

Article

Zooming on Mental States: Developing the Mentalization and Interaction Skills of Early Childhood Education Student Teachers

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Abstract

Early childhood education (ECE) professionals' reflections on mental states have been associated with staff–child interaction quality and child development. However, experimental evidence from mentalization training in ECE teacher education is limited. Fifteen Finnish student teachers with a caregiver background, enrolled in a higher education program, participated in a Video Enhanced Reflective Practice (VERP) intervention. The training was integrated in two blended learning study modules, where the focus was to support children's language, cognitive, and social–emotional development. The student teachers' observed mental state talk increased during trainer-guided peer discussions as well as student-guided discussions with two children during picture book reading interactions. The student teachers' self-reported general interaction skills also improved. In the pilot study, growth was observed in mentalization and interaction skills, following a higher education program that combined VERP with evidence-based content. The preliminary data suggest that future interventions should focus on the transfer of training and on improving ECE student teachers' talk about emotional states during interactions with children.

Keywords: mentalization; interaction; early childhood education; blended learning; video reflection; book reading interaction

1. Introduction

The quality of interaction in early childhood education (ECE) classrooms has been shown to improve children's learning and development (e.g., [Mashburn et al., 2008](#); [Salmi-nen et al., 2021](#)). High-quality interaction is characterized by professionals who are sensitive to children's emotional and cognitive needs, respond to and expand children's initiatives, and scaffold their age-appropriate behavior and thinking. In a longitudinal study, [Mashburn et al. \(2008\)](#) reported that the quality of instructional support predicted children's academic and language skills, whereas the quality of emotional support predicted children's social skills. Although empirical evidence is lacking, it is plausible that ECE professionals who demonstrate stronger support may also talk more often about cognitive and emotional states during classroom interactions, which could contribute to children's positive cognitive and social–emotional development. Therefore, it may be important to promote ECE professionals' awareness of mental states and intentional use of mental state talk to and about children.

Mentalization refers to reflections on mental states that can externalize as behavior and verbal references to one's own or others' thoughts, desires, and feelings (for related concepts



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such as mind-mindedness or reflective functioning, see [Colonnesi et al., 2017](#); [Stacks et al., 2013](#)). In observation studies ([King & La Paro, 2015](#); [Mata López et al., 2020](#)), mentalization has been operationalized as professionals' talk about the type of mental state—cognition, perception, emotion, or motivation—and sometimes distinguishing between mental states of the child, self, or others (for other assessment methods, see, e.g., [Linnavalli et al., 2024](#); [Stacks et al., 2013](#)). As studies from different countries have shown, professionals use cognitive state talk more often than emotional state talk during their interactions with children in the ECE classroom, including samples from Australia ([Mulvihill et al., 2023](#)), China ([Sheng et al., 2021](#)), Israel ([Ziv et al., 2015](#)), the Netherlands ([Colonnesi et al., 2017](#)), and the USA ([King & La Paro, 2015](#)).

Professionals' qualifications or work experience might influence the frequency or content of mental talk they use in classroom interactions with children or when talking about children. The findings regarding the relationship between ECE professionals' background characteristics and their mentalization competence are mixed. Professionals with vocational-level qualifications used more mental state talk than university-level professionals in Chilean ([Mata López et al., 2020](#)) and Chinese samples ([Sheng et al., 2021](#)), whereas Australian university-level professionals used more cognitive state talk than their vocational-level colleagues did ([Andrews et al., 2019](#)). However, no relationship was found between professionals' education level and mentalization in another Australian sample ([Degotardi & Sweller, 2012](#)) and a Danish sample ([Wendelboe et al., 2024](#)). As for work experience, in a U.S. study ([King & La Paro, 2015](#)), more experienced ECE professionals used fewer perception utterances than their less experienced colleagues did during classroom interactions with children. However, there was no connection between ECE professionals' work experience and mental state talk in Dutch ([Colonnesi et al., 2017](#)) or Australian samples ([Degotardi & Sweller, 2012](#)). More research is needed into ECE professionals' mental state talk from different cultures and education systems.

1.1. Mentalization-Based Training in ECE

Few training studies have acknowledged the role of mentalization in improving ECE and pre-primary professionals' relational interactions with children. The aim of a Dutch one-on-one intervention study ([Spilt et al., 2012](#)) was to support individual teachers' relationships with two five-year-old children with whom they had experienced relational and emotional difficulties in the classroom. With the support of the trainer in the first session, the teachers compared their mental representations, that is, their internalized affective and cognitive models of the relationship of one target child with actual video-recorded interactions with the child during a structured small group. In the second session, the teacher-trainer dyad formed a theory-driven relational profile that represented the teacher's strengths and challenges (e.g., in relation to sensitivity of discipline and understanding the child's needs and emotions). After the two onsite sessions for each target child, the teachers improved in self-reported closeness and observed sensitivity toward both children.

Recent evidence from group-based intervention studies further underscores the importance of strengthening ECE professionals' mentalization capacities, especially in the broader classroom context with multiple children. A VERP intervention study conducted in Finnish inclusive classrooms at the team level ([Marttila et al., 2023a](#)) aimed at enhancing professionals' mentalization and quality of interaction with three- to five-year-old children with whom they experienced difficulties. The ECE professionals typically work in teams of three, each with differing higher educational and vocational backgrounds. The VERP trainer guided two teams to reflect on the behavior and mental states of children, themselves, and their colleagues while discussing their video-recorded everyday interactions with the target child chosen by each professional. The intervention, with three onsite

sessions of trainer-guided and video-stimulated group discussions, resulted in no change, as assessed by the professionals' self-reported interaction skills or observed mental state talk. The VERP training might be more effective if the intervention were implemented at earlier stages of the teacher's career or included complementary evidence-based content and diverse teaching methods.

The effectiveness of the VERP intervention was further explored with Finnish preservice teachers enrolled in a teacher education program in higher education and who had little or no work experience in ECE (Marttila et al., 2023b). The basic principles of VERP were embedded in a semester-long study module based on blended learning, with a focus on supporting children's language and cognitive development. Each student teacher video-recorded a picture book reading interaction, an unfamiliar activity for novice preservice teachers, with the same two three-year-old children at the start, middle, and near the end of the intervention. After each recording, the VERP trainer guided the students online in groups of three to share their recordings and reflect on the children's and their own actions and mental states. The students improved their self-reported interaction skills and observed self-focused and child-focused cognitive state talk, but showed no improvement in emotional state talk.

In addition to interventions embedded in professional development and teacher education contexts, mentalization training has been adapted for practitioners with more limited formal education. In an Israeli intervention (Rozenblatt-Perkal et al., 2025), ECE staff with only a high school education but no formal ECE qualification, working in classrooms serving infants, toddlers, and preschoolers, participated in the 12-week mentalization-based program. Weekly 90 min sessions followed a central theme, which included group discussion and guided reflective exercises led by two trainers. Through role play and brainstorming, the staff practiced considering their own and children's thoughts and feelings in everyday situations and explored alternative responses to common classroom challenges. The group discussions supported shared reflection, helping the staff to recognize how mentalization can strengthen their attunement and sensitivity in interactions with children. Following the intervention, participants' mentalization and classroom emotional support improved, and increases in observed mentalization predicted gains in emotional support. Overall, the effectiveness of mentalization-based interventions may be contingent on participants' educational backgrounds; therefore, more research is needed with professionals at different stages of their careers.

Thus far, researchers have not empirically investigated the applicability of blended teaching and learning to mentalization-based interaction training. In the wake of global COVID-19 lockdowns in 2020, the blended learning format became firmly established within Finnish higher education programs during the post-pandemic era. With a blended model, web-mediated online and face-to-face onsite practices alternate (Marshall et al., 2024). As suggested by Theelen and van Breukelen (2022), online and onsite practices share the same key characteristics. In both practices, the teacher scaffolds the students' learning by breaking up the teaching content into parts and guiding the learning process. Student collaboration is incorporated to further enhance peer learning. Moreover, the teacher and the students assess the learning process and plan future learning and teaching based on this evaluation. An in-service training for ECE staff based on a blended format yielded the same positive learning outcomes as onsite practices (Crawford et al., 2021). Considering the key characteristics and success in ECE professional development, it is reasonable to assume that a blended format, which allows both group instruction and individual practice, could offer a promising approach to enhance mentalization and interaction skills of ECE student teachers. Encouraged by the effectiveness of targeted content-specific (e.g., Egert et al., 2020) and blended learning (Theelen & van Breukelen, 2022), as well as the improvements

in cognitive state talk by inexperienced ECE student teachers (Marttila et al., 2023b), we delivered an extended intervention across two semesters in the present study to a group of experienced caregivers enrolled in ECE teacher education.

1.2. Context and Teacher Education in Finnish ECE

The member states of the European Union aim to educate well-trained and motivated professionals to ensure high-quality ECE for all children from different cultural and familial backgrounds (European Commission et al., 2025). Finland provides affordable high-quality childcare services to children under school age who have a subjective right to ECE, which comprises education, instruction, and care with a pedagogical emphasis on supporting the child's well-being, balanced development, and learning, regardless of age, gender, language, ability, or other background. The act on ECE and the national core curriculum for ECE protect the inclusive approach to educational practice. In line with these mandatory documents, children with special needs and immigrant backgrounds attend mainstream classrooms. In Finnish ECE centers, several professionals with differing educational backgrounds work in teams comprising approximately three members. At least one team member is an ECE teacher who must hold a bachelor's degree in education. Usually, the team also includes ECE caregiver(s) with a vocational degree and, at times, a bachelor's-level social pedagogue, a special education teacher, or assistant staff.

To reduce the shortage of qualified ECE teachers in Finland, the Ministry of Education and Culture (2021) funded Finnish universities to develop a new national ECE teacher education program delivered in a blended learning format across two semesters for a target group of qualified ECE caregivers with a vocational background. Only experienced and well-motivated ECE caregivers were enrolled in the higher education program to ensure the participants remained in the teaching profession after graduation with a bachelor's degree in education. As with all prospective teachers applying to Finnish bachelor's degree programs in early childhood teacher education, the target caregivers completed the national academic entrance examination.

1.3. Present Study

Few studies have used mentalization as a method for improving in-service early childhood education professionals' interactions or relationships with children (e.g., Spilt et al., 2012). Finnish findings highlight the need for interventions to improve mentalization among pre- and in-service ECE professionals (Marttila et al., 2023a, 2023b). The present pilot study aimed to promote mentalization and interaction skills among a target group of Finnish ECE caregivers who enrolled in a university bachelor's degree program in early childhood teacher education.

The students participated in an extended VERP intervention, which was embedded in two sequential study modules across the first academic year. This extended format was chosen because a briefer VERP intervention, implemented during a study module on supporting children's language and cognitive development by Marttila et al. (2023b), improved only cognitive, but not emotional, state talk of Finnish ECE student teachers with little or no work experience. We expected specific learning gains based on a match between the content of the study module and the outcome measure. Specifically, we hypothesized (H1) an increase in cognitive state talk during the study module on language and cognitive development in the autumn semester (see Appendix A for the time points). Conversely, we hypothesized (H2) an increase in emotional state talk during the study module on social-emotional development in the spring semester.

We investigated the predicted changes for H1 and H2 in two contexts: a trainer-guided shared group discussion with peers (context 1, i.e., training level) and a student-guided

reading interaction with two children, that is, a familiar activity for experienced ECE caregivers (context 2, i.e., classroom level). To analyze the expected associations between the training level and classroom level (H3), we examined the correlations between student teachers' mentalization across context 1 and context 2. Finally, based on prior evidence on Finnish ECE student teachers (Marttila et al., 2023b), we hypothesized (H4) that the participants would perceive their interaction skills as being better at the end of both the first and the second study module compared to the beginning of their studies.

2. Materials and Methods

2.1. Participants

Seventeen ECE student teachers, who were experienced and well-motivated caregivers, participated in the VERP training, and 15 students gave their informed consent to use the data in the present study. The non-consenting students were excluded from the analysis. The participants had a vocational degree in ECE, were female, and were, on average, aged 39.7 years ($SD = 7.4$, range 26–51). At the beginning of the intervention, one student teacher had less than five years of work experience in ECE, five had less than ten years, and nine had more than ten years of work experience.

2.2. Procedure

The student teachers participated in two study modules given by several university teachers and leading experts in the field during their first academic year of teacher training. As shown in Appendix A, the study module in the autumn semester included theory and practice about children's (bilingual) first language acquisition and cognitive development and high-quality teacher–child interaction (from here on, “Supporting language and cognitive development”). Similarly, the study module in the spring semester offered theory and practice about children's social and emotional development and high-quality teacher–child interaction (from here on, “Supporting social–emotional development”). As in our previous study on ECE student teachers with no previous qualifications and little or no work experience (Marttila et al., 2023b), the study modules were offered to all student teachers (160 in total) enrolled in the ECE teacher education program.

The teaching for all ECE student teachers was based on blended learning—a common practice in Finnish higher education since 2020—with online lectures, onsite and online teaching in small groups, and independent study of the literature. Typically, after each lecture, the students worked independently on practical assignments based on multimedia materials developed for the study modules. The topics were elaborated in university teacher-led group lessons, where students actively observed and reflected on video clips on children's development and high-quality staff–child interactions to integrate theoretical concepts and practice. During the study modules, the student teachers were instructed to plan and video-record 20 min picture book interactions with two children in ECE centers. As the 15 target students reported in this study also worked in Finnish-speaking ECE centers, they could conduct theory-based practical assignments in their workplace. The training procedures and materials of the existing study modules have been approved by the Ethics Committee of the University of Turku. In addition to the regular teaching, the target students participated in the VERP intervention (Marttila et al., 2023b), which was integrated into the two aforementioned study modules. The students who did not participate in VERP training were compensated with literature on supporting children's cognitive and social–emotional development.

Observation and questionnaire data were collected during the two study modules. The heads of the ECE centers and the parents of the children who participated in the video recordings gave written consent. Of the 15 student teachers who gave their consent, one

student did not participate in the study module on social–emotional development; therefore, only 14 students were included in the analysis of the data from the spring semester (T4 and T5). Ethical issues concerning research design, conduct, and data handling were addressed according to the ethical principles of the Finnish National Board on Research Integrity guidelines 2019 (<https://tenk.fi/en>, accessed on 24 June 2025).

2.3. VERP Training

The VERP training was originally developed as an intervention for supporting parenting in high-risk family settings (Kennedy et al., 2015). In the present study (see also Marttila et al., 2023b), the training aimed to stimulate teachers' attuned interaction and guidance as well as reflections on mental states. These were observed in video-recorded teacher–child interactions during shared review discussions. A certified trainer (the first author) facilitated teacher development and modeled the principles of the VERP intervention. To ensure intervention fidelity, the trainer was counseled by a certified external VERP supervisor.

The VERP training was introduced in the first group lesson. During the study module in the autumn semester, the students planned and video-recorded three picture book reading interactions with two children, a boy and a girl, who were the closest to three years of age in the ECE classroom ($M = 39.70$ months, $SD = 3.46$, range 36–47, 63% spoke exclusively Finnish, the majority language). During the study module in the spring semester, the students planned and video-recorded two reading interactions with two self-selected children with whom they experienced interaction difficulties (age $M = 57.46$ months, $SD = 16.53$, range 32–80, 52% spoke exclusively Finnish). In addition to the majority language, the bilingual children were exposed to Swedish, the other official language in Finland, or some other minority language. To maintain children's motivation, a different picture book written by Sanna Pelliccioni was used in each reading interaction (for book titles, see Appendix A). The stories were about the same character, "Little Onni", and the topics of the books represented the daily experiences of preschool-aged children, such as starting childcare, having a sibling, or making a new friend, all of which can evoke both cognitive and emotional state talk.

The 15 students were divided into five groups. Each group participated in online shared review discussions after each video-recorded reading interaction with two children over 30 weeks during the first academic year. The video-recorded discussions, five for each small group, were held via the Zoom video-conferencing platform. Following the strength-based approach emphasized in VERP, the trainer selected two short video clips (approximately one minute each) of successful interaction by each student for the first, second, and third discussions. For the fourth and fifth discussions, the students selected the successful clips to strengthen their learning process. The students watched the video clips several times, focusing on the moment-to-moment process of attuned interaction in the first and guidance in the second shared review discussion (see Appendix A for the subdomains). Both attuned interaction and guidance were the focus of the remaining discussions (T3–T5). The VERP trainer presented reflective questions and used pictures representing attuned interaction (27 pictures) and guidance (8 pictures) as prompts for discussion about the behavior and mental states of the children and themselves. The students were also encouraged to give feedback to each other (for more details, see Marttila et al., 2023b). Individual students were scheduled for about half an hour in each discussion. The shared reviews lasted approximately one hour and forty-five minutes, with some variation (see Appendix A).

2.4. Measures

2.4.1. Observed Mental State Utterances During Shared Review Discussions

The five video-recorded discussions of each of the five groups (25 discussions totaling 42 h 50 min) were professionally transcribed and pseudonymized. We used a previously tested coding scheme (Marttila et al., 2023a) to assess the mental state utterances produced by the ECE student teachers during shared review discussions. Each mental state utterance was coded for type: cognition (e.g., think, understand), perception (e.g., look, listen), emotion (e.g., excited, content), motivation (e.g., want, interested), and target (i.e., child, self, or other participant). The child-focused utterance was coded into the basic category when the student only referred to the child's mental state (e.g., "The child enjoyed it"). In addition, if the student gave an example or explanation of the child's mental state, the utterance was also included in the enriched category. For example, the student said, "She thinks about the glass bead because she repeats the words 'glass bead'...". The mental state utterance was coded only once during the same conversation episode. The number of utterances at T1, T3, and T5 was 305, 453, and 475 for the basic category and 74, 123, and 148 for the enriched category, respectively.

The first author coded the shared review discussions. For interrater reliability, an external trained coder (around 40 h of training resulting in adequate Cohen's kappa values: 0.76 for type, 0.74 for target, and 0.77 for richness) who was blind to the research questions and study design, coded randomly selected transcripts (16%). Cohen's kappa coefficients were good for type (0.80) and target (0.74), but lower for richness (0.42). Due to insufficient inter-rater reliability, the results of richness (enriched mental state talk) were excluded from the analysis. The discrepancies were discussed to achieve consensus.

2.4.2. Observed Mental State Utterances During Reading Interactions

For each ECE student teacher, three video-recorded reading interactions were analyzed. They included the first (T1) and the last (T3) in the autumn semester with two randomly selected children, and the last (T5) in the spring semester with two children with whom they experienced challenges in interaction (see Appendix A). Analysis was conducted by applying the same coding scheme described above. The type (cognition, perception, emotion, motivation) and target (child, self, or story character/other person) were coded up to 20 min per video (44 videos, totaling 13 h 6 min). The students' talk was coded from discussions with the children, not direct reading of the picture book text. Three third-year ECE student teachers, who were blind to the research questions and other data, were trained for around 25 h to code the data until they reached acceptable intercoder agreement ($\kappa = 0.77$ – 0.86 for type and 0.67 – 0.89 for target). After the coding of all data by this team, the first author analyzed 14 percent of randomly selected videos. Interrater reliability reached acceptable Cohen's kappa values (coder 1: type 0.86, target 0.64; coder 2: type 0.88, target 0.78; coder 3: type 0.77, target 0.66).

2.4.3. Perceived Interaction Skills

Before the first and after the third and fifth shared review discussions, the student teachers completed an online questionnaire on their interaction skills with children in ECE classrooms (Marttila et al., 2023a). The 35-item questionnaire was based on the content of the VERP training (Kennedy et al., 2015). Twenty-two items represented attuned interaction (e.g., I give time and space for the child), and thirteen items represented guidance (e.g., I offer choices that the child can understand). The items were rated on a 5-point Likert scale ranging from 1 (not true at all) to 5 (almost always true). High internal consistency was found for both scales at each wave of data collection (attuned interaction pretest $\alpha = 0.89$,

posttest 1 = 0.90, posttest 2 = 0.87; guidance pretest = 0.86, posttest 1 = 0.85) except for one (guidance posttest 2 = 0.53).

2.5. Analysis

We used nonparametric statistical tests because of the small sample size and the nonnormality of many variables. Patterns of change across the intervention were evaluated with the Wilcoxon signed rank test for repeated measures for T1–T3 (i.e., a focus on cognitive state talk, H1), T3–T5 (a focus on emotional state talk, H2), and for T1–T3–T5 (i.e., attuned interaction and guidance, H4). The relationship between the two interaction contexts (shared review discussion and picture book reading) was analyzed using Spearman rank-order correlation coefficient. Alpha was set at the conventional level of 0.05 for all tests in this small-scale, explorative study. In addition, effect sizes (r) are reported to indicate the magnitude of observed training effects.

Tables 1 and 2 below present frequency rates per 10 min to control for variation in the length of the discussions in shared reviews and book-reading interactions. Due to the low frequencies of some mental state types, we combined cognition- and perception-related utterances (henceforth, cognitive state talk) and emotion- and motivation-related utterances (henceforth, emotional state talk). The frequency of specific mental states in educational contexts is generally low (Colonnese et al., 2017; King & La Paro, 2015), including our study. To examine if work experience was related to mental state talk, attuned interaction, and guidance, we compared ECE student teachers who had less than 10 years of work experience with those who had more than 10 years. No significant differences were found between these two groups regarding the main variables.

Table 1. Student Teachers' Cognitive State Talk in Shared Review Discussions and Book Reading Interactions: Mean Rates per Ten Minutes.

	Supporting Language and Cognitive Development	Supporting Social–Emotional Development		Differences Between T1 and T3	Differences Between T3 and T5
	Time 1 <i>M</i> (<i>SD</i>) <i>Mdn</i> (Min–Max)	Time 3 <i>M</i> (<i>SD</i>) <i>Mdn</i> (Min–Max)	Time 5 <i>M</i> (<i>SD</i>) <i>Mdn</i> (Min–Max)		
Child-focused cognition					
Shared review	1.58 (0.59) 1.65 (0.31–2.44)	2.34 (0.94) 1.98 (0.94–4.07)	2.13 (1.01) 1.98 (0.88–4.75)	T3 > T1	T5 = T3
Book reading	8.94 (4.55) 9.50 (2.00–17.50)	11.51 (4.90) 10.67 (2.00–18.50)	10.04 (2.76) 9.72 (5.00–16.00)	T3 > T1	T5 = T3
Self-focused cognition					
Shared review	2.89 (0.94) 2.89 (1.11–4.43)	3.85 (1.41) 3.55 (2.08–7.63)	4.48 (1.75) 4.03 (2.11–7.64)	T3 > T1	T5 = T3
Book reading	1.63 (1.28) 1.33 (0.00–4.67)	2.83 (1.95) 1.88 (1.00–7.33)	2.65 (1.43) 2.36 (0.00–5.33)	T3 > T1	T5 = T3
Story character— focused cognition					
Book reading	1.71 (1.39) 1.50 (0.00–5.33)	4.10 (2.76) 3.33 (1.00–10.00)	1.61 (1.75) 0.83 (0.00–5.50)	T3 > T1	T5 < T3

Table 2. Student Teachers' Emotional State Talk in Shared Review Discussions and Book Reading Interactions: Mean Rates per Ten Minutes.

	Supporting Language and Cognitive Development	Supporting Social–Emotional Development		Differences Between T1 and T3	Differences Between T3 and T5
	Time 1 <i>M</i> (<i>SD</i>) <i>Mdn</i> (Min–Max)	Time 3 <i>M</i> (<i>SD</i>) <i>Mdn</i> (Min–Max)	Time 5 <i>M</i> (<i>SD</i>) <i>Mdn</i> (Min–Max)		
Child-focused emotion					
Shared review	1.11 (0.43) 1.13 (0.42–2.11)	1.13 (0.40) 1.08 (0.47–1.89)	2.13 (1.15) 1.80 (0.82–5.50)	T3 = T1	T5 > T3
Book reading	2.98 (2.01) 3.00 (0.00–7.00)	2.67 (1.44) 2.11 (1.00–7.00)	3.63 (2.15) 3.42 (0.67–7.00)	T3 = T1	T5 = T3
Self-focused emotion					
Shared review	1.26 (0.32) 1.24 (0.78–1.78)	1.51 (0.57) 1.35 (0.75–2.71)	1.97 (1.22) 1.56 (0.70–4.82)	T3 = T1	T5 = T3
Book reading	0.70 (1.21) 0.00 (0.00–4.00)	1.58 (2.09) 1.18 (0.00–8.00)	1.98 (1.41) 1.83 (0.00–4.50)	T1 = T3	T5 = T3
Story character— focused emotion					
Book reading	2.67 (2.56) 2.56 (0.00–8.00)	2.71 (2.26) 3.00 (0.00–6.50)	3.50 (1.67) 3.25 (2.00–8.00)	T3 = T1	T5 > T3

3. Results

3.1. Cognitive State Talk Increases During “Supporting Language and Cognitive Development” (Hypothesis 1)

Table 1 presents the frequency of ECE student teachers' cognitive state talk during trainer-led shared review discussions with peers and picture book reading interactions with two children separately for the study modules in the autumn and the spring. As shown in Table 1, in the autumn, the students talked more often about the children's cognitive states in the final (T3) than in the first shared review ($Z = 2.897, p = 0.004, r = 0.75$). The students also talked more often about their own cognitive states in the final (T3) than in the first shared review ($Z = 2.385, p = 0.017, r = 0.62$). Interestingly, the students also talked more often about the children's ($Z = 2.229, p = 0.026, r = 0.58$), their own ($Z = 2.105, p = 0.035, r = 0.54$), and story characters' ($Z = 2.670, p = 0.008, r = 0.69$) cognitive states in the final (T3) than in the first reading interaction with children. This robust pattern of findings shows a significant increase in cognitive state talk during trainer-led discussions with peers as well as student-guided discussions with the children.

3.2. Emotional State Talk Partially Increases During “Supporting Social and Emotional Development” (Hypothesis 2)

Table 2 presents the frequency of ECE student teachers' emotional state talk during shared reviews and reading interactions separately for the study module in the autumn and the spring. In line with Hypothesis 2 (see Table 2), the students talked more often about the children's emotional states in the final (T5) compared to the previous (T3) shared review ($Z = 2.731, p = 0.006, r = 0.73$). There was no change in self-focused emotional state talk during shared reviews ($Z = 1.601, p = 0.109, r = 0.43$). There was only a trend effect ($Z = 1.669, p = 0.095, r = 0.45$) showing that the students talked more often about the story characters' emotional states in the final (T5) compared to the previous (T3) reading interaction. Moreover, in contrast to the prediction of Hypothesis 2, there was no change

in either child-focused ($Z = 1.119, p = 0.263, r = 0.30$) or self-focused ($Z = 0.849, p = 0.396, r = 0.23$) emotional state talk during book reading interactions with the children from T3 to T5.

3.3. Exploring Cognitive State Talk Across Contexts (Hypothesis 3)

Median scores for cognitive state talk showed improvement. Correlations were calculated across the first two (T1 and T2) trainer-guided shared review discussions with peers (context 1) and the third (T3) student-guided discussions during the reading interaction with two children (context 2). There was a positive relationship between child-focused cognitive state talk during the second trainer-guided discussion with peers and the third student-guided discussion with the children ($r_s = 0.699, p = 0.004$), although the relationship between the first discussion with peers and the third with children only approached significance ($r_s = 0.469, p = 0.078$). Moreover, the relationship between self-focused cognitive state talk in the first discussion with peers and the third discussion with children approached significance ($r_s = 0.469, p = 0.078$). The significant relationship between child-focused cognitive state talk with peers (T2) and with children (T3) shows that child- and self-focused cognitive state talk are empirically related.

3.4. Self-Perceived Interaction Skills Increase from the Autumn to the Spring Semester (Hypothesis 4)

The descriptive statistics (M and SD) of self-reported attuned interaction and guidance at T1, T3, and T5 are: 4.33 (0.31) and 4.17 (0.44); 4.48 (0.36) and 4.37 (0.35); 4.75 (0.23) and 4.69 (0.23), respectively. In the autumn, during “Supporting language and cognitive development,” the increase (from T1 to T3) in attuned interaction ($Z = 1.734, p = 0.083, r = 0.45$) and guidance ($Z = 1.611, p = 0.107, r = 0.42$) did not reach significance. However, in the spring, during “Supporting social and emotional development,” the student teachers perceived significant improvement in their attuned interaction ($Z = 2.064, p = 0.039, r = 0.55$) and guidance skills ($Z = 2.485, p = 0.013, r = 0.66$) from T3 to T5. In addition, they also improved in perceived attuned interaction ($Z = 2.904, p = 0.004, r = 0.78$) and guidance ($Z = 2.708, p = 0.007, r = 0.72$) across the first academic year, aggregating the gains during the first and second semesters.

4. Discussion

The present study aimed to foster experienced Finnish ECE caregivers’ mentalization and interaction skills during their first academic year in a higher ECE teacher education program. The basic principles of VERP were embedded into two existing semester-long study modules on supporting children’s development based on blended learning. In the autumn, the focus was on language and cognitive development, and in the spring, on social–emotional development. The student teachers’ observed mentalization increased during reflective trainer-guided peer discussions and student-guided picture book discussions with two children, and their self-reported interaction skills also improved.

The longitudinal observations confirm an improvement in cognitive state talk during the autumn semester on language and cognitive development (H1). The student teachers, who were already experienced ECE professionals, began to talk more often about the children’s and their own cognitive states in trainer-guided, video-stimulated, reflective peer discussions. The study replicates and extends the positive findings of Finnish second-year student teachers with practically no work experience in ECE classrooms (Marttila et al., 2023b).

The students also began to talk more often about children’s cognitive states during reading interactions with a randomly selected three-year-old boy and girl. To our knowledge, this is the first study to report an increase in cognitive state talk during two contexts

of mentalization. The large effect sizes suggest that the increase was not only statistically significant but also practically meaningful, reflecting a clear shift in student teachers' cognitive state when talking about children and to children. The students' cognitive state talk about the two children during peer discussions was positively associated with variation in cognitive state talk in later student-guided reading discussions with the same two children (H3). This result is encouraging because preservice (La Paro et al., 2012) and in-service ECE professionals (e.g., Salminen et al., 2021) show fairly low-level competence in facilitating children's cognitive and language development. Guiding student teachers to focus on and discuss children's cognitive states during actual ECE classroom interactions may contribute to the quality of instructional support and has the potential to promote higher-order thinking and language learning among children. Moreover, focusing on children's own and others' mental states (such as those of story characters) can support children's development of social cognition (e.g., Grazzani et al., 2016; Kalland et al., 2022).

In some studies, qualification level and work experience were related to ECE professionals' mentalization (Andrews et al., 2019; King & La Paro, 2015; Mata López et al., 2020). Our findings on cognitive state talk may suggest that, in addition to inexperienced students, ECE professionals across varying levels of experience can improve their mentalizing of cognitive states with the newly developed approach. Consequently, these results may indicate broader applicability in professional development settings outside of ECE teacher education. This has potential relevance for both domestic and global contexts.

Although preservice (La Paro et al., 2012) and in-service ECE professionals (e.g., Salminen et al., 2021) are generally sensitive to children's needs, talking and reasoning about emotional experiences may further improve their competence (see also Spilt et al., 2012). This is crucial in inclusive classrooms, which are typical of the Finnish ECE system. The longitudinal observations partially confirmed an increase in emotional state talk during the extended VERP intervention in the spring semester on social-emotional development (H2). The experienced ECE student teachers with a vocational background began to label children's emotions more often during trainer-guided peer discussions about the video-recorded reading interactions with the two children, with effect sizes indicating a substantial and meaningful increase in this context. However, there was no change in emotional state talk with the two children during student-guided reading interactions or any relationship in emotional state talk between the two contexts.

The positive change in the labeling of children's emotional states during trainer-guided peer discussions expands prior evidence on higher ECE teacher education programs, which only included the VERP intervention in the autumn semester during the study module on supporting children's language and cognitive development (Marttila et al., 2023b). During the extension of the VERP intervention into the spring semester, within the study module on supporting children's social-emotional development, the students were instructed to choose a boy and a girl with whom they had experienced challenges in classroom interaction. As a result, the spring sample comprised older, on average, five-year-olds, including some bilingual children and some with special needs. Due to the sampling procedure in inclusive ECE classrooms, the autumn sample of younger children likely included some bilinguals and individuals with special needs. Although any child may elicit various emotional and cognitive experiences during teacher-child interaction, it may be too demanding for even experienced professionals to talk about feelings and reflect on emotions within challenging contexts involving children with extensive cognitive and social-emotional needs (for a review of teachers' emotions in ECE, see Qin et al., 2024). In future studies, the participants' experiences of children's challenges should be controlled to explore the effect of mentalization training on children with different types of special needs.

For experienced ECE caregivers, picture book reading is a familiar, often daily activity. While familiarity gained from repetitive book reading (rather than mentalization training) may have influenced the findings on inexperienced ECE student teachers (Marttila et al., 2023b), a similar effect is less plausible in the current study. The topic of the picture book at the pretest (T3) addressed overcoming fear and the feeling of safety, whereas the topic at the posttest (T5) addressed feelings of greed and the relief of sharing. The different emotion-related topics of the picture books might have affected the students' talk about emotions during their interactions with the two children, although ECE professionals trained for mental state talk can include such talk in any story or daily activity in the classroom (e.g., Kalland et al., 2022). It is also possible that when the students themselves selected successful clips for discussions with peers, they chose moments excluding emotional content, which resulted in less rich emotional state talk. In the future, more frequent trainer-guided peer discussions and practice in various care and play contexts with children may be needed to stimulate ECE students' talk about emotional states.

The development of children's socially competent behavior requires cognitive appraisal; that is, children need to attend to their emotional states and expressions, the emotion-evoking situation, and the behavior of others (e.g., Denham et al., 2003). Without sufficient contextual detail, it becomes difficult to infer another person's emotional (or cognitive) state; rather, interpretation of mental states depends on how these are embedded in specific events, interpersonal dynamics, and observable behaviors. In this regard, future research should place greater emphasis on assessing the richness of ECE student teachers' mental state talk during peer discussions and in student-guided interactions with children (see also Mulvihill et al., 2023).

Our findings expand previous research regarding pre-service interventions with Finnish monolingual children (Marttila et al., 2023b). In the present ECE classrooms, only half of the children were exclusively majority language speakers, whereas the remainder were also exposed to other languages at home or in the community. It is common for ECE professionals to use simplified language and more non-verbal communication with younger children or multilingual children compared to same-aged monolinguals (e.g., Langeloo et al., 2019); this may affect intervention outcomes, as shown by a Finnish study supporting children's social-emotional development (Linnavalli et al., 2024). Future research should examine both monolingual and multilingual children's skills in the majority language to investigate whether ECE professionals differ in the frequency and content of their mental state talk when interacting with children who possess different language proficiencies.

Our evaluation showed a pattern of change in students' perceptions of their interaction skills across the first academic year in ECE teacher education (H4). At the end of the spring semester, the students reported an improvement in their general attuned interaction and guidance skills compared to the beginning of the semester. As professional growth is a continuous, nonlinear process, students' perceptions of their competence may not only change during the teacher preparation program but even decrease after entering the profession as novice teachers (Woolfolk Hoy & Spero, 2005; see also Fukkink et al., 2019; La Paro et al., 2012 for observed interaction skills), which can lead to early career attrition. Enrolling experienced and well-motivated ECE caregivers in higher education programs is an approach that could also be successfully applied beyond the Finnish context to support professional growth and enhance teacher retention after graduation.

During the two-semester-long VERP intervention, students were exposed to a large dose of evidence-based theory and practical training in supporting children's cognitive and social-emotional development (for a briefer and limited VERP training, see Marttila et al., 2023b). The setting was different from a previous in-service study by Marttila et al. (2023a),

based on a more traditional, brief VERP intervention with no additional theoretical and practical training implemented onsite. This is important because, according to [Egert et al. \(2020\)](#), in-service professionals' observed interaction skills improve more in interventions comprising several training components (e.g., one-day workshops, ongoing coursework, and individual support). Moreover, aiming at high-quality daily interactions with special needs children may require an even more extensive approach and regular consultation.

Blended learning that combines online with onsite teaching practices in ECE classrooms has been successful in enhancing mentalization and interaction skills with in-service (e.g., [Crawford et al., 2021](#); [Linnavalli et al., 2024](#); [Pölzl-Stefanec et al., 2024](#)) and, recently, preservice ECE professionals ([Marttila et al., 2023b](#)). Our new results provide tentative evidence for the use of blended learning in teacher education programs and encourage the use of combining online and onsite methods for enhancing ECE teachers' professional development at different stages of their careers. The blended learning format is well-established and familiar via the Zoom platform to students within Finnish higher teacher education. This approach may also be relevant to other teacher education programs with comparable ECE systems, characterized by national core curricula, team-based professional practices, and inclusive, linguistically diverse classrooms.

Limitations and Future Research

Our longitudinal study in an authentic context has a number of limitations. First, the inter-observer agreement was low for coding enriched mental state talk in trainer-guided discussions with peers. Despite high post-training coder reliability, 40 h of training may remain insufficient, with the limited sample size and stringent coding criteria likely compounding the low agreement in the final data. It is important to improve this demanding, in-depth coding system because assessing the richness of mental state talk provides detailed information about how ECE student teachers become aware of and interpret others' mental states during emotion- and cognition-evoking events (see also [Mulvihill et al., 2023](#)). Second, the trainer who guided the peer discussions also evaluated the mental state talk, which may have introduced a degree of experimenter bias. Nonetheless, reliability was strengthened by employing trained coders blind to the research questions and study design. Third, the self-reports used in the present study are inherently more subjective than direct observations of student teachers' interactions with children. Therefore, future research should investigate whether the improvements in mental state talk demonstrated during trainer-guided discussions actually translate into enhanced interaction quality observed in ECE classrooms, given that a competent teacher would focus on and become aware of children's mental states in any event or situation. It should also be noted that the internal consistency of the self-reported guidance was lower for the final wave of data collection (i.e., T5), which complicates the interpretation of students' growth during the final semester. Fourth, the fact that Finnish preservice teachers talked more often about cognitive than emotional states is in line with cross-sectional findings on in-service ECE professionals in Eastern and Western cultures (e.g., [Degotardi et al., 2021](#); [Ziv et al., 2015](#)). This imbalance in mental state talk prompts the need for further investigation, as prior research utilizing ECE classroom observations has consistently indicated an opposite imbalance; that is, low levels of instructional support alongside higher levels of emotional support (e.g., [La Paro et al., 2012](#)). Fifth, the context of reading interaction and the content of the selected picture books may influence the quantity and quality of students' mental state talk to and about children ([Mulvihill et al., 2023](#)). Furthermore, the findings regarding emotional state talk need to be interpreted with caution. This is because the pre- and posttest comparison (i.e., T3 and T5) confounds the effects of time, individual differences between children, and the content of the study module. Finally, the lack of a control group precludes a conclusive demon-

stration of the specific effects of mentalization via VERP training in an authentic first-year teacher education program. In addition, we conducted multiple statistical tests, each at the conventional alpha level of 0.05. This means that the Type I risk (i.e., a false positive) is higher than five percent at the study level. Our results need further validation in different educational, cultural, and language contexts with larger samples and more experimental controls, such as a waiting-list comparison group. Developing professional competence with children in an inclusive ECE classroom may require more frequent trainer-guided peer discussions and practice with children in different pedagogical contexts, combined with content-specific theory and practice. However, integrating mentalization in study modules with evidence-based content and blended training components seems a promising approach for ECE student teachers with varying levels of experience working with young children.

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Abbreviations

The following abbreviations are used in this manuscript:

ECE	Early childhood education
VERP	Video Enhanced Reflective Practice

Appendix A

Table A1. Design of the Intervention.

Weeks	Study Module Content	Time Point	VERP Content
1–16	Supporting children’s language and cognitive development (6 ECTS): lectures (18 h), group lessons (20 h, e.g., the students observed video clips of children’s language skills and picture book reading interactions), independent work (162 h, e.g., practical assignments based on multimedia materials and video clips of lectures by leading experts, reading the examination literature), examination (2 h).	T1	Reading interaction assignment (3 h). Book: Little Onni Goes to the Day Care Center (Onni-poika menee päiväkotiin). Video recording M = 19.2 min, SD = 4.4, range 10–26. The student completed a written self-reflection assignment about children’s development and their interactions with children. Shared review (2 h). Focus: Being attentive, encouraging initiatives, receiving initiatives, and developing attuned interactions. Video-recorded discussion M = 93.8 min, SD = 3.3, range 90–97.
		T2	Reading interaction assignment (1 h). Book: Little Onni Becomes a Big Brother (Onni-pojasta tulee isovelji). Video recording M = 20.9 min, SD = 4.4, range 11–30. Shared review (2 h). Focus: Guiding, deepening discussion. Video-recorded discussion M = 104.0 min, SD = 1.5, range 102–106.
		T3	Reading interaction assignment (1 h). Book: Little Onni and a Monstrous Monster (Onni-poika ja hirveä hirviö). M = 20.5 min, SD = 5.2, range 10–30. Shared review (2 h). Focus: Being attentive, encouraging initiatives, receiving initiatives, developing attuned interaction, guiding, deepening discussion. Video-recorded discussion M = 110.8 min, SD = 4.4, range 106–118.
17–30	Supporting children’s social–emotional development (5 ECTS): lectures (16 h), group lessons (20 h, e.g., the students observed video clips of children’s emotional skills and picture book reading interactions), independent work (135 h), examination (2 h).	T4	Reading interaction assignment (4 h). Book: Little Onni Gets a New Friend (Onni-poika saa uuden ystävän). M = 20.7 min, SD = 5.5, range 12–30. The student completed a written self-reflection assignment about children’s development and their interactions with children. Shared review (2 h). Focus: Being attentive, encouraging initiatives, receiving initiatives, developing attuned interaction, guiding, deepening discussion. Video-recorded discussion M = 105.8 min ^a , SD = 6.4, range 97–112.
		T5	Reading interaction assignment (2 h). Book: Little Onni Wants Everything (Onni-poika tahtoo kaiken). M = 22.1 min, SD = 5.7, range 12–33. Shared review (2 h). Focus: Being attentive, encouraging initiatives, receiving initiatives, developing attuned interaction, guiding, deepening discussion. Video-recorded discussion M = 112.0 min ^a , SD = 1.7, range 110–112.

Note. ^a In the T4 and T5 video-recorded discussions in one group, only two student teachers were present (their length was 78 min in T4 and 80 min in T5). ECTS = European Credit Transfer and Accumulation System.

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