented.

2.2. Data Analysis

Epstein's theory's [29] main concepts and ideas were the base to identify the first keywords for our data analysis process (e.g., partnership, family, involvement, participation, and communication). The syllabi were examined to determine what topics were covered using these keyword searches. According to our goals, only the syllabi including specific content related to FIPE were considered. Therefore, we searched for keywords in the syllabi's educational aims and learning outcomes, content, and recommended bibliographies. After this identification, we complemented with other keywords that emerged from the literature, and from the data (e.g., syllabi typology, stakeholders' roles, family intervention, strategies, and programmes).

Through this search, it was possible to identify and establish our corpus with 98 syllabi, some provided by master's degree coordinators and the majority accessed online. Once all the syllabi were identified, the analysis was carried out in five steps:

1. Identify all the syllabi that include content related to FIPE.
2. Determine the educational aims and learning outcomes related to FIPE specified in the selected syllabi.
3. Categorise the content related to FIPE indicated in the selected syllabi.
4. Recognise the main recommended bibliography related to FIPE in the syllabi.
5. Analyse the coherence and consistency between these core elements (aims, content, and bibliography).

The unit of analysis varied from parts of sentences to whole paragraphs; the criterion for inclusion was that each coded excerpt constituted an independent element of meaning about the phenomenon being studied [61]. The analysis was performed using the MAXQDA plus software version 2022 [65]. The analytical process was thus structured and reliable. A second rater coded 30 syllabi independently to assess intercoder reliability according to a shared codebook previously developed. Cohen's kappa values were calculated to ensure inter-rater agreement, and the kappa value was good ($k\text{-Cohen} = 0.75$), showing an acceptable level of agreement [66].

3. Results

Most of the Portuguese territory (Azores, Madeira, north, Centre, Lisbon metropolitan area, south) was represented by 86.2% ($n = 25$) of the national institutions. Our analysis retained only the courses whose syllabi were available for consultation, comprising 87.8% of the current early childhood education and early childhood and primary school education master's degrees ($n = 36$, 14 educators and 22 educators/primary school teachers), and 88% of the syllabi ($n = 621$).

Of the 25 institutions, approximately 72% were public ($n = 18$), and 72% developed in polytechnic higher education ($n = 18$) and 28% in universities ($n = 7$). Of the 36 courses, 33.3% were developed in Lisbon ($n = 12$) and 44.4% in the north and Central regions ($n = 16$, eight in each). The remaining 22.2% ($n = 8$) were from the other regions of Portugal, mainly the south, but used courses from an institution in the Azores and another in Madeira.

Our final corpus comprised 15.8% of the syllabi analysed ($n = 98$), generated through keyword searching, as stated in the data analysis procedures, with 46 syllabi from the 14 educators and 52 from the 22 educators/primary school teachers' master's degrees.

Following this preliminary glance at the data, we proceeded to identify five different characteristics of the syllabi: the main topics addressed and mandatory/optional nature; educational aims and learning outcomes; content; main bibliography; and the simultaneous presence of educational aims, content, and bibliography.

By analysing each syllabus's main focus, it was possible to identify five different topics: 1. internship; 2. educational needs, psychology, and inclusion; 3. family-school relationship; 4. methodologies; and 5. didactics. As we can see in Table 1, almost one-third of the syllabi content (30.6%, $n = 30$) was related to internship and 23.5% ($n = 23$) to educational needs, psychology, and inclusion. We found 12.2% ($n = 12$) clearly addressing the family-school relationship, representing less than 2% of the 621 syllabi in the 36 courses analysed. When looking at these 12 syllabi, it was possible to see that they represent six educators' master's courses and six educators/primary school teachers' master's courses, and only seven institutions. In Portugal today, only 24.1% of the institutions delivering these master's courses have at least one optional course on FIPE.

Table 1. Main topics addressed in syllabi and mandatory nature.

Main Topics			Optional		Mandatory	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Internship	30	30.61	0	0.00	30	30.61
EN ¹ , psychology, and inclusion	23	23.47	9	9.18	14	14.29
Family-school relationship	12	12.24	10	10.20	2	2.04
Methodologies	19	19.39	3	3.06	16	16.33
Didactics	14	14.29	1	1.02	13	13.27
Total	98	100	23	23.46	75	76.54

¹ educational needs (EN).

Analysing the mandatory or optional nature of the syllabi, it was possible to understand that the main mandatory syllabi were related to internship, representing 30.6% of the corpus ($n = 30$). Most of the optional syllabi were represented by the family-school relationship main topic group (10.2%, $n = 10$) and educational needs, psychology, and inclusion (9.2%, $n = 9$).

Table 2 shows how many working hours were allocated to each major syllabus group through their correspondent European Credit Transfer Accumulation System. The syllabi referring to the family-school relationship have three credits or fewer. Among those with more than six ECTS, the internship syllabi are most represented; however, these tap into many more topics, competencies, and strategies than those related to family involvement. Not only do the syllabi related to the family-school relationship have the fewest predictable

working hours, but they also have the fewest of a mandatory nature—2% out of the 98 syllabi examined.

Table 2. Main syllabus topics and ECTS ¹.

Main Topics	Less than or Equal to 3 ECTS		Greater than 3 and Less than or Equal to 6 ECTS		Greater than 6 and Less than or Equal to 9 ECTS		Greater Than 9 ECTS	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Internship (<i>n</i> = 30)	1	1.02	1	1.02	3	3.06	25	25.51
EN, psychology, and inclusion (<i>n</i> = 23)	11	11.22	12	12.25	0	0	0	0
Family–school relationship (<i>n</i> = 12)	12	12.25	0	0	0	0	0	0
Methodologies (<i>n</i> = 19)	5	5.10	14	14.29	0	0	0	0
Didactics (<i>n</i> = 14)	3	3.06	5	5.10	6	6.12	0	0
Total	32	32.65	32	32.66	9	9.18	25	25.51

¹ European Credit Transfer Accumulation System (ECTS).

After identifying the institutions and master’s degrees whose syllabi explicitly addressed the family–school relationship and general information, we proceeded to identify their educational aims and learning outcomes.

Educational aims and learning outcomes were organised into six main groups: 1. involvement in the field of educational needs; 2. conceptualising family involvement; 3. school and family relationships; 4. family involvement models; 5. family involvement challenges and benefits; and 6. family involvement strategies and/or programmes. Table 3 presents the main educational aims and learning outcomes, together with the main topics of the syllabi in which they occur.

Table 3. Most mentioned educational aims and learning outcomes addressing FIPE ¹.

Main Topics	Family Involvement in EN	Conceptualising Family Involvement	Family–School Relationships	Family Involvement Models	Family Involvement Challenges and Benefits	Family Involvement Intervention	No Educational Aims and Learning Outcomes on FIPE
Internship (<i>n</i> = 30)	0	0	12	3	0	13	4
EN, psychology, and inclusion (<i>n</i> = 23)	7	3	4	0	0	4	4
Family–school relationship (<i>n</i> = 12)	0	10	3	9	7	10	0
Methodologies (<i>n</i> = 19)	0	0	5	3	1	3	8
Didactics (<i>n</i> = 14)	0	0	1	1	1	4	8
Total (<i>n</i> = 98)	7 (7.14%)	13 (13.27%)	25 (25.51%)	16 (16.33%)	9 (9.18%)	34 (34.69%)	24 (24.49)

¹ family involvement and participation in education (FIPE).

The most mentioned educational aims and learning outcomes are related to family involvement intervention and the development of programmes and strategies for family involvement (e.g., “Know different strategies to promote family involvement and training” or “Plan and develop daily strategies for a relationship with the family or other people in the child’s life”), emerging in 34 syllabi (34.69%), of which 13 belong to internship. This is followed by 25 syllabi (25.51%) referring to family–school relationships and understanding the roles (e.g., “Recognise the role of the educator/teacher in promoting the participation of parents”; “Realise the importance and power of their action in the development of parenthood”); here, too, internship is the major group (*n* = 12).

The study and conceptualisation of family involvement and participation in education, where the construct interpretation is expected, is surprisingly limited to 13 syllabi (13.27%), of which ten are family–school relationship syllabi (e.g., “To know and reflect the family and the community in a descriptive, historical, political and cultural perspective”). Exploring family involvement models (e.g., “Reflect on the school-family relationship in a holistic and systemic perspective” or “Master the theoretical and intervention models of parental involvement”) and recognising family involvement challenges and benefits (e.g., “Identify obstacles to effective parental participation” and “Recognise its advantages and limits”) are also educational aims and learning outcomes mostly emerging in specific family–school relationship syllabi.

The results of the family involvement and participation in education (FIPE) content addressed in the syllabi are presented in Table 4. These were firstly organised into six major groups: 1. contents in the field of EN; 2. conceptualisation; 3. family intervention—generic, programmes, and strategies; 4. family involvement models; 5. roles; and 6. challenges and benefits.

The most mentioned content (46.94%, $n = 46$) was generic references to intervention in the family (e.g., “Interaction with families and other actors for a pedagogy of participation in the educational process”; “Family/school/community interactions”; “Parental involvement in their children’s schooling”); these generic references appear in all the syllabus types. The remaining content is represented in a smaller number of the syllabi, ranging from 12.24% ($n = 11$) for content about educational needs to 2.04% ($n = 2$) for content related to families’ participation in decision-making processes.

From Table 4, it can also be noted that almost all the categories have few cases and almost all are from references in the syllabi specifically focused on family involvement as they have information in almost all content groups identified. We can also see that although internship is the most represented syllabi among the syllabi analysed ($n = 30$), the syllabi mainly focus on generic content about family interventions.

Regarding the main recommended bibliography, by searching for keywords in their titles, we found that 29.59% ($n = 29$) of the 98 syllabi have only one explicit reference to FIPE and 17.35% ($n = 17$) have two or more explicit references, leaving more than 53% ($n = 52$) of the syllabi with no specific references to FIPE in the bibliography. As we can see in Table 5, it is in didactics (78.57%) and in internship (70%) syllabi that the absence of a recommended bibliography is most observed. Data also highlight that in the family–school relationship syllabi, almost all (91.67%) have two or more explicit references to FIPE.

Table 4. Most mentioned content addressing FIPE.

Main Topics	1		2		3				4				5		6
	Educational needs	Conceptualisation	Generic	Programmes	Family Intervention Strategies	Decision Making	Family Support	Communication	Hoover–Dempsey and Sandler	Eccles and Harold	Epstein	Other	Teacher	Roles	Challenges and Benefits
Internship (n = 30)	0	1	16	2	1	0	4	1	0	0	0	0	2	1	0
EN, psychology and inclusion (n = 23)	12	0	5	0	0	0	0	1	0	0	0	2	0	2	0
Family–school relationship (n = 12)	0	7	7	5	8	0	2	7	5	5	5	4	4	4	9
Methodologies (n = 19)	0	1	9	0	0	2	1	0	0	0	0	0	3	3	1
Didactics (n = 14)	0	2	9	0	0	0	1	0	0	0	0	0	0	1	0
Total (n = 98)	12 (12.24%)	11 (11.22%)	46 (46.94%)	7 (7.14%)	9 (9.18%)	2 (2.04%)	8 (8.16%)	9 (9.18%)	5 (5.10%)	5 (5.10%)	5 (5.10%)	6 (6.12%)	9 (9.18%)	11 (11.22%)	10 (10.20%)

Table 5. Recommended bibliography addressing FIPE.

Main Topics	No References		1 Explicit Reference		2 or More Explicit References	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Internship (<i>n</i> = 30)	21	70	6	20	3	10
EN, psychology, and inclusion (<i>n</i> = 23)	8	34.78	13	56.52	2	8.70
Family–school relationship (<i>n</i> = 12)	1	8.33	0	0	11	91.67
Methodologies (<i>n</i> = 19)	11	57.89	8	42.11	0	0
Didactics (<i>n</i> = 14)	11	78.57	2	14.29	1	7.14
Total (<i>n</i> = 98)	52	53.06	29	29.59	17	17.35

Table 6 was organised in an attempt to determine the coherence and consistency of the data. It reveals that, of the 98 syllabi, only 33.67% (*n* = 33) have information in all these fields, eleven of them being family–school relationship syllabi.

Table 6. Coherence and consistency analyses.

Main Topics	Coherence between Educational Aims and Learning Outcomes, Content, and Recommended Bibliography	
	<i>f</i>	%
Internship (<i>n</i> = 30)	6	20
EN, psychology, and inclusion (<i>n</i> = 23)	12	52.17
Family–school relationship (<i>n</i> = 12)	11	91.67
Methodologies (<i>n</i> = 19)	3	15.79
Didactics (<i>n</i> = 14)	1	7.14
Total (<i>n</i> = 98)	33	33.67

4. Discussion and Conclusions

Global initiatives in teacher training aim to prepare pre-service teachers to engage with families and communities. Proper training in this area has a positive impact on family involvement and participation [67]. Its benefits and importance have been proved repeatedly and consistently over the years [68–71]. Family involvement and participation in education (FIPE) is widely accepted as a policy and educational ideal; however, efforts in terms of curricular coverage within initial teachers’ education courses have not kept pace with the demands of the educational agenda [72]. Research has shown that pre-service teachers’ preparation for FIPE is insufficient or may be entirely missing [21,24,38,39,68]. The disparity between the relevance of FIPE and the attention that initial teacher education assigns to this issue has increasingly been highlighted. Our main goal was to characterise FIPE in initial teacher education courses for early childhood educators in the Portuguese context. This was accomplished through an in-depth analysis of their required master’s courses.

Our initial attempts to map Portuguese initial teacher education addressing FIPE revealed a complex and evolving landscape. We found syllabi from diverse topics that somehow included information about FIPE, FIPE within internship, and in standalone syllabi. Our research also revealed that while some initial teacher education master’s courses in Portugal prepare pre-service teachers for FIPE in a variety of ways, much more must

be done to ensure consistency and coherence in this preparation. Over 88% of the existing master's degrees for early childhood educators were analysed. Out of the 621 syllabi, only 98 (17.2%) contained keywords that led us to believe that we would find explicit information on FIPE in their detailed analysis. In fact, they all included some information on the topic, even if it was more generic. In the end, our results revealed that just 33 syllabi provided complete, coherent, and consistent information in all the fields analysed (educational aims and learning outcomes, content, and recommended bibliography). So, while FIPE is possible and is included in some syllabi, gaps, inconsistencies, and an already crowded curriculum imply that not all pre-service teachers have the opportunity to address this topic.

Our findings make clear that the Portuguese syllabi are hardly aligned with Epstein's internal or external model [29]. The educational aims or content addressing FIPE in the syllabi were far from referring to theoretical models or challenges and benefits from these complex interpersonal relations. Although some family intervention strategies are existent in the syllabi analysed, they are mainly generic and not specifically child-centred.

These results corroborate and complement data in other studies in different countries [18,38,53,73], and are possibly behind what Epstein [41] also uncovers, that most newly trained teachers do not feel prepared to work with students' families. The data also highlight the major absence of explicit and intentional information on FIPE in the training of early childhood educators, similar to what was identified in other countries (e.g., [36–38,50,57,59,73]). However, an analysis of all the courses and syllabi allowed us to see that while some syllabi prioritise this topic, others give minimal attention to it, without a coherent and consistent theoretical framework and without explicit guidelines.

Concerning the conceptualisation, as widely mentioned in the literature (e.g., [4]), there is, again, no consistency. The educational aims and learning outcomes, when explicit in the syllabus, do not always give rise to specific content in the curriculum and are not necessarily supported by an explicit theoretical framework in the recommended bibliography, which is an important way to give consistency and intentionality when training pre-service teachers. Recent investigations showed inconsistencies, without “an intentional and structured approach (in this area)” in initial teacher education, perpetuating a disconnection between training for FIPE, which we hope pre-service teachers will receive, and what is really addressed and learned [17] (p. 263), [18].

Research has provided evidence that education systems are progressively more concerned with initial teacher education in terms of developing knowledge and skills among pre-service teachers to involve families [12,41]. Efforts have been comprehensive and include more activities aimed at better preparing pre-service teachers for FIPE [12,38,57,73]. In line with the international scene (e.g., [12,24,26,36,41,73]), we found advances, with some specific syllabi in the curricula addressing the topic. Portugal recognises FIPE's significance through its legislation and some advances in a few institutions responsible for delivering this training, but implementation methods or an involvement and participation framework are yet not clearly defined.

Today, we know that the professional's role in this field requires a specific approach during training and that this must be intentional and of high quality [13,24,67]. Concerns about the academic skills of pre-service teachers are recurrently featured in education quality policy discussions around the world [55]. Portugal is not an exception, and with this study, we aimed to take a bigger picture of the initial teacher education curricula in terms of the presence of up-to-date FIPE content and the possible impact of policy and practice. This curricula analysis allows us to confirm that in Portugal (with few exceptions and like other European studies), the learning of competencies, attitudes, and skills that pre-service teachers must develop to promote FIPE is not totally explicit in their master's syllabi. While FIPE is possible and takes place in some (few) syllabi, gaps, inconsistencies, the European Credit Transfer Accumulation System (ECTS), and the mandatory nature imply that not all pre-service teachers have the opportunity to address this topic.

The research literature has called for more consistency in training pre-service teachers to work with families, and our study supports these concerns by highlighting a lack of continuity among the syllabi. Based on findings from this study and the emergent literature in the field [38,39,41,74], our main recommendation for policy is related to the development of further and clearer standards for teachers' master's degree courses, and the inclusion of parent engagement competencies in teacher standards/certification requirements. Teacher preparation programs should incorporate and guarantee, besides internship practices, other opportunities to learn and practice FIPE. These opportunities should allow the development of family involvement competencies, and the understanding and appropriation of theoretical frameworks. Sometimes it is difficult to have specific and mandatory courses due to the already overcrowded curriculum [26]. However, the training of future teachers and the development of competencies in parental involvement must not be compromised. Therefore, space and time must be made available for them to learn, understand, and apply their knowledge.

We recognise that this study has some limitations. We analysed over 88% of the existing syllabi for early childhood educators' master's courses; however, we have little information regarding whether and how pre-service teachers are taught this topic in their classes. As a result, this study presents a broad picture rather than a detailed portrayal of how FIPE is addressed in Portuguese initial teacher education courses. More research is needed to identify how FIPE contents and goals are taught in pre-service teachers' master's degree programs. This study recommends additional research into how pre-service teachers' preparation happens, the shift from syllabus to practice, and how pre-service teachers perceive and experience FIPE in their initial teacher education courses. Further research on this key component is needed to achieve greater consistency in preparing early childhood educators to engage effectively with families.

This exploratory stage was fundamental to support our research, making room for the next steps: these involve a content analysis of interviews with initial teacher education master's coordinators and teachers and the implementation of a questionnaire to teaching students to get a view from the field encompassing different perspectives and actors.

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Article

The Effect of COVID-19 on a Short-Term Teacher-Education Program: The Israeli Case

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Abstract: Given the unemployment wave caused by COVID-19, the Israeli Ministry of Education and other organizations initiated a unique alternative short-term retraining program to offer unemployed college and university graduates the opportunity to earn teaching certificates. This study aimed to examine the alternative short-term program from the coordinators' perspectives. We assess the personal and organizational impact of the program and its contribution to teacher-education initiatives. The present study had two main goals: to learn about the structure of the program and its implementation from the professional and personal points of view of the program's coordinators as they experienced it and to examine the contribution of the new short-term program to the participants—the teacher trainees—and the Israeli education system in general. Analyzing semi-structured interviews with program coordinators revealed insights regarding the program's various phases in five categories: recruitment of the coordinator; establishing the program; clinical experience; the students of the program; and future initiatives for teacher education. Although the effectiveness of the online format for practical clinical training was questioned, the conclusion suggests that this alternative short-term teacher-education program may have broader relevance in routine times.

Keywords: short-term teacher-education program; COVID-19; ERT—emergency remote teaching

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1. Introduction

To prevent the spread of COVID-19, many governments worldwide closed schools in the first half of 2020. One and a half billion learners and workers were forced to be absent from the education system. Due to the threat of COVID-19, the entire education system, from kindergartens to higher education institutions, faced difficult decisions on whether to continue teaching and learning while possibly exposing the teaching faculty and students to a public health risk. As a result, society has moved from traditional education to various versions of online education at a frantic pace. Due to the critical circumstances that led to this transition, this worldwide phenomenon in the educational field was called ERT (Emergency Remote Teaching). However, the temporary shift turned into a prolonged situation.

Education systems worldwide hoped that the change in the learning–teaching processes would lead to a different approach regarding distance learning. The hope was that distance learning would become more significant and that its effects would be long-lasting beyond the current crisis. The need to compare the quality and results of online learning in that complex reality with those of traditional face-to-face teaching led to the publication of many articles [1,2].

However, beyond ERT, and even before COVID-19, it was clear to many involved in teaching, in general, and in teacher-education programs, in particular, that an alternative

to traditional teaching had to be found. This alternative is referred to in the literature as Future-Oriented Pedagogy or Future-Based Learning. These trends have created alternative pedagogical principles that vary from the traditional doctrines and future teacher training [3,4].

In the State of Israel, as happened almost worldwide, the COVID-19 pandemic resulted in many losing their jobs, and an unprecedented wave of unemployment erupted. According to Israel's Central Bureau of Statistics reports, 18% of the 193 thousand unemployed people in June 2019 had an academic background (such as a degree in law, business administration, technology, science, or engineering). Given this state of affairs, as well as the outbreak of the pandemic, an initiative arose for engaging the cooperation of the Ministry of Education (Division for Teacher Training and Internship), the employment services, the Israeli Lottery Fund (Mifa'al Hapais), and the MOFET Institute (the National Institute for Research and Development in Education). This cooperation aimed to enable higher education graduates who had lost their jobs due to the pandemic to obtain a teaching certificate by participating in a short-term training teaching program. The program, named 'Kivun H'adash' (in Hebrew: a new online approach), mainly consisted of online training via Zoom. The search for suitable candidates for the short-term training program was guided by the discipline fields in the education system in Israel, in which more teachers were (and still are) needed. The lack of teachers is especially noticeable in the science disciplines (mathematics, physics, chemistry, and computer science), in the humanities (e.g., language arts and foreign language teaching), in early childhood education (based on the knowledge that there was a significant shortage of preschool teachers), and elementary-school education. The main goal of the program was, on the one hand, to respond to the needs of the Ministry of Education, which, as mentioned, faces a shortage of teachers in several disciplines, and on the other hand, following the mass layoffs during the COVID-19 period, to increase the retraining options available to a high-quality population of professionals that can be suitable to teach in the education system.

1.1. Teacher-Training Programs

In the last three decades, along with traditional teachers' training programs, other programs known as "alternative", "unique", "independent", and even "innovative" have been developed [5,6]. Most of these programs are short-term programs designed to provide aspiring teachers with the necessary skills and knowledge to enter the teaching profession quickly. These programs often cater to individuals with a bachelor's degree in a different field who want to transition into teaching.

These programs began to develop due to the global crisis that the teaching profession is facing, namely, a decline in the attractiveness of the profession in general [7], resulting in a shortage of teachers in general, with an emphasis on unique areas of knowledge [8], as well as a greater dropout rate among quality personnel in the field [9,10]. Thus, despite reports of a yearly increase in the number of teachers completing their training in teacher-training institutions, there is still a shortage of teachers in Israel. At the same time, the Central Bureau of Statistics yearly report indicates that more than 50% of English teachers and about one-third of the math teachers in high schools and middle schools in Israel were not trained to teach these subjects [11].

Compared to the traditional outline, unique alternative programs are characterized by a shortened teacher-training period. One of the standard features of these programs is that they are usually delivered online or combine online and face-to-face learning. Most of them are flexible and adaptable and, at the same time, collaborative and interactive. The cost-benefit analysis of these programs may vary depending on each program's context, objectives, resources, and outcomes.

The trainees in the unique alternative teacher-education programs, which target a population that has already earned an academic degree, do not have the benefit of early integration into the educational field, which has been shown to create a strong connection between the theoretical and the practical aspects of teaching. Thus, the briefer training

period of the alternative programs might be at the expense of the clinical training through which participants in the traditional programs gain experience. (In traditional programs, clinical training precedes the internship, wherein trainees are placed in a teaching position in schools.) The research literature does not provide precise details regarding the alternative programs' impact on the quality of teaching. If establishing the effectiveness of traditional programs is challenging, the difficulty is even more incredible when examining the many and varied alternative programs. The various alternative training programs do not encompass a uniform body of knowledge or use a consistent method, which makes it impossible to compare their effectiveness [12]. The programs vary significantly in terms of minimal threshold conditions, with some accepting only outstanding candidates, while others offer accelerated paths or extend over longer periods. Some programs strictly follow the curricula of academic training institutions, whereas others operate independently without any supervision over their training processes.

The programs differ on many factors, ranging from minimal threshold conditions to acceptance of only outstanding candidates and from accelerated programs to those that take place over a relatively long period, and from programs that adhere closely to the curricula of academic training institutions to programs that prefer to operate without any supervision over their training process [4].

In Israel, 25 teacher-education programs have been recognized by the Ministry of Education and defined as unique alternative programs. Some are offered by teacher-education colleges, some by universities, and some by colleges and universities. Between a quarter and a third of the graduates of teacher-training programs in Israel are graduates of unique programs, which is higher than the norm in the rest of the world [13]. Any unique alternative program must meet the conditions of the outline approved by the Israeli Council for Higher Education and the Ministry of Education to receive formal recognition and accreditation.

1.2. Gaining Teaching Experience as Part of the Teacher-Training Process

Teacher training in most of the Western world includes two main components: theoretical academic studies and practical teaching experience. One of the main goals of the teacher-training process is to create a meaningful mix of theoretical academic studies and the experience or practice of teaching. Furthermore, the training is designed to impart systematic knowledge of teaching methods, construct the learners' professional perceptions, and form their professional identity while guiding them to simultaneously engage in a critical examination of the educational reality [14].

In Israel, as is customary in other countries, the experiential aspect consists of two main parts. The first is clinical experience gained during the training phase. All trainees must participate in a practicum to accrue experience in the educational system relevant to the age of the target group and the professional discipline they have chosen to teach. The second part of the experiential aspect of training is the entry stage—specializing in teaching. After gaining experience in the training phase, all training program graduates who have completed at least 80% of their studies and completed the practicum must—in most cases—complete a year of internship. This year, the interns are assigned to schools where they teach the discipline they have studied and receive a salary. All interns are assigned a mentor who oversees their work and accompanies them throughout the year. The mentor is a school teacher who has undergone training for the mentor role and teaches at the school where the internship occurs [15].

In unique alternative training programs, two concepts guide the training process. The first concept is “on-the-job training,” whereby most practical training occurs after the intern has been placed in a school [16]. The second concept is “programs anchored in the field” (not unlike a residency program), which emphasizes not only the early entry into the workplace but also the adaptation of teaching and lessons to the needs of the learners' environment and circumstances [17].

1.3. *Kivun H'adash—The Short-Term Program Examined in This Study*

The program examined in this study is a unique alternative short-term teacher-training program with an apparent affinity for accelerated and intensive studies. Designed by the Israeli Ministry of Education, the program was intended to train about 400 people at various institutes of higher education. All candidates would be screened according to three criteria: applicants were required to have an academic degree related to the proposed teaching discipline (such as mathematics), explain their motivation to work and persist in the field of education, and be available to undertake intensive studies for a short period.

The program consists of three intensive months of theoretical studies during the summer of 2020 and practical experience gained afterward during the 2020/21 school year. The internship phase started in September 2020, and trainees would be required to attend one study day at the academic institution during the week. After completing all the academic and professional requirements, the aspiring teachers would receive a teaching certificate and a license to practice teaching at the end of the internship year.

The division for the training of teaching in the Israeli Ministry of Education sent out a “call for proposals” to academic institutions that feature a teacher-training program, asking them to submit proposals for a short-term program that would include the regular curricula according to the procedures of the Council for Higher Education and according to the guidelines of the Ministry of Education. Twelve academic institutions responded to the “call for proposal,” which was approved by a professional team that examined each program according to professional criteria. The program opened only in nine institutions after three had dropped out, mainly due to the small number of enrolled participants. In each institution, a program coordinator was selected by the Ministry of Education.

The curriculum for the three intensive months of theoretical studies included 24 weekly academic hours for trainees seeking to teach secondary school subjects (equivalent to a traditional teacher-training program) and 30 weekly hours (equivalent to a traditional teacher-training program) for candidates intending to teach primary and early childhood education. In some cases, supplementary studies were required if the candidates’ academic backgrounds did not precisely match the teaching discipline. In sum, the aspiring teachers studied for about eight to ten hours each day, five days a week, for three months (May to August 2020). The studies took place using online, synchronous, and asynchronous technological tools, emphasizing the use of the Zoom platform. After these three months, and with the opening of the 2020/21 academic year (September 2020), they began teaching in the schools while at the same time continuing to study one day a week at the academic training institutions to complete the quota of hours necessary for a teaching certificate.

The structure of the practical internship experience was complicated because most schools in Israel were not operating routinely. The solutions for completing the requirements of the experiential component were varied and extended the program by three months and even later into the 2021 work year.

Simultaneously with the formulation of the program and the transition to the stages of its implementation, it was decided to establish an organizational directorate at the Institute of Education. The directorate’s role was to find solutions related to the program’s organization, meet the aspiring teachers’ needs, provide regular information updates, and create a coordinators’ forum for biweekly meetings.

At the end of the screening process, approximately 380 applicants were accepted into the program at different academic institutions. All participants received financial support, and each student was entitled to a conditional loan of NIS 10,000. In addition, each participant was awarded a grant of NIS 5800 in exchange for a commitment to volunteer in the education system for 80 h.

1.4. *Study Goals, Questions, and Hypotheses*

The present study had two main goals:

1. To learn about the structure of the program and its implementation from the professional and personal points of view of the program's coordinators and the participants, as they experienced it.
2. To examine the contribution of the new short-term program to the participants—the teacher trainees—and the Israeli education system in general.

2. Materials and Methods

2.1. The Context of the Research

The study employed a qualitative research method, which provides a holistic perspective and has the potential to generate new concepts [18]. The research was grounded in field theory and utilized an inductive approach to interpret the voices and perspectives of the participants [19,20]. The focus of the research was on the perceptions of the academic coordinators of the Kivun H'adash program, with the aim of uncovering a macro-level perspective of the program.

2.2. Participants

Semi-structured, in-depth interviews were conducted with nine academic coordinators of the program (six of them women) operating within teacher-training institutions. The research aims were presented to the participants, anonymity was guaranteed, and personal consent to participate in the study was obtained before the interview. The interviews examined each coordinator's perspective on the Kivun H'adash program. The interview started with an open question: "Tell me about the unique program that you conducted in your college". The interviews were held online via the Zoom application, and each lasted about one hour.

2.3. Data Analyzing

The qualitative data were analyzed using narrative categorical analysis [21]. In total, we had 100 pages that were used as the raw material for this research [22]. The analogizing act occurred in 4 stages:

1. All interviews comprised a recording and transcription of the Zoom conversations.
2. Each researcher read the interview and noted his interpretation of everyone's experiences.
3. The researchers identified the similarities and differences between their texts. This process includes the breakdown and reconstruction of the conversations, phenomena, and issues that enable us to study and understand the responses from a holistic perspective.
4. The interviews were divided into meaningful units in line with the research questions [23]. This led to the identification of the themes, extracted into five categories: recruitment of the coordinator; establishing the program; clinical experience; the students of the program; and future initiatives for teacher education.

2.4. Ethical Considerations

This study received ethics authorization from the Ethics Committee of the Mofet Institute. We respect the participants, and they know that we are conducting research that might be published at the end of the study. All names used herein are pseudonyms to conduct ethical research [24]. Those findings were not included in this research.

3. Results

3.1. Recruitment of the Coordinator

The first stage in organizing the new program, 'Kivun H'adash', was to recruit and assign a professional coordinator. Most institutions set threshold conditions based on discipline specialization and project management experience. Four coordinators had previous experience coordinating teaching programs for trainees with an academic degree in science (teachers in academic retraining programs). The other five coordinators had no expertise or experience in coordinating academic programs. The coordinators described a speedy and rushed process that occurred "suddenly" without organized preparation. Such

circumstances can sometimes lead to unpleasant situations. For example, all the coordinators indicated that their job conditions, including salary, had not been adequately settled. Yehuda (all names mentioned in the Section 3 are pseudonyms), one of the coordinators, described this situation as follows:

“We did not have enough budget for the project. I worked hard and was paid very little. However, I did not do it for the money. For me, it was a mission.”

Yehuda’s words in the interview also highlighted his motivation for accepting the coordinator position in the Kivun Hadash program. Like other coordinators, Yehuda mentioned that a sense of mission was his primary motivation for becoming involved in this project. He explained that the complex situation of the COVID-19 crisis in the Israeli educational environment encouraged him to think about his obligation as a citizen. Salary was the least important factor in this decision, as he said the following:

“We were called on for this project, and it felt like a calling! We are citizens, and we must see that we are ready to make all the efforts and invest time for the sake of the country and its children to assist people who were laid off due to the pandemic (Yehuda).”

The COVID-19 crisis was unexpected. The coordinators recurred with motivation of an educational mission, in a time of crisis. They emphasized that short-term alternative program options will not be able to exist for a long time and be established as an alternative educational program, without the organizational conditions such as a clear position, salary, and goals for academic development for the coordinator.

3.2. Establishing the Program

Even though the teacher-training institutions had sufficient experience training academics for teaching (academic conversion programs), Kivun H’adash posed new challenges for these institutions, specifically, preparing a teacher-training program during a fatal pandemic. The coordinators described the challenges while designing the program’s curriculum in the interviews. They explained that they had to cope with the entire planning process by writing the rationale, presenting the syllabuses, recruiting teaching teams, meeting the students, and quickly giving them information about the program. They rarely received clear or specific answers to their questions and often were confused, under pressure, and lacked control. Some of them even described their job as a “war zone.”

The coordinators all agreed that the most challenging task was recruiting students. They knew they had to recruit at least 20 students to open a fully funded program. However, it was not very easy. Even though many employees had lost their jobs during the pandemic, and many were interested in the program, the number of students who registered for the program was relatively low. Table 1 demonstrates the recruiting process.

Table 1. The recruiting process.

Stage		Applications
1	Posted mailing was sent	14,800 unemployed academics had registered for unemployment
2	Survey questionnaires	2545 candidates showed interest
3	Phone consultation	1540 candidates participated in the phone consultation
4	College application	1443 candidates completed the application for the program
5	Registration	380 candidates registered for the program in various colleges

The coordinators mentioned that some candidates heard about the program via friends, social networks, or other sources. They also indicated that collaboration with the employment services was not easy; it was intense, and sometimes, the administrators sent unqualified candidates who specialized in subjects other than those taught in the program. However, they described the situation as “under control,” and “it happened quickly,” and they

were progressing according to the outline of the plan. Planning and designing the program reflected the confusing situation during the COVID-19 crisis. Rima said the following:

"I do not think I had a day or night of summer vacation: I had to contend with many factors as I was involved in conversations with candidates, meetings with lecturers, and answering emails, all within a few days."

Nevertheless, the coordinators emphasized that everyone who worked with the program, in the governmental offices or the colleges, felt they were part of a larger mission and tried to do their best. They had the impression that even though they experienced many difficulties, they successfully designed a good program.

Yona elaborated as follows:

"We had a good experience as a team, especially within the college, with the training team and department heads. Everyone was dedicated and eager for the program to succeed in attracting more and more candidates. They all did it wholeheartedly and earnestly despite the difficulties and working in such a positive atmosphere felt good."

Most academic teaching colleges are organized into both administrative and academic departments, creating a division of responsibilities between organizational management and the academic aspects of teaching. Coordinators were tasked to develop all elements of the program. While this gives them valuable experience and control over the entire process, it also leads to feelings of burden and stress. A short-term alternative program cannot rely heavily on a single coordinator who is responsible for all teams, the program, and the students.

3.3. Clinical Experience

The coordinators explained that the Kivun H'adash program was clinically oriented like other teacher-training programs. Therefore, the clinical experience was a significant part of the program. However, during the pandemic, designing adequate opportunities for clinical experience was a challenge the coordinators faced. The coordinators shared their difficulties finding opportunities for trainees to experience teaching at schools. The biggest challenge was that during most of the training process, schools were closed due to a national lockdown, and most of the activity happened virtually via the Zoom application.

Moreover, the complicated restrictions prevented numerous students from attending when schools opened. Second, many of the coordinators did not have experience in organizing the clinical component of the educational training, some were not familiar with the processes needed to collaborate with the schools, and they did not have relevant connections at schools. In addition, the brief planning period left them with insufficient time to organize the trainees' clinical experience. Yona described the complex situation she had to maneuver while managing the program:

"My trainees hardly met any students or peers. We could not create such opportunities. We tried internally, we tried with all kinds of schools... it just did not work. They learned the materials but did not interact with the classroom, which was lacking."

The coordinators admitted they had to think creatively to find opportunities for trainees to practice teaching. During the interviews, they mentioned some solutions they initiated for the clinical phase of the program, for example, teaching among colleagues, using simulations, observing classes via Zoom, private instruction (one-on-one), and participating in Zoom classes by co-teaching with a veteran teacher. Another answer for this issue was to delay the clinical experience until their first year on the job.

One of the most significant components in teacher training in all the programs including alternative programs is the creation of a space for practical experience. The coordinators faced difficult challenges in this regard during the coronavirus period because most schools were closed, and when they opened, teaching and learning were through Zoom. Despite these difficulties, the coordinators attempted various creative solutions, such as peer teach-

ing, simulations, and co-teaching via Zoom. Some even suggested delaying the clinical experience until the trainees' first year on the job.

3.4. The Students of the Program

Two main criteria for student recruitment constituted the prerequisites for participating in this program. The first criterion was an academic degree. The second criterion was being unemployed. The purpose was to recruit candidates knowledgeable in their subject matter who had acquired some experience in the labor market. The coordinators admitted that many students who participated in the program were not unemployed, as was intended. Laura, one of the coordinators, said the following:

"We had different candidates come to us. Some were not even laid off but had been at home before, and the program created an opportunity for them... Some of them told me they wanted to do this their whole lives, and finally, there was a good opportunity."

It is important to note that most students were between the ages of 30 and 60; they were married with children. The coordinators mentioned some challenging points concerning the students. For example, unemployment caused stress; some students said they "Suddenly found themselves hanging in midair." Many students experienced emotional difficulties resulting from the pandemic environment, the lockdown, and the need to deal with their children at home all day in uncertain times. Moreover, some students chose a field of study in which they did not have the required qualifications; for example, Yona describes the following: *"One student with a bachelor's degree in education or literature wanted to be a preschool teacher; she had no idea about preschool children."*

In contrast, the coordinators stated that the students were more mature and serious. They had good intentions and were committed to pursuing the program. The added value is demonstrated by their ambition to return to the classroom, study a new profession, and achieve it from a mature point of view. Shuzanz said the following:

"The students were more mature; they brought some added value—not just the studies and degree. They have experience with people; they have experience with children of all ages... So, these people are already in midlife; they had a good situation, family, and livelihood, and suddenly they found themselves ungrounded."

The coordinators were responsible for all aspects of recruiting the students and integrating them into the unique alternative program. They adapted students to the program conditions including conducting interviews with them. In addition, during the study period, they accompanied the students in dealing with challenges beyond studies, such as childcare, health problems, and more. This component of the program emphasizes the importance of personal accompaniment in alternative programs, as a key component in ensuring the successful integration of the students into the educational work later.

3.5. Future Initiatives for Teacher Education

The coordinators interpreted the program for the professional retraining of the participants in two ways: as an unavoidable necessity that stemmed from a given reality and as an opportunity for candidates to change their profession, refresh and renew, and even fulfill past wishes. Following the commentary on the various motives of the program participants, thoughts also arose about their potential success in the professional field and their potential to persevere in the different divisions of the education system.

Some reactions showed worry and care based on the coordinators' thorough knowledge of the profession, the field, and the challenges; Rima tells us the following: *"[In the past] they were in positions where they had a car, a cell phone, and coffee whenever they wanted [from their workplace]. This is not the case; here, they must pay for their coffee."*

Rima related to working conditions, whereas Suzanna hesitated about authority.

One of the candidates said that in his former profession, people would agree or disagree, but they listened to others and were listened to when they spoke. Now, he comes to class and suddenly discovers that some children do not want to listen to him;

the following reaction provides an adequate summary of the coordinators' view of the situation with the words of Simcha:

"There are some people I am not sure will make it through the entire transition. I think everyone can be a teacher, but I am not sure everyone will succeed. Some will find it challenging to manage a classroom with children, and some will not face the gap between income and expectation, especially once opportunities open up again in the market."

The success of an alternative program is contingent upon its implementation and contribution to the education system. Consequently, the coordinators have expressed both hopes and concerns regarding the professional future of the students enrolled in the program.

4. Discussion

Israel's higher education institutions, including teacher-education colleges, remained operational during the COVID-19 pandemic, whereas many other public entities faced disruptions [25]. By comparison, interruptions in teaching and learning were minimized or negligible. Although China reported school and university closures seven weeks before the outbreak of the pandemic reached Israel, the teacher-education colleges in Israel did not take proactive measures to prepare for a similar scenario. This lack of readiness is surprising, given Israel's constant security concerns. Moreover, despite extensive efforts to integrate technology into the teaching and learning processes in Israeli teacher-education colleges over the past two decades, many teachers found themselves unprepared and lacking the necessary knowledge to adapt [26].

In response to the urgent need for ERT, teacher educators attended the numerous professional development opportunities offered by their institutions. Entire colleges transformed into communities of practice [27] (Wenger, 1998). Many teacher educators who worked independently participated in valuable discussions and activities concerning the nature and direction of their teaching programs for prospective teachers.

The findings from this research can lead us to a broader perspective that is not directly related only to the program under examination and not just as a solution to the crisis that arose during the COVID-19 period. We should ask ourselves if such a model would be relevant even in routine times.

4.1. Unique Alternative Teacher-Education Programs—Contribution

The current study had two main objectives. The first was to learn about the structure of this unique alternative program and its implementation from the professional and personal perspectives of the program coordinators and the selected students who chose to study in it—as reflected through their experiences. The second objective was to evaluate the contribution of the 'Kivun H'adash' program to the new teachers who studied in the program and were trained through the program, as well as its overall contribution to the education system.

Regarding the second goal of the research, understanding the program's contribution to the education system regarding the shortage of teachers in general [7] and to the new teachers trained in 'Kivun H'adash,' it is difficult to draw clear-cut conclusions. One reason for this difficulty is that the onset of the COVID-19 pandemic introduced a reality previously unexperienced in the Western world or Israel over the past century, which also affected how research could be conducted. Hence, this study represents a deviation from the norm.

Amid the COVID-19 crisis, the Israeli Ministry of Education boldly and proactively decided to launch new, unique alternative teacher-education programs despite facing substantial public criticism. This decision reflected the Ministry's trust in the teacher-education colleges, given their ability to continue functioning at the outset of the COVID-19 pandemic [28]. The colleges' ability to withstand public scrutiny and their confidence in taking on this mission was likewise grounded in their earlier handling of teaching and learning with the outbreak of the pandemic.

While most alternative teacher-education programs have typically arisen in response to dissatisfaction with traditional teacher-education programs, the current program implemented by the Israeli Ministry of Education represents an effort to capitalize on an opportunity to attract high-caliber candidates to the education system. Similar to other alternative programs, it also incorporates elements lacking in traditional programs [29]. These elements include transformative-oriented professional development, alterations in conventional time and space paradigms, on-the-job training, collaborative learning, and personalized learning. All of these components characterized the educational landscape during the era of the COVID-19 pandemic [30].

4.2. Circumstances and Conditions in the Future

Although the program was designed to partially address the unprecedented wave of unemployment and the shortage of teaching personnel in the education system while also adapting to the new reality created during periods of ERT, it raises the question of whether the program is suitable and applicable for regular circumstances. Can teachers be trained remotely in the future? While prestigious institutions worldwide have increased the number of Massive Open Online Courses (MOOCs), it remains unclear whether online courses can replace the practical clinical training of educators. Can simulation rooms replace classrooms with students and schools with organizational cultures that require real-world experience [31]? Can technology platforms genuinely replace the human connection inherent in the teaching profession [32]? This research could not fully answer these questions, but it provided insights from both quantitative and qualitative data.

In most institutions where students were trained in the program, they underwent little to no practical training. This lack of hands-on experience led to significant dissatisfaction, not only among school students but also among instructors. However, it is essential to note that the finding of dissatisfaction is not unique to the Kivun Hadash program but has been shown to describe the reactions of many new educators trained in various other programs [33].

The main finding of this research is that hybrid teacher-training programs can teach disciplinary content online. Still, practical work, including clinical training and specialization, likely needs to occur in the traditional setting of teacher-training institutions.

In summary, the coronavirus pandemic prompted the Israeli teacher-education system, particularly its educators, to adapt to the challenges of the fourth industrial revolution in the 21st century [34]. The imminent challenge on the horizon is to strengthen and sustain these accomplishments. Teacher-education alternative programs are responsible for equipping future educators with the pedagogical knowledge, tools, traditional values, and resilience needed to effectively address forthcoming educational challenges like those encountered during the COVID-19 pandemic [4].

5. Conclusions

One conclusion from this research is that hybrid teacher-training programs, in which the disciplinary field can be learned online, still require, and perhaps even necessitate, practical work, including clinical experience and a specialization year, to be conducted in the familiar format within teacher-training institutions [34].

A few essential practical findings should be considered for future similar programs. The first one regards the recruitment of candidates. The recruiting entities, whether they are governmental or academic institutions, should take great care in the outreach, selection, and admission of students to ensure monitoring of the quality of those accepted.

The second practical finding concerns the program coordinators. The choice of program coordinators should be made with an emphasis on prior experience leading teacher-training programs. A clear role definition for coordinators is essential. This role definition should be binding for all accrediting institutions.

The third practical finding concerns the training process. It is recommended to emphasize the skills required for “future-oriented teaching.” It is also suggested not to conduct

training entirely online. The training can be hybrid. Each stage of the program should examine the division of roles and the structure of the training process for experiential learning: pedagogical instructors, field guides, teacher trainers, internship supervisors, and mentors. It is mandatory to incorporate simulations into some of the teacher-training programs, especially within each pedagogical module taught in the program. Since we know that positive experiences enhance professional self-efficacy, the more simulated experiences are integrated, the higher the likelihood that the trainees' level of professional competence will improve accordingly. However, it is essential to note that simulated experiences cannot substitute for ongoing clinical training.

In research on teacher education, various terms are used to describe field experiences, such as school placement, teaching practicum, or school internship. These terms all pertain to a component of teacher-education programs wherein aspiring educators spend a specific time working in a school environment. Consequently, the primary aim of numerous field experiences is to cultivate fundamental teaching abilities, among other objectives [33].

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Article

Assessing the Professionalism of Teacher Educators in Relation to Sustainability: Developing the Teacher Education and Sustainability Scale (TESS)

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Abstract: This study focuses on the design and implementation of the Teacher Education and Sustainability Scale (TESS), an instrument to assess the professionalism of teacher educators in relation to sustainability in the context of Agenda 2030 and its 17 Sustainable Development Goals (SDGs). Despite the importance of the SDGs, there is very little research on the identity of teacher educators in relation to sustainability. The Teach4Reach 2.0 project, an international collaboration between the University of Pretoria, the University of Vienna and the University of Innsbruck, aims to fill the research gap in the quantitative measurement of this key area by examining the professionalism of teacher educators in relation to sustainability in order to strengthen their identity. The TESS questionnaire was developed in a structured four-stage process that initially included AI-generated items and was followed by expert refinement and a testing phase with participants from Austria and South Africa. The findings discuss the process of developing the TESS questionnaire and include a critical reflection on AI and on the need for targeted professional development for teacher educators in the field of sustainable development.

Keywords: teacher education; teacher educators' professionalism; sustainability; instrument development; quantitative research; 2030 Agenda; Sustainable Development Goals (SDGs)

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1. Introduction

Health crises such as the COVID-19 pandemic, economic and technological challenges such as inflation and digitization, the global climate crisis and the violation of civil rights through wars are events that have a profound impact on the quality of education [1]. To address some of these current challenges, the focus is on moving towards a sustainable future. Agenda 2030 and its 17 Sustainable Development Goals (SDGs) provide a comprehensive framework to guide these efforts and to ensure that key aspects of sustainability are considered and addressed in education reforms [2,3]. Education should support personal transformation and pave the way for the societal changes needed to address global challenges and build a more sustainable world [4]. This requires the integration of new competencies into educational practice to promote resilience and adaptability in future teachers. Teacher educators play a central role in achieving this goal. They can be described as key actors who have a significant impact on the professional development and quality of (future) teachers [5]. They are in a position to empower learners to acquire the knowledge,

skills, values and behaviors needed to tackle global challenges and play a role in creating a more just, peaceful, and sustainable world [4]. Izidinia [6] and the European Commission [5] emphasize that responses to socio-cultural and environmental developments have a significant impact on the professionalism of teacher educators. Therefore, the professional development of the identity of teacher educators is an important issue in teacher education. Professional identity is described as a complex interaction involving societal demands and challenges, personal identities based on individual qualifications, attitudes and values, and collective identities that represent the experience of being an integrated member of a group [6–8].

Recent literature on the professional identity of teacher educators, particularly in relation to sustainability, is sparse [9]. Schritteser [10] notes that little attention has been paid to educators who are recruited from the academic staff of colleges and universities, such as professors and junior academics. Their attitudes, practices and teaching activities require independent research, which is still lacking. Although some progress has been made [11–13], much of the existing literature focuses primarily on the knowledge and professional development of teachers, rather than that of their instructors. Similarly, various meta-analytical tests and professional identity scales focus on the professionalism of teachers (e.g., [14–17]). On the topic of sustainability, UNESCO and Educational International conducted a global survey of 58,000 teachers to determine how teachers assess their own ability to contribute to achieving the SDGs. The results showed that only a third of teachers felt prepared for the challenges. They were motivated to teach new skills and topics, but complained of a lack of knowledge, resources and structural support [18].

There are few empirical studies that directly address the professional knowledge and needs of teacher educators (e.g., [9,13,19–26]). These studies highlight the need for future research to examine the normative beliefs of teacher educators in order to develop their professionalism in the 21st century and to meet the requirements of a sustainable transformation. The International Forum for Teacher Educator Development (InFo-TED) has developed a dynamic model that underpins the knowledge base for teacher educators at the personal, local, national and global levels [20]. The model underscores the significance of lifelong learning across 13 areas, addressing social changes, diversity, identities and technological changes, all of which are linked to sustainability issues. Therefore, there is an urgent need for further studies and standardized measurement tools to comprehensively capture the professional identity of teacher educators and to adequately acknowledge their identity in teacher education with a focus on a sustainable future [9,10,27].

To address the research gap on the professionalism of teacher educators in relation to sustainability, the Teacher Educator Sustainability Survey (TESS) questionnaire, developed within the international Teach4Reach 2.0 project, was designed to gain insights from the teacher educator context. The professional understanding of teacher educators is based on Rieckmann [28], Ferrer-Estéves and Chalmeta [29], who point out that a central part of the professionalism of teacher educators is that they are able to deal with changing requirements and influence a shift in consciousness and mentality in favor of values, attitudes and behaviors for a sustainable future [29]. In this context, studies emphasize the potential to strengthen the identity of teachers [6]. In this project, the concept of sustainability was based on the UNESCO Agenda 2030 within the framework of the 17 SDGs [3], with the aim of contributing to the development of scientific knowledge and deeper theoretical understanding of the professionalism of teacher educators. Since the early 1990s, the concept of sustainable development has become an internationally recognized paradigm for the integration of economic, social and environmental development goals [30,31]. In 2015, the United Nations set out 17 Sustainable Development Goals (SDGs) in Agenda 2030, which are to be achieved by 2030 [32], and which take these three dimensions of sustainable development into account. However, at the midpoint of the program, a worrying picture is emerging with regard to the achievement of the SDGs [18,33,34]. The increased action to promote sustainability in the context of education through the UN Decade of Education for Sustainable Development (ESD) (2005–2014) and the Global Programme of Action

for ESD (2015–2019) have also failed. Therefore, Education for Sustainable Development: Achieving the Global Sustainable Development Goals (ESD, 2030) was launched as a global framework program [35] to strengthen the contribution towards achieving all 17 SDGs, focusing on five priority action areas: Advancing Policy (1), Transforming Learning and Training Environments (2), Building Capacities of Educators and Trainers (3), Empowering and Mobilizing Youth (4) and Accelerating Sustainable Solutions at the Local Level (5) [36]. Despite extensive efforts and various initiatives, studies show their limited impact [34]. The concept itself has also been criticized. A common criticism of the SDGs is that they are embedded in a neoliberal economic model that prioritizes economic growth and development. Critics argue that this focus can contradict the goals of true environmental sustainability, as the SDGs often support the existing capitalist order instead of tackling the root causes of global crises. Instead of promoting transformative approaches, they risk reinforcing current power structures and inequalities [31,37]. Despite these criticisms, however, the SDGs provide an important framework for guiding sustainable transformation. They address critical global issues and provide a starting point for discussions on how to achieve a just and environmentally sustainable future. By providing a common point of reference, the SDGs can help coordinate global efforts towards meaningful change [38,39].

To support and broaden the discourse on sustainable development in the context of teacher educators and link to the priority action areas, this paper focuses on the development and piloting of the Teacher Education and Sustainability Scale (TESS), a tool to assess the professional understanding of teacher educators in the context of sustainability and the extent to which sustainability is integrated into instructional methods and teaching practices. The TESS questionnaire was developed in a structured four-stage process that included initial artificial intelligence (AI)-generated items, expert refinement and pilot testing with participants from Austria and South Africa. The development process of the questionnaire is described in detail, with particular attention to the pilot phase and its implications for ensuring the quality of the instrument in relation to the use of AI in a first step.

Nowadays, AI plays a central role in research and therefore also in the creation of questionnaires. Russell and Norvig [40] and Nilsson [41] (p. 13) define AI as the process by which computers analyze vast amounts of data and apply extremely complex algorithms to simulate human behavior or reasoning and enable a society to “function appropriately and with foresight in its environment”. With the introduction of ChatGPT at the latest, AI tools were on everyone’s lips. From one day to the next, a wide variety of AI tools were available and accessible to a broad section of the population, making them widely used. The advantages of artificial intelligence are that vast amounts of data can be searched in a short space of time, which also makes it interesting for researchers from various disciplines. By comparing large amounts of data, AI systems can generate novel hypotheses or be part of autonomous research, which promises greater efficiency, accelerated work processes, accuracy and the possibility of exploring different areas [42]. Nevertheless, Landgrebe and Smith [43] argue that AI has not yet been able to master the complex and evolving patterns of human dialogue. Nevertheless, AI is playing an increasingly important role in a dynamic and interactive process of knowledge creation [44]. AI systems can help to analyze large amounts of data and recognize patterns that would be difficult for humans to discern. They can bring together different perspectives and information and thus create a broader knowledge base. At the same time, the question arises as to how AI itself generates knowledge and whether it is able to take the social and context-dependent nature of knowledge into account appropriately. AI can both reinforce and distort knowledge, depending on how it is programmed and what data it processes. When using AI, educators and researchers would need to design materials in such a way that it not only reflects one dominant perspective, but also incorporates the diversity of human experiences and perspectives. This would allow it to function not just as a technical tool, but as an active participant in the process of knowledge generation, helping to promote more inclusive and comprehensive insights.

While AI is penetrating everyday lives increasingly, in many ways it is still an abstract notion. The discourse on the risks and challenges of using AI, some of which cannot yet be assessed and some of which are not yet understood, increasingly supports this abstract view of AI. These aspects lead to an even higher responsibility on the part of scientists to break down the scientific and technical core of AI systems in order to create transparency and promote public discourse on the use of AI [42]. In addition to breaking down the scientific and technical core of AI, creating transparency also requires clear communication about the areas of a scientific process in which artificial intelligence was used, along with a valid justification. Through openness and disclosure, the quality standards of scientific work can be maintained. However, the role of the scientist does not end with mere investigation; rather, it is about subsequently checking and validating the results and findings emanating from AI use. It is therefore advisable to develop a strategy that is based on a clear objective, and which follows the tenets of science.

The seemingly biggest hurdle in using AI in the scientific process is learning how to handle AI ethically and use it in a targeted, constructive manner. There are various studies that discuss the role of AI in research, e.g., in the fight against climate change or for a sustainable future [45–48]. The benefits of using AI are visible in different areas, as it is able to detect anomalies in data, which is crucial in areas such as medical research, where AI algorithms can detect early disease onset patterns in patient data [49]. In education, AI offers the possibility to analyze individual learning challenges or use individualized tutoring chatbots [15]. In addition, it can support educators in correcting tests and designing competence-based tasks [50]. Bjola [45] (p. 86) describes AI as a new chapter in the development of theory and practice, and point to open questions about how the integration of AI could theoretically and normatively restructure the various disciplines.

Despite all the advantages, however, it is important to bear in mind the challenges that the use of AI brings with it, and this brings the role of the researcher back into the foreground. Since science makes a claim to truth, it is essential to check the accuracy of the sources. This also includes the unconditional identification of copyrights. It is necessary to reflect on the use of AI at all times in order to avoid over-reliance, which might reduce the researcher's ability and need for critical and creative thinking. In the social sciences, the use of AI can lead to a loss of competences, such as the correct handling of sources or the understanding of the core topic of a manuscript. With all the possibilities, but also challenges, it seems necessary to agree on a legally binding framework, also to ensure fairness among researchers. It is about reflecting on the results presented by AI based on a high-quality understanding of scientific practice, recognizing the limitations and intervening, because the human being as a scientist should remain the driving force in the scientific process. AI is playing an increasingly important role in scientific research by improving data analysis, optimizing experimental design and facilitating new discoveries. However, integrating AI into research brings with it ethical challenges that need to be addressed to ensure fair, transparent and responsible use. Researchers need to be trained to use AI responsibly and adapt their work to the ever-evolving opportunities and challenges.

Against the background of sustainable development, however, the use of AI in particular needs to be scrutinized more closely. AI has the potential to make a significant contribution to sustainable development by addressing challenges in areas such as energy efficiency, resource conservation and environmentally friendly innovation. Nevertheless, the environmental and social challenges of AI must also be taken into account to ensure that its development and application are in line with the principles of sustainable development [51–53]. The high energy consumption associated with training complex AI models poses a significant sustainability challenge. These models require considerable computational resources, often provided by large data centers that rely on fossil fuels. The development of energy-efficient algorithms and hardware-optimized processors, as well as the use of renewable energy sources are key to reducing the environmental impact. In addition to energy consumption, resource consumption is also of crucial importance. The production of hardware for AI requires rare raw materials, the extraction of which can be

ecologically and socially problematic. Therefore, sustainable development in the AI sector should promote recycling and reuse, and support circular economy models to minimize waste and optimize resource use. Ethical considerations are also central to sustainable AI development. Technology should promote social justice and not exacerbate existing inequalities. This requires transparent, fair systems and broad access to AI technologies to ensure that the benefits are equitably distributed and not reserved for a few large companies. Several strategic actions are needed to promote sustainable development in the context of AI. Investment in research and development is essential to develop energy-efficient algorithms and sustainable hardware technologies. The introduction and enforcement of policies that support sustainable practices in the AI industry and the establishment of regulatory standards for energy consumption and resource utilization are also essential. Raising awareness among developers, businesses and the public about the importance of sustainability in AI and promoting ethical use of the technology is key. In addition, collaboration between industry, research and government is crucial to develop and implement best practices in line with sustainability principles. In summary, the integration of sustainable development concepts into the development and application of AI is not only a technical challenge, but also an ethical imperative. Careful management of the environmental and social impact of AI is essential to ensure that this technology makes a positive contribution to a sustainable future [54].

2. Materials and Methods: A Questionnaire on Teacher Educators' Professionalism in Relation to Sustainability—TESS as an Example

Questionnaires are regarded as an appropriate research tool to gather valid and reliable data on a research topic [55]. As Smeyers and Smith [56] (p. 7) explain, quantitative research is “*erklärung*”, i.e., an “*explanation*” of a phenomenon that can not necessarily be seen [1], in contrast to qualitative research, which provides “*verstehen*”, i.e., an “*understanding*” of the phenomenon [22] (p. 7). As such, a professional questionnaire should be well designed in terms of validity and reliability, but also keep in mind factors such as the use of language, clarity, level of difficulty, length [55], layout of the questionnaire, participant and sample size in order to provide useful information [57]. Mann [57] also advises placing easier questions at the beginning of the questionnaire and asking questions that require more thought later in the questionnaire. Another critical aspect, according to Mann [57], is a well-structured cover letter, as this is the researcher’s first contact with potential participants.

Online questionnaires can be used to reach a large population that is not limited to a specific location, without the process of distributing questionnaires being as time consuming [48] as it would be with the administration of hard-copy questionnaires. The structure of a high-quality questionnaire starts with an introduction that explains the purpose of the study and that participation is confidential and voluntary, and that it is possible to withdraw from the study at any time [58]. It also states the approximate time to complete the survey, which in our case was estimated at six to eight minutes. According to a study by Galesic and Bosnjak [59], participants are more likely to take part in surveys that take up to 10 minutes to complete than longer surveys. The researchers were careful to use language that is easy to understand [58], especially given that participants are based in different countries and English might not be everyone’s first language. The researchers drafted the statements and questions with care to avoid leading, loaded, two-fold and double negative questions and statements [58,60,61] throughout the survey.

The first section of the TESS questionnaire consists of eight background questions (drop-down and/or multiple-choice option), where one or more options can be selected depending on the background information required [62]. The background information provides information about the participants’ age, gender, country, level of qualification, current position, specialism, context of experience, etc. This information is important for research and reporting purposes.

After the background information, participants are given instructions explaining what is expected of them when completing the subsequent survey questions. The first set of

questions in the TESS are statements based on teacher educators' personal perceptions of their role in terms of sustainability, teacher professionalism and the education of future teachers. These questions consist of 14 quick, strongly declarative statements that capture various aspects of sustainability in education, with response options on a Likert scale [58,60] that are anchored [61] and provide a rich item pool for collecting research data [60]. The response options are clearly delineated to avoid confusion in selecting the most appropriate option [60]. They consist of the following indicators: strongly disagree, disagree, neutral, agree, strongly agree.

Statements such as "I demonstrate a deep understanding of sustainability concepts and principles" address participants' knowledge of sustainability. Other prompts include "I incorporate sustainability topics into my teaching" and "I encourage student teachers to think critically about environmental and social issues related to sustainability", which promotes critical thinking skills and reflects curriculum integration.

In addition, educators are asked about their sustainable practices in education through statements like "I promote sustainable practices within the lecture hall (e.g., waste reduction, energy conservation)". In addition, the questionnaire uses statements like "I involve students in sustainability-related projects or initiatives within the community" to go deeper into community engagement and emphasize the significance of practical applications.

The item "I have general knowledge of the 17 Sustainable Development Goals of Agenda 2030" emphasizes awareness of global sustainability agendas. In addition, participants are asked to reflect on why they are motivated to establish sustainable learning environments and how they collaborate with others to incorporate sustainability themes into a variety of subject areas (items number eight and nine). The statements "I model sustainable behaviours in my daily life" and "I develop materials to support sustainability practices" not only encourage self-reflection, but also challenge educators to rethink their efforts to develop resources.

Finally, the TESS questionnaire includes questions concerning professional development, such as "I actively seek professional development opportunities related to sustainability education" as well as questions about classroom discussions about sustainability and creating an environment that can shape the training of future teachers.

As DeVilles and Thorpe [60] note, researchers can use an odd or even number of Likert-scale responses depending on their preference and the nature of the questionnaire. The advantage of using an odd number of responses is that participants have the option to choose a neutral response if none of the alternative options apply to them. However, care should be taken to ensure that participants do not lose interest in the questions and use the neutral point as an easy way to complete the survey.

The final section on knowledge about sustainability consists of three open-ended questions that give participants the opportunity to add information related to the research topic from their own perspective [58]: Which sustainability themes/topics do you know most about and are you best placed to teach? Which sustainability themes/topics would you like to learn more about in terms of your professional development? Is there anything else you would like to share with us? The qualitative data from the open-ended questions can provide new insights into the participants' understanding of sustainability as an alternative measure. This dual approach aims to strengthen the general validity of the study findings by bridging quantitative scores with qualitative feedback. Making use of open and closed-ended questions in a survey is not an uncommon practice in research as it provides different perspectives of participants' experiences related to the research topic [58]. Participants are, however, encouraged to limit their responses to avoid lengthy feedback [62]. Galesic and Bosnjak [59] found that participants are more likely to give shorter answers later in the survey, which could be another strategy to obtain concise answers on open-ended questions. The TESS questionnaire is designed as a formative assessment tool rather than a summative one. Its purpose is not only to quantify attitudes or knowledge, but also to provide qualitative insights that help identify areas for the professional development of teacher educators.

The TESS questionnaire is available on a Qualtrics platform, making it easy to distribute and potentially reach a larger population [62]. The link to the questionnaire is emailed to participants working in higher education in various educational departments. Although the research group cannot predict the outcome of the sample, the aim is to reach a large sample size in order to limit sampling errors associated with smaller samples and to obtain as true a picture as possible [61,63] of the professionalism of educators in higher education in relation to the Sustainable Development Goals and Agenda 2030. The researchers are aware that recruiting a larger sample might be time-consuming [63] and that the response rate might not be what they expected. They opted to send out the invitations at a time when potential participants are more likely to have time to complete the questionnaire, for example before or after the holidays. Second invitations are also sent out to remind potential participants of the research survey. Another advantage of using an online questionnaire for data collection is that participants can complete the survey in their own time when they find it convenient to do so [23].

Johnson and Christensen [61] recommend that a questionnaire be piloted by five to 10 participants. The TESS questionnaire was piloted with 10 participants from South Africa and Austria. During this process, participants could give feedback on factors such as the overall design of the questionnaire and the wording of questions [58,60,63], highlight information, statements or questions that could potentially lead to misunderstandings [64], test the validity of the scores and “provide an initial evaluation of the internal consistency of the items” [63] (p. 154).

2.1. Instrument Development

The Teacher Education and Sustainability Scale (TESS) was developed in four stages over a period of nine months (October 2023–June 2024). A core team of seven researchers in Austria and South Africa conceptualized and developed the final instrument to measure teachers’ professionalism in the context of sustainability. In Phase 1, the items of the Likert scale were generated with the aid of artificial intelligence and the suitability of the generated items was evaluated within the research team. In Phase 2, the Likert scale was refined and adjusted based on the research aim of the project, and in Phase 3, the full questionnaire with biographical details and open questions was developed with a statistical expert. In the final phase (Phase 4), the instrument was piloted in Austria and South Africa ($n = 10$). The current study reports on this process.

2.1.1. Phase 1: Generating Initial Items

In the first phase, three draft questionnaires were created by utilizing task-specific prompts on ChatGPT. Prompt 1 was formulated as: “Develop a 10-point scale to assess teacher professionalism in terms of sustainability. The scale should include responses on a 5-point Likert scale” (Questionnaire 1). A second questionnaire was then created by rephrasing the first prompt (Questionnaire 2). Subsequently, a second prompt was used, worded as follows: “Develop a 10-point scale to assess teacher professionalism in relation to sustainability. The scale should include responses on a 5-point Likert scale. Also include five biographical variables at the start of the scale” (Questionnaire 3). The three questionnaires were then compared by a member of the research team to assess their suitability. The criteria for comparison were clarity of wording and alignment with the central research question of the project. On the basis of this analysis, Questionnaire 3 was selected for the next phase.

2.1.2. Phase 2: Refining the Likert Scale Items

In the second phase, Questionnaire 3 was further reviewed and revised in more depth by a member of the research team. For example, the following technical adjustments were made:

- The title of the questionnaire was adjusted from “Teacher Sustainability Professionalism Scale” to the “Teacher Professionalism and Sustainability Scale” (TPSS)

- The instructions for the questionnaire were adapted to the specifics of the research project and made more informative.
- The biographical questions were expanded. Variables such as “Current position”, “Country”, “Subject field” and “Context” were included.
- The statements starting with the phrase “As a teacher, I . . .” were changed to “As a teacher educator, I”. For example, “The teacher actively seeks . . .” was reformulated to “As a teacher educator, I actively seek . . .”
- Some of the item descriptions in brackets were revised—for instance, from “(recycling, conserving resources)” to “(recycling, reducing my ecological footprint, reducing food waste)”.
- Specific word choices were revised throughout the questionnaire. For instance, from “guardians” to “caregivers” and from “classroom” to “lecture hall”.

2.1.3. Phase 3: Developing the Full Questionnaire

The revised questionnaire was sent to an experienced statistician for comment. Several comments were made on specific items, instructions, data brackets and the overall presentation of the questionnaire. The questionnaire was revised accordingly by a member of the research team and presented to the full research team. The questionnaire was then discussed during an online meeting and further adjustments were made. These adjustments included the development of the biographical details section, the addition of more Likert-scale questions, the addition of two open-ended questions and the rephrasing of the introductory texts for the three sections of the questionnaire. The conceptual difference between teachers and teacher educators was emphasized as a point of clarification. The questionnaire needed to focus on teacher educators, rather than the teaching profession in general due to the focus of the study.

At this stage, the questionnaire consisted of Section 1 (background), Section 2 (statements on a Likert scale) and Section 3 (open-ended questions). In addition to the online meeting, the questionnaire was sent to the entire research team for a period of one week for further consideration after the online meeting. Further recommendations were made on the wording of some items, e.g., some context-specific adaptations on qualifications between Austria and South Africa, teaching contexts and subject fields. The title of the instrument was confirmed as the “Teacher Education and Sustainability Scale (TESS)”.

2.1.4. Phase 4: Piloting of the Instrument

Once the research team was satisfied with the completed instrument, it was piloted with teacher educators ($n = 6$) in Austria and in South Africa ($n = 4$) (Table 1).

Table 1. Background of the pilot participants.

Pilot Participants	Gender		Scientific Fields
	Male	Female	
Austria	2	4	Teacher education and school research Educational Sciences Educational Philosophy
South Africa	1	3	Educational Psychology Science Education STEM

The instrument was uploaded and emailed to the pilot participants. Their responses and feedback were sent to members of the research team in Austria and South Africa respectively and collated by them. Feedback from one participant included that a few statements would be better written in the negative form. This style of phrasing statements is used to avoid respondents falling into a “response set” whereby they mark options

without answering them thoughtfully [60,61] ([62] p. 281). Debates around the use of negative statements were considered, but as it is not a lengthy questionnaire, the advantages outweigh the disadvantages of using negative statements [60].

There were references made to statements that should be made clearer, such as the “type of teaching” or “level of teaching” the questionnaire refers to in the “background information” section. Another participant wanted clarity on how “broad knowledge” should be interpreted. Wording that causes confusion can lead to invalid responses [58,60] and affect the validity of the research. It was suggested that the repetition of the phrase “As a teacher educator” at the start of each statement should be removed. Unnecessary wording can have an effect on the time taken to complete the survey and contribute to “participant fatigue” [63]. Constructive, positive feedback included that the “questions and instructions are very straightforward”, which is in line with recommendations by researchers such as DeVilles and Thorpe [60], Johnson and Christensen [61] and Tymms [62]. During the pilot phase, participants could determine how long they needed to complete the questionnaire to avoid “participant fatigue” [63] (p. 154) and how much time was required to answer the questions. In relation to this statement, the feedback was that the questionnaire was “quick to complete”. This is an important factor to consider when creating questionnaires, as researchers do not want to burden participants with unnecessary, time-consuming questions, but at the same time get as many relevant and needed data as possible [62].

At the suggestions of the pilot participants, a picture of the Global Goals was added, an additional open-ended question was added and the automatic responses upon completion of the questionnaire were refined to include the contact details of the lead researchers in the two countries. The Likert scale was designed as a scale from 1 (Strongly Disagree)–5 (Strongly Agree) for all statements.

To improve the TESS questionnaire and make it available to participants, the pilot feedback was summarized in a single document. The feedback and suggestions were discussed amongst the members of the research group and the necessary changes were made accordingly.

3. Results

Table 2 presents the Likert-scale items of the TESS questionnaire that emerged from the pilot study. The table shows how the initial questions evolved in comparison to the final questions.

One difference between the initial and final questions lies in their wording and clarity. The closing questions are more precise and specific, which avoids misunderstandings and allows for more consistent responses. For example, from “The teacher demonstrates a deep understanding of sustainability concepts and principles” to “I demonstrate a deep understanding of sustainability concepts and principles”. By shifting from a third-person perspective to the first person, the question becomes more personalized, which may encourage respondents to think more deeply about their own practices and beliefs. The initial questions reflect an external observational perspective, while the final questions switch to a first-person perspective. This change aims to make the assessment more introspective and personal. For example, from “The teacher incorporates sustainability topics into their curriculum” to “I incorporate sustainability topics into my teaching”. This change to a first-person perspective helps respondents assess their own actions and commitments more accurately.

The final questions introduce new aspects and topics that were not covered in the initial questions. This extension allows for a more comprehensive collection of relevant information. For example, from “The teacher communicates the importance of sustainability to parents and guardians” to “I have general knowledge of the 17 Sustainable Development Goals in Agenda 2030”. The final question adds a focus on personal knowledge of the Sustainable Development Goals, which was not addressed in the initial questions. A further difference is that the final questions tend to provide more detailed and specific content and help to pinpoint specific actions and behaviors rather than making broad, general

statements. For example, from “The teacher models sustainable behaviors in their daily life (e.g., recycling, conserving resources)” to “I model sustainable behaviors in my daily life (e.g., recycling, reducing my ecological footprint, reducing food waste)”. The final version offers more specific examples of sustainable behaviors so that respondents can more easily identify and assess their own practices. New questions were also added to cover aspects that were not addressed in the initial questions but are important to the aim of the study, such as “I foster a learning environment that encourages discussions about sustainability” and “I collaborate with colleagues to integrate sustainability themes across various subject fields”. These additions help to complete the picture of teaching activities related to sustainability and provide a fuller understanding of the teacher educator’s professional identity.

Table 2. TESS questionnaire Likert-scale items.

Final Instrument Items	Initial Instrument Items
As a teacher educator, I demonstrate a deep understanding of sustainability concepts and principles.	The teacher demonstrates a deep understanding of sustainability concepts and principles.
I incorporate sustainability topics into my teaching.	The teacher incorporates sustainability topics into their curriculum.
I encourage student teachers to think critically about environmental and social issues related to sustainability.	The teacher encourages students to think critically about environmental and social issues related to sustainability.
I do not promote sustainable practices within the lecture hall (e.g., waste reduction, energy conservation).	The teacher promotes sustainable practices within the classroom (e.g., waste reduction, energy conservation).
I model sustainable behaviours in my daily life (e.g., recycling, reducing my ecological footprint, reducing food waste).	The teacher models sustainable behaviours in their daily life (e.g., recycling, conserving resources).
I do not actively seek professional development opportunities related to sustainability education.	The teacher actively seeks professional development opportunities related to sustainability education.
I foster a learning environment that encourages discussions about sustainability.	The teacher fosters a classroom environment that encourages discussions about sustainability.
I collaborate with colleagues to integrate sustainability themes across various subject fields.	The teacher collaborates with colleagues to integrate sustainability themes across subjects.
I involve students in sustainability-related projects or initiatives within the community.	The teacher involves students in sustainability-related projects or initiatives within the community.
I have general knowledge of the 17 Sustainable Development Goals of Agenda 2030.	The teacher communicates the importance of sustainability to parents and guardians.
I do not actively integrate aspects of Agenda 2030 into my teaching.	
I am highly motivated to create learning environments to support Agenda 2030 for Sustainable Development.	
I collaborate with colleagues in my field at my/other institution(s) to increase sustainability themes in my teaching.	
I have developed materials to support sustainability practices.	

In summary, the final questions represent a refined and expanded version of the initial questions. They are more personalized, cover a broader range of topics and contain more detailed content. These improvements increase the clarity and relevance of the questions and lead to more meaningful and reliable responses. The iterative process of revision and refinement ensures that the questionnaire effectively fulfils the research goals and collects relevant data for the evaluation and improvement of teacher education in sustainability.

4. Discussion and Conclusions

In the Teach4Reach 2.0 project, the researchers involved decided that interviewing a large sample of people was the best way to obtain the necessary information on the professionalism of teacher educators in relation to sustainability. Both the construct of sustainability and that of professionalism raise many questions: one prevailing perspective on sustainability is that of Agenda 2030 and the Sustainable Development Goals (SDGs). As the SDGs are strongly focused on economic factors, there is a risk that this impetus will frame the outcomes of the scale under development, leaving very few likely outcomes that are not embedded in the economic framework of these goals. While the SDGs of Agenda 2030 are well-intentioned and address important global challenges, they are also rooted in an economic framework that reflects existing power structures. As a result, they may end up reinforcing the current system rather than challenging it or promoting alternatives beyond capitalism or the Anthropocene. However, the research team agreed on using the SDGs to define sustainability and measure sustainable development as a possible response to socio-cultural and environmental challenges, since Agenda 2030 was adopted by 193 countries of the UN General Assembly in 2015, including Austria and South Africa, where the current study is being conducted. As Izidinia [6] and the European Commission [5] point out, such responses have a significant impact on the professionalism of the educator's identity, which is described as a complex interaction between societal demands and challenges, and personal and collective identities [6]. The study also aligns with calls for more systemic sustainability initiatives in higher education and the 'third mission' of universities to connect their teaching and research with societal challenges [2].

To gain an overview of the topic in Austria and South Africa, the researchers were faced with the task of designing a suitable instrument, a formal, standardized questionnaire, between October 2023 and June 2024. In general, it may be best to use existing questionnaires to ensure valid and reliable data on the research topic [55,56,58]. However, even after a lengthy search, no suitable instrument was found to assess teacher educators' professional understanding of the SDGs and Agenda 2030, and the extent to which sustainability is integrated into teaching methods and practices, which led to the development of a new questionnaire to provide insights into this field of research. Concepts of ESD are often characterized by a strong tendency towards moralization and the associated individualization of the sustainability debate, implying an evaluation in terms of 'good/less' 'good/bad' [65,66]. Further, this is an approach that risks perpetuating the attitude-behavior gap, where there is agreement on the desirability of sustainable development, but actual behavioral change lags behind [67]. In the Teacher Education and Sustainability Scale (TESS), the research team took these notions into account and ensured that all important concepts, such as knowledge and understanding, transfer, creation and action in both an individual and collective sense with the idea of integrating economic, social and environmental development were covered through a structured four-stage process consisting of initial AI-generated Likert scale items (Phase 1), refinement and adaptation to the research objective within the research team (Phase 2), expert refinement (Phase 3) and pilot testing with participants from Austria and South Africa (Phase 4).

The questionnaire was structured according to Young [58], taking into account the time limit of Galesic and Bosnjak's [51], and was designed to be completed within 10 min. The first section of the TESS questionnaire consists of eight background questions that provide information on demographic factors such as age, gender, country, level of qualification, current position, specialism, context of experience, etc. The first set of 14 questions in TESS are statements based on the teacher educators' personal perceptions of their role in relation to sustainability, teacher professionalism and the preparation of future teachers. They provide information on the respondents' interest in the issue and their attitudes towards sustainability. Section three, with three open-ended questions on knowledge and awareness of the issue of sustainability, gave the researchers room to explore unexpected responses and follow up on unforeseen factors that may have been overlooked [58]. While open-ended questions allow respondents to formulate their own responses, closed-ended

questions allow respondents to specify the response categories most appropriate for their purposes. The five-point scale of Section 2 offers flexibility in that it can be used to look at all five groups in the overall sample, but can also easily combine the two agree positions and/or the two disagree positions when looking at sub-groups.

The TESS questionnaire is designed for the type of self-administered online questionnaire, also known as the ‘mail survey’. Respondents receive the online questionnaire in an email, read the accompanying instructions and complete it at a place of their choice [23]. To facilitate distribution and potentially reach a larger population [62], it will be made available on the Qualtrics system. Self-administered questionnaires should be kept as simple, short and self-explanatory as possible to ensure that instructions are short and clear, response categories are unambiguous, and the line of questioning avoids complicated skip patterns [57,62]. One of the greatest challenges for researchers is to design and develop a standardized questionnaire that meets the data needs and is designed in such a way that each respondent understands the intent of each item and is willing and able to respond [55]. The consideration that the questionnaire cannot be adapted once fieldwork has begun emphasizes the importance of carefully designing and pre-testing of the survey instrument. Therefore, a pilot test was conducted with 10 participants working in higher education in different education sectors in Austria and South Africa. The second important variable affecting the design of the questionnaire was also taken into account, namely the type of sample from which data are to be collected. Since well-designed questionnaires should provide the most complete and accurate information possible, the test phase was very helpful and led to optimization of the questionnaire. The testing process determined whether respondents understood the questions and whether they were able to complete the tasks or had the information required by the questions or prompts. The test phase also provided the most direct evidence of the validity of the questionnaire data for most items and led to a reformulation of the questions to make them more specific and relevant to the participants (see Table 2 for the Likert scale items of the TESS questionnaire resulting from the pilot study).

Additional help in designing a questionnaire came from numerous sources, besides the testing process with representatives of the participants, roughly stratified by age, gender and education. It also came from a literature review, discussions of design challenges with colleagues and experts, with the aim of changing the researchers’ preconceptions. All of this was taken into account in the questionnaire design process. To obtain general input on existing information about the topic, generative artificial intelligence (AI), such as ChatGPT, assisted in the first phase to create three draft surveys with multiple choice and short text questions. AI questionnaires overcome several limitations of traditional surveys, from low response rates and biased answers to respondents’ inability to understand complex questions and researchers’ inability accurately to gauge user sentiment. That said, the use of AI raises ethical and legal concerns, such as a lack of trust in relation to bias or privacy issues. For example, the current study recognizes the risk of potential bias if AI algorithms perpetuate or reinforce existing prejudices and create a more unequal and divided society. The introduction of a four-stage approach to instrument development was intended to compensate for this potential effect. In addition, AI does not have enough contextual information and cannot adapt in a way similar to human experts. For this reason, open questions were included in the TESS questionnaire. There is also the question of whether AI will be able to take all important aspects into account and how creative the approach to generating instrument items will be. In this respect, several versions of the questionnaire were created for the current study. AI also raises important questions about its own sustainability: its operation requires enormous amounts of energy, so it may obscure rather than solve the problem of energy consumption. On the other hand, it was possible in the current study to develop initial ideas and a framework of questions relatively quickly, whereupon the instrument was developed independently of the use of AI. The combination of traditional and AI questionnaires can provide valuable insights from the participants and collect more accurate and reliable data, while carefully considering

the risks and challenges [42]. The discourse and reflection phase in the research team during the development of the questionnaire was a crucial factor for the quality of the instrument and the guarantee of achieving the objectives of the study. In this study, the researchers tried to mitigate some of the risks associated with the use of AI by working intensively on the development of the instrument over a longer period of time, holding detailed discussions and setting up several feedback loops. In this study, AI provided initial assistance in generating some ideas, but the subsequent developmental process highlights the importance of critical engagement by humans, the application of scientific thinking and the value of expert knowledge [43]. The development of quantitative instruments should not only rely on AI; for qualitative research, a multi-perspective discussion with experts can add value to the complex field of teacher educators' professionalism and its measurement.

The TESS questionnaire is the first of its kind to explore the topic of teacher educators' professionalism and their approach to sustainable development in the context of Agenda 2030. By measuring the professionalism of teacher educators in this regard, the study aims to contribute to the creation of knowledge about sustainability and to leverage the potential influence of teacher educators on the professional practice of future teachers.

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Article

University Teaching as a Site for Professional Learning of Teacher Educators: The Role of Collaborative Inquiry and Reflection within a Professional Learning Community

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Abstract: While initial teacher education (ITE) has been acknowledged as an important process for improving the quality of education by preparing future teachers, less attention has been paid to the support of the continuous professional learning of teacher educators (TEs). This study reports on the supporting processes and tools for a collaborative inquiry-based systematic reflection of five TEs and the effects of their use in constructing professional knowledge about ITE. The reflective written reports and reflective discussions of the TEs are thematically analysed to show the focus of inquiry, the links among inquiry, reflection, and action, as well as the contributing role of collaboration within a professional learning community (PLC). The results show that the TE inquiry was a continuous process of exploring the beliefs, understandings, and participation of pre-service teachers (PSTs) during teaching; the impact of the teaching context on TE actions and decisions; and the ways in which their collaboration enhanced professional learning. The inquiry results informed the reflections and practice design of TEs. Guiding questions, sustained interactions among the PLC members, and support from a facilitator created opportunities for the collaborative construction of the professional learning of TEs. This article provides TEs or/and facilitators of PLCs in teacher education with a methodology for supporting professional knowledge through collaborative inquiry and reflection.

Keywords: teacher education; inquiry; reflection; professional learning community; higher education; collaboration

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1. Introduction

Initial teacher education (ITE) has been acknowledged as an important process for improving education through the appropriate preparation of pre-service teachers (PSTs). Teacher educators (TEs) are usually not educated themselves about how to support PST learning and how to make informed decisions about the course of their actions during ITE. However, expertise in a subject matter is not necessarily transferred to the ability to teach this knowledge and support PSTs' learning during ITE [1]. The importance of teacher educators having knowledge of pedagogy has been emphasized in prior research. TEs can gain this knowledge by engaging in professional inquiry of their own practice and their students' learning [2,3]. Based on the Cochran-Smith, Villegas, and colleagues' review [4], practitioner research and self-study conducted by teacher educators typically have two main objectives. Firstly, to examine strategies and practices and generate inputs concerning

teacher education processes in specific contexts. Secondly, to develop concepts, theories, frameworks, models, or strategies that can also be applied in international contexts.

There are several work-based constraints on TEs to conduct research and reflection on their own practice. The lack of funding [5] and structural barriers such as the large number of students and heavy workload for university teachers [6] may discourage TEs from undertaking the responsibility of PST learning by making inquiry-informed decisions about teaching in higher education. Moreover, TE obligations to comply with study regulations [7] and top-down organisational structures [8] create a mismatch between quality teaching and predetermined practices and, therefore, limit TE autonomy in decision making, resulting in reduced motivation. In addition, the lack of a cooperative culture at a university may not promote collaboration among colleagues to study their practice in higher education [9]. However, the systematic study of TEs' pedagogical practices in higher education can provide us with the means to critically understand and deliberately design ITE processes [10].

Teacher education has mainly been made accountable through external evaluation based on uniform standards rather than as an internal, contextual process in which TEs themselves initiate and perform for the purpose of improving their practice in a collaborative context [11]. In this article, our study is based on the alternative of democratic accountability and the concept of intelligent professional responsibility [12] to describe and reflect upon a process of collaborative and reflective inquiry by five TEs. We report on the construction of a committed PLC to improve teaching within ITE and focus on the processes and tools that support the development of TEs' professional learning. PLCs have been studied as a context to generate the professional knowledge of TEs [13]. Professional learning communities (PLCs) do not have a universally accepted definition. According to DuFour [14], the term "professional learning community" is commonly used, but it refers to a group of educators who regularly come together to share, improve, and assess the effectiveness of their teaching methods with the aim of enhancing student learning [15]. The key components of the PLC concept, which are also evident in our study, include all team members being dedicated to achieving high academic objectives, fostering a culture of collaboration and problem solving, prioritizing student learning, continuously evaluating teaching and learning and supporting each other's reflection, utilizing the results to enhance student learning, and promoting continuous learning and growth among professionals [13,14,16,17].

When collaboration among academic staff has been studied, many benefits have been presented, such as the creation of new knowledge, the construction of a "common language" for learning, staff well-being in the workplace [5,9,18,19], as well as the construction of professional learning. Still, studies regarding PLCs mainly report on their evolution, their perceived outcomes, and the factors that affect these outcomes [18]. Some other studies focus on exploring participant satisfaction based on their engagement in a PLC [20]. Even if exploration of TE actions and individual or collaborative reflections are mentioned in studies of PLCs, only in specific studies have we found detailed descriptions of what this collaboration entailed and specifically how inquiry and reflection within this collaboration assisted in the construction of professional knowledge [9,21].

Overall, reflection in teacher education has been discussed as a transformative and social process [22], including the act of critically examining what you are doing, why you decided to do it, and what its effects have been [23]. Increasing one's awareness of the factors and assumptions that affect and guide teaching [24] and bringing unconscious aspects of experience to conscious awareness [25] is part of a deliberate and conscientious process that employs a person's cognitive, emotional, and somatic capacities to mindfully contemplate on past, present, or future (intended or planned) actions in order to learn, better understand, and potentially improve future actions [26]. When reflective practices are used in higher education, research reports on benefits for both TEs (i.e., self-knowledge, awareness of theories and practice, and improvement in teaching) and PSTs (learning and critical thinking) [5,7]. However, research rarely describes the content, reasons, processes,

and tools for reflection as well as its effects in transforming teaching [27]. Reflective records are usually described as open-ended and self-directed procedures [28], or as having some basic axes for reflection [29–31]. Therefore, studies do not always provide us with a set of specific tools for enhancing reflection, or with information about the content, structure, and frequency of reflective records produced by TEs.

Reflection is also not clearly or necessarily linked to a process of inquiry by TEs. Thus, in some studies, inquiry is employed by those who facilitate TE professional learning to explore the processes and outcomes of their learning within a PLC [13]. When TEs themselves are involved in the inquiry of their own practice, it is not always shown how inquiry specifically facilitates TE reflection and subsequent action. Last, the results of keeping reflective records of teaching are not usually connected to results regarding PST learning [29,30,32] or to the ways they contribute to the gradual transformation of teaching practice. We, therefore, require more detailed accounts of the relationships among TE inquiry, reflection, and action and the processes by which these facilitate professional learning in a collaborative context.

For the above reasons, this study aims to examine how TEs can learn from a collaborative inquiry-based reflection of their practice.

Specifically, our research questions are:

1. What can the focus of TE inquiry be and how can inquiry be related to TE reflection and action in ITE?
2. How can TE inquiry, reflection and collaboration within a PLC facilitate the construction of professional knowledge?

2. Materials and Methods

A group of five experienced TEs working in four different Early Childhood Teacher Education (ECTE) university departments initially came together as participants in a funded educational programme aiming at disseminating scientific knowledge about children's participation in decision-making processes during ITE (VOICE program). The TEs knew each other well from previous participation in a national teaching practice network of ECTE departments and conferences. The TEs had varying years of teaching experience at the university. The first author who acted as a facilitator of the PLC had 28 years of experience, the next three authors had 15–19 years of experience, while the last one had 7 years of experience. All the TEs were familiar with teaching about participatory practices in early childhood education (ECE), but the first author also had research and practical experience in facilitating teachers' understanding and practice regarding children's participation in ECE. As part of the funded programme, the TEs were responsible for testing the educational materials created to help PSTs reflect on and reconsider their beliefs about children's abilities to participate in decision-making processes during their education. The materials were designed to help PSTs understand the importance and the requirements for children's participation in decision making as well as familiarise them with various strategies that can enhance children's participation in education. The first author as a facilitator of the group organised the structure of the reflective records, raised questions for further reflection, coordinated discussions, and promoted communication and dialogue among the members of the PLC.

The facilitator introduced a process for the TEs to maintain a semi-structured diary after each lesson. In this diary, they were required to record their teaching aims, the educational material used during the lesson, comments on the effectiveness of the materials, general feedback on the overall teaching intervention, and suggestions for future improvement. These diary entries were created based on TE inquiry; that is, based on their observations of PST participation in the lessons, recordings of PST misunderstandings of theories or/and examples of children's participation, and PST difficulties in transforming their beliefs and practices. The TEs evaluated the achievement of the lesson goals based on the way PSTs, either individually or working in groups, responded to questions; analysed examples from practice; or made suggestions to enhance participatory practices. The

inquiry results assisted the TEs in detecting issues that required consideration, understanding what needed to change, and designing alternative methods of action. Diaries were uploaded by all to a shared folder to provide access to each other’s thinking and practice. The TEs continued to collaborate as a group after the end of the semester. Their aim was to support each other’s professional learning and practice as TEs for another semester.

For the purposes of this study, three reflective written accounts of teaching produced at different times during an academic year were analysed. All reflective reports were guided by questions prepared by the facilitator to support focused reflection and evidence-based construction of professional knowledge. The type of reflective questions was based on previous research that showed that when the questions foster participants’ reasoning, making connections, evaluations and generalisations, the depth of reflection is enhanced [33–36]. The first reflective account (Table 1) was written individually at the end of the first semester as a report that summarised information collected in diaries after each lesson and provided evidence about the relationships among TE inquiry, reflection, and action.

Table 1. Aims and guiding questions for writing the first reflective report.

Guiding Questions for the First Reflective Account	
Aims	Questions
Description	What kind of materials did you use?/How are the materials connected to the content of your course?
Inquiry-based evaluation and reasoning (interaction with materials and processes)	How did the materials and the related activities foster PST awareness of participatory practices in education?
Relating inquiry, reflection, and action (PST understandings and TE actions)	What issues did you detect regarding PST responses/reactions/readiness in relation to the aims of your lessons? What kind of PST needs did you observe while working with the materials? What did they find difficult to understand? What made an impression on them? What did you need to explain further? What did you insist on? What did you need to return to and re-examine? Was there something else that you observed, realised, or made an impression on you?
Relating inquiry and reflection (PST progress)	Did you notice the influence of your teaching in the final written examination of your PSTs?
Description	Overall, what were the positive aspects of the educational material?
Description	What actions did you take to improve the educational material?

The second reflective account (Table 2) was written at the end of the second semester, aiming to enhance the production of an evidence-based construction of the gained professional knowledge.

Table 2. Aims and guiding questions for writing the second reflective report.

Guiding Questions for the Second Reflective Account	
Aims	Questions
Generating the gained knowledge	What did you detect as issues that concerned you during the teaching of children’s participation to PSTs?
Providing spaces for in-depth reflection	Why did these issues concern you?
	Were these issues common for all your students? Were there dominant trends or were there differentiations regarding their beliefs and understandings?
	Were you aware of the issues beforehand and you just confirmed them?
Detecting relationships between reflection and action	Are these issues related to the fact that you taught children’s participation for the first time?
	What did these issues make you think about or reflect?
	Did you face any dilemmas about what you needed to do in your teaching? How did you confront them?
Proceeding to theorising knowledge	How did your reflection influence your actions?
	Did you change something in relation to how you have designed/scheduled it? What and why did you change?
	Do you think that your teaching was consistent with the enhancement of participatory practices? Taking into account Shier’s model (2001) of participation, what level of participation did you manage to achieve?

The third reflective account (Table 3) was created after each member of the PLC read the reflective accounts of the other PLC members at the end of the second semester to detect commonalities or differences in the gained professional knowledge.

Table 3. Aims and guiding questions for writing the third reflective report.

Guiding Questions for the Third Reflective Account	
Aims	Questions
Detecting commonalities or differences in other reflective accounts proceeding to an account of collective knowledge	Which of the things you wrote about in your second reflective report do you find similar or different to the other reflective reports regarding (a) teaching children’s participation to teachers in training, (b) the ways we learn as TEs through inquiry and reflection on our teaching, and (c) how much we can foster participatory practices in higher education and why we should foster participatory practices in HE.

After the third reflective report was produced, a two-hour reflective discussion was held among the members of the PLC to share their thoughts and understandings of the collaborative production of professional knowledge (Table 4). The facilitator initially guided the discussion based on the questions shown in Table 4 and co-ordinated the exchange of opinions and experience between the group members.

Table 4. Aims and guiding questions for the reflective discussion.

Reflective Discussion	
Aims	Questions
Reflecting upon the processes of a collaborative creation of professional knowledge	What did you gain by reading each other’s reflective written accounts? How did the reading of the others’ reflective reports function as a process for your learning? (the discussion developed after these initial questions based on exploratory dialogue among the members of the PLC).

Thematic analysis of these reflective reports and discussions was employed based on an inductive process of gradual data reduction and on a continuous comparison of the TE responses to the reflective questions in their reports and discussion [37]. Specifically, each response to an open-ended question was coded firstly to describe the various meanings entailed in the text of the report or the transcript of the discussion. A comparison of these codes and an exploration of their similarity produced conceptual categories for each question analysed. For example, in their reports TEs referred to the reasons that enabled or hindered PST participation in their courses. The coding of the references “big number of PSTs in the course” and “inappropriate classroom space” formed the category “structural constraints”. Likewise, other categories emerged from the coding of TE reports such as “TE teaching methods and processes”, “PST expectations from teaching”, “PST resistance to engage in designed activities”, and “institutional context”. All these categories informed us about the various contextual factors that enabled or hindered PST participation in the course, generating a further abstraction under the theme “the role of context in shaping possibilities and constraints to enhance PST participation during teaching”. The categories and themes were cross-checked by all researchers to achieve trustworthiness and relevance. Disagreements, while rare, were discussed until a 100% agreement was reached. The themes that emerged from the analysis were the following: (a) supporting relations among TE inquiry, reflection, and action as a continuing process; (b) the role of context in shaping possibilities and constraints to enhance PST participation during teaching; (c) teaching as a dialogical and collaborative process based on inquiry and reflection; and (d) collaborative construction of professional learning.

3. Results

3.1. The Focus of TE Inquiry and the Relationship between Inquiry, Reflection, and Action in ITE

The inquiry of teaching had varying foci during TE practice: inquiry into PSTs’ prior beliefs about participation, inquiry into PSTs’ interactions with the materials and the teaching process (i.e., PST reactions, questions, and understandings during teaching), inquiry into the progress observed in PSTs’ understandings, and inquiry into PSTs’ learning outcomes. However, in all cases of inquiry, the results of each inquiry were closely linked to TE reflections and design or re-design of their practice as we show below.

Initially, the inquiry of the prior beliefs of PSTs was explored through the common use of a questionnaire with open-ended questions at the beginning of the semester. These questions asked PSTs to describe the meaning and necessity of children’s participation, give examples of children’s participation, and present their knowledge about the strategies for enhancing it in education. The analysis of PST responses played a crucial role in the TEs achieving an awareness of the starting point of the intervention and, thus, what PSTs thought about and knew about children’s participation. PSTs’ beliefs were characterised by all TEs as having a general, abstract, simplistic, and stereotypical understanding of children’s participation. This awareness guided TEs in reflection about how to foster the deconstruction of stereotypical beliefs, facilitate their reconsideration by PSTs, and assist in their in-depth understanding of children’s participation. These reflective questions based on the results of the inquiry led to the design of TE goals of action and the development of appropriate activities. For example, the TEs utilised the initial PST responses as examples in

the lesson to create opportunities to reflect and question their prior beliefs. They also used examples from practice that PSTs examined to detect the level of children's participation according to Shier's model of participation [38]. In this way, both personal beliefs and theoretical models were employed to assist PSTs in analysing situations, detecting the level of participation, and providing alternatives for teacher actions.

The inquiry of PST interactions with materials and teaching processes focused on PST difficulties in understanding and applying theories of participation as well as on their misconceptions. The inquiry also focused on the restrictions and pitfalls of the teaching materials in relation to facilitating the successful understanding of children's participation by PSTs. Indicative reflective questions developed from the inquiry results were "how can I make easier PSTs' understanding of children's participation? What needs to be altered in the teaching process to give more opportunities to PSTs to develop their understanding of the concepts? How can I enrich/change the materials and towards which direction? How can I promote a dialogue to assist PSTs to express and clarify their opinions?". After this reflection, some of the TEs related the notion of children's participation to what PSTs already knew or were familiar with to provide opportunities for them to cooperate in groups and present their different or contrasting views and ideas as a source for further dialogue, to enrich the materials with more examples and audio-visual resources for further analysis, and to give more time than scheduled to the theme of children's participation and insist in achieving an understanding with PSTs. Reading each other's diary entries was also mentioned as a resource for making decisions regarding the methods for confronting similar difficulties and re-organising the materials to be used during teaching.

The inquiry of PST progress involved continuous observations of changes observed in PST thinking, abilities, and practice. For example, the TEs gradually observed the ability of PSTs to refer to the theoretical context when reasoning their ideas, to doubt their initial beliefs, to proceed to an emphasis on looking at children's perspectives, to recognise the need to decrease teacher guidance, and to reflect upon the ways they could support children's participation. These findings informed further actions related to the distribution of time regarding the course content and the detection of issues that they still needed to insist on based on a formative evaluation of their teaching practice.

Last, the inquiry of the teaching intervention outcomes was based on asking PSTs to respond again to the questions posed at the beginning of the semester regarding the meaning, necessity, and strategies for children's participation. All the TEs spotted changes as well as stability in PST beliefs by comparing their responses at the beginning and end of the semester. At the same time, the success rate of the final evaluation exams was considered by one TE as an indication of added value to the teaching intervention. Considering these outcomes, the TEs proposed further changes to the educational materials and the teaching processes they employed.

3.2. Constructing Professional Knowledge Based on Inquiry, Reflection, and Collaboration

TEs' professional learning was affected by the specific contexts of their teaching. The construction of professional knowledge was based on a dialogue among TEs and PSTs informed by inquiry and reflective processes as well as on a collaboration among the members of the PLC.

3.2.1. The Role of Context in Shaping TE Actions

As explained above, all the TEs recorded PST interactions with the teaching process and the materials to gain knowledge of their understandings, misconceptions, or difficulties in designing their practice informed by inquiry and reflection. However, the focused reflection on the issue of whether or not the TEs encouraged PST participation during teaching, and in what ways, was dealt with in the second reflective report. The use of Shier's [38] model of participation provided an opportunity for an in-depth reflection on teaching as a participatory practice. Specifically, reflection referred to whether the TEs observed a consistency in the content of their teaching that focused on how to enhance

participation in education and the opportunities they provided to PSTs to participate actively in shaping the course of teaching.

All the TEs described in their reflective reports that there were several ways in which they fostered PST participation. For example, they encouraged the expression of PST beliefs, opinions, and suggestions (pedagogy of listening) and utilised them systematically for further exploratory discussion and reflection. They used multiple tools to encourage PSTs' expression of opinions and suggestions, such as written texts in open questions, online learning games (i.e., Kahoot), and discussions in groups. One TE explained that he informed the PSTs about the content and ways of working with the materials at the beginning of the course and discussed with them their suggestions for the evaluation methods of the course, providing them with the possibility to select one of the evaluation methods.

At the same time, the TEs were aware that they were not able to foster PST participation in the decision-making processes in teaching since although they tried to explore and adjust teaching to their difficulties and needs, the final teaching decisions were made by them. The TEs were critical not only of their practice but also of several contextual factors that they perceived as constraints for supporting higher levels of PST participation. These constraints regarded PST expectations of the role of TEs and their own role during teaching. Some of the PSTs expressed a desire for clear-cut answers, guidelines, and bodies of knowledge that they could easily understand to pass the course. This desire created a relevant constraint for the TEs as it demonstrated the resistance of PSTs to engage in activities designed to enhance their critical thinking or to read and discuss supplementary materials. The TEs also mentioned difficulties faced by some of the PSTs, such as their inability to express their opinions in a clear and concise manner. In addition, since PSTs had limited experience in kindergarten classrooms, a difficulty was noted both in extracting and processing their own experiences of classrooms and in reasoning their ideas and proposals for alternative actions.

The TEs also recognised other contextual factors that affected PST participation. These were the large number of PSTs on the course (from 70 to 150 PSTs), together with the fact that this large group of PSTs displayed different levels of knowledge and abilities. Thus, the TEs felt that they should encourage different levels of PST participation simultaneously to respond to their varying levels of knowledge and abilities; a fact that they found difficult due to the number of PSTs. In addition, the organisation of classroom space (i.e., amphitheatre) did not easily facilitate group work and discussions among the PSTs. Last, it was communicated that the context of university teaching did not encourage a higher level of PST participation in decision-making processes because the TEs were required to submit and upload a detailed course outline before the start of the course in which the aims, content, teaching, and evaluation methods, as well as the learning outcomes, were fully described.

3.2.2. Teaching as a Dialogical and Collaborative Process Based on Inquiry and Reflection

The written accounts of the TEs based on the professional knowledge they gained about how to support PST learning highlighted the inquiry of practice and relevant reflection as necessary preconditions to shape the teaching process. Specifically, making connections among the inquiry of PST understandings as well as participation and TE actions verified inquiry as a process informing reflection and teaching in ITE. The following examples of these connections were mentioned by the TEs: "I utilised PST's feedback to modify my lessons and encourage their analytical and critical thinking" (TE1); "Exploration of PSTs' beliefs and understandings made me give attention to and stress things that I would ordinarily take for granted" (TE4).

Inquiry and reflection were also important for the TEs to construct professional learning because they facilitated their awareness and conscientious action, as shown in the following excerpts from the reflective reports: "I became aware that PSTs' difficulties and misconceptions assisted me in understanding better what I teach and how" (TE3), "I realised the need for teaching tools that facilitate PSTs' voices and the need for less 'silent' materials that do not encourage participation" (TE4), "I encouraged PSTs to talk about

emotions that the discussion of their beliefs created to them" (TE5), and "I realised that it is important to raise more questions than give clear cut answers" (TE3).

A common understanding that developed among the TEs was the approach of teaching in ITE as a dialogical and collaborative process co-shaped with the PSTs. This understanding skipped the distinction between teacher-centred and student-centred orientations of teaching in higher education and emphasised the co-construction of the teaching process. One of the TEs summarised this point well in her reflective report: "Teaching is a kind of conversation with our students, a co-shaping process with our students based on a continuous exploration and evaluation of this process that helped me become more inventive in my teaching" (TE4).

3.2.3. Collaborative Construction of Professional Learning

The collaborative construction of professional knowledge was achieved through reading each other's reflective accounts and taking part in joint discussions during meetings. Four processes were detected by all the TEs that enhanced the development of their professional learning within the PLC. Finding commonalities in TE observations, reflective writings, understandings, and actions facilitated the production of professional knowledge within the PLC. Such commonalities pertained to PST misconceptions, TE practices that re-organised the time and emphasis given during their teaching according to PST difficulties, and contextual restrictions they faced in their efforts to enhance PST participation. In this way, professional knowledge was constructed and verified by a comparative process of written or oral reflective records produced by the TEs. The second process detected by the members of the PLC to enhance their professional knowledge was the fact that sharing each other's perspectives assisted them in raising new questions or acquiring new lenses to view their own practice. Again, this learning occurred based on the comparison of one's own thinking and practice to the other members' thinking and practice. The third process of constructing professional knowledge was based on learning new things by sharing ideas and practices during discussions or reading alternative proposals of action in the diaries and reflective records. Last, in some cases, the TEs also acted as "critical friends", posing questions to one another after reading the reflective reports (i.e., "do you think that PSTs' previous experience of online learning during COVID had a share of responsibility for their passivity and lack of eagerness to participate in the discussions?" (TE2)).

Therefore, the uploading of diaries and reflective reports in a shared folder and the reflective discussions in meetings facilitated access to each member's thinking and practice and allowed for the exchange of ideas and awareness of one's teaching profile. As the TEs indicatively explained: "The uploading of my colleagues' diaries and reflective reports in a common folder in which I could look for their observations, remarks and proposals was important. We exchanged ideas, utilised ideas from others, shared experiences regarding our teaching and our concerns" (TE 2). "I learnt new things by reading each other's reports and made a step further at looking into my teaching in depth" (TE3).

The active involvement of all members in shaping the course of the PLC, a climate of respect, and lack of competition among the PLC members were important to avoid hierarchical relationships among them, as stated in the reflective discussion: "It was important that we gradually built a framework and criteria for what is important to teach and how and that these criteria were built through collaboration" (TE2). "It was important for our collaboration the fact that we were all open or well-intentioned to work on this matter, without competition, without saying who did it better or worse and so on. It was the basic condition for us to be able to talk meaningfully with respect to the different point of view that was being heard and to move forward" (TE3).

In addition, guiding questions for the diaries and reflective reports were found valuable for making professional knowledge conscientious and concrete. As one TE explained, "guiding questions provoked an internal monologue to bring knowledge to the surface. At the same time, comparing my perspective to the others' experiences and remarks provided me with new lenses to look back at my teaching experience and bring in new perspec-

tives" (TE4). And another TE explained during the reflective discussion: "The questions assisted us to examine in-depth our pedagogical practices and to foster our development as researchers, making the knowledge we gained as TEs more concrete" (TE5).

4. Discussion

This study contributes to extending our knowledge of methodological tools and processes by which TEs construct their professional learning through the inquiry of their teaching practice, their reflections based on the results of the inquiry of their practice, informed design of teaching, and collaboration among them in a PLC. While there are studies which refer to collaboration and reflection processes among TEs, many of them focus on an evaluation of the learning outcomes of PLCs rather than a detailed account of the processes of learning within the PLC [11,13]. At the same time, while the inquiry and engagement of TEs in research (i.e., exploration of PST beliefs and learning processes) are often mentioned as forwarding TE professional learning within PLCs [13], we do not have detailed information about the kinds of inquiry TEs employ and the ways in which inquiry informs their reflection and action. Previous studies have reported that PST feedback contributes to understanding the impact and efficiency of our teaching as TEs [5], stressing the role of inquiry in evaluating the outcomes of teaching. In our study, the inquiry into practice was expanded to include a continuing exploration process: inquiry of PST beliefs at the beginning of the course; PST interactions with the materials and the teaching processes; PST progress as shown in changes in their beliefs, understandings, and abilities; and, finally, PST learning outcomes. Thus, the inquiry into practice formed a continuous process for TEs to construct their knowledge based on the exploration of teaching contexts, processes, progress, and outcomes. The results of the inquiry facilitated focused reflections from the TEs and informed their decisions about the content and processes of teaching in ITE, as shown in this study's results. By showing the different foci of inquiry and how they facilitated reflection and action, this study highlights methods that TEs can adopt to foster their professional learning. In addition, by showing the interconnectedness among the methods of inquiry, reflection, and action of TEs, we provide examples for facilitators of PLCs about the use of inquiry and reflection in enhancing the development of conscientious and robust professional knowledge.

Another point to highlight is that the TEs gained professional knowledge by conducting a reflective inquiry of the processes by which they gained this professional knowledge that guided their practice. The use of systematic inquiry and reflection upon their practice allowed for the production of professional knowledge about goals, priorities, and ways of teaching. Most importantly, it allowed learning to teach to occur as a co-constructing process among TEs and PSTs whose understandings and actions are in a continuous dialogue since they inform each other in making decisions about teaching. Additionally, this study confirmed curricular structures and organisational conditions that may bring about constraints in the autonomy and flexibility of TEs in implementing teaching based on inquiry and reflection [6–8].

Learning from each other in a PLC was based on sharing and triangulating experiences [6] and acquiring different perspectives on the issues of concern [39]. The results of this study show that a PLC can contribute to TE learning by offering structure, content, interactions, and collaboration among its members [40]. Specifically, collaboration among the TEs within the PLC entailed finding commonalities among inquiry results and practices, raising new questions based on the others' perspectives, learning new things, and receiving feedback from the members of the PLC. PLC as a context for collaborative professional learning functioned as a "critical friend" to TE professional knowledge development [39,41]. However, although the development of professional knowledge within a PLC required a common interest and exchange of experience among its members, this study showed that this was not adequate. The facilitation of inquiry and reflection as well as coordination of systematic interactions among the members of the PLC were important to articulate and make concrete the professional knowledge gained from participating in a PLC. Thus,

the facilitator's preparation of tools for inquiry used by all members of the PLC (i.e., the questionnaire used at the beginning and end of the course as a way to plan teaching and also reflect upon its effects) and the provision of guiding questions to enhance TE reflection and structure the writing of their reflective reports were important actions to fostering professional knowledge creation based on inquiry and reflection. In addition, the facilitator ensured sustained interactions among the members of the PLC and initiated a constant comparative method of reading each other's reflective reports and sharing understandings to support the collaborative construction of professional knowledge. Finally, ensuring the active role of the PLC members in shaping the course of the PLC and working together in a climate of acceptance and respect was also important in the development of TE professional knowledge.

In this study, five TEs from different universities came together initially by participating in a funded program that involved them in exploring the use of specific materials to enhance PSTs' knowledge and understanding of children's participation in education. As described in this article, this collaboration proceeded based on a common interest to learn together based on inquiry and reflection upon our practice. However, it is important to ask whether the improvement in teaching in teacher education is related only to TE initiatives to improve teaching or whether support of a collaborative culture and practice from the institution is also required. Cooperative and collegial relationships assist in developing communities of practice [9] but are not adequate, as there are several structural and organisational barriers to TEs [5–7]. TEs require a proactive stance to improve teacher education processes rather than only a reactive stance to external accountability processes. Therefore, democratic accountability and intelligent professional responsibility [12] can play significant roles in improving teaching, as this study shows, without ignoring the demand of institutional support for improving TEs for the benefit of PST learning and, finally, for the benefit of the pupils themselves and society.

This study has some limitations that could impact the depth of the insights gained. One limitation of this study was the lack of a longitudinal component to track the impact of collaborative reflection on TE pedagogical thinking and practice over time. In addition, this study highlights the need for more extensive evidence on the impact of TE collaborative inquiry and reflection on PST learning outcomes. It is crucial to acknowledge that this research might not accurately represent the experiences or viewpoints of PSTs, since it did not incorporate their opinions. Moreover, external factors such as educational policies and student demographics could have influenced the outcomes, but they were not explored in depth in this study. Additionally, there were constraints originating from the institutional context, such as time, audience, and scope, which limited the participants' actions. Collaborative inquiry and reflection were not part of the institutional working culture, which further limited this study.

This study analysed the results of a specific process. Further research could validate the tools and processes of supporting the professional learning of TEs within PLCs based on larger groups of university teachers. However, other strategies such as verbal interviews and extensive discussions, peer observations, etc., may suit some TEs more than the proposed process. Thus, future research could also explore how to encourage and support inquiry, reflection, and collaboration based on technologies, like electronic portfolios and weblogs, since they might influence the nature and outcomes of reflective practices. Additionally, comparative analyses of the formation of teaching styles and the challenges faced by TEs in different global contexts, as well as longitudinal studies tracking the experiences of academics and their development over time are suggested. Collaborative inquiry and reflection could also be used to explore ways in which TEs can creatively respond to institutional demands and the impact of different support mechanisms. These suggestions aim to expand our understanding of the formation of learning interactions in higher education, the effect of external stressors on TEs, and the support mechanisms needed during times of social turmoil.

Future studies should also consider the perspectives of PSTs with diverse backgrounds to understand their thinking, challenges, and the outcomes of reflective interactions in different teaching methods, including lectures, interactive sessions, and online resources. Moreover, future research could focus on innovative teaching models that integrate theory and practice to promote reflective teaching practices and support the development of critical thinking in TEs and PSTs. Finally, future research could explore the scalability of the proposed collaborative inquiry and reflection process to determine its feasibility for implementation in different disciplines and courses of study.

5. Conclusions

This research inquiry explores the practices and experiences of TEs and is motivated by two primary research questions: The first research question focused on the spectrum of TE inquiry and its impact on TE professional learning within a community of practice. The focus of inquiry for TEs can be on exploring the beliefs, understandings, and participation of pre-service teachers during teaching; the impact of the teaching context on TEs' actions and decisions; and the ways in which collaboration enhances professional learning. The inquiry results can facilitate reflection and action in ITE by informing the reflections and practice design of TEs.

The second research question asked how TEs constructed their professional knowledge. TEs' professional knowledge was constructed based on inquiry and reflection upon their teaching practice and collaboration among them. This study found that when collaborative inquiry-based reflection is facilitated to be a systematic and continuous process, it can support the professional learning of teacher educators. This study also highlights the importance of creating a supportive culture of collaboration and reflection within a professional learning community for teacher educators.

In summary, the research presents a systematic approach to enhancing professional expertise via collaborative investigation and introspection. This approach might be valuable for those involved in educating becoming-teachers and overseeing communities focused on professional development in teacher education. The study's results highlight the need for institutional backing to enhance TE professional learning processes and emphasise the significance of fostering a culture of cooperation and reflection among TEs. Rather than only responding to external accountability procedures, this research recommends that TEs actively work to improve teacher education processes. Improving teaching methods in teacher education may be achieved via the application of intelligent professional responsibility and democratic accountability, according to this study.

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Article

'If You Do Not Write, You Dry Up': Tensions in Teacher Educator Research and Academic Writing

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Abstract: Teacher educators struggle to balance heavy teaching loads, research, writing, and institutional service. This qualitative study uses institutional ethnography to question how college leadership understand the significance of academic scholarship in the professional lives of college-based teacher educators in Israel. Data from interviews with eight college position holders shed light on the working lives of college-based teacher educators and how they are positioned as researcher-writers in an institution where scholarship expectations are blurry. Findings reveal three themes: the importance of academic activity for institutional prosperity, the difficulties in academic scholarship experienced by teacher educators, and the support the institution provides to encourage and maintain academic activity. The discussion contemplates the tensions between institutional and individual teacher educator advancement. The complexity of the institutional structure deserves attention to achieve institutional aims and attend to individual faculty's professional needs and desires. The implications of this study are significant for leadership in teacher education and higher education around the world, prompting leaders to rethink ways of supporting faculty involved in research and writing alongside teaching and additional roles. Balancing conflicting roles, providing clear expectations, and maintaining an ongoing dialogue between teacher educators and leadership regarding professional development needs can lead to institutional prosperity alongside individual professional advancement.

Keywords: teacher educators; academic writing; academic writing communities; institutional ethnography; leadership; professional development

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1. Introduction

It is difficult to define the role of teacher educators in general or even in a specific institution [1]. The work of teacher educators, in which teaching, institutional service, and research are interwoven, is recognised as onerous and complicated in many countries [2–5]. Teacher educators are influenced by and influence the institutional context in which they work [6]. To appreciate teacher education frameworks, we must consider the particular context's historical, cultural, and political characteristics [7] and view them in light of global changes in higher education.

The country and the specific institution in which teacher educators work determine the professional expectations placed on them in teaching and research [8]. Since the 1980s, when Israeli colleges of teacher education were recognised as academic institutions, the emphasis on research and academic writing for publication has escalated [9]. This academisation process aimed to improve instruction in schools and strengthen the status of the teaching profession [10]. The transition into scholarly activity was challenging for many teacher educators, especially those who were previously teachers in schools [11].

At the beginning of the 2022–2023 academic year, Nikki, a teacher educator, was struggling to find time to engage in academic writing in her professional life. Aware that

many of her colleagues were “drying up”, disconnecting from research and writing for publication, she responded to those challenges faced by teacher educators by initiating a grassroots academic writing community for her peers in an academic college of education in Israel. The community, called Etnachta, which means lull or break in Aramaic, provides a supportive social space for teacher educators to engage in research and writing. The community’s aim is to develop a writing routine that enables teacher educators to pause, preserve time for scholarly activity, and engage in collegial conversations about writing [12].

In this study, following the initiation of the writing community, we explore how eight members of institutional leadership in that college perceive the significance of research, writing, and publication by teacher educators and how they view the academic and professional development needs of teacher educators.

1.1. Teacher Education in Israel

Both colleges of education and universities award undergraduate and postgraduate teacher education qualifications in Israel. In 2018, colleges educated 81 per cent of the country’s teachers [13]. Like in many other countries, teacher education in Israel is very different in colleges of education than in universities [14], and there are consequential distinctions in the academic cultures of the various institutions [15,16].

Since the 1980s, following a Council for Higher Education decision, Israeli colleges were required to begin a process of academisation leading to permission to grant higher degrees and recognition as official academic institutions [10]. Initially, teacher educators’ roles focused on teaching and supervising pre-service teachers and increasingly included research. Teacher educators in colleges of education have traditionally held heavy teaching loads without time allotted for research and writing [17]. Today, teacher educators in colleges teach double the hours of university-based lecturers [18], and research and writing are not included in their employment schemes [19]. Although the policy requires teacher educators in Israel to hold a PhD and publish research for promotion [8], post-doctoral writing and professional development are not compulsory in colleges of education. Guberman and Mcdossi [9] discuss the conflicting nature of professional priorities delineated by institutional leadership in Israeli colleges of education, where teaching responsibilities and professional development activities are often incompatible with promotion requirements based on scholarly publication. Like in universities, college-based teacher educators can gain academic promotion with an increase in salary if they publish papers in recognised academic journals [9]. In Israeli colleges, many teacher educators choose not to work towards publication, even though it is a significant requirement for promotion [14]. Research activity in colleges of education is, therefore, still comparatively low and is often limited to practitioner studies [8].

1.2. Challenges for Teacher Educator Writers

Academic writing in all fields is considered laborious and stressful and requires a great deal of time [20]. The rough peer-review process causes many researchers to feel vulnerable [21]. The challenges of academic writing for teacher educators are not unique to Israel. Loughran [22] identifies the blurriness surrounding the expectations of teacher educators regarding research and writing, “expectations that could be described as ranging across a continuum from the implicit to explicit and hence not easily recognized nor grasped by beginning teacher educators” (p. 277). Malm [23], writing in Sweden, draws attention to the tension between the pressure on teacher educators to write and publish and the burden of teaching and mentoring. Similarly, Knowles et al. [24] in Australia and North America argue that finding time for writing is difficult for teacher educators, and Smith and Flores [25], located in Norway and Portugal, identify “the tensions between teaching and research in relation to time, competence, institutional and external demands, and . . . self fulfillment” (p. 429). In the UK, almost all of the participants in a study by Nicholson and Lander [26] claimed that they did not have time for research, citing the writing element

as the hardest. Turner and Garvis [5] researched the working lives of Australian teacher educators and found that

The most frequently reported stressor for teacher educators was workload intensification, followed by university policy, processes, and procedures. Factors found to decrease teacher educator wellbeing included: job insecurity, excessive workload, supporting student wellbeing, perceived lack of institutional support, and teacher-researcher role conflict.

(p. 12)

1.3. Institutional Ethnography

In recent years, institutional ethnography has increasingly been used in educational research [27]. The institutional ethnographer is interested in how organisational mechanisms regulate people's lives and experiences in a particular context [28]. Research begins with the experiences and viewpoints of people "whose everyday activities are in some way hooked into, shaped by, and constituent of the institutional relations under exploration" [29] (p. 18). Often, a researcher is familiar with an organisation's "administrative or professional practices and sets about studying how they are carried out, how they are discursively shaped, and how they organize other settings" [29] (p. 22).

There are different ways of conceptualising institutional ethnography. According to Kearney et al. [30], it is a "critical theory/methodology, with a particular focus on people's everyday lives and how their lives are organized and coordinated by institutional forces" (p. 17). Walby [28], however, argues that it is "neither a theory nor a methodological technique per se; it is more like an agenda for inquiry that is guided by particular theoretical and methodological commitments" (p. 141).

Institutional ethnography usually focuses on work procedures and how they are regulated and integrated [31]. Work is usually defined as paid employment [32], but institutional ethnography, originally interested in the work women do in unpaid contexts, proposes a definition of work which incorporates "anything or everything people do that is intended, involves time and effort, and is done in a particular time and place and under local conditions" [32] (p. 10). All kinds of work in and around the organisation are explored, leading to an understanding of the relative value attached to different activities in the institution [33]. The employment structure and the wages earned reflect the status of the institution and the individual employee. Devault [31] argues that "institutional ideologies typically acknowledge some kinds of work and not others" (p. 294).

A critical examination of the social relations central to an institutional organisation can uncover and clarify the position of various stakeholders [30]. According to Smith [33], institutional ethnography's "critique of objectified knowledge and its use in the management of institutional life suggests that, frequently, and in systematic ways, the categories and conceptual frameworks of administration are inattentive to the actual circumstances of the diverse lives people live" (p. 33). Taber [34] argues that institutional ethnography reveals an organisation's "ruling relations", allowing the researcher to "begin to interrogate and challenge them" (p. 20). Our choice of institutional ethnography in this study is grounded in our interest in the working lives of teacher educators in an organisational setting and the "opportunities for intervention and change" that it presents [35] (p. 11). That interest led us to the research question leading this inquiry: how do college leadership responsible for the professional development and promotion in the institution understand the significance of research, writing, and publication in the professional lives of college-based teacher educators?

2. Materials and Methods

This is a qualitative study exploring the institutional standpoints and processes in one college of education in Israel. We see the value in this kind of research when it reaches our readers and joins "clusters of related studies, and parallels in studies of different institutional complexes, [which] reveal the meta-discourses that reach across arenas and so-

cieties . . . Each investigation takes us a bit farther and opens new avenues for inquiry” [31] (p. 296). This study seeks to explore the professional lives of teacher educators “from the perspectives of the insiders who work, teach, study, research, guide and lead in the fast-changing contexts of that field” [36] (p. 8). Institutional ethnography, which can be conceptualised by researchers in many ways, provides us with different lenses, enabling us to scrutinise the work of individuals as they are influenced by an organisational setting.

2.1. Participants

This study involved eight senior employees holding or previously holding leadership positions in a college of education in Israel. Leadership roles in the institution are grounded in a “rotation policy”, which determines that teacher educators are chosen to hold positions on a temporary basis for a predetermined number of years [37]. Seven of the eight participants held doctoral degrees and teaching certificates, seven were female, and seven were or had been in academic leadership positions. Four of the eight served as faculty deans, and two of the eight had served as heads of the institutional research authority. One of the participants was in a senior administrative position. The eight participants were all central figures in determining college policy and work conditions for teacher educators.

Name (All Names Are Pseudonyms)	Academic Status
Neta	Professor
Hanny	Professor
May	Senior lecturer
Iris	Senior lecturer
Zohar	Professor
Moran	Professor
Tal	Senior lecturer
Ori	Non-academic ranking

2.2. Data

We chose interviews as the data source in this study. Brinkmann and Kvale [38] explain that knowledge generated in interviews is the result of the unique interplay between the interviewer and the participant in a particular context. Interviews are used in this kind of qualitative research to “understand the world from the subjects’ points of view, to unfold the meanings of their experiences, to uncover their lived world” [38] (p. 3). Interviewing is a central data form in most institutional ethnographic studies, and interviewees are often institutional leaders or policymakers [29]. Interviews are used to look beyond the individual participant to identify the interrelations between different people working in different parts of the organisational network [29].

This research generated data through interviews with eight position holders. Four interviews took place face-to-face in their offices, and four were conducted online. All the interviews were in Hebrew and approximately an hour in length. The interviews opened with the request, “Please tell me about yourself as an academic writer”. The following questions focused on the participants’ knowledge of the Etnachta writing community for teacher educators and their understanding of the roles of teacher educators in the college regarding research, writing, and publication.

2.3. Data Analysis

The interviews were fully transcribed in Hebrew by a professional, and the authors translated chosen quotations in the writing of this article. We read the interview transcripts individually and then together. Initially, one transcript was chosen for reading and discussion to generate a shared language between us about the interview content and ways of reading it. We each read and reread the transcript, marking significant elements in the interview and noting points of interest to explore in all eight interviews. Our choice to engage in analysis together and apart was based on our understanding that a single data

source can lead to disparate interpretations based on individual connections to the topic or the participants, prior knowledge or beliefs, and reasons for researching the issue [39]. We used a form of thematic analysis involving a close exploration of the interview transcripts in an “interpretive, inductive process of identifying themes” [40] (p. 33). According to DeVault and McCoy [29], “people in an institutional setting describe their work using the language of the institution” (p. 37). One of our aims in the analysis process was to uncover those terms and expressions used by college leadership when they described the work of teacher educators.

2.4. Ethical Considerations

This study received ethics authorisation from the Ethics Committee of the Mofet Institute. It is arduous for educators in institutions of higher education to conduct research in their own workplaces [41]; the practice also requires heightened sensitivity to ethical conduct. We spent time and effort grappling with ways to conduct this research ethically and in ways that respected the participants as part of our ongoing responsibility to them as colleagues. Additionally, we are ethically responsible for preserving the well-being of our teacher educator colleagues, the institution we are studying, and our field of practice [42]. To preserve the participants’ anonymity, additional details like specific leadership positions and age are not provided, and all names are pseudonyms [43].

2.5. Researcher Positioning

Etherington [42] argues that scholars can achieve “validity and rigour in research by providing information about the contexts in which data is located . . . reflexivity in research conversations and writing creates transparency and goes some way to addressing the ethical issues and power relations between researcher and researched” (p. 47). In research in and around higher education, it is common for the researcher and the study participants to work in the same institution; those studies are often called “insider” research [44]. Brinkmann and Kvale [38] urge researchers to acknowledge the power relations involved in the interview setting and its influence on the process of knowledge production in the study. In our study, the authors “represent differing degrees of insider-outsider positioning in relation to the community they are researching [which] raises complex methodological issues and intricate ethical dilemmas” [39], (p. 442). It is, therefore, significant that Nikki who interviewed the participants is a teacher educator of lecturer status and has recently become a department chair at the college of education. She was interviewing leadership in her own institution, many of whom were responsible, directly or indirectly, for her professional advancement and academic promotion. The initiative to open an academic writing community in her college emerged out of Nikki’s struggle to balance her heavy teaching load alongside institutional service and her desire to find time for academic writing. Orna is a teacher educator of professor status and a faculty dean in another college of education in Israel. She was not involved in the college of education explored in the study. The combination of two researchers positioned differently strengthens this study and provides additional insight and trustworthiness.

3. Results

Three major themes emerged from our analysis of the interviews, which aimed to uncover how college leadership understand the significance of research, writing, and publication in the professional lives of college-based teacher educators:

- (1) The importance of academic activity by teacher educators for institutional prosperity;
- (2) The difficulties in academic scholarship experienced by teacher educators;
- (3) The support provided by the college to encourage and maintain academic activity in the institution.

3.1. The Importance of Academic Activity for Institutional Prosperity

In the interviews, college leadership identified three elements that they considered crucial in strengthening the academic nature of the college to ensure institutional prosperity:

A. The institutional structure, B. improving teaching, and C. knowledge generation. The importance of academic scholarship and publication, as seen by college leadership, is illustrated in Figure 1.

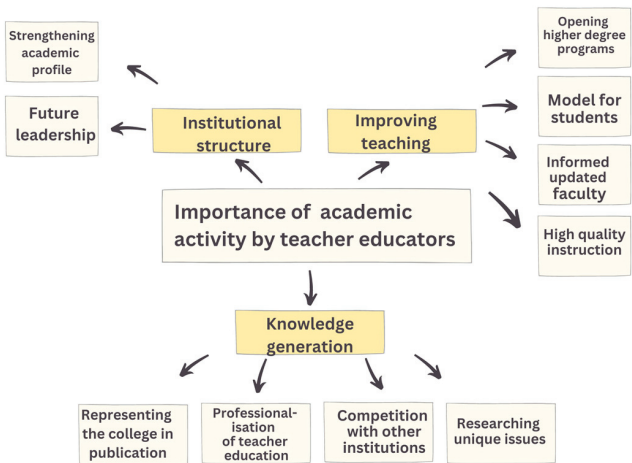


Figure 1. The importance of academic activity by teacher educators according to college leadership.

3.1.1. The Institutional Structure

Academic institutions are characterised by the structure of faculties and departments. This structure, which provides the basis for opening a variety of programmes for students’ professional development, is dependent on academic ranking.

“We have very few professors; the college’s academic profile is very low. Even in the master’s program, we need professors, and there aren’t enough; many faculty aren’t researchers”. Understanding the significance of academic rankings, Iris shared her concern. She was aware that college departments must all have a strong team of teacher educators with high academic credentials and was worried about the institution’s present academic profile. Neta referred to those high-ranking teacher educators as *“academic leadership reserves, which will run the college academically, not just in research, but in pedagogy, management, in defining the institution’s future”*. Regarding future leadership in the college, Moran argued that the college needs people to receive their professorships earlier in their careers: *“Otherwise, the college doesn’t enjoy the benefits of their promotion . . . We need a group of home-grown professors; it’s important for the academic committee and a range of roles—rector, president, in short, we need local professors”*.

3.1.2. Improving Teaching

Several leaders connected research and writing with being informed and relevant. *“Writing keeps us updated”*, Tal commented, connecting research and teaching:

Doing research requires you to be renewed, to change all the time . . . You can see the difference between faculty who are active researchers and those who aren’t. Researchers’ syllabuses are up-to-date and change all the time. Others can stick with the same syllabus for a decade, and they won’t change a letter.

May, too, emphasised the importance of being informed and involved in scholarship.

People should be up to date. The more you research and write, the more you are exposed, a thousand times more, and you are a thousand times better as a lecturer. A thousand times better. And people look up to you.

Similarly, Zohar argued, *“Those who dry up can’t be good teachers—teacher educators or classroom teachers”*. These three examples show how the leadership understand the impact of teacher educator research on the institution. They connect research with up-to-date, relevant syllabuses and superior performance as educators.

Several leaders discussed teacher educator research and writing as a means of strengthening the college’s student body through high-quality teaching. May, for example, focused on research courses and claimed, *“You are a thousand times better teaching a research course if you research and write”*. Similarly, Neta argued that

You can’t talk about applied research without being an applied researcher. That means that you can’t talk about soccer without being a player. A player needs to be active. To just be a trainer, a coach, without being a player . . . You need to be an active player who is developing . . . It is unquestionable!

The understanding is that teacher educator researchers provide high-quality instruction for the student’s benefit and, thereby, improve the quality of the institution.

May and Moran both emphasised the importance of teacher educators as role models for their students. May shared, *“It’s fun for my students that I am an authority in fields I am good at. It’s fun for them that I suddenly appear in a book, article or internet news site . . . They feel proud”*. Moran argued, *“It just can’t be that someone who finished their doctorate and ended the story teaches in the master’s program. They need to be an example”*. In Moran’s understanding, to increase students’ higher education opportunities, doctoral research should be the beginning of a teacher educator’s research career, leading to continuing research and a publication profile.

One of my aims is to put as many programs as possible into the research stream with a thesis . . . We have four programs out of nine with temporary or permanent authorisation to require a thesis . . . With a thesis it is easier for our students to continue to a doctorate. Today, most . . . finish with practical term papers. That means an additional year of study and a thesis, and then they can continue to doctoral studies, and not in all universities . . . Eight to ten per cent continue to doctoral studies; I want them to have a good beginning so that they can come to the university with their heads high and join the most advanced programs.

3.1.3. Knowledge Generation

Research and writing are also seen to strengthen the college’s image in a broader context. Ori explained, *“Research should serve the institution’s interests . . . to represent the college around the world as a body that is research-oriented and a leader in education”*. Neta stressed that the institution should *“be proud that we have researchers at an international standard. Research can make the college prominent; it is the business card of the college”*. Moran argued, *“This isn’t philosophy or ideology; it’s simple: the higher the level of our programs, the more we have research streams with a thesis, the more the department’s reputation will grow”*. She discussed the prestige attached to research and its role in competition with other institutions to attract potential students. *“The competition is enormous . . . It’s the only way to survive, to show that we are like the universities”*.

Tal was the only leader who mentioned the role of teacher educators in contributing to the professionalisation of teacher education through knowledge generation. Tal identified the problem as

A separation of authorities between creators of knowledge and disseminators of knowledge. That means that educators are a kind of passive hose which passes on knowledge developed somewhere else . . . When we write about our research, we join a professional milieu which generates and develops knowledge.

Tal saw a unique role for college-based teacher educators

. . . they fill a void in Israeli research as they research issues relevant to the field. They are at the junction because universities are too distant for a thousand and one reasons . . .

The research of college faculty can develop a unique niche because we deal with teacher education and are connected to schools.

Tal provided specific examples like early childhood education and informal education. *“There are many niches that if the colleges of education don’t go into them, they won’t exist, they won’t appear in the literature”.*

College leadership is aware of the importance of teacher educators’ academic achievements in ensuring the continued growth and prosperity of the institution. However, they acknowledge the difficulty faced by teacher educators striving for academic promotion.

3.2. Difficulties in Academic Scholarship Experienced by Teacher Educators

According to college leadership, teacher educators find research, writing, and publication difficult for several reasons.

3.2.1. Academic Background

Most teacher educators come to the college from one of two backgrounds: from teaching and educational leadership in schools or from a university. Ori explained that

People don’t finish their studies and arrive here; they’ve usually progressed in educational or other fields; they come here with life achievements. They almost never begin here when they are very young. The percentage of people who arrive here from the field, from schools, is very high.

Moran described the academic challenges faced by many teacher educators who come from school employment backgrounds. *“I’m not saying they can’t do it, god forbid, but it is much more challenging if you haven’t undergone the socialisation in academia, as a research assistant or something similar”.* Teacher educators who come from the field usually find it more difficult to engage with research, academic writing, and the peer-review process.

Initially, Zohar denied that teacher educators should experience particular difficulties, but later, she identified publication as the most challenging element of writing for teacher educators.

The work, the time, and the knowledge that publication requires . . . it’s difficult, and it doesn’t matter if you are a good educator or not . . . There are things you need to know, and nobody teaches you them . . . you learn them from personal experience; there are some that the process finishes them off and others who grow from it.

Zohar distinguished between research, writing, and publication.

There are people in the college who are wonderful researchers, but the moment they sit down and work on publishing, it doesn’t work; they can’t do it. They can teach research methodology well, but they can’t take their research and get it published. It doesn’t work.

Teacher educators in the college are burdened with heavy teaching loads and many institutional service tasks. As Ori explained, many of the teacher educators employed in the institution have a field-based rather than an academic-background. Those educators need to undergo a process of identity work to include a more theoretical outlook in their practice. Challenging questions of professional identity are often prominent as teacher educators move between focusing on practice in the field, research, and theory. One of the reactions to living in those two worlds and coping with the heavy workload is to slow down. Many teacher educators find themselves slowing down in their academic progression. Even though it might hold more prestige, they have less experience in academic scholarship. Neta contended, *“Every person who begins the complex, demanding, and exhausting process of working on a doctorate has a passion for research. They don’t receive a doctorate to get a specific job”.* She expressed concern that *“afterwards, something happens between the doctorate and the process of academic promotion in the colleges. People slow down. They get into a routine which greatly affects them, and somehow, they lose the passion”.* Moran identified the same problem:

The longer people drag their feet after completing their doctorate, the worse their situation is . . . there is a handful of people who manage to progress after a break, but it is really,

really difficult; it's carving in a mountain . . . it is very, very difficult, and most get stuck and don't succeed.

Zohar shared,

It's Neta's, my, the department chairs', and the deans' role to run after faculty . . . to push them, and push them, and push. I admit that sometimes, this leads to despair. People say, 'I didn't make any progress, I didn't succeed, I didn't move forward, I didn't make it'. After three or four answers like that, I don't bother.

Zohar expressed the frustration college leadership experience when they try to encourage and support teacher educators to continue writing after their PhD studies and meet faculty who are disengaged from research, too busy with their teaching, or not striving for academic promotion.

3.2.2. Employment Scheme

Tal described teacher educators' employment scheme and salary: *"Like in all colleges of education, their role is defined as teaching, not research. We get paid for teaching hours or leadership roles, and certainly not for research"*. Tal identified and described the underlying challenge.

It creates a situation where faculty members can't make a living respectfully, even when employed full-time. They need to work in various other places . . . Based on sixteen teaching hours per week, with meagre wages, the chance of successfully engaging in research seriously and intensively is very low. If we want to be cynical, we can say that teaching in the college is approximately seven months of the year, then there are free months, so if people really want to find the time for research, they can. [Laughing] Of course, if they have to work in other jobs . . . when you teach sixteen weekly hours, you have to prepare many courses and grade many exams—it is all very, very difficult.

Institutional ethnography turns our attention to how institutional structures and bureaucratic procedures, such as employment models, affect individuals' lives and how teacher educators navigate and negotiate those structural limitations. Ori explained, *"Today, you can get tenure for a third of a position, but you need to make a living, and as soon as you divide yourself between four or five places, you can't really fit in"*. May, too, discussed the disadvantage connected to the part-time nature of many teacher educators' employment.

When you only give people third—or half-time employment, with very, very few hours, they aren't even part of the group eligible to receive the resources. Until they have tenure, they can't even reach the threshold of receiving resources from the college, even if they are really suitable for writing and academic promotion.

Zohar claimed that the specific faculty or department that the teacher educators work in within the college also influences their ability to progress academically. *"If you aren't on a team prioritising research and publication, you will be held back"*. Similarly, she argued that the decision to progress academically is not always a personal decision. *"If the college wants to promote you, it's partly an institutional decision, not an individual one"*.

Institutional ethnography shows that the employment scheme has power dynamics within institutions. It explores how authority is exercised and maintained through institutional practices such as the creation of work conditions, how employees are promoted, and hierarchical positioning. How people "have tenure" in part-time employment and have to manage working in several institutions affects individuals differently based on factors like social position, financial stability, family situation, and academic motivation.

Ori, however, believed *"It must start with personal motivation. Research must be in your blood; you have to desire it very much to research while working full-time . . . in one or more institutions"*. She argued that teacher educators' ability to maintain a career in research and academic writing is not dependent on institutional structures; rather, it is based on an individual's motivation. Moran also claimed that individual motivation is crucial.

It's also a matter of motivation and priorities. Don't tell yourself the stories that half of the faculty, or even more, tell themselves. 'How can I do research?' 'It's not comfortable!' Yes, we do teach a lot, but if you want to, it's possible.

Moran dismissed some of the difficulties teacher educators say they face in academic work. She saw teaching loads and time limitations as only partially responsible for the difficulty teacher educators experience.

"They are mainly women; most of the faculty here are women", Ori explained. Most teacher educators employed in the college are women, many with additional carer roles. They usually have less time and ability to reach self-realisation, and their salaries are low. Moran stressed, "Their salaries are determined by what is called the 'ranking of educational employees'; it's the same collective agreement as schoolteachers, with nuances for colleges ... It's not really academia. It's not the Council of Higher Education ...". Zohar also acknowledged the role of the teacher educators' families and the importance of their support in academic writing and promotion. "There are some who succeed and others who don't ... I do not doubt that the support of the family environment and family expectations (if they want Mum to progress) make it easier".

3.2.3. Financial Resources

Institutional ethnography uncovers the often invisible institutional mechanisms that shape teacher educators' professional lives. Financial resources are an institutional mechanism that can facilitate equitable development opportunities but, at the same time, can grant more power to institutional leaders as they channel funds to areas that the institution needs. Those priorities may not reflect the needs of the individual.

May argued, *"It takes resources to do research, it takes resources to edit in English ... and there are no resources in the college, no real resources"*. Zohar also mentioned a lack of financial support as a cause of difficulty. *"I know that the financial tensions at in the college are unbearable. How much money can the college devote to that when nobody considers it a research institution, and nobody gives it research funds?"*

Some leaders compared university conditions to those in colleges of education to explain the challenges faced by teacher educators. Zohar explained, *"That's the catch, the big difficulty. Universities allow you a little more time to cope with those difficulties, the college much less"*. Iris stressed the comparison, *"In the universities, the standard is six teaching hours ... there is nothing, nothing, nothing to compare"*. May mentioned other advantages universities enjoy:

They always have groups of master's and doctoral students; that's firepower, crazy. We don't have that at all. A few people here manage to do it a little by managing themselves wisely in the master's program. Otherwise ... you're alone; with the loneliness, we don't have research students here at all, and it significantly delays any progress.

3.2.4. Changing and Blurry College Agendas

Ori mentioned institutional priorities, saying, *"There are always changes; every time a new president arrives, bringing a new agenda, the spotlight moves to something different"*. She highlighted the changing priorities by saying that

There is an expectation that teacher educators progress and research. There are presidents who are more and those who are less, but there is an expectation to research, write, and progress. [The previous president] said it out loud, 'It's important. I want to promote the faculty academically'.

Institutional priorities are often connected to the professional experience of college presidents; several have come from a background outside of education and teacher education. Discussing the institutional development of the college, Ori said,

In the past, there was some confusion between those who wanted this to be an academic place, like a university and those who didn't really want that. In that gap, there are many grey areas that aren't solved and aren't managed.

Hanny exposed the blurriness of the research agenda, saying,

There is no agenda; the college doesn't have any organised expectations [of new faculty]. Look at yourself. Has anyone ever told you what you have to do? Did they when they employed you? You're nice, serious, okay, let's move on. That's how it works . . . We don't even have an organised index, not for requirements and not even for development to show people this is the direction. We don't have it, and I think we should develop it. There are department chairs that it is important to them and others that it is less important to them. There are some that it is most important to them that everyone is nice.

Discussing the difficulty teacher educators face in colleges of education, Neta argued, *"In most of the colleges, there is no organised research culture. Research is not a condition for progressing in the institution . . . for achieving tenure"*. Hanny continued to emphasise the fuzziness of the requirements,

If two people apply for a position, and one writes and the other doesn't, the writer would be accepted . . . but it's not written anywhere, and there is no organized format. We need to create an academic, not just an administrative, process of absorbing faculty. It needs to be much clearer, defined, and directed.

Iris, on the other hand, said, *"When we accepted new people into the faculty departments, the admission requirements were that the person was a researcher and that they had publications"*. The variety of responses here uncover a lack of unity in the perceptions, expectations, and role descriptions the college leadership has for the teacher educators employed in the college. Employment requirements are blurry and undefined.

3.3. Institutional Support for Research and Writing

All the position holders interviewed were enthusiastic about the institutional support provided for teacher educators interested in pursuing research, writing, and publication. Moran shared, *"As a dean and other positions, my central aim has always been to promote faculty . . . We searched for many ways to help beyond financial assistance. We do everything we can to solve the issue of people who are stuck"*. Neta stressed that *"it is college policy to organise conferences, to encourage people to create international partnerships, to advance Erasmus agreements for research partnerships, and encourage people to participate in research focused events"*. Some expressed pride in the college's efforts and compared them to those of similar colleges of education. Moran, for example, explained,

In reality, there is endless support; you only need to come and take it . . . The college gives a tremendous amount, more than any of the other colleges of education; I say that with full responsibility; I checked . . . and we give it to people without academic rankings as well.

Tal explained,

Our research authority has always been an 'institution' compared to other colleges of education. It's a kind of anchor that really supports the faculty members who want to do research and reach promotion . . . and in the end, the support bears fruit: very impressive research studies and promotions.

Tal qualified previous positive comments about institutional support by saying *"We're not giving enough; we aren't providing good enough conditions for faculty members to engage in research"*. Moran also moderated her remarks by adding *"Of course, you can't receive all of this from your first day here, but pretty quickly, you can receive help, lots and lots of support, even if you haven't achieved academic promotion"*.

3.3.1. Research Funds

All the interviewees mentioned the research funds, which May called *"small grants"*, that interested teacher educators in the college can apply for. The grants are not connected to regular salaries. Neta referred to those small amounts of money distributed: *"Here, every*

researcher receives a little". She regards those funds as a show of appreciation to teacher educators who engage in research. *"There is appreciation, financial appreciation, not just verbal expression of appreciation"*. Moran compared those funds to external research grants, emphasising how easy it is to receive financial support from the college.

Do you know what it means to receive a grant? In most cases, you won't get it. So here they only ask you for a declaration of intention, 'This is what I'm planning to do ...', and then, of course, you must show that you have done something ... I think it is simple, one page in Hebrew, not more than that, a declaration of intention.

May expressed frustration that many faculty members did not utilise that financial support.

It's easy for people not to notice. I said to one of the department chairs, 'I can't believe you haven't applied'; she simply hadn't noticed. It's a shame ... I have always been very active and understood what I am eligible for. There is no way I would miss funds, ever.

May also expressed dissatisfaction with those who receive and do not use funds. *"It really bothers me that we give money to people, and they don't research and don't write"*.

3.3.2. Research Groups and Programmes

Several position holders referred to research groups initiated by the college research authority, faculties, or individual teacher educators as a form of support provided by the college. Hanny proudly described four or five research groups set up in her faculty, *"I'm happy about it; it's my personal agenda"*. Iris focused on the social support developed in the groups: *"There are people who find it good to sit in research groups; that's how they push one another forward, together"*. Moran explained that most of the research groups were very active, *"and it works because they are working in a group, which gives a lot of confidence, and then they publish together, too"*. Neta stressed the institutional interest in the initiative by explaining that each research group met with the college's president yearly to discuss their progress and future directions.

The college leadership was markedly proud of the competitive "Academos" programme, which Iris described as *"the attempt to produce a few professors for us"* and Tal described as *"inspiration directed downwards ... It symbolises what the college thinks ... and it provides very significant recognition. People awarded are happy that the college acknowledges their efforts and abilities and sincerely wants to help them progress"*. Neta explained, *"Last year, six researchers received the opportunity of reducing their teaching hours by twenty-five per cent in favour of academic writing ... it's very significant"*. Moran outlined the programme benefits as follows: *"First of all, they are given research funds, although they are modest, assistance with editing and translation. It's not a great deal, but it's better than nothing"*. Moran expressed her enthusiasm: *"It's an excellent idea, it's a collaborative initiative of the president and the rector"*, explaining, *"A lot of money is invested in those people, and they are identifying a group, an elite group ... they are the spearhead, those who are going towards a professorship"*. Hanny also expressed her approval of the programme but stressed the small number of recipients. *"I think it is a nice program; it is minimal but nice"*. Regarding the small number of participants, Tal said, *"Even if only a few individuals are awarded, it is something to strive for"*. Tal also commented on the evaluation of the programme, saying, *"I hope it bears fruit. It will be tested very quickly; we will see if we have succeeded. If they manage to reach promotion in a year, two or three, each according to the academic rank they are approaching ..."* Neta excitedly stressed the programme's uniqueness, comparing the institution with other colleges of education. *"'Academos' is an extraordinary initiative that is exceptional in the Israeli college landscape. No other college has a program like that"*.

Other forms of professional development initiated by the college leadership and provided for teacher educators were also mentioned. Moran mentioned *"workshops focussed on English, presenting at conferences, article writing. Several women professors gave excellent lectures ... all sorts of methodologies, quantitative and qualitative ... and there are research forums where you can hear about articles and studies and present too"*. Moran and Neta also mentioned the college's annual research conference as supporting teacher educators' academic de-

velopment. Hanny described how she sent teacher educators struggling to write to join the Etnachta writing community. In passing, Moran also mentioned access provided to research tools and data banks and the college's assistance in publishing books written by teacher educators.

3.3.3. Consultancy and Mentoring

According to the leadership, teacher educators in the college have a network of support; they always have someone they can go to for advice surrounding research, writing, and promotion. Moran described herself as a person teacher educators could always approach. *"I invite people to come and ask me for advice, and they come, many people come . . . not all from my faculty"*. May argued,

There is always someone you can talk to, even on short notice. I have sent many people to Zohar, and she gives you exactly what comes next and what you need to accomplish. People aren't getting lost because of a lack of information. When they express interest, the college is very organised in what it provides . . . I think that gives a good feeling.

The leaders were referring to position holders or others higher up in academic ranking who were there to give advice and support. They did not mention peer support.

Several position holders mentioned a project developed by the research authority to closely accompany early career researchers. Moran identified them as *"developing lecturers, those at the beginning of their journey, they've just completed their doctorate"*. She explained, *"The research authority insists that if money is left over, it goes to the developing lecturers; they are people who don't have anything yet, and they need to start"*. Iris expressed her appreciation for the project: *"In my view, it is very, very, very nice"*, and explained, *"As a dean in the faculty, I often asked if there were two thousand shekels left in the budget for a young lecturer"*. The college research authority also founded a mentoring programme where an early-career researcher is paired with a more experienced scholar. Neta explained, *"We now have eight pairs like that. Mentors can be at the dean level; even deans find the time for mentoring"*.

Some of the position holders qualified their enthusiastic statements about the support the college offers teacher educators interested in pursuing academic research and writing. Zohar admitted, for example, *"It might be possible to invest more in the assistance given by the research authority; it depends on the college's financial priorities"*. Tal expressed pride in what the college provides for its teacher educator researchers but also reflected,

There is a lot to be satisfied with, the productivity, the doing, and the energy, but it is still saved for a limited group. I don't know exactly how many, but approximately one hundred faculty members move around the research authority. They know how to respond to calls for papers and grants and are active. A large group isn't there and doesn't see themselves as belonging there. In short, I would be happy to see that grow if we could see it grow this year to 110 and next year to 120. I hope we are going in that direction.

The number of teacher educators enjoying the support offered worried Iris, too. *"It's the same people, the same circle of people . . . it's not a high percentage who are benefitting from what the college has to offer"*.

The rich results from our exploration of college leadership's perceptions raise significant issues for discussion about the work of college-based teacher educators in their various roles as educators, academic researchers, and writers.

4. Discussion

This qualitative inquiry deals with the question: how do college leadership responsible for the professional development and promotion in the institution understand the significance of research, writing, and publication in the professional lives of college-based teacher educators? The Etnachta community, which aims to create a collegial space for academic writing for individual teacher educators, triggered our interest in this study of institutional leadership's viewpoint. In this discussion, connecting our findings to global scholarship,

we grapple with the tensions between the position holders' understanding of the working lives of teacher educators, the needs of individuals, and the needs of the institution.

4.1. *The Conflict between Institutional and Individual Advancements*

Internationally, academic institutions are characterised by three elements: academic teaching based on the generation of new knowledge, the advancement of research in a range of fields, and the writing and publication of professional innovation [45]. From a historical point of view, the structure of academic institutions is conservative, hierarchical, and built around promotion tracks that afford control and power relations. At the same time, throughout the years, academic institutions have cultivated a vision of academic freedom for the creation of knowledge and preservation of institutional independence without political or social intervention [46]. Levin et al. [47] draw attention to the positioning of the individual and groups of faculty in the competitive neo-liberal culture in institutions of higher education, arguing that their professional "authority as individuals is negligible or nonexistent" (p. 3). These complexities are evident in the results of this study. The institutional ethnographer is interested in how organisational mechanisms regulate people's lives and experiences in a particular context [28]. Our results, drawn from interviews with college leadership, uncover tension in the academic institution between the advancement of the institution's academic positioning and the academic advancement of the individual researcher-writer. The tension is present in core areas, such as academic programmes, course syllabi, research funds, and publications. These areas are interdependent. Edwards [48] argues that in the United Kingdom, "Neo-liberalism . . . is shaping the content and practice of academia, and the identities of academics within it. In particular, the nature of research funding and performance in higher education has become framed by institutional and corporate goal-laden priorities" (p. 912). Although it appears that academic institutions and individual faculty have similar interests, which are to generate and disseminate knowledge, discover new areas of interest, and explore fields through innovative research, forces within and beyond the institutions are influencing priorities. Institutional and other stakeholders' interests are not always in line with the needs, desires, and abilities of the individual researcher-writer.

This dichotomy is reflected in the perceptions of institutional leadership, and it creates tensions between the advancement of the structure of the academic institution through new programmes and faculty publications in journals and the individual promotion of the researcher. In interviews, the position holders stressed the advancement of research for the strengthening of the college and the opening of new academic programmes. They argued the need for individuals' promotion for institutional advancement. Although the leaders all acknowledged the burden of the individuals' workloads, in colleges of education in particular, their priorities were focused on institutional achievements. These results support the view of Taber [34] that institutional ethnography reveals an organisation's "ruling relations", allowing the researcher "to begin to interrogate and challenge them" (p. 20). This outlook reflects the tension between the institutional requirements and the personal needs of the teacher educators and highlights the constant conflict between institutional and individual advancements.

4.2. *The Structure of Employment*

Institutional ethnography usually focuses on work procedures and how they are regulated and integrated [31]. In the results, we present how college leaders explained the importance of institutional advancement in connection to the structure of the teacher educators' employment. We found that the interviewees compared colleges of education to universities to stress the challenges college-based teacher educators face in balancing practice and academic work [49]. Characterising the work of teacher educators by comparing the institutional structure highlights the differences in employment models. Teacher educators employed in colleges of education in Israel are required to teach double the number of teaching hours required in universities [18]. Beyond those hours, teacher educators mentor

students and attend staff meetings to design and advance programmes and stay up to date and engage in various kinds of institutional service. All of these create an employment structure that barely leaves time for individual academic and professional development, including research, writing, and publication [9]. The wage structure is also different in colleges of education. In Israel, all academic institutions must function according to the guidelines and under the regulation of the Council for Higher Education. Colleges of education, however, are also subject to the governing of the Ministry of Education [15]. The structural progression of the education system—from early childhood through to colleges of teacher education—positions teacher educators as part of the schooling structure, and the regulation of wages is in accordance. This strengthens the perception of teaching and emphasis on practice rather than academic promotion through research, writing, and publication.

The institutional structure of professions that are traditionally dominated by women (like nursing and teaching) creates a structure of power relations that makes upward mobility to positions of power difficult. This is the case in academic institutions. The burden of household work and caring roles disadvantages female academics in higher education [50]. Most of the teacher educators in colleges of education are women, and most come with employment backgrounds in schools. Others are teacher educators who did not succeed in reaching tenure in universities and had settled for a lower-level academic option. Many teacher educators who are combining academic achievements and family life prefer to work in colleges of education rather than the university context. They settle for an academic context in which the promotion process threatens their personal and familial worlds less. Leaders in those institutions, who are also usually women, recognise the gap between the ideal academic institution and the complex reality, where most of the faculty are talented, motivated women struggling to balance professional advancement and personal familial commitments [51].

In light of what we have written here about the institutional employment structure, together with the gender imbalance and the burden of a heavy workload without time and resources allocated for research and writing, it appears that colleges of education perpetuate the gaps in research, writing, and publication for those institutions and the individuals within them.

4.3. Implications

As teacher educator researchers, we, too, have struggled with the contradiction between heavy teaching loads and promotion through academic writing and publication. These hidden tensions are gradually understood by faculty in the course of Sisyphean work in the college. The Etnachta academic writing community, like teacher educator writing communities in other countries [6,52,53], exemplifies a way to fulfil the needs of teacher educators as researchers and academic writers as a response to the tension between the individual's development and the institution's advancement. In this article, we are sounding our voices, drawing awareness to the significance of research progress for the individual and the institution. In this section, we suggest a number of practical implications of this research. Additionally, we invite our readers to explore their own professional environments and to consider the ways in which their institutions balance organisational requirements and the professional needs of faculty in their research and writing. Workman [35] explains that although institutional ethnography begins with individual positions, it progresses to grapple with the organisational, "opening opportunities for intervention and change" (p. 11).

Acknowledging the hierarchical structure of institutions of higher education, this study suggests a need for ongoing dialogue between institutional leadership and teacher educators. Support for teacher educator researchers should be designed and budgeted for within that dialogue. Role expectations and the significance of research and academic writing, which are blurry [22], need to be more explicit and transparent to all stakeholders.

Increasing the number of programmes in the institution can broaden the variety of avenues for institutional development and, at the same time, open opportunities for teacher educator development. For example, a programme that requires the submission of a thesis can assist students in continuing to further higher education and entering doctoral studies in the future. This can grant teacher educators in the programme opportunities for research collaborations with colleagues from other programmes and with students.

There is growing interest in groups and communities for faculty development in academia (see [54,55]). Colleges of education should consider creating supportive research frameworks like those offered by universities, including allocating time and resources for research. Research groups, functioning as communities of practice [56,57], could emphasize teamwork, which addresses issues of loneliness in academia and concentrates on the well-being of faculty [3]. Support frameworks can create interactions between colleagues, which might compensate for the burden of the employment structure. Academic writing communities or research groups can generate a supportive research culture and create a shared dynamic institutional language. These collaborations might create reflective practices, which can advance research at an institutional and an individual level.

Additionally, colleges should consider different models of employment, alternative methods of dividing financial rewards, and ways to reduce the burden of teaching hours. A differential division of roles, for example, adapted to the preferences and abilities of individual teacher educators might be advantageous. Employment could entail different amounts of teaching hours and research time. These options could benefit the institution and individual teacher educators through the development of research leadership and expertise in teaching and professional practice in the field.

It is interesting that during the interviews with the position holders, the role of technological innovation was not raised. With the development of Artificial Intelligence, the worlds of research, learning, writing, and publication are already changing dramatically [58]. There is room to wonder how digital platforms might lead the institutional leadership to address the problems they have described.

4.4. Future Research Directions

In this study, college leadership presented what they do and provide for teacher educators in the institution to encourage them to increase their scholarly activity. Further research is needed to sound the voices of teacher educators and explore the solutions they suggest for overcoming the challenges raised here. Quantitative data could be helpful in understanding the employment schemes and the promotion processes in different kinds of institutions. This study is local and focuses on a single institution. Additional research should examine the teaching–research–service tensions and the need for balance in other kinds of academic institutions and in other geographical contexts.

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Review

A Review of Research on Mathematics Teacher Educator Knowledge: Mapping the Terrain

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Abstract: Over the past two decades, the landscape of research on mathematics teacher educators (MTEs) has grown considerably. One particular area of interest has focused on MTE knowledge and the ways in which it is developed and used in teaching practice. However, studies have conceptualized MTE knowledge in different ways and have employed considerably different methodologies and approaches to its study. In an effort to understand this varied landscape, we conducted an extensive review of research on the nature and development of MTE knowledge. This review provides a broad descriptive analysis of the existing theoretical and empirical research on MTEs' knowledge, explores the theoretical underpinnings of the existing frameworks for and studies on MTE knowledge, and considers implications for future research.

Keywords: mathematics teacher educator; teacher educator knowledge; mathematical knowledge for teaching teachers; mathematics education

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1. Introduction

The mathematics education community has long been concerned with ensuring the adequate preparation of prospective teachers in learning to teach mathematics effectively [1,2]. More recently, the issues of what mathematics teachers need to know [3–5] and how to prepare prospective teachers (PTs) as part of teacher preparation programs (e.g., [6–8]) have become central foci in both research and policy arenas in many countries. Despite such attention to teacher knowledge and preparation, research on mathematics teacher educators (MTEs) is still in its infancy. The term “MTEs” refers to individuals who work with PTs in a variety of contexts to develop and improve the teaching of mathematics [9], including mathematicians, graduate students, mathematics education researchers, and classroom teachers. As such, these individuals play a critical role in the mathematical preparation of PTs.

Over the past two decades, the landscape of research on MTEs has grown considerably. This growth is reflected by the increase in the number of working groups at international conferences [10–12], special issues of journals [13,14], and international handbooks [1,11,15], all of which have taken up questions focused on MTE knowledge. However, researchers have studied MTEs and their knowledge in a variety of ways, employing considerably different methodologies, approaches, and theoretical lenses. For example, some researchers have conducted self-studies of their own practice to highlight the nature of their knowledge used when teaching teachers (e.g., [16,17]). Other researchers who have studied MTE knowledge have used research on teacher knowledge to conceptualize what MTE knowledge entails in different ways (e.g., [18,19]). Still, others have conducted research on MTE knowledge through the lens of MTEs' instructional goals and design decisions to understand the knowledge they draw on when teaching teachers (e.g., [20,21]). Despite the

growing number of studies focused on MTEs, to date, there has been no comprehensive review of research focused on MTE knowledge.

In an effort to understand this varied landscape, the authors conducted an extensive review of research on the nature and development of MTE knowledge. This review provides a broad descriptive analysis of the existing theoretical and empirical research on MTEs' knowledge, explores the theoretical underpinnings of the existing frameworks for MTE knowledge, and considers implications for future research. We focused our review primarily on research related to university-based MTEs who teach courses for elementary PTs (we define elementary to include students aged 5–12 years old). We chose university-based MTEs because of the recent calls by various organizations and governmental education authorities for reforming teacher preparation programs to incorporate particular content standards and core practices and thus increase the accountability of these programs (e.g., [3,5,22]). Notably absent from all of these recommendations is guidance for MTEs in implementing their suggestions and for the preparation and professional support of MTEs who do this work. The quality of teacher preparation programs largely depends on the competence and expertise of its teacher educators [7,23], yet little is known about the qualifications of the faculty and staff who teach such programs (e.g., [24]). Moreover, much of the extant research on MTEs draws on the construct of mathematical knowledge for teaching (MKT; [4]), a model of teacher knowledge that is grounded in elementary school teaching. Thus, research on MTEs is largely focused on MTEs who teach elementary PTs.

In this review, we focus on the following questions: (1) What differences and similarities exist in how MTE knowledge has been conceptualized? (2) How has MTE knowledge been studied? and (3) What are the different contexts in which MTE knowledge is developed?

The currently changing context surrounding teacher preparation programs provides a critical opportunity for the field to seriously consider how MTEs who work with elementary PTs are prepared and supported. This population includes a diverse set of individuals who come to this work with varied backgrounds and are often not professionally prepared [24]. By mapping the terrain of research on MTE knowledge, our goals are to advance the field's collective understanding of MTE knowledge and identify pathways for future research on MTEs that will be generative and build on each other in systematic ways.

2. Conceptualizing MTE Knowledge

To understand the nature of the extant research on MTE knowledge, it is necessary to consider what constitutes teacher knowledge. Broadly defined, knowledge is the information and skills that teachers develop through experience and education. Researchers have long recognized the tension that exists for teachers between their general content-specific knowledge, developed in teacher education programs, and the craft knowledge that is developed through teaching practice [25,26]. Craft knowledge, for example, includes “know-how for teaching based on past experiences, empirical data, and well-reasoned arguments and predictions” (Hiebert & Morris p. 476 [27]), knowledge that is developed through experience of working with students. Like others [28,29], we argue that teacher knowledge is intimately related to teaching practice—teachers' knowledge is further developed and enhanced over time as they teach students and interact with their colleagues.

In their review of research on knowledge and teacher learning, Cochran-Smith and Lytle explicated three prominent perspectives for how teacher knowledge is developed [29]. The perspective most closely aligned with this review is knowledge of practice. Notably, the other two perspectives (i.e., knowledge in practice and knowledge for practice) in their review involve a more formal knowledge base for teachers to learn, one that includes both theoretical and practical elements. For MTEs, no such formal, agreed-upon knowledge base currently exists—a point we return to later in the discussion.

Cochran-Smith and Lytle describe knowledge of practice as knowledge derived from inquiry where teachers use their own or others' classrooms as sites for investigation in order to problematize and actively investigate their own or others' teaching practices [29]. From this perspective, the knowledge teachers need to be effective is developed as they

draw on resources, such as research studies or the knowledge of colleagues, to inform and further develop their practice over time. Such knowledge can be derived from reflective self-studies or inquiry communities where teachers examine their own practice, decision making, and instructional goals and the ways these aspects of practice influence their instructional interactions and ultimately student learning. Hiebert and Morris describe such knowledge as that which both new and more experienced teachers access and draw upon to support students in achieving specific goals and outcomes [27]. Underlying this perspective is an assumption that teachers, both new and experienced, develop their knowledge over time by problematizing and inquiring into their own and others' practices. As such, a knowledge-of-practice perspective elevates the development of practical or craft knowledge. We extend these definitions to include MTEs as the teachers and PTs as the students.

Implicit in a knowledge-of-practice perspective is a sociocultural perspective on how knowledge is developed through a person's interactions and experiences with the physical, social, and cultural contexts in which they participate [30,31]. MTEs develop and refine their knowledge not only through their interactions with colleagues as part of formal or informal professional learning experiences, but also through their interactions with the PTs they teach—interactions that are influenced by the broader social and cultural contexts in which MTEs' teaching practice occurs. In this review, we are concerned with the nature of MTE knowledge and the ways in which it is developed through teaching practice.

Also central to this review is an assumption that the knowledge needed by MTEs for their work with teachers differs from the knowledge needed by teachers for working with students. Researchers generally agree that the work of MTEs involves working with PTs and/or practicing teachers to develop their knowledge of teaching practice [9]. As there is considerable diversity in the nature of MTEs' work, the range of expertise shared by MTEs is similarly diverse, involving varying levels of mathematical expertise, pedagogical expertise, and/or expertise derived from their experiences as teachers [32].

While there are similarities between the knowledge needed by MTEs and teachers, there are also important differences. Mason (1998) argues that teachers need to be able to engineer instructional situations in which students experience a shift in their attention to become aware of ideas and concepts of which they were previously unaware. However, in addition to developing new content knowledge, MTEs need to support PTs in shifting their awareness to understand how the concepts they are learning connect to their future teaching of students. This requires MTEs to also understand what is involved in teaching mathematics to students. To simultaneously enhance PTs' own content learning and connect that content learning to teaching students—work that is different from what teachers do with students—MTEs need mathematical knowledge for teaching teachers (MKTT). According to Zopf, such knowledge is different from teacher knowledge in three significant ways: (1) students approach learning mathematics with only informal understanding, whereas PTs bring with them more formal, albeit often limited and procedural, knowledge; (2) teachers teach mathematics while MTEs teach MKT; and (3) the purposes of teaching students and the purposes of teaching PTs are different. While students often learn mathematics to participate in school and society writ large, PTs learn MKT to teach mathematics to students [33]. Thus, like Beswick and Chapman [10], we consider MTE knowledge to be an elaborated extension of teacher knowledge that also includes subdomains of MTE knowledge that are characteristically different from teacher knowledge.

3. Method

Literature Search

We define research related to MTEs as theoretical and empirical peer-reviewed studies and dissertations. Recognizing that there are many definitions of research, we use Creswell's idea that research constitutes a process in which information is collected and analyzed to inform one's understanding of a topic or phenomenon [34].

We conducted a literature search using ERIC and dissertation abstracts using the following search terms: (1) *mathematics teacher educator(s)* AND *knowledge*, (2) *mathematics* AND *teacher educator* AND *knowledge*, (3) *teacher trainer* AND *knowledge*, and (4) *mathematics* AND *teacher trainer*. We also searched edited books and book series that were cited in many of the articles we reviewed, recent special issues of peer-reviewed journals, and conference proceedings of the Research in Undergraduate Mathematics Education (RUME) annual meetings, as these were not captured in the ERIC search results. The search covered articles written in English and published in peer-reviewed scientific journals or conference proceedings, as well as dissertations. Hereafter, we use the term “articles” to refer to the resulting set of scientific studies, books, book chapters, dissertations, and conference proceedings. Because Shulman’s seminal article about teacher knowledge was published in 1986 [26] and the majority of the research on MTEs emerged in the early 2000s, we confined the search to the years 1986–2021.

4. Selection of Articles

The literature search resulted in 755 articles (including 104 dissertations) (see Figure 1). Two steps were taken to identify articles relevant for our review. First, the authors evenly divided up and reviewed the 755 abstracts, selecting those that (1) focused on MTEs working with PTs in institutions of higher education and (2) the research phenomenon studied included MTE knowledge or its development (beyond just including implications for MTE knowledge). In the case that the assigned author could not easily determine whether to include an article or not, which occurred in approximately one-third of the reviews, these abstracts were then assigned to a different author for an additional review. During this process, any inconsistencies between authors were discussed at weekly meetings. Selections were then discussed as a whole group until a consensus was reached. A significant portion of articles did not meet our criteria because they did not explicitly focus on MTE knowledge. For example, the majority of articles focused on developing tasks and lessons for, or collaborations around, designing courses for PTs, where MTEs were only mentioned in the implications of the studies. This first step resulted in 87 remaining articles (including 6 dissertations).

Second, three authors divided up these remaining articles and individually reviewed each one in its entirety, summarizing each in terms of research goals, method(s), research questions, researcher roles, and findings. As we read and organized the articles, we inductively developed and refined a set of categories. Specifically, we categorized articles as empirical or theoretical. We then described the relationship between the key ideas or research questions in the article to MTE knowledge. For example, we considered whether the research questions were about MTE knowledge or knowledge development and grouped articles accordingly. Then, we identified the main argument or focus of the article (e.g., illustration of an analytic approach or description of a course or workshop). Notably, the purpose or focus of the research was not always explicitly stated in the same terms. In those instances, the authors inferred a research purpose based on the framework and/or discussion sections in the articles. This process led to the three main categories in Table 1, which includes a more detailed description of these summarization categories. This work was followed by group discussions until a consensus was reached. As a result, 50 articles were excluded based on this process. This second step resulted in 37 articles (see Figure 1).

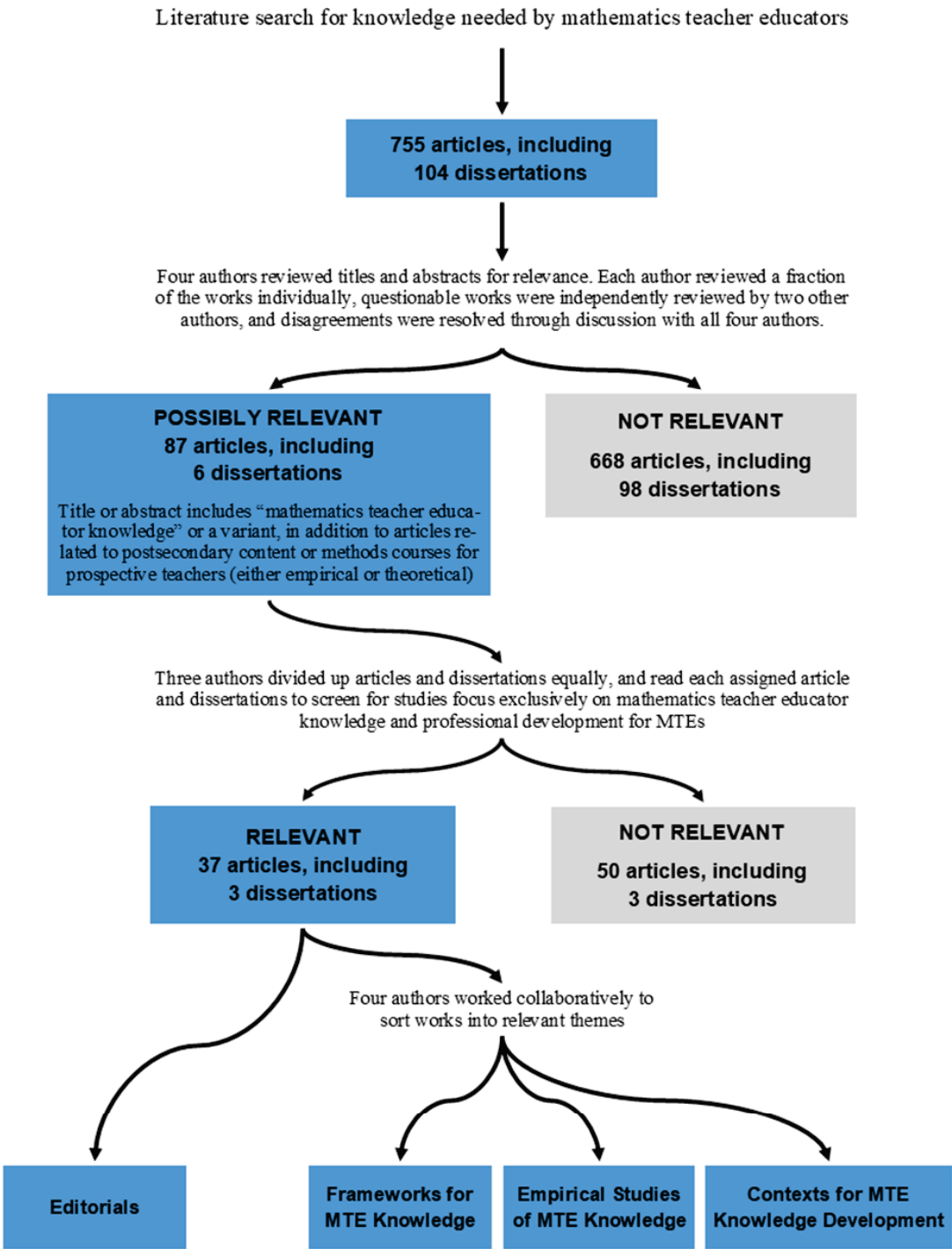


Figure 1. Outline of inclusion/exclusion process and numbers of works at each stage.

Table 1. Overview of categories of reviewed articles (n = 33 *).

Category	Subcategory	Description
Frameworks for MTE Knowledge (n = 14)	Complete Frameworks for MTE Knowledge (n = 9)	Proposes a complete framework for MTE knowledge; most articles are theoretical
	Components of a Framework for MTE Knowledge (n = 5)	Proposes different components of a framework for MTE knowledge
Empirical Studies of MTE Knowledge (n = 10)	Studies of MTE Knowledge (n = 6)	Focuses on the knowledge MTEs use when teaching PTs
	Studies of Relationship Between MTE Knowledge and Practice (n = 4)	Describes different aspects of MTE instructional practice and decision making
Contexts for MTE Knowledge Development (n = 9)	Conducting Research to Develop MTE Knowledge (n = 2)	Describes how MTEs conducting research in math teacher education enhances MTE knowledge
	Professional Learning to Develop MTE Knowledge (n = 6)	Describes PL workshops, experiences, and coursework for MTEs designed to further develop their knowledge
	Developing MTE Knowledge Through Self-Study (n = 1)	Focuses on MTEs' conducting self-studies of their own teaching practice and describes it as a means by which MTEs can further develop their knowledge

Note: * Shaughnessy et al. [35]. was included in two categories.

5. Review of Articles

The 37 remaining articles formed the basis of our review. The results are organized into three main categories, as described in Table 1: Frameworks for MTE Knowledge, Empirical Studies of MTE Knowledge, and Contexts for MTE Knowledge Development. Like Selmer and colleagues (2016) [36], we recognize that researchers use various terms, often interchangeably, to mean both similar and different things (e.g., domain and elements). For clarity, we use *MTE knowledge* to refer to the larger domain of knowledge MTEs require to teach elementary PTs and the terms *subdomains* and *components* of MTE knowledge to refer to the types of knowledge of varying grain sizes within the overall domain of MTE knowledge.

Finally, our review identified articles (n = 5) relevant to MTE knowledge, including two editorials in special issues of journals [14,30], two introductory chapters to edited volumes of research on and by MTEs [9,11], and a brief report of a discussion group at a professional conference [10]. We highlight these articles separately at the beginning of the results section as they discuss the state of research on MTE knowledge at the time they were published and thus serve a different purpose than the articles included in Table 1.

6. Results

Summary of the State of Research on MTE Knowledge

In an introductory chapter to an edited volume focused on the professional learning of MTEs, Jaworski described the similarities and differences between teacher knowledge and MTE knowledge, demonstrating the unique nature of the latter [9]. She argued that one key difference in these knowledge bases is that, unlike teachers, MTEs need to understand research on teachers and the broader systems in which teachers work (e.g., classrooms, schools, and communities), as well as knowledge of the professional and research literature on mathematics teaching and learning. She concluded by describing the evolution of research on teachers, from largely cognitive and psychological to sociocultural perspectives on teachers and teacher learning, as well as the implications of this trajectory for research on MTEs' knowledge. Four years later, in a discussion group led by Beswick and Chapman at the 12th International Congress on Mathematical Education, participants discussed how

MTE knowledge is acquired, who conducts research on MTEs (i.e., self-studies and others), and the applicability of teacher knowledge types to MTEs [10]. While the report on this discussion is quite brief, it reflects several strands of research that were emerging at the time (e.g., knowledge required by MTEs). Later, Jaworski and Huang [30] and Beswick and Goos [14] both wrote editorials to special issues of journals describing the broader state of research on MTEs. Both sets of authors examined a range of extant studies on MTE knowledge and posed questions and directions for future research. A common theme in the editorials, published four years apart, is the use of different teacher knowledge frameworks as foundations for conceptualizing MTE knowledge.

Most recently, in their introductory chapter of an edited volume focused on the learning and development of MTEs, Goos and Beswick highlighted the three themes reflected in the book: the nature of MTE expertise; the learning and development of MTEs; and the methodological challenges in researching MTE expertise, learning, and development [11]. Relevant to this review, Goos and Beswick described various frameworks for MTE knowledge, many of which are included in this review, identifying similarities across the frameworks that point to the specialized nature of MTE knowledge. They also highlighted past research efforts to apply teacher knowledge frameworks to MTEs and identify ways in which teacher knowledge differs from MTE knowledge—both themes being reflected in the articles we reviewed. Goos and Beswick argued that MTEs require a kind of “meta-knowledge” that includes the knowledge needed by math teachers as well as knowledge that is unique to MTEs. Collectively, these articles outline the evolution of research on MTE knowledge across two decades.

7. Frameworks for MTE Knowledge

As a result of our review, we found 14 articles that proposed either comprehensive frameworks or parts of frameworks for conceptualizing MTE knowledge (Table 2). In the following sections, we discuss the differences in both the structures and conceptualizations of MTE knowledge as reflected in these articles.

Table 2. Frameworks for MTE knowledge (n = 14).

Author(s)	Year	Origin	Research Purpose
Comprehensive Frameworks for MTE Knowledge (n = 9)			
Castro Superfine, Prasad, Welder, Olanoff, and Eubanks-Turner	2020	USA	Proposes a conceptualization of MKTT that extends from and contains analogous domains of MKT [4]
Chavout	2009	USA	Proposes a conceptualization of MTE knowledge that builds on the MKT framework [4]; suggests an “MTE as researcher” knowledge subdomain
Escudero-Avila, Montes, and Contreres	2021	Mexico and Spain	Proposes a conceptualization of MTE knowledge with seven subdomains based on a review of research with and about mathematics teachers
Hauk, Jackson, and Tsay	2017	USA	Builds on Ball et al.’s MKT framework [4] to propose a framework for the “mathematical knowledge for teaching future teachers”
Mason	1998	UK	Conceptualizes MTE knowledge as including different levels of awareness
Olanoff, Welder, Prasad, and Castro Superfine	2018	USA	Proposes a conceptualization of MKTT that extends from and contains analogous domains of MKT [4]
Perks and Prestage	2008	UK	Proposes an MTE knowledge “tetrahedron” based on their teacher knowledge “tetrahedron” [37]
Shaughnessy, Garcia, Selling, and Ball	2016	USA	Builds on Ball et al.’s MKT framework [4] and Cohen et al.’s instructional triangle [38]
Zaslavsky and Leikin	2004	Israel	Builds on Jaworski’s “teaching triad model” for teacher knowledge [39]

Table 2. Cont.

Author(s)	Year	Origin	Research Purpose
Components of a Framework for MTE Knowledge (n = 5)			
Chavout	2008	USA	Proposes curricular knowledge for MTEs: knowledge of programs and materials, lateral and vertical curriculum knowledge, indications and contraindications of curricula
Chick and Beswick	2013	Australia	Proposes PCK for MTEs: knowledge of examples, curricula, student thinking, common misconceptions
Chick and Beswick	2017	Australia	Proposes PCK for MTEs
Felton-Koestler	2020	USA	Proposes MTE knowledge for sociopolitical mathematics teaching: knowledge of sociopolitical issues and sociopolitical curriculum
Olanoff	2011	USA	Proposes components of MTE knowledge for teaching multiplication and division: multiple representations of topics, how topics relate, how to identify student learning goals in relation to topics, and how to design and use topic assessments

7.1. Comprehensive Frameworks for MTE Knowledge

In one of the earliest articles we reviewed, Mason conceptualized MTE knowledge not as different types of knowledge or knowledge domains, but rather as different levels of awareness that encompass the locus, focus, and form of teachers’ attention in their teaching practice [40]. Through a self-reflective analysis, he proposed three levels of awareness, each of which encompasses the previous one: (a) awareness-in-action, which involves an awareness of one’s actions and own learning, i.e., the development of one’s knowledge of mathematical content; (b) awareness-in-discipline, which includes an awareness of one’s awareness-in-action, i.e., the development of one’s mathematical knowledge needed for teaching so that one can develop others’ knowledge of mathematical content; and (c) awareness-in-counsel, which encompasses an awareness of how to develop awareness-in-discipline in others, i.e., the development of one’s knowledge for teaching teachers in order to develop another’s mathematical knowledge for teaching. Implicit within each level is a consciousness of one’s awareness at that level. For Mason, MTE knowledge is synonymous with awareness -in -counsel, as MTEs enhance different levels of PTs’ awareness (as learners and future teachers) [40]. Notably, unlike other frameworks, Mason conceptualizes MTE knowledge as an awareness of or attention to elements of teaching practice as opposed to conceptualizing MTE knowledge as the possession of certain information and skills about teaching practice.

Several other articles structure MTE knowledge in relation to teacher knowledge in similar ways. For example, both Zaslavsky and Leikin [41] and Perks and Prestage [42] include an existing teacher knowledge framework as one of the many subdomains of MTE knowledge in their frameworks and propose analogous knowledge subdomains in their MTE knowledge framework. For example, Zaslavsky and Leikin [41] expanded Jaworski’s teacher knowledge framework [39], the “teaching triad of mathematics teachers”, which highlights the interactions among three elements of teaching: challenging content for students, management of students’ learning, and sensitivity to students. In their “teaching triad of MTEs” framework, Zaslavsky and Leikin created analogous terms for the knowledge required to teach teachers: challenging content for mathematics teachers (i.e., content to be learned), management of mathematics teachers’ learning (i.e., how to support teachers during instruction), and sensitivity to mathematics teachers (i.e., understanding who teachers are as learners) [41]. Zaslavsky and Leikin considered Jaworski’s “teaching triad for mathematics teachers” to be entirely contained within challenging content for mathematics teachers and thus a subdomain of MTE knowledge.

Similarly, Perks and Prestage proposed the “teacher-educator knowledge tetrahedron” [42], positioning the “teacher knowledge tetrahedron” framework [37] as a subdomain of MTE knowledge. Both frameworks include four subdomains: teacher knowledge, professional traditions, practical wisdom, and learner knowledge. However, in the teacher-educator knowledge tetrahedron, the learners in question are PTs and the teachers in question are MTEs. For Perks and Prestage, teacher educator knowledge refers to the knowledge MTEs develop over time as they teach PTs, professional traditions refer to knowledge of teacher preparation coursework and research on mathematics teacher education, practical wisdom refers to the tasks and activities used with PTs, and learner knowledge refers to the content that PTs need to understand [42]. Notably, the teacher knowledge tetrahedron [37] is entirely contained within the learner knowledge subdomain of their teacher-educator knowledge tetrahedron. Thus, like Zaslavsky and Leikin [41], Perks and Prestage conceptualize MTE knowledge as not only including the knowledge that teachers need to know, but also knowledge of other teaching elements [42].

Five additional frameworks draw specifically on Ball and colleagues’ MKT teacher knowledge framework to conceptualize MTE knowledge [4]. All structure the teacher knowledge framework as entirely contained within an MTE knowledge subdomain and, in some instances, propose analogous MTE knowledge subdomains. For example, Olanoff et al. and Castro Superfine et al. proposed a conceptualization of MTE knowledge [43,44] that similarly extends from and is connected to the subdomains of MKT [4]. They posit that, similar to how MKT is composed of subject matter knowledge and PCK, MTE knowledge includes subject matter knowledge for MTEs (including MKT) and PCK for MTEs (for facilitating PTs’ learning of MKT). They conceptualize MTE subject-matter knowledge as comprised of three subdomains analogous to those comprising subject matter for teachers: MTE knowledge of MKT (Ball et al.’s MKT framework [4]), MTE specialized content knowledge (mathematical content knowledge that is specific to developing PTs’ MKT), and knowledge at the mathematical horizon for PTs. They conceptualize MTE PCK as being composed of three subdomains analogous to those comprising PCK for teachers: knowledge of content and PTs (i.e., MTE knowledge of content and students), knowledge of content and teaching PTs (i.e., MTE knowledge of content and teaching) and knowledge of curricula for PTs (i.e., MTE knowledge of curricula).

In their conceptualization of MTE knowledge, referred to as Mathematical Knowledge for Teaching Future Teachers (MKT-FT) [45], Hauk and colleagues also expanded upon the MKT framework [4] while integrating it with another teacher knowledge framework from their previous work [46]. Their previous framework included subdomains of university-based MTE PCK. They argued that akin to how teachers require specialized mathematical knowledge for teaching students, MTEs require specialized knowledge specific to supporting PTs in developing MKT. The MKT-FT framework includes four subdomains: knowledge of discourses (i.e., knowledge of communicating about MKT and the teaching of mathematics in different instructional situations), knowledge of content and teaching (i.e., knowledge of teaching mathematics to PTs and attention to MKT in making instructional decisions), knowledge of curricula (i.e., materials and resources used to teach PTs), and knowledge of content and students (i.e., knowledge of how PTs learn and understand content) [45]. Their previously developed model for teacher knowledge [46] is entirely contained within this last subdomain, which they describe as including knowledge of how to support PTs’ development of MKT, as well as knowledge of how to engage PTs in learning to unpack mathematical ideas in ways needed for teaching students [45].

Chauvot also drew on the MKT framework [4], as well as Shulman’s framework for teacher knowledge [26], and proposed analogous MTE knowledge subdomains from both frameworks [18]. Specifically, she proposed subject matter content knowledge, PCK, and curricular knowledge that parallel knowledge subdomains for teachers described by Shulman [26]. Chauvot’s model expanded Shulman’s work by placing all three of his subdomains of knowledge for teaching within the subject-matter content knowledge of MTEs. She also extended several of the MKT domains [4] to MTE knowledge, including

knowledge of how to develop PTs' specialized knowledge, PCK, and knowledge of how to engage PTs with content in ways that are connected to teaching. Chauvot also included a knowledge of context subdomain, which is an understanding of contextual factors affecting the teachers with whom they work (e.g., standards and policies for teacher preparation).

Shaughnessy and colleagues similarly drew on the MKT framework [4], as well as another framework (albeit not a teacher knowledge framework per se). They expanded Cohen and colleagues' instructional triangle for teaching (i.e., interactions among teachers, students, and content) [38], positioning it as the content knowledge needed by MTEs [35]. Furthermore, like Chauvot [18], they proposed analogous subdomains of MTE knowledge that parallel those of the MKT framework [4], arguing that MKT is a subdomain of MTE knowledge. These subdomains include the following: MTE common content knowledge (e.g., knowledge of how to explain multi-digit subtraction that allows PTs to engage in this instructional practice), MTE knowledge of content and students (e.g., knowledge of common errors that PTs tend to make when engaging in instructional practices like regrouping using base-10 blocks), and MTE knowledge of content and teaching (e.g., knowledge of the types of tasks, representations, etc., that are useful in helping PTs learn elements of mathematics teaching) [35].

Escudero-Avila and colleagues drew on past research about mathematics teachers and teaching to propose seven subdomains of MTE knowledge: (1) mathematical knowledge (i.e., MKT), (2) knowledge about teachers' PCK (i.e., theories of teaching and learning standards), (3) knowledge about mathematics teaching practices and skills, (4) knowledge about professional identity (i.e., PT conceptions and beliefs), (5) knowledge of the features of the professional development of mathematics teachers, (6) knowledge of teaching the content of initial math teacher education programs (i.e., PT coursework and relevant activities), and (7) knowledge of the standards of math teacher education programs [47]. While not proposed as a framework per se, Escudero-Avila and colleagues' subdomains share many similarities with subdomains in other MTE knowledge frameworks included in our review. Notably, the authors did not propose a structure for how to relate the various knowledge subdomains.

7.2. Components of a Framework for MTE Knowledge

Five articles listed in Table 2 do not include comprehensive frameworks for MTE knowledge but either conceptualize components of an MTE knowledge subdomain or propose a new subdomain of MTE knowledge. For example, Chick and Beswick conceptualize components of MTE PCK, building their descriptions of PCK for MTEs from descriptions of the PCK teachers require [48,49]. They identified several components of MTE PCK, including knowledge of examples, curricula, student thinking, and common misconceptions. Using vignettes from the first author's practice, they provided evidence of the existence of the various components of MTE knowledge, illustrating ways in which such knowledge is leveraged as an MTE teaches PTs. Similarly, Chauvot conceptualized four components of curriculum knowledge for MTEs, including (a) knowledge of programs and materials (e.g., different models for teacher preparation, textbooks, and materials for use in courses for PTs), (b) knowledge of indications and contraindications of curricula (e.g., use of curricula or program materials in particular circumstances and the effectiveness of curriculum programs), (c) lateral curriculum knowledge (e.g., knowledge of other courses PTs are enrolled in), and (d) vertical curriculum knowledge (e.g., knowledge of coursework that precedes and follows current courses in which PTs are enrolled) [50]. Chauvot concluded by highlighting the use of MTE curricular knowledge in current studies of MTEs' professional learning, arguing for the centrality of curricular knowledge in MTEs' work. Olanoff also conceptualized components of a larger MTE knowledge domain, with a particular focus on the knowledge components leveraged while teaching a particular concept to PTs [51]. These components include knowledge of (a) multiple representations of the topics, how the representations relate to other topics, and which representations best support PTs in making connections; (b) how to set specific goals for student learning; and (c) how to design and

use assessments effectively. Finally, Felton-Koestler proposed knowledge for sociopolitical mathematics teaching—a knowledge subdomain that he argues teachers at all levels need, including MTEs, for mathematizing sociopolitical issues in order to address issues of equity and social justice in their work [52]. Felton-Koestler describes this subdomain as including knowledge of sociopolitical issues and a broader sociopolitical curriculum for teachers.

8. Empirical Studies of MTE Knowledge

As a result of our review, we categorized 10 articles as empirical studies of MTE knowledge in Table 3. (We use the term “empirical” to refer to articles that follow a more traditional approach to research reporting, with a research question(s), methods, and results or findings.) Throughout the following sections, we discuss the ways in which authors approached the study of MTE knowledge and the findings of their work.

Table 3. Empirical studies of MTE knowledge (n = 10).

Author(s)	Year	Origin	Research Question(s)
How MTE Knowledge is Leveraged in Teaching PTs (n = 6)			
Castro Superfine and Li	2014a	USA	What forms of knowledge do MTEs use, and how is this knowledge different from that of teachers?
Jankvist, Clark, and Mosvold	2020	Denmark, USA, and Norway	What knowledge do MTEs leverage when describing how they would engage in certain tasks of teaching with PTs?
John	2002	UK	What are the knowledge and expertise that teacher educators hold and use?
Veselovsky	2017	USA	What goals for teaching and learning do MTEs develop in their teaching of content courses? What practices do they foster and why do they draw on particular forms of knowledge?
Zazkis and Mamolo	2016	Canada	How can the work of an MTE be explained in terms of levels of awareness [40] and knowledge of the mathematical horizon [53]?
Zopf	2010	USA	What is the work of teaching math to teachers, and what are the knowledge demands entailed by this work?
Self-Studies of MTE Knowledge in Practice (n = 4)			
Masingila, Olanoff, and Kimani	2018	USA	When MTEs reflect on their teaching in a community of practice, what types of MKTT do they use and develop?
Mendoza Álvarez, Rhoads, and Jorgensen	2020	USA	How is MTEs’ knowledge developed as they implement and revise tasks in math courses for PTs?
Muir, Wells, and Chick	2017	Australia	What aspects of MTE PCK are evident when MTEs observe each other’s practice? In what ways do MTEs make their teaching practice explicit to PTs?
Muir, Livy, and Downton	2021	Australia	How does the knowledge needed by MTEs differ from that required by schoolteachers? To what extent is the Knowledge Quartet [54] applicable to MTEs?

8.1. *Studies of How MTE Knowledge Is Leveraged in Teaching PTs*

Zopf [33], Castro Superfine and Li [55], and Jankvist and colleagues [56] analyzed the knowledge leveraged by MTEs as they teach PTs, drawing on different artifacts of teaching and interviews with MTEs to articulate ways in which MTE knowledge is distinct from the knowledge leveraged by teachers in their practice. Zopf [33] and Castro Superfine and Li [55] did so by analyzing instances in which MTEs teach tasks that develop PTs' specialized content knowledge. For example, using observations of and interviews with two different MTEs, Zopf identified three ways in which teaching PTs is different from teaching students: both the content and learners are different and, most notably, the purposes of instruction are different [33]. As such, the knowledge MTEs use to develop PTs' specialized content knowledge is unique. Castro Superfine and Li studied artifacts (i.e., videotaped classes, lesson plans, and slides) taken from several iterations (and multiple instructors) of a content course for PTs to illustrate instructional examples in which MTEs use their knowledge in practice [55]. In one example, during a discussion of students' errors related to multiplication, the authors described how MTEs not only need to have knowledge of common student errors but also knowledge of instructional strategies teachers might use to determine the sources of such errors. In doing so, the MTEs used this knowledge to both elicit PTs' understanding of these errors and connect PTs' learning to the work of teaching. Using course artifacts from and interviews with participating MTEs, Jankvist and colleagues analyzed the knowledge MTEs leveraged as they described how they would engage in certain tasks of teaching PTs (e.g., selecting examples and managing enactment of tasks) [56]. Collectively, by drawing on various artifacts of teaching and interviews with MTEs, these studies illustrate empirical approaches to studying how MTEs use their knowledge in practice when teaching PTs.

While not particularly focused on the uniqueness of MTE knowledge, Veselovsky analyzed the relationships among MTEs' knowledge in practice, their goals for PTs' learning, and their instructional practices [21]. Using classroom observations, interviews, and course artifacts, she developed case studies of four MTEs teaching content courses for PTs. Although Veselovsky found considerable alignment among individual MTEs' teaching and learning goals and their demonstrated knowledge, her cross-case analysis also identified notable differences. For example, while three MTEs indicated that one main teaching goal was to activate PTs as resources for each other, their purposes for doing so were different. One MTE saw all learners as having valuable knowledge, while another saw mathematical knowledge as a tool for social improvement, arguing that everyone should have access to mathematics. Similarly, John demonstrated the dynamic relationship between MTE knowledge and practice in his exploratory study of teacher educators in different disciplines [57]. Relevant to this review, John presented the case of Beth, an MTE, and characterized the ways in which she drew on her knowledge and experience in teaching PTs. Using interviews and classroom observations, John described how Beth leveraged her knowledge of research in mathematics education in her instructional interactions with PTs. In describing Beth's practice, John characterized the practice of teaching PTs as that of reorienting, that is, supporting PTs in reconceptualizing for themselves what it means to learn and teach mathematics. Together, Veselovsky [21] and John [57] demonstrated that an analysis of the knowledge MTEs use in their practice can reveal insights into the relationship between MTEs' knowledge and their instructional goals with PTs.

In contrast to focusing on MTE knowledge generally, Zazkis and Mamolo analyzed a specific subdomain of MTE knowledge and how it was used by an MTE in practice [58]. Drawing on Mason's levels of awareness [40], the authors proposed MTE knowledge of the mathematical horizon (see [4]), which they define as MTEs' use of mathematical knowledge beyond that which is required in school curricula. Using a particular instructional interaction, the authors focused on an MTE's response to a "disturbance," an instance in which an unexpected mathematical solution emerged during a class discussion to which the MTE did not have a suitable response. In their analysis, they described how the MTE reflected on the disturbance and revisited the mathematics underlying the unexpected solution, eventually

connecting the solution to mathematical ideas that resided beyond the curriculum of the course. In doing so, they illustrated an MTE's knowledge of the mathematical horizon as an awareness of the periphery of a mathematical concept, understanding that the concept lies within a larger mathematical structure that is not necessarily accessed during teaching.

8.2. *Self-Studies of MTE Knowledge in Practice*

The remaining four empirical studies in our review analyzed how the authors themselves, as MTEs working within a larger collaborative community of colleagues, use their knowledge in practice teaching PTs. Muir and colleagues, for example, focused on a particular subdomain of MTE knowledge and explored the PCK that MTEs use when teaching PTs [59]. Two of the authors observed each other's courses for PTs across two semesters and engaged in pre-planning and post-observation discussions about their practice and collected artifacts of PT learning. The authors used Chick and Beswick's framework for MTE PCK [48] to identify instances in their data sources where the MTEs drew on MTE PCK. Once identified, the authors applied the Knowledge Quartet framework from Rowland and colleagues [54] to analyze those instances. While acknowledging similarities between the knowledge teachers require and the knowledge the MTEs used in their study, the authors illustrated the unique nature of MTE PCK, demonstrating ways in which MTEs support PTs' development of PCK.

In their study of MTEs within a community of practice, Masingila and colleagues examined ways in which MTEs develop their knowledge for teaching teachers by reflecting on the process of teaching content courses for PTs [60]. Drawing on Zaslavsky and Leikin's notion that MTEs develop knowledge through teaching [41], the authors focused on the types of MTE knowledge that they used and gained while supporting PTs' development of MKT. Over the course of two semesters, the authors each taught sections of mathematics content courses for PTs focused on problem solving. Using transcripts from planning and debriefing meetings, observations of the courses, and reflective memos of their own practice, the authors identified three tasks of teaching PTs wherein the MTEs used and further developed their own knowledge. For example, with the task of identifying goals for PTs, the MTEs considered the concepts most important for PTs to engage with to develop MKT and how to facilitate the learning of these concepts. The authors argued that participating in a community of practice focused on teaching courses for PTs provided opportunities for them to reflect on their own practice and make explicit how they were drawing on their knowledge as MTEs in their practice.

Mendoza Álvarez and colleagues studied how their own knowledge as MTEs was further developed as they implemented and revised various tasks in their mathematics courses for PTs [61]. Building upon Chick and Beswick's conceptualization of MTE PCK [49], the authors discussed the central role that MTE PCK plays in the work of teaching PTs. Drawing on classroom observations, PT artifacts, and their own reflections, the authors illustrated the evolution of tasks implemented across different courses and described their efforts to improve their facilitation of those tasks over time. For example, they discussed how their reflections on how PTs interacted with tasks led to them changing their facilitation moves and the types of questions they asked to ensure that PTs maintained a high level of cognitive challenge. In doing so, they highlighted how their own MTE PCK [49] was enhanced as they implemented and revised their tasks for PTs.

In their study, Muir and colleagues focused on the applicability of the Knowledge Quartet [54] framework to understanding MTE knowledge in practice [59]. Like other frameworks for teacher knowledge, the Knowledge Quartet includes domains that address knowledge of content, pedagogy, and instructional routines (e.g., lesson planning). Using a case study methodology, the authors examined the knowledge an MTE used as they co-taught, with a schoolteacher, a PT course focused on mathematics pedagogy. Drawing on lesson plans, class observations and individual interviews, the results of their analysis indicated similarities in the type of knowledge used by the MTE and schoolteacher and highlighted important differences. In particular, Muir and colleagues pointed to an example

in which the MTE demonstrated knowledge of the theoretical rationale underlying certain practices (e.g., why certain models are more efficacious for teaching place value) [59]. Their analysis also indicated that the MTE drew on knowledge of how to model various instructional practices for PTs and to articulate why and how such practices were supportive of student learning. Overall, the study by Muir and colleagues points to the uniqueness of the knowledge MTEs use in teaching PTs. Moreover, while not extending the subdomains of the Knowledge Quartet framework to MTEs, the authors demonstrate the applicability of a teacher knowledge framework to analyzing MTE knowledge in practice.

Taken together, the articles on MTE knowledge provide empirical evidence of the uniqueness of MTE knowledge and illustrate ways in which this knowledge is distinct from teacher knowledge based on analysis of artifacts of teaching PTs. Moreover, the articles in this section highlight the unique forms of knowledge MTEs leverage when teaching PTs through the interconnections among their knowledge, goals, and instructional decision making. Notably, all of these articles approached the study of MTE knowledge through qualitative analyses of teaching and learning artifacts, observations, and interviews with and reflections from MTEs.

9. Contexts for MTE Knowledge Development

We placed nine articles in the Contexts for MTE Knowledge Development category, as shown in Table 4. Two articles describe the impact of MTEs’ research activities on their development of knowledge, six share the design of specific professional learning opportunities for MTEs, and one discusses the ways in which conducting self-studies can lead to MTE knowledge development.

Table 4. MTE knowledge development (n = 9).

Author(s)	Year	Origin	Research Question(s)
Conducting Research to Develop MTE Knowledge (n = 2)			
Peled and Hershkovitz	2004	Israel	In what ways do various phases of research conducted by MTEs afford them learning opportunities, and what conditions contribute to their learning?
Rowland, Turner, and Thwaites	2014	UK	In what ways do MTEs experience changes in their awareness and practice as a consequence of conducting research in math education?
Professional Learning Experiences to Develop MTE Knowledge (n = 6)			
Castro Superfine and Li	2014b	USA	What are MTEs’ design decisions and goals for their math content courses? How do MTEs achieve these goals? What challenges do MTEs encounter as they carry out these goals?
Golding and Batiibwe	2021	UK and Uganda	What are the affordances and constraints in the design of a Mathematical Thinking and Instructional Technology course for MTEs? What impact did the course have on MTE knowledge?
Roesken-Winter, Schüler, Stahnke and Blömeke	2015	Germany and Norway	What was the impact of a year-long course for MTEs on MTE content knowledge and pedagogical content knowledge? To what extent did the design principles applied in the course become relevant for MTEs’ work?
Shaughnessy, Garcia, Selling, and Ball	2016	USA	What knowledge/skills are demanded of MTEs to engage in practice-based teacher education? What structures are useful for supporting novice MTEs’ learning of such knowledge/skills?
Szatjn, Ball, and McMahon	2006	USA	How can researchers design professional learning models for MTEs focused on developing their understanding of MKT for PTs?
Van, Mao, and Cnudde	2018	Cambodia	What is the impact of a professional development intervention on MTEs’ PCK and content knowledge of rational numbers?
Developing MTE Knowledge Through Self-Study (n = 1)			
Taylan and da Ponte	2016	Turkey and Portugal	How does teaching and researching students support MTEs in developing MKTT?

9.1. Conducting Research to Develop MTE Knowledge

Two articles in our review described ways in which MTEs' research activities contributed to their own development of knowledge in practice. Rowland and colleagues provided a reflective account of their development as MTEs, describing changes in their awareness [40] and instructional practices as a result of conducting research on teacher knowledge [62]. Using narrative inquiry with elements of autobiography, the authors described instances where each drew on one or more dimensions of the Knowledge Quartet [54] in their work teaching PTs. For example, they described how PTs often selected mathematical representations based on superficial features without attention to the underlying mathematical ideas. To address this in their practice, the authors discussed how they drew from their research on teacher knowledge to inform their teaching of mathematical representations. The authors concluded that even though the focus of their research was on the knowledge development of PTs, their work resulted in their own professional development, as their enhanced understanding of teacher knowledge informed the content and design of their courses for PTs.

Similarly, Peled and HersHKovitz described a three-phase research study in which they worked with PTs on problem-solving tasks, reflected on what PTs learned, and then reflected on their own knowledge development as MTEs [63]. Drawing on both Zaslavsky and Leikin's model [41], which emphasizes the role of reflection in MTE professional learning, and Jaworski's model for MTE–learner relations [64], the authors reflected on three examples from their research and described the nature of their learning in each. In particular, they discussed their dual attention to observing PTs' engagement with the tasks (as MTE instructors) and their efforts to design tasks in ways that enable data collection to support their research goals (as MTE researchers) [63]. For example, they described revising their plan for implementing a particular task, basing their decisions on two elements of Jaworski's model (i.e., sensitivity to learners and mathematical challenge) [64]. Peled and HersHKovitz provide an example of MTEs learning from and in teaching, as they ultimately enhanced their own theoretical understanding of mathematical tasks by designing tasks and reflecting on PT learning [63].

9.2. Professional Learning Experiences to Develop MTE Knowledge

Six of the articles we reviewed described the design of professional learning experiences for MTEs and, in some cases, presented descriptive analyses of ways in which the designs supported MTE professional learning. In their work, Shaughnessy and colleagues focused on ways of supporting novice MTEs in learning to teach PTs [35], arguing that MTEs require specialized knowledge for teaching MKT [4] to PTs. The authors describe various support structures within their weekly planning group that support novice MTE learning. One structure includes rehearsals, wherein an experienced MTE roleplays a PT who is explaining core content, a novice MTE runs the rehearsal, and another experienced MTE provides feedback to the novice MTE on the rehearsal. This structure provides opportunities for novice MTEs to develop and receive feedback on their practice and to further develop their specialized knowledge for teaching PTs.

While not specifically focused on novice MTEs, Szatjn and colleagues [65] and Castro Superfine and Li [66] described designs and illustrated implementations of more formal professional learning experiences for MTEs. These experiences included either monthly workshops or intensive week-long summer retreats during which MTEs analyzed live or recorded observations of MTEs teaching PTs. With the overall aim of enhancing their own knowledge in practice, MTEs engaged in professional inquiry of artifacts from MTEs teaching content courses. In both designs, the authors focused on MTEs' development of the specialized content knowledge needed by MTEs for teaching PTs.

Similarly, Van and colleagues described a professional learning intervention focused on improving MTEs' content knowledge and PCK of rational numbers [67]. The intervention consisted of three multi-day modules focused on understanding rational numbers and related representations and assessments. Following the modules, MTEs taught rational

number-focused lessons and received mentoring around those lessons. Through a pre-/post-test design, together with lesson observations of MTEs, the authors found that a majority of participating MTEs significantly increased their PCK, including their ability to assess PTs and address PT misconceptions of rational numbers. The authors argue for the need for more professional learning experiences for MTEs to further develop their own knowledge, as few exist.

The remaining two articles described the design and impact of courses for MTEs. Golding and Batiibwe discussed a Mathematical Thinking and IT (Instructional Technology) course designed to enhance MTEs' technological, mathematical, and mathematics pedagogical knowledge through various types of activities [68]. Using data from tests, course assignments, and individual interviews, their results indicated that the participating MTEs demonstrated moderate improvements in their mathematical knowledge, and the MTEs who showed improvement reported feeling confident in their ability to apply ideas from the course to their local contexts. Roesken-Winter and colleagues similarly described the impact of a year-long course for MTEs on MTE content knowledge and PCK [69]. The multiple course modules ranged in focus from mathematics content and PCK to behavior management and technology skills. Data from questionnaires and individual interviews indicated significant development of MTE knowledge, among other positive outcomes. The authors also measured the potential sustainability of the course on MTE outcomes (i.e., 6 months post-course) and found similar positive gains in both types of MTE knowledge. Together, these articles demonstrate the potential of focused coursework for enhancing MTE knowledge in practice.

9.3. *Developing MTE Knowledge through Self-Study*

While several researchers have employed self-study to analyze MTE practice, only one article we reviewed explicitly focused on how self-study can enhance MTEs' development of knowledge. Taylan and da Ponte focused on the first author's professional learning from her practice teaching a group of elementary students, as part of a larger university-school research program [17]. In particular, the authors focused on ways in which the MTE drew on her PCK in her instructional interactions with the students. Using videotaped classroom observations and the MTE's reflections on particular instructional interactions, Taylan and da Ponte illustrated ways in which the MTE refined certain aspects of her own PCK over time. In doing so, the authors argued that analyzing the practices MTEs use while teaching young students can provide opportunities for MTEs to make important connections between research and practice, which they can in turn make explicit when teaching PTs.

Overall, the research on MTE professional learning highlights the prevalence of self-study and the use of reflective analysis to develop MTEs' knowledge in practice. Less commonly reported was the conduction of research in mathematics teacher education as a form of professional learning for MTEs. Most notable were the six articles that described formal professional learning opportunities for MTEs [35,65–69]. What this review makes clear is that the majority of opportunities for professional learning are largely those that are initiated by MTEs themselves in the form of self-studies or collaborations with colleagues.

10. Discussion

There is a general consensus within the teacher education community that the knowledge MTEs require in their work with PTs includes not only the knowledge that teachers need but also unique elaborations of that knowledge. In fact, many of the articles we reviewed conceptualize MTE knowledge as an extension of teacher knowledge. That is, these frameworks not only position teacher knowledge as a subdomain of MTE knowledge but also partition MTE knowledge into subdomains similar to those found in frameworks for teacher knowledge. In our previous work, we proposed a fractalization metaphor to describe the ways in which various articles conceptualize MTE knowledge, as the visualizations of many of these frameworks resemble part of a fractal [43,44,70]. We use the term

fractalization to refer to the process by which one knowledge component or subdomain is entirely contained within a larger knowledge component or subdomain, where the larger component or subdomain is analogous in structure to the smaller one.

11. Conceptual and Structural Similarities across MTE Knowledge Frameworks

Many of the MTE knowledge frameworks we reviewed build on existing frameworks for teacher knowledge and, in many instances, represent fractalizations of teacher knowledge frameworks (e.g., the teaching triad [38], the instructional triangle [39], and the teacher knowledge tetrahedron [37]). In other words, many frameworks for MTE knowledge include a teacher knowledge framework in its entirety as one of their subdomains. Furthermore, the researchers conceptualized certain subdomains (and related components) of MTE knowledge as being “meta” forms of analogous teacher knowledge subdomains (e.g., [18,41,42,45]). For example, Shaughnessy and colleagues [35], Olanoff and colleagues [44], and Castro Superfine and colleagues [43] (proposed MTE knowledge subdomains analogous to the MKT framework from Ball and colleagues [4], including MTE common content knowledge (which contains MKT), MTE knowledge of content and students, and MTE knowledge of content and teaching. In other words, as teachers of teachers, MTEs require similar types of knowledge needed by teachers, but MTEs need knowledge of these subdomains in ways that are specific to teaching PTs. We found such structural similarities across many of the frameworks we reviewed. Such a structure reinforces a conceptualization of MTE knowledge not only as an extension of teacher knowledge but also as including knowledge subdomains that are uniquely different from teacher knowledge.

Despite overall structural similarities, there are important conceptual differences in the subdomains of the frameworks we reviewed. Broadly speaking, all of the knowledge frameworks in our review include some or all of the four main subdomains representing extensions of teacher knowledge domains (e.g., [4,26]): knowledge of content, knowledge of curriculum and context, knowledge of PTs, and knowledge of ways of supporting PT learning. However, some frameworks include subdomains unique to MTEs, such as Zaslavsky and Leikin’s sensitivity to mathematics teachers (PTs) [41]. Considering the uniqueness of PTs as a population of learners, this knowledge includes understanding that PTs often enter teacher preparation programs with limited conceptual understandings of math. As such, the work for MTEs is to support PTs’ relearning of math, which involves PTs ultimately reconstructing their previously developed knowledge of mathematics [43,71]. Further, Chauvot included MTEs’ knowledge of mathematics education research as part of the knowledge needed to effectively prepare PTs [18]. In fact, Chauvot posited that knowledge of research in mathematics education underlies all the other knowledge subdomains MTEs require in their work with PTs (e.g., knowing the research on how children learn different concepts can inform MTEs’ design of content courses for PTs). This echoes other researchers who describe conducting research in mathematics teacher education as a form of professional learning (e.g., [62]). Notably, these different subdomains are unique to MTEs and arguably do not have analogous subdomains in a teacher knowledge framework. In addition, there were important differences in the grain size at which the researchers whose work was considered in this review conceptualized MTE knowledge. While the majority only identified subdomain levels using the four main subdomains described above, a few deconstructed their subdomains into components. For example, Chauvot described different components of MTE curricular knowledge (e.g., lateral and vertical curricular knowledge) [20], whereas Castro Superfine and colleagues specified components of MTEs’ content-specific knowledge (e.g., specialized content knowledge and knowledge of content and teaching) [43]. More work needs to be done to theorize components of the four main subdomains of MTE knowledge and empirically explore the ways MTEs leverage such knowledge components in their teaching.

Another theme that emerged is the process by which MTE knowledge has been studied and conceptualized, which has largely been from a knowledge-in-practice perspective. Through an analysis of various artifacts of practice and reflections on MTEs’ work with PTs,

researchers applying a knowledge-in-practice perspective to the work of MTEs highlight the types of knowledge leveraged as they teach PTs, reinforcing the dynamic relationship between knowledge and practice. A majority of the articles on MTE knowledge described a self-study process wherein one or more of the authors reflected on and described the types of knowledge they leveraged in their work with PTs (e.g., [58–60]). Such a process is productive for understanding the types of resources (e.g., experiences, beliefs, and knowledge) that impact MTE practice to support drawing on different types of knowledge considering their expertise. However, more work needs to be done to explicate the analytic processes employed in research on MTE knowledge so that others can employ similar methods and contribute to the knowledge base. Moreover, while self-studies (i.e., research by MTEs) provide unique insights into the nature of MTE knowledge, the research base would be strengthened by research on MTEs to corroborate and further specify the various MTE knowledge subdomains and components. While not included in our review, Goos’ analytic framework provides a useful starting point for studying MTE knowledge in practice by considering the interactions among MTE knowledge, beliefs, and contexts and the ways in which these interactions manifest in the various knowledge subdomains leveraged by MTEs [72].

Another theme that emerged was the application of self-study approaches by researchers to empirically study MTE knowledge and its subdomains. For example, Muir and colleagues, who examined MTE PCK [59]; Zazkis and Mamolo, who focused on MTEs’ knowledge of the mathematical horizon [58]; and Masingila and colleagues [60] and Bergsten and Grävholm [32], who focused on MKTT more broadly, all employed a version of self-study, where one or more of the authors was the object of study while the other author(s) served as researcher(s). The methods employed for the “object” of study ranged from general qualitative inquiries into and analyses of MTEs’ reflections and analyses of artifacts of teaching practice (e.g., observations, meeting notes, PT work samples, and lesson plans) to retrospective analyses of their own practice with PTs. Similar to those in the research base for frameworks for MTE knowledge, self-studies of specific aspects of MTE knowledge provide unique insights that other approaches cannot offer. However, Adler and colleagues argue that, in the context of such self-studies, researchers need to take a critical stance with respect to their practice and include external observers to strengthen the arguments being made [73].

12. Expanding the Contexts for MTE Knowledge Development

Despite the centrality of MTEs in teacher education, little is known about the nature of professional learning opportunities for them to develop and enhance the knowledge needed to teach PTs. This is particularly important as MTEs who teach PTs include mathematicians, graduate students, mathematics educators, and classroom teachers who have varying professional backgrounds and are often not professionally prepared for the work of teaching teachers [24]. There were few articles in our review that described formal opportunities for MTE professional learning that aimed to develop MTE knowledge (e.g., [65,66]). By formal we mean professional learning opportunities that mirror those for teachers, such as workshops, coursework, or summer institutes. Within these articles, professional learning took the form of either coursework (e.g., [68,69]) or structured workshops and experiences focused on MTE knowledge development (e.g., [35,65,66]). In these examples, the authors made explicit the designs of the coursework and professional learning opportunities, illustrating how MTE knowledge can be further developed through inquiry into the practice of teaching PTs. Indeed, there is a great need for the development of additional professional learning opportunities for MTEs such as these [5,24]. Goodwin and colleagues found that the majority of the teacher educators they surveyed learned to teach PTs “on the job”, with no formal preparation for this work, as there are currently few, if any, graduate programs in the US devoted exclusively to the professional preparation of teacher educators [74]. One option for supporting the professional learning of MTEs might be to enlist experienced MTEs to develop graduate-level programs for preparing novice MTEs to teach PTs. In our

review, the work of Shaughnessy and colleagues was most closely related to graduate-level programs—in this case, for novice MTEs [35]. In addition, though not a formal professional learning experience, Masingila and colleagues described their efforts to understand how MTE knowledge is developed when teaching MKT to PTs [60]. Their study involved two novice MTEs observing one more experienced MTE.

Across the articles we reviewed, the use of self-study was a common form of professional learning for MTEs. While our review only included one example of how self-study can be leveraged to enhance MTE knowledge (e.g., [17]), several articles that were not included in our review, because they did not focus explicitly on MTE knowledge, employed self-study methodologies to enhance MTEs' instructional practice (e.g., [16,75]). These articles, taken together with other recent scholarship on MTE learning (e.g., [11,76]), highlight how the use of self-study to support MTE professional learning has grown considerably in recent years. In all of these articles, the researchers (who were also participants) took a knowledge-of-practice perspective to analyze their own practice. Again, such “inside” perspectives are useful for understanding the development of MTE knowledge but should be complemented by “outside” perspectives, where researchers include external observers to promote a more critical stance [73].

13. Conclusions

While our review indicates a growing research base that builds on research related to teacher knowledge, it is fragmented in many ways. Nevertheless, if we are to pursue the process of building a knowledge base for MTEs, we must assume, like Lampert and Graziani, that there is some knowledge about teaching that is relevant across contexts and that it can be “taught” and “learned” [77]. By “taught”, we do not mean to imply a purely didactic or transmission model of teaching and learning but rather suggest that a community of MTEs can supply useful information, establish an environment, and arrange experiences conducive to providing MTEs with opportunities to further develop their knowledge. In fact, research like that conducted by Zaslavsky and Leikin [41] offers evidence that knowledge in practice can be developed and shared within a community of MTEs in such a way that supports MTEs in learning, growing, and becoming more confident in their abilities to prepare effective teachers of mathematics.

We posit that there may be processes by means of which the field can identify knowledge that is generally useful across varied situations so that we might begin building a mutually agreed-upon knowledge base for MTEs. Such a knowledge base could inform the design and implementation of opportunities to improve the preparation and professional development of MTEs—a logical next step regarding the horizon of this landscape. However, it is worthy to note that Chapman has pointed out several potential issues surrounding the use of a category-based approach for conceptualizing MTE knowledge [78]. She states that “We are at the early stage of researching MTEs, and the category-based perspective makes sense at this point as a way to begin to understand MTE knowledge. However, it is important for research to explore other ways of understanding and representing MTE knowledge” (p. 415).

Our hope is that this review can contribute to the ongoing discussion related to MTEs and the development of their knowledge as this research base continues to grow and evolve.

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