Australian Education Research Organisation

AUSTRALIAN LITERACY & NUMERACY FOUNDATION

Peer mentoring for sharing skills and knowledge from professional learning: The importance of planning and support

Findings from an experimental study

November 2024

The Australian Education Research Organisation (AERO) is Australia's national education evidence body, working to achieve excellence and equity in educational outcomes for all children and young people.

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Acknowledgement of Country

AERO acknowledges the Traditional Owners and Custodians of the lands, waterways, skies, islands and sea Country across Australia. We pay our deepest respects to First Nations cultures and Elders past and present. We endeavour to continually value and learn from First Nations knowledges and educational practices.

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Glossary

Term	Definition
Direct participants	Research participants in the 'direct participation approach'. They were educators and teachers who attended (i.e., participated directly in) the external professional learning along with all or most other preschool educators and teachers at their service.
Direct participation approach	A professional learning approach where all or most staff attend (i.e., participate directly in) external professional learning. In this study, an educational leader and 3 other teachers and educators working in the preschool room attended external professional learning. These 4 staff represented all or most staff working in the preschool room.
Early Language and Literacy (EL&L)	The professional learning program used in this study. The course included training and on-site Australian Literacy and Numeracy Foundation (ALNF) mentoring. Refer to Appendix A.3 for further details.
Early Language and Literacy Developmental Index (ELLDI)	The tool used to measure child outcomes in this study. It is a formative assessment that describes a child's development (ages 2 to 8 years), incorporating psychometrically aligned tasks across the 7 key subdomains of oral language and early literacy development. Refer to Appendix A.4 for further details.
Educators and teachers	Collective term for early childhood educators, teachers and educational leaders.
Educational leader	A designated position in early childhood education and care (ECEC) services for a suitably qualified and experienced staff member to lead the development and implementation of educational programs in the service (Ministerial Council for Education, Early Childhood Development and Youth Affairs, 2011).
EL&L mentoring	The mentoring provided by ALNF as part of the EL&L program. This mentoring was only provided to educators and teachers who participated in the external professional learning (i.e., direct participants and peer mentors).
External professional learning	Professional learning delivered to staff by an external provider – for example, ALNF's EL&L program accompanied by the ELLDI.
Nominated mentees	Research participants in the 'peer mentoring approach'. They were preschool educators and teachers nominated by their service to receive peer mentoring. They did not attend external professional learning.
Peer mentors	Research participants in the 'peer mentoring approach'. They were preschool educators and teachers who attended (i.e., participated directly in) external professional learning and were tasked with sharing their skills and knowledge with 2 colleagues who did not attend the professional learning.

Term	Definition
Peer mentoring	A collaborative professional relationship between colleagues that is used to build capacity and enhance practice. Mentors share their expertise to support the ongoing learning of their mentees over a sustained period of time. Peer mentoring is responsive and flexible and may involve various practices (e.g., modelling, observation, goal setting, collaborative discussions, problem-solving and reflection).
Peer mentoring approach	A professional learning approach where a limited number of staff attend professional learning and are tasked with sharing their skills and knowledge with colleagues who did not attend. In this study, the peer mentoring approach involved an educational leader plus one preschool educator or teacher who attended external professional learning. They then focused on sharing the skills and knowledge they learnt (in a way that suited them) with 2 nominated mentees who also worked in the preschool room.
Preschool children	Children in New South Wales who are eligible to start primary school in the next calendar year (5 years old, on or before 31 July).
Preschool educators and teachers	Early childhood educators, teachers and educational leaders who work with children in the year before school at their service.
Preschool room	The room in ECEC services that includes children in the year before school.
Professional learning delivery approaches	The 2 approaches examined in this study: direct participation and peer mentoring.

Executive summary

Professional learning is a key driver for improving the use of evidence-based practices in education. However, participating in high-quality external professional learning requires a significant investment of time and resources, which can be challenging for under-resourced or minimally staffed educational settings.

A peer mentoring approach to professional learning is one way to resolve this challenge. It involves a small number of staff completing external professional learning and sharing what they learnt with colleagues who did not attend. This approach to professional learning is common practice in many workplaces. While some workplaces may have an organised approach to peer mentoring, others may expect it to happen organically.

Although often used, there is a lack of research demonstrating that a peer mentoring approach is effective. This study aimed to address this gap.

This study investigated the feasibility and impact of peer mentoring for sharing skills and knowledge from professional learning, in comparison to an approach where all or most teachers and educators receive external professional learning. We conducted the study in early childhood education and care (ECEC) services with educators and teachers who worked in preschool rooms. The external professional learning focused on providing ECEC educators and teachers with the skills and knowledge to use evidence-based oral language and early literacy practices. Specifically, we aimed to:

1. Examine the effect of providing a small group of teachers and educators in an ECEC service with external professional learning and encouraging them to share their acquired skills and knowledge via peer mentoring on:
   a. educator and teacher oral language and early literacy knowledge and practice
   b. children's oral language and early literacy outcomes.
2. Examine the enablers and barriers that influenced knowledge and skill-sharing through peer mentoring.

We conducted the study as a small-scale, two-arm cluster randomised trial. ECEC services were randomly assigned to one of 2 professional learning delivery approaches:

1. The intervention group, referred to as the '**peer mentoring approach**' involved an educational leader plus one preschool educator or teacher attending external professional learning ('peer mentors'). Peer mentors were tasked with sharing what they learnt with 2 'nominated mentees' who also worked in the preschool room (though they could also share with any other colleagues).
2. The comparison group, referred to as the '**direct participation approach**' involved an educational leader and most or all other teachers and educators who worked in the preschool room ('direct participants') attending external professional learning. Direct participants could share what they learnt with colleagues but were not required to do so.

The key difference between the 2 groups was that the peer mentoring approach depended on those who attended the external professional learning sharing what they learnt; whereas the direct participation approach enabled all or most educators and teachers to experience the professional learning directly.

The goal of the study was to generate initial rigorous causal evidence on whether peer mentoring is a promising and feasible approach to professional learning. As such, some guidance was provided to services to support teachers and educators with engaging in peer mentoring. However, it was not intended to be comprehensive and the peer mentors in our study did not receive specific training on peer mentoring. Rather, peer mentors and nominated mentees determined how learnings were shared. We look to future studies to test particular models of peer mentoring, what features of peer mentoring are most effective and whether peer mentoring has differential impacts according to the characteristics of staff involved.

Thirty-seven Australian preschool educators, teachers and educational leaders from 10 ECEC services in Western Sydney, Australia, participated in the study. ECEC services were of various sizes and had different numbers of rooms for children of different ages, but all only had one preschool room. Participating educators, teachers and leaders varied in terms of qualifications and years of experience but the 2 study groups were well-matched in terms of these variables. Children's oral language and early literacy outcomes were collected with parental consent from 152 preschool children who attended these services.

Although the study is small-scale, it makes 2 significant contributions to research on professional learning. The first is to systematically test the assumption that a peer mentoring approach to professional learning (without specific instruction on how to peer mentor) is as effective as directly participating in professional learning. The second contribution is to demonstrate the efficacy – as well as the challenges – of applying a randomised research design to the complex topic of professional learning.

Key findings

- **All educators and teachers, regardless of professional learning approach, demonstrated learning in terms of knowledge and use of evidence-based practices.** Children's oral language and early literacy development outcomes were also similar regardless of professional learning approach.
- **Several factors influenced the success of peer mentoring.** These factors included managing staffing constraints, allocating time for peer mentoring, having collegially supportive environments, managing the cognitive load placed on peer mentors and selecting appropriate staff for skill and knowledge sharing. Where any of these factors were not present, they were seen as barriers, especially by the peer mentors tasked with sharing their skills and knowledge.
- **The upfront cost and time investment for peer mentoring was lower but the overall time investment was similar to the direct participation approach.** The time needed for peer mentoring was distributed over an extended timeframe, while the time needed for direct participation was an intense, initial block. Therefore, a peer mentoring approach may be a suitable alternative when educational settings cannot make an upfront cost or time commitment to train all or most staff.

A peer mentoring approach allows for all educators and teachers to participate in professional learning, with a small group (i.e., peer mentors) attending the external training, and then sharing what they have learnt with their colleagues over subsequent months. Overall, our findings suggest that while peer mentoring requires a high level of planning and support, **peer mentoring is a feasible and promising way to disseminate professional learning so more educators and teachers, and ultimately children, can benefit.**

As such, educational settings can consider a peer mentoring approach if it suits their needs, skill sets, circumstances and ability to facilitate mentoring of staff. Services that are not able to provide this support may prefer a direct participation approach, where all staff participate in external professional learning.

1. Background

This report presents the findings of a study conducted by the Australian Education Research Organisation (AERO) in partnership with the Australian Literacy and Numeracy Foundation (ALNF). This study investigated the feasibility and impact of peer mentoring as a professional learning delivery approach by testing it in early childhood education and care (ECEC) services.

The report's first section introduces the study, including its context, aims, research design and limitations to generalisability. The following section presents the key findings alongside relevant limitations. Finally, implications and next steps are discussed.

1.1. Rationale

Educational settings invest significant time and resources into professional learning. Despite this substantial investment, we are yet to fully understand how best to deliver professional learning to ensure that it is as effective as possible in driving sustainable improvements in the use of evidence-based practices.[1] While recent research has begun to identify key mechanisms that underpin effective professional learning (Harper et al., 2024; Sims et al., 2021) and outline guidance to inform the delivery of professional learning (Elek et al., 2024; Eadie et al., 2019; Elek & Page, 2019), more is needed to ensure that this research is translated into sustained practice change. This evidence is critical given that the skills of educators and teachers are central to promoting children and young people's learning and development outcomes (AERO, 2024; Gibson et al., 2023; Organisation for Economic Co-operation and Development, 2018; Productivity Commission, 2023; Rankin et al., 2024).

1.2. Participating in effective professional learning requires time and resources

Research has shown that professional learning programs are most effective in changing practice when they include a range of mechanisms, such as managing cognitive load, setting and agreeing on goals, modelling and arranging practical social support (see Sims et al. (2021); Education Endowment Foundation [EFF] (2023) for details). These mechanisms can be enacted using a variety of delivery methods, such as coaching, facilitated collaboration and communities of practice (Cirkony et al., 2024). However, as a lot of these mechanisms and delivery methods involve activities that need to be spread out over time, participating in professional learning that includes effective mechanisms requires significant investment of time and resources by educators and educational settings.

Additionally, there are many barriers to participation in professional learning, especially when training large numbers of staff. These barriers exist in both ECEC and school settings, and can include cost and difficulties associated with staff being away from their workplace while attending training (Jackson, 2020).

1 Evidence-based practices are educational approaches backed up by research evidence. This means there is broad consensus from rigorously conducted evaluations that they work. In ECEC, this refers to educators, teachers and leaders being intentional in their practice, with their practice drawing on rigorous research and advice from recognised authorities such as government or peak bodies (Early Childhood Technical Assistance Center, 2023; Jackson, 2020; Mancenido & Fabry, 2022, Masters, 2018).

For example, the 2021 ECEC National Workforce Census demonstrates the impact of these barriers, reporting that only a quarter (27.7%) of paid contact staff in centre-based long day care settings had undertaken any formal training to strengthen pedagogy or practice in the 12 months prior (Social Research Centre, 2022). It is, therefore, beneficial to explore avenues that allow more staff to be trained, particularly in a way that reduces these barriers. Peer mentoring is a potential approach that overcomes some of the barriers to participation in professional learning by reducing the number of staff who directly participate in training.

1.3. Peer mentoring is a common way to disseminate professional learning

Sharing skills and knowledge with colleagues after participating in professional learning is common practice across many professional settings (Cramer et al., 2022). A recent systematic review of a professional learning approach involving peer mentoring for nurses showed that this approach can be a time-saving and sustainable way of delivering professional learning, particularly in the context of workforce constraints (Nexø et al., 2024).

Peer mentoring can take many forms, such as one-on-one mentoring, distance mentoring, group mentoring or flash mentoring, which involves briefer exchanges rather than ongoing relationships (Morrissey & Nolan, 2015; Nolan & Molla, 2018; Vogt et al., 2015). Mentoring can look different across and sometimes even within workplaces (Kent et al., 2013) but, ideally, will share the same core components: a collaborative approach to learning, supportive relationships and a shared leadership approach focused on common goals and informed by critical reflection (Nolan & Molla, 2018).

In some cases, professional learning programs are designed explicitly for a peer mentoring approach and include a component focused on building capabilities in this area (e.g., Siraj et al., 2023). However, many professional learning programs are not expressly designed for this purpose, yet training attendees may be asked by their workplace to disseminate their learnings using a peer mentoring approach. They may receive no further training to assist with peer mentoring, with the skill and knowledge transfer often expected to happen organically.

Despite peer mentoring following attendance at professional learning being relatively common (Cramer et al., 2022), there is limited evidence in the broader education literature of the effectiveness of this approach to professional learning. There are 2 notable exceptions: the Victorian Advancing Early Learning (VAEL) study (Pilsworth et al., 2017) and the Fostering Effective Early Learning (FEEL) study (Siraj et al., 2023). The VAEL study was a small-scale pilot[2] investigating the impact of a professional learning program that coached educational leaders on implementing evidence-based teaching strategies so they could, in turn, coach educators and teachers at their service. The VAEL study trialled this approach to professional learning in 4 ECEC services. The study found evidence that professional learning focused on increasing the leadership quality of educational leaders led to descriptive increases in educators' responsive and educational talk and increases in the amount of time they spent 1:1 with children. The VAEL study showed preliminary evidence a peer mentoring approach to professional learning can work in education settings.

2 A pilot study, pilot project or pilot experiment is a small-scale trial that is conducted in order to test the effects of an approach before implementing it on a larger scale. A pilot project can also help to determine feasibility, cost, adverse events and necessary improvements to the approach.

The FEEL study evaluated the Leadership for Learning professional learning program by randomising 83 New South Wales ECEC services to receive this program (intervention condition) or not receive this program (control group). Key staff from the 38 services in the intervention condition participated in the program that covered evidence-based practices to promote children's learning and development. Further, the program involved a 'cascading model of delivery', where those who directly participated received leadership training to enable them to effectively pass on their learnings to their colleagues at their service. The Leadership for Learning program significantly improved educators' practices and children's early numeracy skills. The FEEL study demonstrated that a professional learning program explicitly designed for a peer mentoring approach is feasible and effective relative to receiving no professional learning.

What is still unknown is the impact of a peer mentoring approach relative to a delivery approach where all or most staff directly participate in external professional learning, or the impact of a peer mentoring approach when the professional learning does not include specific training in peer mentoring.

There is a wealth of research on the specific attributes of mentoring and coaching that are more likely to yield positive results, including in ECEC services (Hobson & Malderez, 2013; Nolan & Molla, 2018). This literature outlines a range of factors of effective mentoring and coaching that can assist with articulating an evidence-informed approach to peer mentoring. Firstly, it is important that mentors are experienced, approachable and confident (Morrissey & Nolan, 2015; Nolan et al., 2013). Secondly, components of effective mentoring and coaching that are likely to contribute to successful peer mentoring include activities like goal setting, modelling best practice, observing practice and then providing feedback and time for critical reflection (Australian Institute for Teaching and School Leadership, 2020; Elek & Page, 2019). It is vital there is enough time in the working week for these activities (Morrissey & Nolan, 2015). Finally, it is important there is mutual respect within the mentoring relationship, and that participants approach the relationship as co-learners and collaborators, who engage in discussion and decision-making in a 'safe' environment (Harper et al., 2024; Molla & Nolan, 2020; Nolan, 2017). This research aided interpretation of the findings of this study.

2. The research study

To examine the feasibility and impact of a peer mentoring approach to professional learning, we conducted a randomised trial in ECEC services in partnership with ALNF. ALNF provided the external professional learning program, and AERO conducted the research.

The external professional learning program was ALNF's Early Language and Literacy Program (EL&L) and training in ALNF's Early Language and Literacy Development Index (ELLDI) formative assessment tool (refer to Appendix A.4). This program focuses on developing use of evidence-based practices (based on the science of reading) in child oral language and early literacy. It also utilises effective professional learning mechanisms and delivery methods (see EEF, 2023 and Cirkony et al., 2024 for details). In addition, a recent evaluation found the EL&L program shows promise for improving child oral language and early literacy outcomes when extensively adopted within a service (Cloney et al., 2022). Specifically, when most preschool educators and teachers received EL&L, which includes training and onsite ALNF mentoring, preschool children at their service had significantly higher ELLDI scores after 12 months compared to services in the same geographic area who had yet to receive this program (Cloney et al., 2022).

Given this evidence, ALNF prefers providing all or most staff at a service with EL&L. However, many ECEC services cannot send a large number of staff to offsite learning (Jackson, 2020). As such, ALNF's professional learning provided an opportunity to test whether a peer mentoring approach could be a feasible alternative to providing external professional learning to all or most staff. In this study, we focused on all or most staff who worked in the preschool room at a service. Running the study in ECEC services was particularly advantageous given these services are mandated to designate an educational leader who is uniquely positioned to provide peer mentoring to staff within their service as part of their role. In addition, educators and teachers often work shoulder to shoulder within the same room at their service – offering repeated opportunities for collaboration which may facilitate a peer mentoring approach.

Educational leadership and collaboration in ECEC

Educational leaders play a crucial role in mentoring staff and driving change within ECEC practice. While the daily tasks of the educational leader may vary across services, the main duties outlined by Standard 7.2 of the National Quality Standard (NQS) involve collaborating with educators, guiding curriculum direction, supporting planning cycles, leading program development and ensuring children's learning aligns with approved frameworks. There is an emphasis on mentoring and supporting educators' understanding of educational programs and practices and assisting educators in understanding and implementing reflective practice (Australian Children's Education and Care Quality Authority [ACECQA], 2023). Leaders are often supported by capacity-building opportunities not offered to all staff. However, there is an expectation that their learning will be passed on and applied at the centre level (ACECQA, 2019).

Professional collaboration (Element 4.2.1) is embedded in the NQS. Ideally, educators and teachers work together to challenge and learn from each other and to learn about each other's strengths and areas where they can further build their knowledge, skills or confidence. Collaborative leadership and teamwork – one of the Principles of the Early Years Learning Framework V2.0 – prompts all educators and teachers to exercise aspects of leadership in their daily work. It invites them to engage in peer mentoring and share their views about improving practice to learn and grow professionally and provide high-quality programs for children. Early Childhood Australia (ECA)'s Code of Ethics encourages educators and teachers to participate in a 'lively culture of professional inquiry' to support continuous improvement and to implement strategies that support and mentor colleagues to make positive contributions to the profession (ECA, 2016).

This study was conducted as a small-scale, two-arm cluster randomised trial, where we compared 2 professional learning delivery approaches.[3] We investigated the feasibility and impact of peer mentoring as a professional learning approach in comparison to an approach where all or most teachers and educators are trained. In particular, we examined a peer mentoring approach where sharing skills and knowledge acquired from professional learning is expected to occur organically and without specific training related to peer mentoring.

This study does not test a particular model of peer mentoring or what features of peer mentoring are most effective. Nor does it explore whether peer mentoring has differential impacts according to the role and qualifications of staff involved. Rather, the goal of the study was to generate initial rigorous causal evidence on whether peer mentoring is a promising and feasible approach to professional learning compared to a direct participation approach.

We aimed to:

1. Examine the effect of providing a small group of teachers and educators in an ECEC service with external professional learning (on oral language and early literacy practice) and encouraging them to share their acquired skills and knowledge via peer mentoring on:
   a. educator and teacher oral language and early literacy knowledge and practice
   b. children's oral language and early literacy outcomes.
2. Examine the enablers and barriers that influence knowledge and skill sharing through peer mentoring.

3 This study does not have a traditional control group that participates in the study but does not receive any 'treatment'. We were primarily interested in the relative impact of a peer mentoring approach to professional learning compared with an approach where all or most staff attend external training. As such, the most appropriate group to use as a comparison was one where all or most staff were trained. This kind of randomised trial is commonly used when a traditional control group is not the most appropriate comparison to answer the research question (Capili & Anastasi, 2023), such as when the evidence needed is whether a certain approach is better than current practice (Willingham & Daniel, 2021). In addition, while a traditional control group would have added additional insights, persistent recruitment challenges constrained the scope of the research.

ECEC services located in Western Sydney, New South Wales, were contacted to participate in the study. Those who agreed to participate were randomly assigned to one of 2 professional learning delivery approaches (see Figure 2.1):

1. The intervention group, referred to as the '**peer mentoring approach**', which represented a scenario where a limited number of staff within a workplace attended external professional learning. These staff were then tasked with sharing their skills and knowledge with colleagues who did not attend the professional learning. In this study, the peer mentoring approach involved an educational leader plus one preschool educator or teacher who attended external professional learning ('**peer mentors**'). Peer mentors were tasked with sharing what they learnt with 2 '**nominated mentees**' who also worked in the preschool room (though they could also share with any other colleagues).
2. The comparison group, referred to as the '**direct participation approach**', which represented a scenario where all or most staff attended external professional learning. In this study, the direct participation approach involved an educational leader and most or all other teachers and educators who worked in the preschool room ('**direct participants**') attending external professional learning. Direct participants could share skills and knowledge with any of their colleagues but were not required to do so.

The key difference between the 2 groups was that the peer mentoring approach depended on those who attended the external professional learning sharing what they learnt; whereas the direct participation approach enabled all or most teachers and educators to experience the professional learning directly (Table 1).

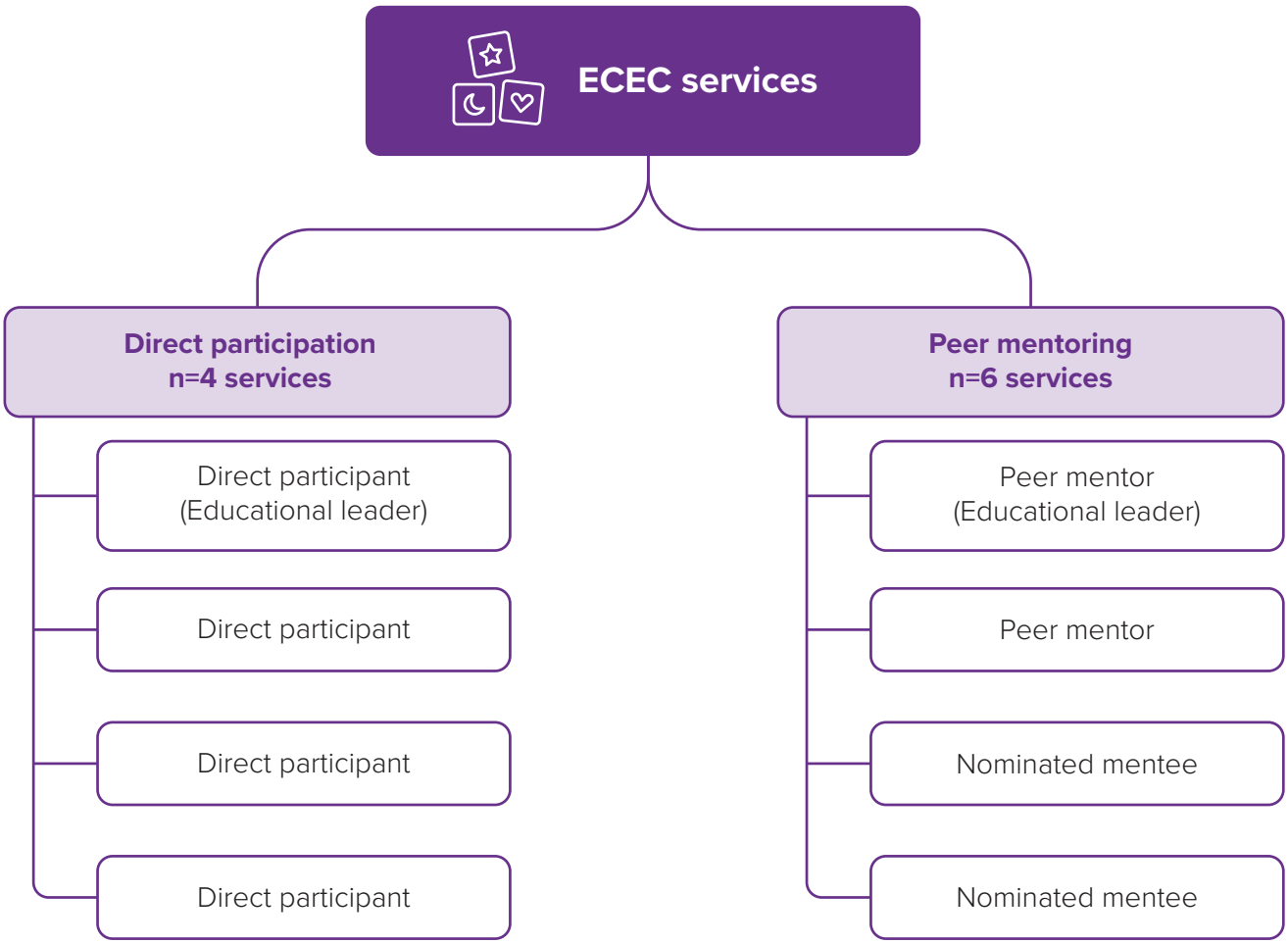
Table 1: What was involved for each participant type

	Direct participation approach	Peer mentoring approach	
	Direct participants n=4 educators or teachers per service	Peer mentors n=2 educators or teachers per service	Nominated mentees n=2 educators or teachers per service
Attended ALNF's EL&L course and ELLDI training	✓	✓	✗
Participated in ALNF's onsite mentoring	✓	✓	✗*
Tasked with sharing skills and knowledge with nominated mentees	✗	✓	✗
Received peer mentoring	✗	✗	✓

Note: * Nominated mentees did not directly participate in the onsite ALNF mentoring, however, given this mentoring was provided during normal operating hours at services, nominated mentees may have unavoidably witnessed some of it.

The services that participated in this study typically had 4 staff working with children in the preschool room. Therefore, the educational leader, plus 3 preschool educators and teachers from each service that participated in the study constituted all or most of the services' preschool educators and teachers (See Appendix A.2 for details). The direct participants and peer mentors (i.e., those who attended the external professional learning) in the study could share skills and knowledge with any other staff at their service, although there was no requirement to do so. The other staff were not study participants and outcomes for these staff were not recorded as part of the study.

Figure 2.1: Participants within each delivery approach



For peer mentors tasked with sharing what they learnt with the nominated mentees, the suggested dose of peer mentoring was 20 hours per nominated mentee over a 5-month period. Some guidance was provided to services to support teachers and educators in peer mentoring, however, it was not intended to be comprehensive (see the Peer mentoring text box). Indeed, no specific model of peer mentoring was provided, and staff were able to determine how they shared their learnings. The frequency of meetings and exactly what they shared were also not prescribed. Peer mentors and nominated mentees were not paired. Hence, peer mentors were permitted to share their skills and knowledge with either of the nominated mentees as appropriate for their context. Figure 2.2 shows the life cycle of the study, from recruitment to conclusion.

A total of 37 Australian educators and teachers (including 10 educational leaders) from 10 ECEC services in Western Sydney, New South Wales, participated in the study. The participating educators and teachers varied in terms of qualifications and years of experience working in the early childhood sector but the 2 study groups were well-matched in terms of these variables (as displayed in Table A1). We obtained parental consent for 152 preschool children who attended these services throughout 2023 to participate (see Table A3 for child and family demographic details). The 10 services that participated in the study were of various sizes and had different numbers of rooms for children of different ages,[4] however, each service had only one preschool room.

Peer mentoring

In this study, peer mentors and nominated mentees were provided with guidance documents that detailed evidence of best practices and suggestions for how they could prepare for and engage in the peer mentoring process.

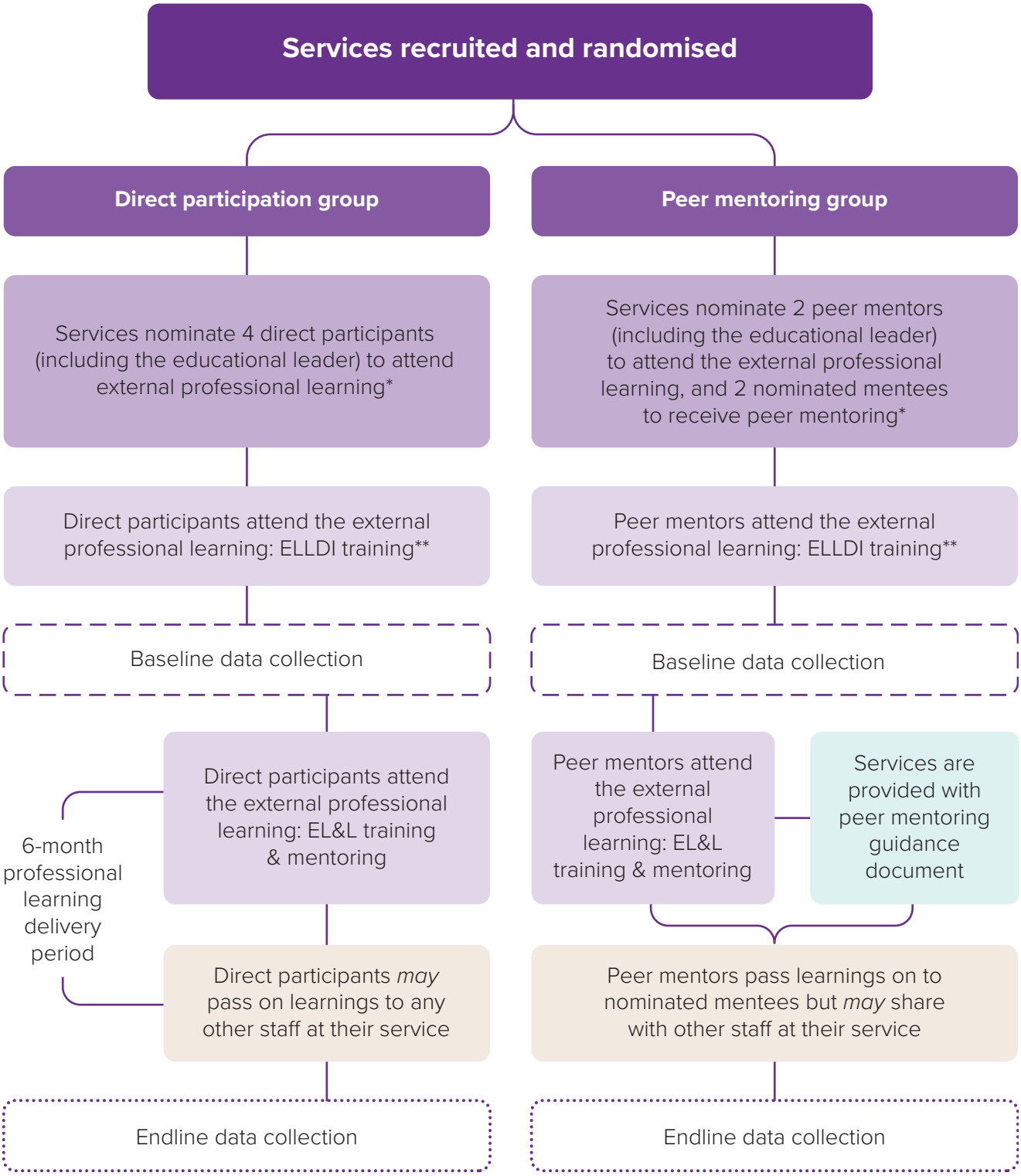
The type of knowledge shared and modelling of practice were determined between the peer mentor and mentee and were based on their existing knowledge and the external program rather than a directive framework. Participants managed the mentoring process in a way suitable for their context. However, we suggested they focus on the following principles:

- **Collaboration**: The course participant and mentee worked together to put learning into practice.
- **Support**: Building a collegial relationship based on trust was important in creating a shared language for problem-solving and learning together.
- **Consistency**: The mentoring was spread out over time rather than being a brief, intensive effort.
- **Flexibility**: The course participant and mentee worked out a plan to suit both of them and changed the plan when required.
- **Professionalism**: The course participant and mentee modelled professional knowledge, practice and behaviour.

The resources we supplied provided guidance based on research about peer mentoring, however, they were not intended to be comprehensive resources to instruct teachers and educators on this topic.

4 One service was a preschool that only has one room. The remaining 9 services were long day care services: 5 of these services had 2 rooms, 3 had 3 rooms and the final service had 4 rooms. These services had an average of 11 staff members and an average of 4 educators or teachers who worked in their preschool room. Further service demographic details are available in Section 3.5.2.

Figure 2.2: Life cycle of the study



Notes:

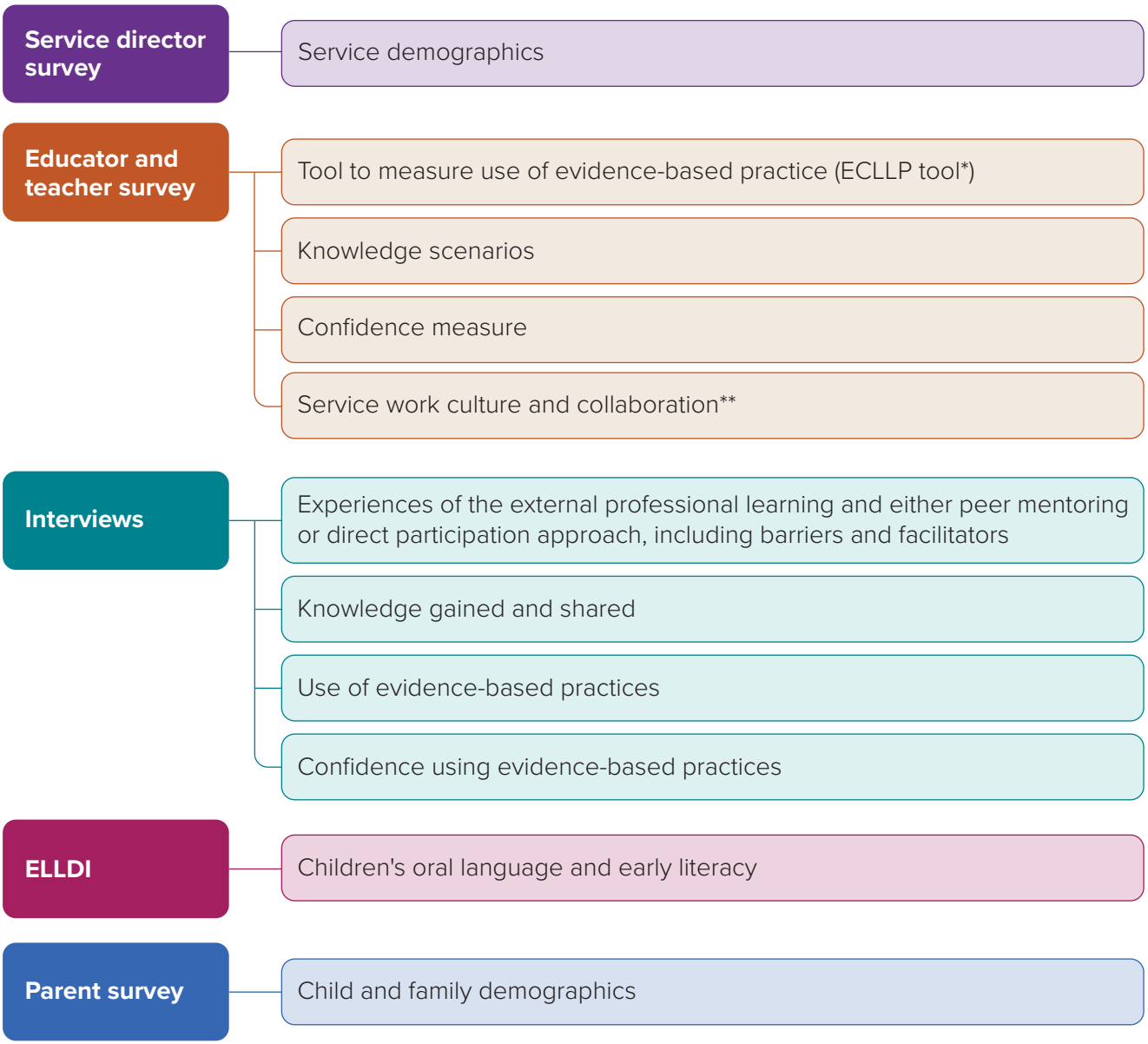
* The services that participated in this study typically had 4 staff working with children in the preschool room. Therefore, 4 educators or teachers (including the educational leader) represented all staff in the preschool room. Further service demographic details are available in Table A2.

** The ELLDI training provided ahead of the baseline data collection of children's outcomes to the direct participants and peer mentors only included information about how to administer the tool. It did not contain information about evidence-based practices Training regarding evidence-based practices was provided after the baseline data collection as part of the EL&L training and mentoring.

2.1. Outcomes and reporting measures

Educator and teacher outcomes in the study focused on knowledge and use of evidence-based oral language and early literacy practices, as well as confidence in using these practices. These outcomes were measured via self-report survey questions. Interviews with participating teachers and educators were also conducted to discuss these outcomes. Children's oral language and early literacy outcomes were measured using the ELLDI (Cloney et al., 2022), which was administered by participating educators and teachers via face-to-face assessments of their oral language and early literacy development. Demographic information about the service and children was collected via surveys with service directors and parents, respectively. See Figure 2.3 for a visual summary of the data collection and Appendix A for full details of methods.

Figure 2.3: Data collection types



Notes:
* The Early Childhood Language and Literacy Practice (ECLLP) tool is a self-report rubric developed by AERO to measure the use of evidence-based practices that promote preschool children's oral language and early literacy (see Appendix D for further information and for the tool itself).
** This was not an outcome measure but was used as a covariate in analyses.

This study did not include a room-level observational assessment of the quality of practice in a given room at a service, such as the Early Childhood Environment Rating Scale (ECERS-E) (Sylva et al., 2003) or Classroom Assessment Scoring System (CLASS) (Thorpe et al., 2020). The high cost of administering such assessments made them infeasible for this study. Further, we were conscious of reducing in-person visits and research burden to services and participants, particularly in the wake of the COVID-19 pandemic.

Self-report measures

Self-report measures rely on a respondent's ability to accurately reflect on and honestly communicate their behaviour – hence, they may result in under- or overestimation of ability. However, they are a cost-and time-efficient method of measuring change, and teachers' self-perceptions of their instructional practices are often highly correlated with the ratings of third-party observers (Koziol Jr & Burns, 1986; Reddy et al., 2015). As such, this study used self-reported measures to assess changes in educator and teacher outcomes (See Section 3.5.3 and Appendix A.4 for discussion).

2.2. Program fidelity

ALNF's EL&L and ELLDI professional learning program was well-attended and delivered as planned. Direct participants and peer mentors attended 100% of ALNF's offsite professional learning sessions and onsite mentoring sessions[5] delivered by ALNF as part of the professional learning program. Peer mentoring occurred in all services in the peer mentoring group. The methods peer mentors used to share skills and knowledge across services varied, including use of a buddy system, formal and informal meetings, observations, ongoing reflections, shared resources and staff message boards. Only 40% of nominated mentees reported receiving the recommended 20 hours of targeted mentoring during the study period.[6] Effects this may have had on the nominated mentees' knowledge, confidence and use of evidence-based practices are discussed in the key findings (see Section 3).

Nominated mentees did not participate in the onsite ALNF mentoring. However, given this mentoring was provided during normal operating hours at services, nominated mentees may have unavoidably witnessed some of it. There were 6 hours of onsite ALNF mentoring per service, so nominated mentees had a maximum of 6 hours of exposure to external expert advice – this is only 15% of the total time the direct participants and peer mentors received external professional learning.

5 These on-site ALNF mentoring sessions involved 2 half day sessions at each participating service.
6 It is worth noting that part way through the study, one nominated mentee resigned, and another was moved to the early years room, thus restricting peer mentoring opportunities.

3. Key findings

This section provides the study's findings with results from statistical tests interpreted alongside participant interviews. Findings presented in this section are those that relate most directly to the research questions (see Appendix A and Appendix B for details of other analyses conducted).

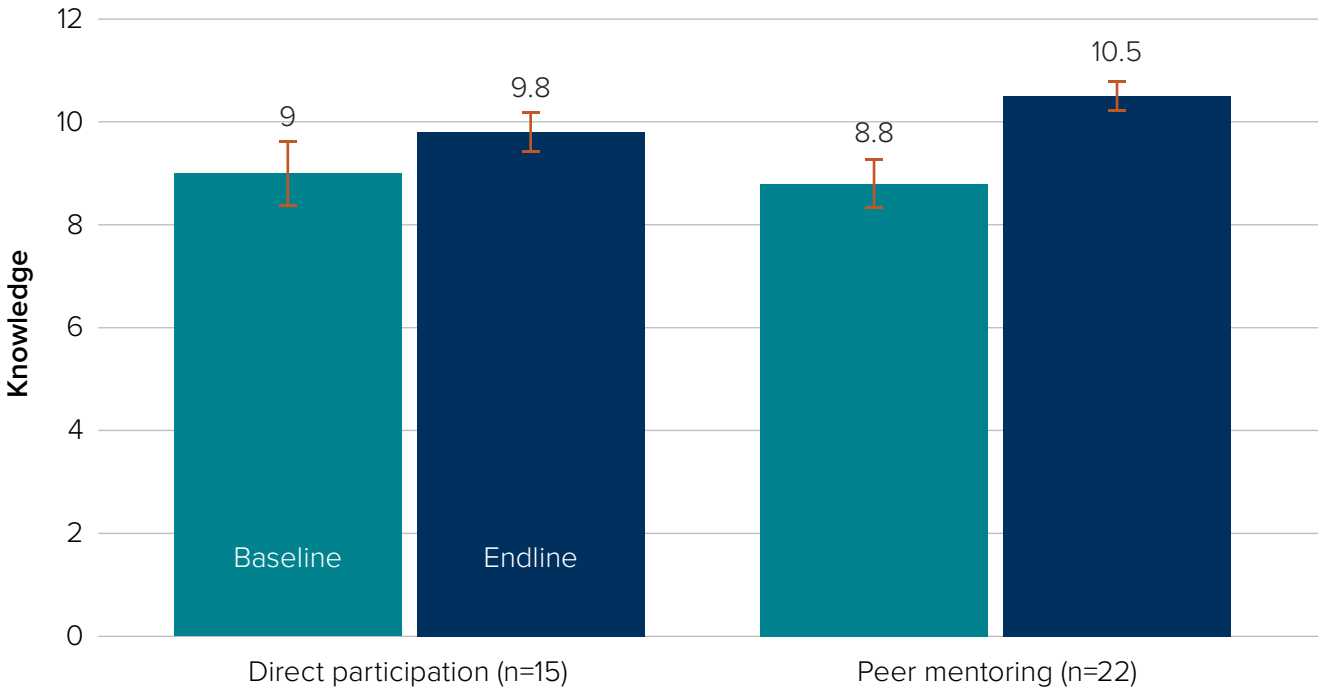
3.1. Both approaches improved knowledge and use of evidence-based practices

3.1.1. Knowledge of evidence-based practices

We measured educators' and teachers' knowledge of evidence-based oral language and early literacy practices via survey questions. The questions outlined 4 fictitious scenarios and asked educators and teachers to describe actions they would take to focus on developing children's oral language and early literacy outcomes – for example, what actions they would take to help children learn about the sounds in words or help children learn to write their names.[7] We also asked about perceptions of educators' and teachers' knowledge growth during interviews.

Analysis of survey data showed that the knowledge of educators and teachers in both professional learning approaches increased by the end of the study, with a small but statistically significant increase in the peer mentoring group[8] (see Figure 3.1).

Figure 3.1: Knowledge of evidence-based oral language and early literacy practices at baseline and endline by professional learning delivery approach*

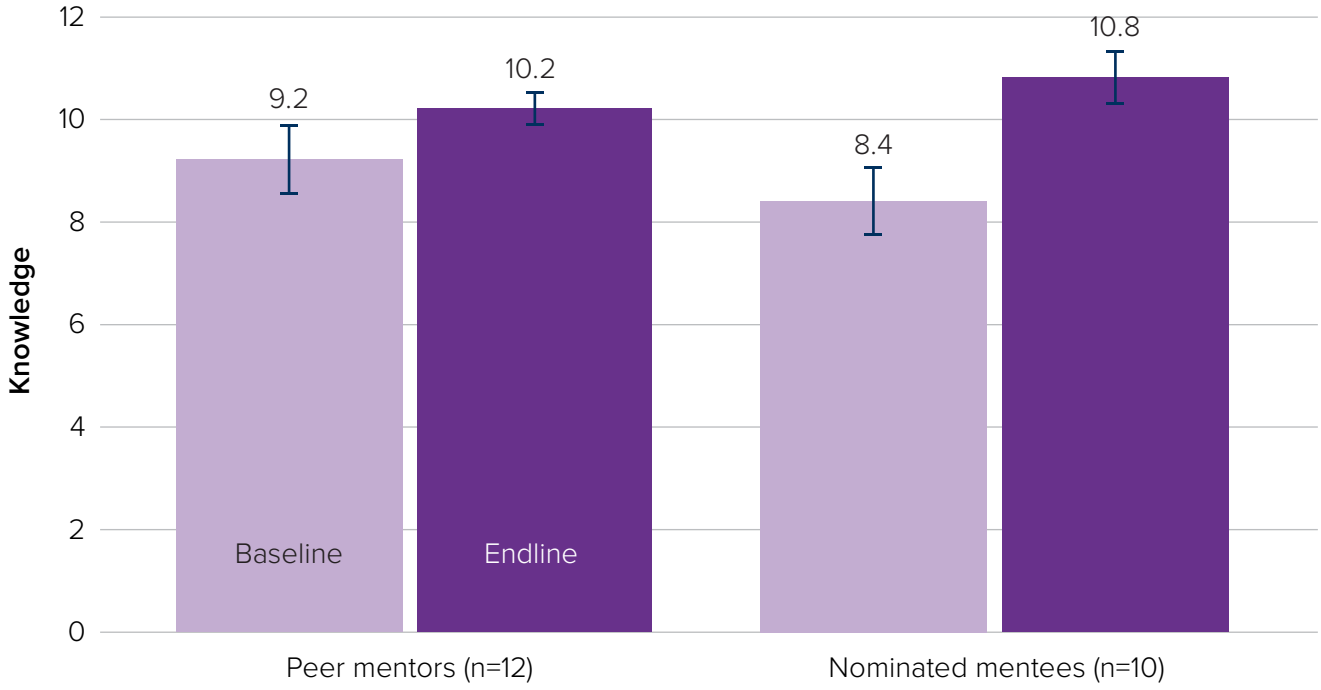


Note: * Measured via survey scenarios (max score=12).

7 Further details of this measure are available in Appendix A.4.
8 Wilcoxon signed rank test, p=.003.

Notably, the increase in knowledge in the peer mentoring group seems mainly due to gains the nominated mentees made[9] (see Figure 3.2). Nominated mentees started slightly lower than peer mentors but caught up over time.

Figure 3.2: Knowledge of evidence-based oral language and early literacy practices at baseline and endline for peer mentors and nominated mentees in the peer mentoring group*



Note: *Measured via survey scenarios (max score=12).

During interviews, we gauged educators' and teachers' *self-perceptions* of knowledge growth. Participants in both professional learning delivery approaches reported that they gained knowledge about the use of evidence-based practices. Knowledge gained mainly involved an increased awareness of the importance of evidence-based practices and new techniques to use in their practice:

> I gained so much knowledge and now I just extend it in the learning stories, the children's activities. It has been a big improvement.
>
> — Peer mentor (Educational Leader), Peer mentoring group

> So those little bits and pieces are really helpful to expand our knowledge – and more of looking at the language literacy we already knew, but then we have new ideas to incorporate. And more knowledge, I guess.
>
> — Nominated Mentee, Peer mentoring group

9 Wilcoxon signed rank test, p=.02.

Educators and teachers also talked about ways the new knowledge helped with intentional shifts in practice:

> [Previously] I wouldn't go there with them with letters and numbers until they are showing interest in it... but now I'm sort of more intentional ... even the children who are showing a little bit of interest, they would come and ask me to write their names, I would guide them towards that. ... that's the part that I feel like has changed.
>
> — Nominated Mentee, Peer mentoring group

> Even yesterday, just reading that story to them in the library and remembering everything that I was taught really helped me enhance those practices to just unlock that potential within children just to see and engage, and you can see their minds open, the brain's buzzing, the neurons are firing, connections are being made.
>
> — Direct Participant (Educational Leader), Direct participation group

One explanation for why those in the peer mentoring group – particularly the nominated mentees – showed the largest growth in knowledge of evidence-based practices over time is that peer mentors and mentees may have been selected in particular ways (for example, half the peer mentors being educational leaders means they may be more likely to have higher qualifications and greater experience in the ECEC sector (see Table A1), while nominated mentees had more room to grow).

Another explanation may be that peer mentoring is more effective than training and mentoring delivered by external experts. For example, educators and teachers may prefer to learn from a colleague with whom they have an existing professional relationship and who may be able to pick out aspects of the professional learning most relevant to their context as well as children's needs and interests. Working with a colleague might also better manage cognitive load and allow educators and teachers to revisit prior learning more easily, as information and knowledge sharing can be spread over long periods.

In support of this suggestion, a recent randomised controlled trial found that when teachers received an initial professional learning workshop followed by ongoing support from teacher colleagues to embed learnings into practice, this had a greater impact on student reading comprehension and vocabulary than when external researchers were the ones providing ongoing support (Swanson et al., 2024). The greater success of the teacher-led professional learning was attributed to strengthening social networks within schools. These strengthened social networks may allow more ongoing and flexible access to feedback, social support and knowledge, compared with when schools or services solely rely on guidance from external coaches who are not full-time staff (Swanson et al., 2024).

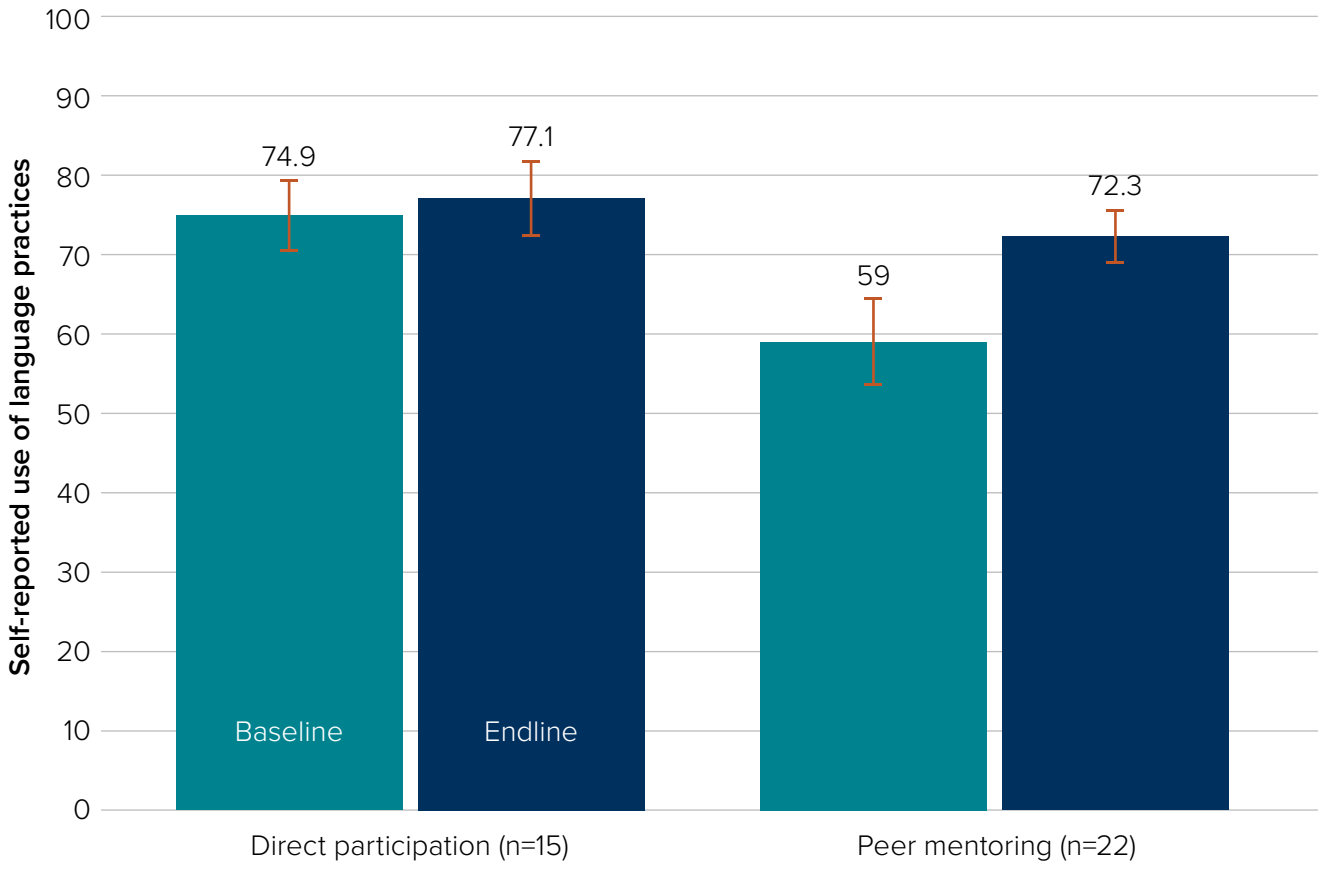
Another explanation for why the nominated mentees' knowledge increased is that they received enough peer mentoring – or at least more than they typically receive. A recent survey of knowledge dissemination in ECEC settings found that, in general, discussions regarding professional learning content typically occurred shortly after staff attended external professional learning rather than on an ongoing basis and mostly involved those who attended the sessions filling in those unable to attend (Cramer et al., 2022). Further, they found that only around half of the 44 ECEC staff they surveyed reported ever sharing what they learnt from external professional learning with their colleagues. Thus, the nominated mentees in the present study may have received more mentoring and knowledge dissemination than they would have usually, albeit less than we recommended.

3.1.2. Use of evidence-based practices

Self-reported use of evidence-based oral language and early literacy practices was measured via survey responses to the Early Childhood Language and Literacy Practice (ECLLP) tool (see Appendix A.4 for further details on this measure). Interviews also provided information about changes in practice.

Survey data showed that the peer mentoring group's self-reported use of evidence-based practices increased overall. Despite services being randomised to each study group, there was evidence that all participants in the peer mentoring group started significantly behind those in the direct participation group.[10] However, all participants in the peer mentoring group increased their self-reported use of evidence-based practices over time,[11] and by the end of the study, there was no significant difference in use of evidence-based practices between the delivery approaches. In other words, the peer mentoring group caught up to their direct participation group counterparts by the end of the study (see Figure 3.3).

Figure 3.3: Self-reported use of evidence-based oral language and early literacy practices at baseline and endline by professional learning delivery approach



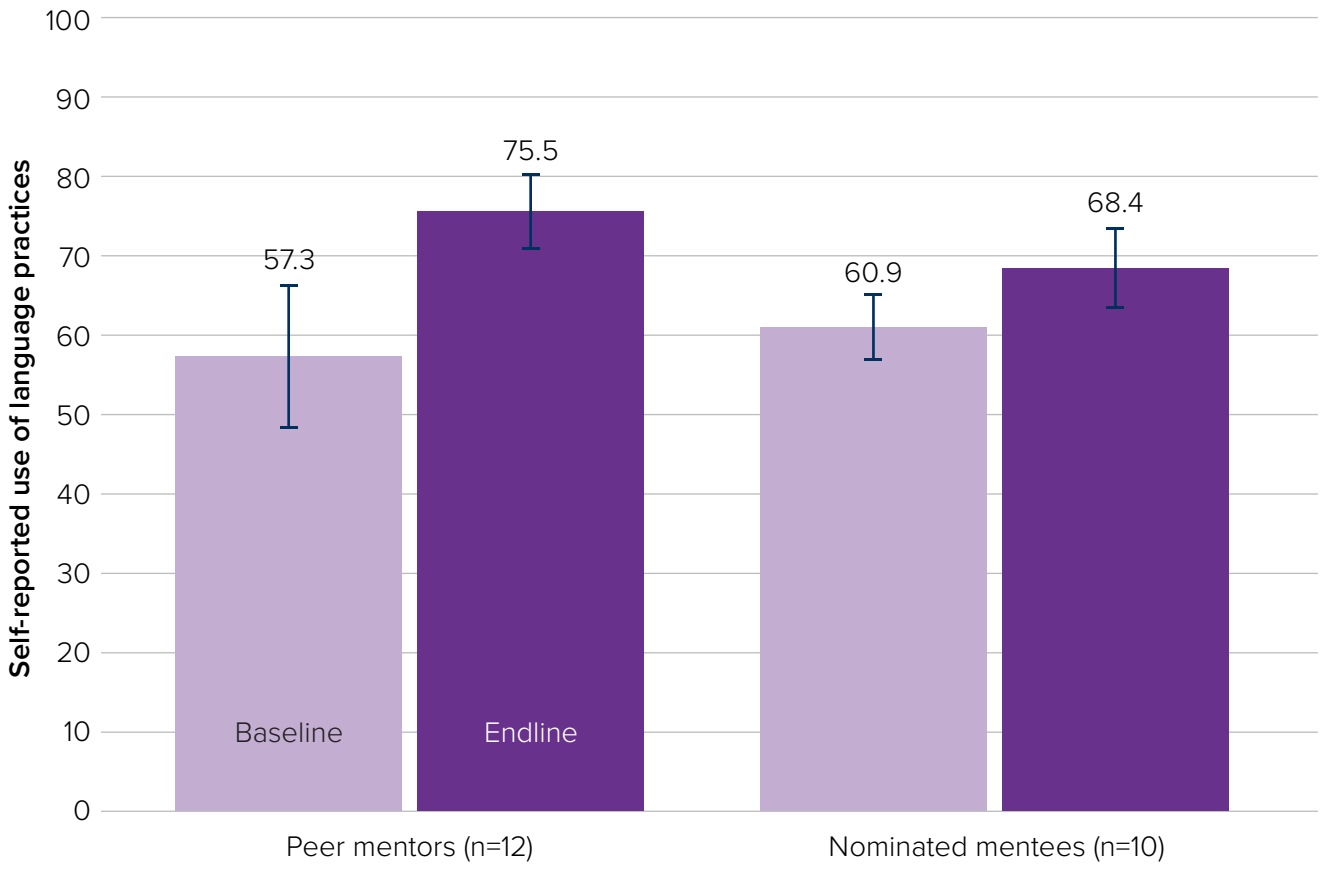
10 Welch two-sample t-test, p=.02, 0.78 SD difference between groups at baseline – this is notable given this difference is larger than the average difference between receiving oral language and early literacy focus professional learning or not (0.59 SD) in terms of the quality of early childhood educators' and teachers' instructional processes and interactions with children (Markussen-Brown et al., 2017).

11 Paired sample t-test, p=.01.

Follow-up analyses in the peer mentoring group demonstrated that this increase was driven by the peer mentors (those directly trained and mentored by ALNF) rather than the nominated mentees.[12] However, there was a trend for nominated mentees also to increase their self-reported use of evidence-based practices[13] (see Figure 3.4).

The lower self-reported baseline use of evidence-based practices by peer mentors compared to nominated mentees was surprising, given that they were expected to be at a higher level of practice than nominated mentees. It may be that greater awareness of evidence-based practices at baseline meant they were more likely to be aware of practices they were not yet using, or the pressure of self-identification as a peer mentor may have led to under-reporting of use of these practices. Research on mentoring in ECEC indicates that teachers and educators may not feel comfortable identifying themselves as sufficiently expert in practice to guide peers (Kupila et al., 2017; Pavia et al., 2003).

Figure 3.4: Self-reported use of evidence-based oral language and early literacy practices at baseline and endline for peer mentors and nominated mentees in the peer mentoring group



12 Paired sample t-test, p=.007.

13 We did not have a sufficient number of participants to conduct a path analysis examining how shifts in peer mentors' knowledge and practice predicted growth in nominated mentees' knowledge and practice, nor did we have enough participants to examine whether those who had the greatest improvements in knowledge or confidence also had the greatest improvements in practice. This line of analysis is recommended for future research with larger samples. In this study, we triangulated quantitative findings with interviews to gain richer insights.

Although we did not find that the direct participation group increased their self-reported use of evidence-based practices to the same extent as the peer mentoring group, this was likely due to a ceiling effect. This group started closer to the maximum score of the measurement tool (~1 standard deviation away from a maximum of 99), leaving less room to measure growth. Despite the ceiling effect, there was a trend for an increase in self-reported use of evidence-based practices for this group.

Interviews with educators and teachers were very positive about their use of evidence-based practices, with educators and teachers from both groups indicating they increased their use of these practices. The survey findings, taken together with the information from interviews, suggest that use of evidence-based practices over the course of the study improved across delivery approaches for all participants. However, it may have improved most for the direct participants and peer mentors, rather than the nominated mentees.

It can take time to translate knowledge into practice (Parker et al., 2020). It is possible that there was a lag in learning for the nominated mentees due to the nature of the mentoring process. Nominated mentees received knowledge and skill sharing sometime after the peer mentors attended external professional learning and participated in the on-site ALNF mentoring. In addition, nominated mentees did not generally have specific time set aside from their daily work to focus on their learning (while direct participants and peer mentors had time during the external professional learning and onsite ALNF mentoring sessions). While nominated mentees increased their knowledge of evidence-based practices, interviews provided evidence that they may have only been at the beginning of applying their knowledge to practice. More time may be needed to see significant changes in their use of evidence-based practices:

> I found because it's so in-depth, we need time away from work to actually read through and take time. [The peer mentors] had the time to listen to the videos or have the Zoom meetings. But then we had to find our way to get the information and process the information and everything.
>
> — Nominated Mentee, Peer mentoring group

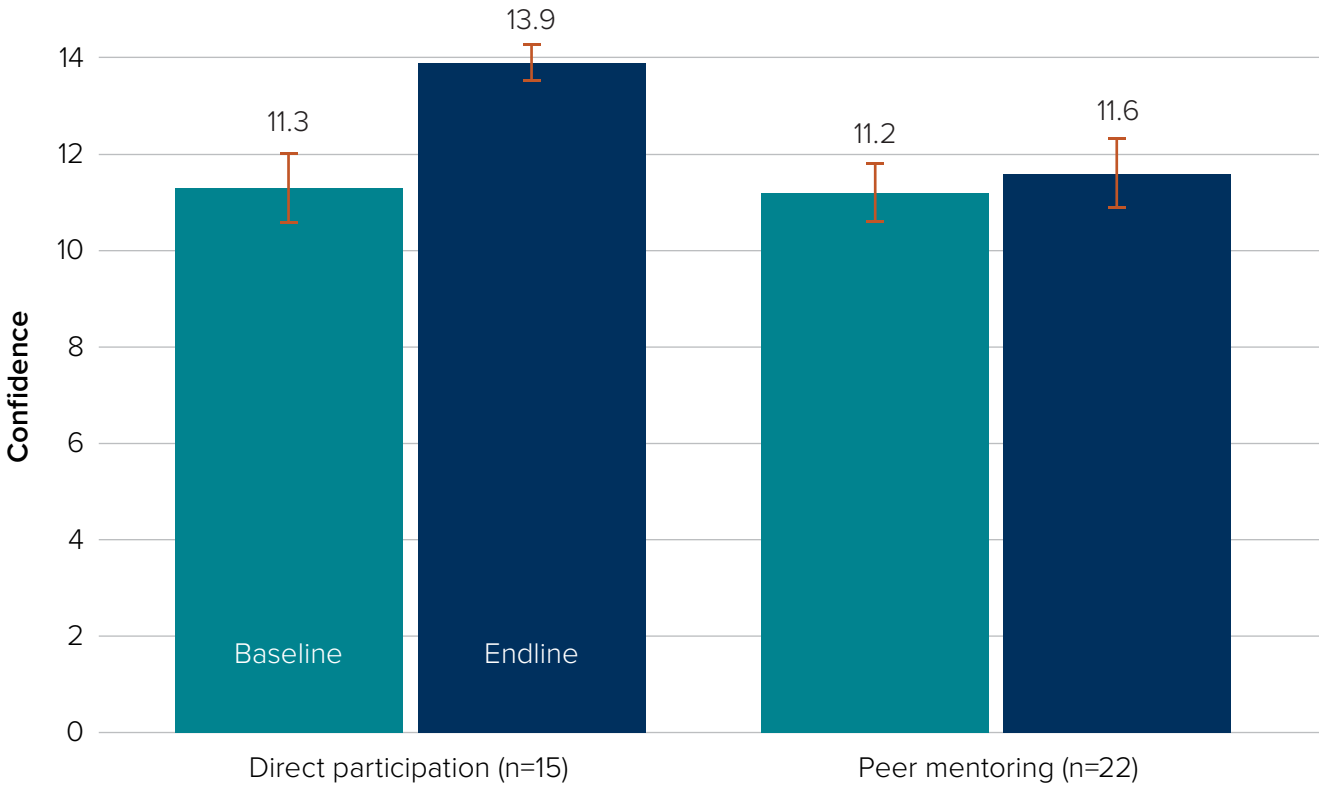
Despite the peer mentors sharing their knowledge, the nominated mentees may have received less support in translating and embedding learning into practice change. This may have hindered their ability to implement and sustain changes in practice by the end of the trial period. While building knowledge is an important part of professional learning, this is only a first step. To embed long-term change, professional learning must also spark motivation, develop techniques and afford opportunities for practice and refinement (Sims et al., 2021). If nominated mentees received fewer than the recommended hours of mentoring and, as such, less support to develop their practices, they would have less opportunity to translate their understanding into consistent, long-term improvements in their work.

3.1.3. Confidence in using evidence-based practices

Self-reported confidence in using evidence-based oral language and early literacy practices was measured via survey responses. Interviews also provided information about changes in confidence. We found that teachers and educators who were direct participants or peer mentors increased their confidence in using evidence-based practices at the end of the study.

While confidence in implementing evidence-based practices was similar between groups before the professional learning, those in the direct participation group significantly increased their self-reported confidence[14] in comparison to the peer mentoring group.[15] Further analyses,[16] controlling for baseline confidence, confirmed that the professional learning delivery approach significantly impacted confidence growth, with only the direct participation group increasing their confidence. Figure 3.5 shows these results.

Figure 3.5: Self-reported confidence using evidence-based oral language and early literacy practices at baseline and endline by professional learning delivery approach



Confidence and use of evidence-based practices may have been strongest in the direct participants and peer mentors simply because they attended the external professional learning program, which utilises effective professional learning mechanisms and delivery methods (EEF, 2023; Cirkony et al., 2024). In particular, it's possible that the presentation of information and modelling from external experts as a credible source provides increased reassurance to educators and teachers that they are making evidence-based changes to their practice. In comparison, peer mentoring requires peer mentors to be an intermediary while they are still building their knowledge and practice. This may affect mentees' perception of the reliability of the information shared, as mentor confidence is a key ingredient in successful mentoring (Nolan & Molla, 2017).

14 Wilcoxon signed rank test, p=.002.

15 Wilcoxon rank sum test, p=.046, a 0.89 SD difference in confidence between groups at endline. To contextualise this difference, a recent Australian study investigating the impact of physical education-focused professional learning on ECEC educator and teacher confidence found the intervention group were 0.42 SD more confident than the control group (Simpson et al., 2023).

16 A linear mixed-effect model generates compelling support that the model of professional learning delivery significantly impacts growth in confidence using evidence-based oral language and early literacy practices over time (p=.02). Being in the direct participation group was associated with a 2.2. unit greater growth in confidence scores (range of scale: 3 – 15) over time compared with being in the peer mentoring group.

Another possible explanation is that direct participants worked well as a group, potentially building stronger levels of collaboration, affirmation and reinforcement of learning, as well as practical social support. This could have led to boosted confidence, as described by the following participant:

> You can bounce ideas, 'Oh, that worked really well; I liked how you did that.' So you're not only selecting but you're undertaking more learning even, more professional learning, as you're doing it together, so I think the model worked really well.
>
> — Direct participant (Educational leader), Direct participation group

To further explore differences in confidence, we compared the self-reported confidence of peer mentors and nominated mentees. This showed that peer mentors were more confident in using evidence-based practices than nominated mentees by the end of the study.[17] This difference in confidence between the peer mentors and nominated mentees may have been driven by the act of teaching the nominated mentees, as described by a peer mentor:

> I do believe that training other staff is actually helping expand my knowledge as well, so to make me really confident in terms of how I gain the information.
>
> — Peer mentor, Peer mentoring group

In contrast, this quote from a nominated mentee supports the idea that mentees were less confident than their peer mentors, demonstrating a nervousness in applying what they had learnt to their teaching:

> Sometimes, you need to be very specific with what you're saying and how you're teaching it... it was a bit nerve-wracking because it's like, oh my gosh, am I saying the right thing?
>
> — Nominated Mentee, Peer mentoring group

Another possible explanation for the difference in confidence is that nominated mentees may have felt placed under scrutiny by having a peer mentor in their service, in contrast to the peer mentors and direct participants whose trainer was external to their workplace. When a mentor is employed externally, the mentee may feel more comfortable acknowledging their flaws or confidentially discussing challenges in the workplace (Bonnett & Ly, 2017; McIntyre & Hobson, 2015; Morrissey & Nolan, 2015; Pavia et al., 2003; Puig & Recchia, 2008). It is plausible that this potential pitfall of peer mentoring could be mitigated if the peer mentor and mentee have a professional relationship with high mutual trust and respect, given the wealth of research linking relationship quality to mentoring success (Bonnett & Ly, 2017; Carroll-Lind et al., 2016; Harper et al., 2024; Howe & Jacobs, 2013; Morrissey & Nolan, 2015; Nolan & Molla, 2017, 2018; Pavia et al., 2003; Peterson et al., 2010).

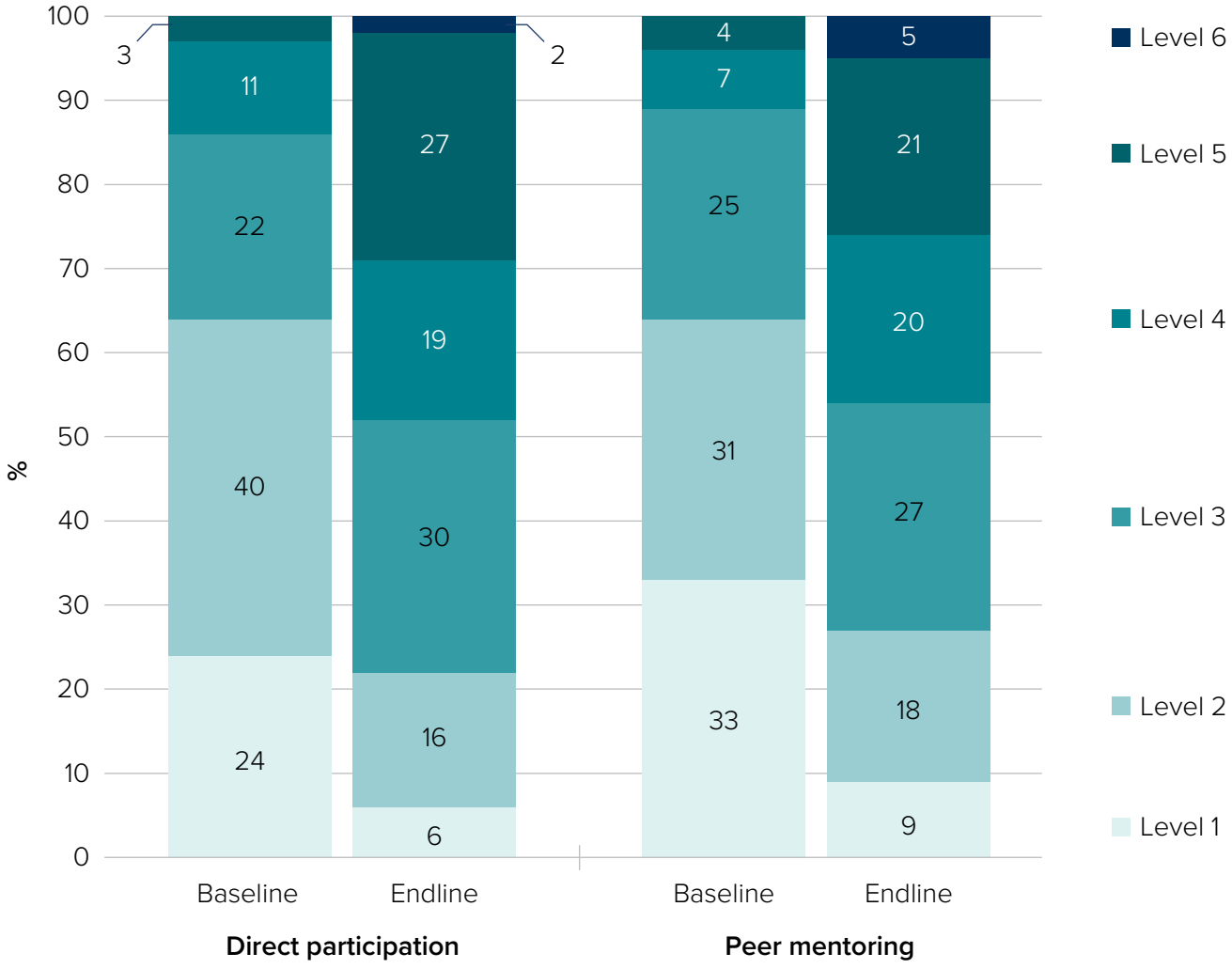
Finally, nominated mentees' confidence in using evidence-based practices may have been impacted by the fewer hours of professional learning they received compared to the peer mentors and direct participants. There may also have been a delay in the development of confidence for nominated mentees as they moved through the change process from understanding to being competent and confident in their application of the new techniques.

17 Wilcoxon rank sum test, p=.047, 1.02 SD difference in confidence between groups at endline.

3.2. Both approaches had a similar impact on children's oral language and early literacy development

Children's outcomes were measured via the ELLDI, which is underpinned by a robust progression scale and has been validated against large Australian and international datasets (Cloney et al., 2022). ELLDI data showed that children's oral language and early literacy development at services in both delivery approaches improved over time.[18] This increase did not differ significantly between the direct participation and peer mentoring approache[19] (see Figure 3.6), suggesting that a peer mentoring approach had a similar effect on children's oral language and early literacy development as a direct participation approach.

Figure 3.6: Stacked bar chart of the distribution of children across ELLDI levels[20] at baseline and endline by professional learning delivery approach



18 Paired sample t-tests conducted for each group separately generated very small p-values, $p<.0001$.

19 A linear mixed effect model demonstrated no evidence that the professional learning delivery approach significantly impacts growth in ELLDI scores over time ($p>.05$). The intra-cluster correlation coefficient (ICC) indicating the degree that children within a service are similar in terms of ELLDI scores was ICC =.12.

20 ELLDI levels indicate sequential stages of oral language and early literacy development. Level 1 is the lowest level. See Table 52 in Cloney et al. (2022) for greater details of what children at each ELLDI level can typically achieve.

In interviews, educators and teachers in both groups reported seeing improvements in children's literacy following their involvement in ALNF's professional learning program. An educational leader in the peer mentoring group spoke about the improvements they observed:

> The children have definitely benefited from it. And, yeah, we're seeing amazing progression in many of the children in terms of their language development.
>
> — Peer mentor (Educational leader), Peer mentoring group

It is important to note that without a study group that did not participate in any professional learning, we are unable to pinpoint the proportion of growth in child outcomes attributable to the trialled professional learning delivery approaches.[21] However, this was not the purpose of this study, which was focused on understanding whether children may particularly benefit or 'lose out' from a peer mentoring approach in comparison to a direct participation approach. Our findings suggest that there was no difference in children's oral language and early literacy outcomes depending on whether their educators and teachers directly participated in the external professional learning or were part of a peer mentoring approach.

3.3. Peer mentoring requires adequate planning and support

3.3.1. The peer mentoring group experienced more barriers than the direct participation group

Overall, the peer mentoring group reported more barriers than the direct participation group. However, they also reported slightly more enablers (see Table 2). This difference indicates that while many aspects can help facilitate a peer mentoring approach, this approach to professional learning can be much more challenging than a direct participation approach.

Table 2: Reported barriers and enablers to participating in the delivery approaches

Theme	Direct participation (number of codes)	Peer mentoring (number of codes)
Barriers	77	223
Enablers	79	95

The main factors influencing the delivery of the professional learning approaches were similar between both groups. However, they were sometimes experienced as a barrier in one group and an enabler in the other. For example, the theme 'time' was identified as a barrier (lack of time to transfer learnings into practice) and also an enabler (greater time out of ratio set aside for peer mentoring). However, barriers associated with time were coded 5 times more than enablers (102 references to barriers, 19 references to enablers), suggesting that the impact of the barriers associated with time was stronger than the enablers.

21 Previous research has already found that services that sent most educators who work with 3- and 4-year-old children at their service to ALNF's EL&L course (that is, similar to the direct participation group in the present study) had children with significantly higher ELLDI scores after 12 months compared to services in the same geographic area who had yet to receive the program (Cloney et al., 2022).

The main enablers and barriers focused on factors related to managing staffing constraints, allocating time for peer mentoring, having collegially supportive environments, managing the cognitive load placed on peer mentors and selecting appropriate staff.

3.3.2. Peer mentoring requires managing time and staffing constraints

Time to plan, reflect and mentor others is limited for many educators, including those in ECEC (Creagh et al., 2023; Jackson, 2020). When educators and teachers indicated that time was a barrier to their delivery approach, they spoke mainly about it as a consequence of staffing constraints. Workforce constraints are currently an issue in the Australian ECEC sector with low availability of suitably qualified staff and high turnover rates often creating staffing challenges (Education Services Australia, 2021). Staffing was mentioned twice as often by those in the peer mentoring group compared with the direct participation group (41 times, compared to 20). Staffing constraints made it challenging to find appropriate relief staff for the duration of the external professional learning and restricted availability to participate in the program's peer mentoring component:

> I found it quite difficult to pass on the knowledge. It's just because in order for them to have that time with me, then we need to relieve them as well. Also, it takes me away from the existing work that I have. It's just a challenge.
>
> — Peer Mentor (Educational Leader), Peer mentoring group

> I needed to make sure I [backfilled] all the staff, and that my program was staffed appropriately, because having two staff out of the program at a time is sometimes a challenge, particularly in this year that's been quite a challenge in terms of staffing.
>
> — Direct Participant (Educational Leader), Direct participation group

In addition to staffing constraints, many participants spoke of how their existing workload didn't allow for extra time to digest their learnings and then translate it into something that could be taught to a colleague. This was felt mainly by the peer mentoring group. Several research studies have found lack of time is a major barrier to peer mentoring success and suggest allocating protected time to ensure mentors and mentees can fully engage in the process (Gut et al., 2014; Hobson & Malderez, 2013; Morrissey & Nolan, 2015):

> I just let them watch and observe, and I told them to observe me, so when it's their turn, they can do it as well. But in saying that, I didn't really have a chance to let them do it and watch and give them feedback.
>
> — Peer Mentor, Peer mentoring group

3.3.3. Peer mentoring is facilitated by collegial support

Working with peers through communities of practice can help build supportive professional relationships, provide guidance on using new practices, and increase educators' motivation and confidence. They can also encourage ongoing reflection and long-term success in applying learnings to practice (Siraj et al., 2019). Having peers with whom they can learn and brainstorm can also support an individual in moving from a novice to an advanced beginner (Persky & Robinson, 2017). The importance of such collegial support was clear from those who attended the training. They often cited opportunities for collaboration with others who attended the training as a key enabler of practice change. The collaboration allowed them to develop their skills further and reflect on their practice with colleagues. While this pattern was clear in the direct participation group, it was also reported by the peer mentoring group, although less often:

> Definitely the amount of staff ...having the 4 of us go through the training. Our conversations have been endless. We're talking about it every time we're doing something. It's almost like we're challenging each other to bring out more all the time.
>
> — Direct Participant, Direct participation group

> It's actually made a huge difference in terms of being able to have those dialogues and those conversations because you're not in it alone... you've got 4 perspectives as opposed to one.
>
> — Direct Participant (Educational Leader), Direct participation group

> ...hav[ing] both of us for the training, it was good because then we can remind each other if we forget anything ... have discussions and have a deeper thinking.
>
> — Peer Mentor (Educational Leader), Peer mentoring group

Some peer mentors reported feeling overwhelmed by the responsibility of both learning something new and then passing these teachings on to their colleagues. Peer mentoring can be a difficult process that requires additional cognitive load to unpack and translate the learnings (Johnson, 2006). Being confident in mentoring someone else requires that mentors themselves are supported in consolidating their knowledge alongside developing mentoring skills. While a novice spends time remembering information, some researchers suggest that an expert level of understanding may be needed before teaching others (Persky & Robinson, 2017). More effort is required for those with less experience, as retrieving information requires significant cognitive demands. The cognitive demand was noted by the peer mentoring group, where peer mentors felt increased pressure in their role to share what they learnt with their colleagues:

> You're not only learning a new skill but you're then having to share that and almost become the master of it when you're just finding your own feet.
>
> — Peer mentor (Educational Leader), Peer mentoring group

> I think if we had more people who knew the program, it wouldn't have felt like quite so much.
>
> — Peer mentor, Peer mentoring group

3.3.4. Selecting the right peer mentors and supporting them is critical

Mentoring can be demanding, and not selecting the right mentor can negatively impact the mentee (Livingstone, 2018). Educators and teachers from both professional learning delivery approaches in this study also noted that staff's suitability to be a peer mentor depended on a range of aspects related to skills, dispositions, experience and role responsibilities.

Given that instruction for peer mentoring was not provided in this study, services in the peer mentoring group needed to consider which staff had the appropriate skills and dispositions to attend the external professional learning and share their skills and knowledge. In addition, both groups noted that educational leaders who were experienced in their role tended to be confident in peer mentoring and, therefore, better able to engage in this program component:

> I think if you had sent in someone who's not as experienced, I think they would have been quite lost with it.
>
> — Peer mentor (Educational Leader), Peer mentoring group

> Peer mentoring is my role, it's my job and it just comes down to the relationships I have with my [colleagues]. I just continue to the natural rhythm that I have.
>
> — Peer mentor (Educational leader), Peer mentoring group

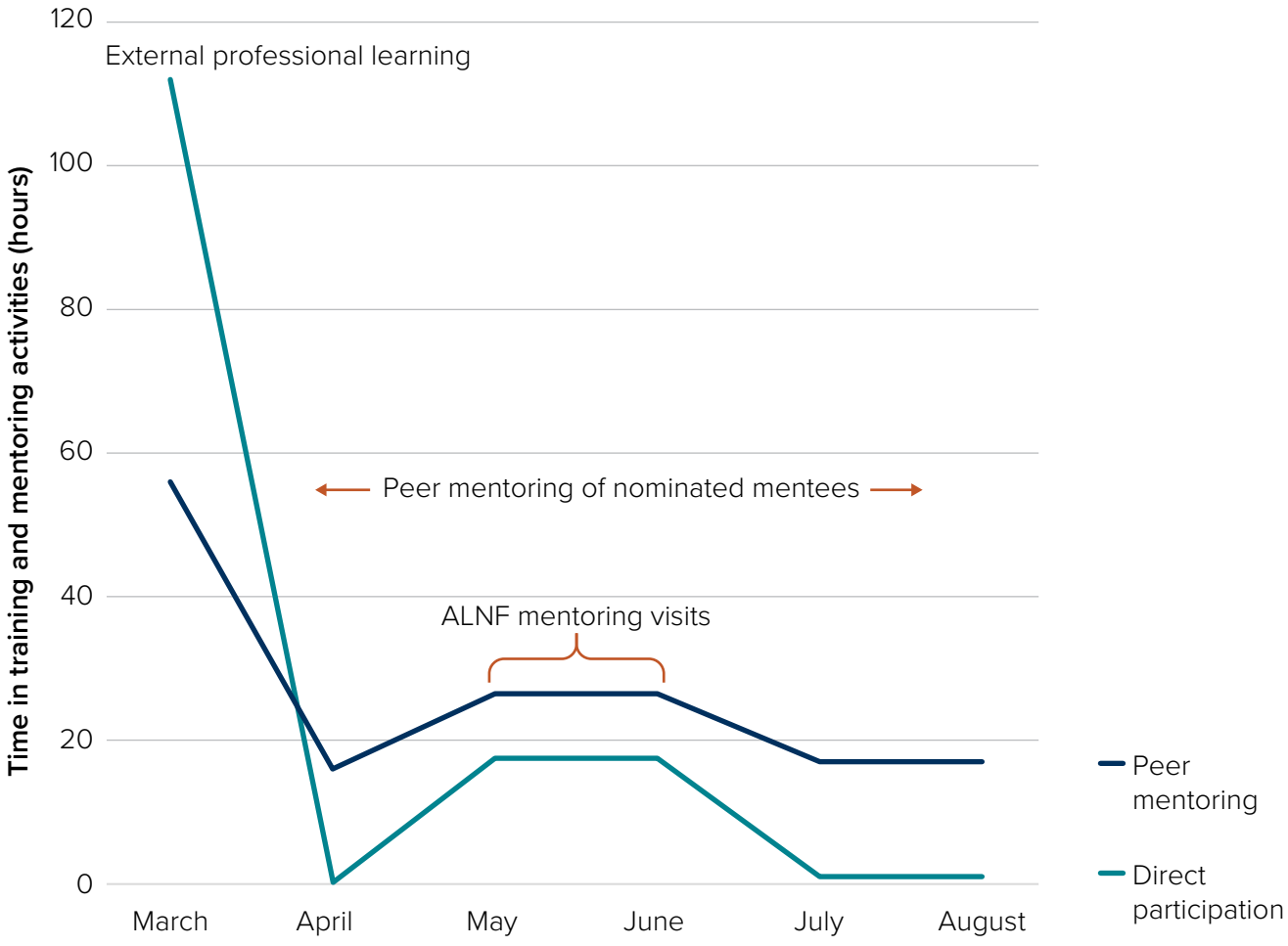
The peer mentoring group reflected on how aspects of their role did not involve working directly with their colleagues and this restricted their ability to engage in peer mentoring. There were also mixed views on whether the educational leader was best placed to attend the external professional learning and share their learnings. While some felt that attending professional learning and subsequently peer mentoring staff was a vital element of the educational leader role, others felt that their position as educational leader was only one aspect of their role within the service. Specifically, the 10 educational leaders in our sample often juggled 2 or more leadership roles in their service and varied in the amount of time they spent in ratio in the preschool room (see Appendix A.5 for further detail). Those with significant administrative responsibilities reported they had minimal opportunities to share what they learnt. These findings are supported by the literature, that indicates peer mentoring is most effective when it involves activities like modelling (Elek & Page, 2019) and when, crucially, there is enough time in the working week for these activities (Gut et al., 2014):

> I actually found it really hard because I am only sometimes in the room. I've got time where I'm in the office, I'm in my other room as well. And the times that I was in the room, I was more so just implementing, but I would make sure that the other staff were watching, and we'd have a little chat about what we did. In terms of sitting down and teaching them the things, I found it really, really hard to implement from my role within the service.
>
> — Educational leader, Peer mentoring group

3.4. Both approaches required similar time investments, just distributed differently

Through surveys and interviews, we found that the peer mentoring approach required a smaller upfront time commitment and financial investment compared with the direct participation approach, as 2 staff attended the external professional learning instead of 4. However, the time commitment between approaches was broadly similar. The direct participation approach was only slightly less time-intensive overall, requiring **149 hours of staff time** per service over 6 months, compared with **159 hours**[22] for the peer mentoring approach. As shown in Figure 3.7, the peer mentoring approach required a greater ongoing time commitment from those tasked with peer mentoring.

Figure 3.7: Time investment in training and mentoring activities[23] (hours/month) per service by professional learning delivery approach



22 This figure assumes 40 hours of peer mentoring is delivered by 2 peer mentors to 2 nominated mentees. In our study, we know that services in the peer mentoring group mostly fell short of this benchmark.

23 As part of the EL&L course, educators and teachers were also required to implement EL&L practices in their daily work and log the number of hours they spent doing this. The time in training and mentoring activities does not include the time educators and teachers spent implementing the practices they learnt in training and mentoring. Thus, while the direct participation approach may not have engaged in any training or mentoring activities in the second, fifth or sixth month, it was assumed they were spending time putting into practice what they learnt throughout the delivery period.

Given these findings, the suitability of a peer mentoring approach can depend on a service's capacity for making a large upfront time commitment or a commitment that is initially smaller but covers a more extended period.

As displayed in Table 3, twice as many participants withdrew from the study before commencing the professional learning program in the direct participation group compared to the peer mentoring group. This demonstrates the challenge of making an upfront time commitment to train all or most preschool educators and teachers at a service. However, a similar number dropped out of the peer mentoring group during the peer mentoring and implementation period following the external professional learning. This is notable given that, as mentioned, there was a more significant time burden for peer mentoring group participants during this period: the peer mentors were tasked with both changing their practice and providing peer mentoring, and the nominated mentees were tasked with learning new approaches from colleagues while fulfilling their usual day-to-day duties.

Table 3: Participant dropout rates before and after commencing professional learning by group

Group	Withdrew before professional learning	Withdrew during the study period
Direct participation	16 (51%)	1 (3%)
Peer mentoring	8 (26%)	2 (6%)

3.5. Limitations

This study compared 2 approaches to delivering professional learning using a small number of ECEC services in each group. While the inclusion of a comparison group and randomisation increased the rigour of the study, some limitations are present. As such, the findings must be interpreted appropriately.

3.5.1. Small sample size

Recruitment challenges resulted in a smaller sample size than originally designed and planned for. This small sample size may have affected the ability of statistical tests to detect differences between groups. With 37 educators and teachers in the sample, we were powered to detect between-group differences in educator and teacher outcomes[24] as small as 1.08 SD. With 152 children in the sample, we were powered to detect between-group differences as small as 0.59 SD regarding children's oral language and early literacy outcomes. We used statistical tests to assess the possibility that the between-group differences we observed were due to chance or were evidence of the differential impacts of the trialled approaches to delivering professional learning. Where appropriate, effect sizes are reported alongside the findings to facilitate interpretation further. Given that we were underpowered, we also used descriptive data to look for trends of between-group differences. We used high-quality qualitative data from educator and teacher interviews at every step to help interpret and bolster the quantitative findings.

24 Knowledge, confidence and use of evidence-based oral language and early literacy practices.

3.5.2. Baseline differences between groups

There were baseline differences between groups despite randomisation. The peer mentoring group, relative to the direct participation group, had lower NQS ratings, services located in areas with lower socio-economic status, fewer educators in preschool rooms, lower baseline use of evidence-based oral language and early literacy practices, and lower levels of parental education levels. We attempted to address these imbalances by including covariates in our analyses. However, these differences may still affect our ability to attribute end-of-study group variations to the professional learning approaches (direct participation versus peer mentoring). While the peer mentoring group showed significant improvement in self-reported use of evidence-based practices, this could be due to initial disparities. Moreover, selective attrition exacerbated existing differences, as more services withdrew from the direct participation group (see Table 3), possibly skewing findings.

3.5.3. Reliability of measures

We faced challenges finding validated measures suitable for our study's objectives that also minimised participant burden. Consequently, measurement error may have influenced results. For example, our questions may have been interpreted differently by different participants or social desirability bias may have led participants to answer in a more socially acceptable, rather than truthful, way. We calculated reliability statistics (Cronbach's alpha) to estimate the degree of measurement error. The confidence measure (survey questions related to confidence – see Appendix A.4) and the evidence-based oral language and early literacy practices measure (ECLLP tool – see Appendix A.4) used in the present study had excellent reliability ($\alpha>0.9$). The knowledge measure (survey scenarios – see Appendix A.4) provided a lower level of reliability ($\alpha=.56$). While this measure is a limitation of the study, it is important to note that the impact of a lower reliability statistic is a loss of experimental power, making it harder for us to find significant differences in knowledge between groups or over time. Thus, it is notable that we still found significant growth in knowledge over time, and issues with the way we measured knowledge do not discredit these findings. While we could estimate our outcomes' reliability, the data collected was insufficient for full psychometric validation.

3.5.4. Location and type of service

This study was conducted solely in ECEC services in Western Sydney, New South Wales; as such, population characteristics may have influenced findings. In addition, the sample was predominantly long day care services. Again, the characteristics of these types of services may have influenced findings.

We recognise that different types of ECEC services may have vastly different structures to the long day care model (for example, single-teacher preschools). Our findings can, therefore, be considered generalisable only to those services with a similar staffing profile that enables either of the 2 professional learning approaches investigated in this study. As long day care is a common model for ECEC provision across Australia, our findings are broadly relevant to the ECEC sector in Australia and provide valuable insights for other educational settings interested in peer mentoring.

4. Implications and next steps

This study aimed to generate initial evidence of whether peer mentoring is a promising and feasible approach to delivering professional learning. We compared a peer mentoring approach, where some staff participated in external professional learning and then share their learnings with colleagues, to a direct participation approach, where external professional learning is provided to all or most staff. Peer mentoring to disseminate professional learning is often used in educational settings due to resourcing pressures, despite a lack of rigorous causal research demonstrating that it is effective.

4.1. Peer mentoring has the potential to increase overall participation in professional learning

This study showed that a peer mentoring approach is a feasible option for professional learning compared to a direct participation approach. We found that educators' and teachers' knowledge and use of evidence-based practices were broadly similar across approaches, with both direct participation and peer mentoring groups demonstrating learning by the end of the study. We also found that there were no differences in children's oral language and early literacy outcomes, suggesting that children do not gain or lose out from either professional learning approach.

Given these findings, a peer mentoring approach has the potential to increase overall participation in professional learning. This may particularly be the case in under-resourced and minimally staffed educational settings, where sending large groups of educators to external professional learning sessions may be difficult due to cost and resourcing. External professional learning sessions are often expensive, with additional costs associated with backfill for staff attending the training. Peer mentoring allows for all educators and teachers to participate in professional learning, with some peer mentors attending the external training, and then sharing what they have learnt with their colleagues over subsequent months.

4.2. Settings should select the professional learning approach that aligns best with their context and capacity

When considering how to access professional learning, ECEC services and other educational settings can consider a direct participation approach, in which all or most teachers and educators are trained, or a peer mentoring approach, where a portion of teachers and educators attend professional learning and subsequently engage in peer mentoring to share their skills and knowledge. While we found outcomes were similar between the professional learning approaches, we also found that peer mentoring can be challenging – particularly for peer mentors – and that effective peer mentoring requires appropriate planning and support.

As such, although the peer mentoring approach may be attractive given the reduced upfront cost and time commitment, decision-makers need to consider whether those who attend the external professional learning have the capacity and opportunity to pass on what they have learnt. This includes consideration of time and staffing constraints, the need for collegially supportive environments, and the importance of selecting the right peer mentors and supporting them.

The external professional learning (EL&L training and ALNF mentoring) provided in this study was not explicitly designed to be delivered using a peer mentoring approach. This is the case for many professional learning programs. Although this study provided some peer mentoring resources alongside the training, they were not intended to be comprehensive. Some of the barriers identified in this study (for example, sharing the cognitive load placed on peer mentors and peer mentors having the right skill sets) are clearly related to the lack of instruction in peer mentoring and would likely be reduced or removed with appropriate training to build capacity in this area (Kupila et al., 2017; Siraj et al., 2023).

To improve the success of peer mentoring approaches, comprehensive guidance or training for passing on learnings should be provided to peer mentors to ensure they have the required skills, and those they are mentoring receive the correct information and support. For example, one mentoring training program for preschool teachers involved 4 monthly seminars with reflective tasks and opportunities to practice interaction skills. This program led to greater appreciation that mentoring is a two-way process of collaborative learning, where both the mentor and mentee have the opportunity to learn (Kupila et al., 2017). If available, settings could select professional learning designed for a peer mentoring approach that incorporates peer mentoring skills training into the professional learning. For example, the Leadership for Learning program evaluated in the FEEL study shows the success of professional learning that includes both instruction on evidence-based practice *and* mentoring training (Siraj et al., 2023).

Considering the workload and roles of those sent to external professional learning is also essential to increasing enablers and reducing barriers associated with peer mentoring. This is particularly true for settings that can only accommodate sending a few staff to external professional learning. Those tasked with driving practice change must be given the time to do so. This could involve peer mentors being given weekly protected time to mentor colleagues. This suggestion is supported by qualitative evidence that knowledge sharing in ECEC settings often happens in informal and spontaneous ways. For example, a small group of colleagues may have a ‘meeting on the run’ to refine their educational program or the approaches they are taking with children. A second suggestion is to devote a portion of regular meeting time to discussing what was learnt during offsite professional learning. A narrative synthesis of 81 studies by Liu et al. (2024) examining collaborative learning in ECEC settings supports this suggestion.

Time for learning and reflection – particularly in smaller groups – was identified as a critical structural factor facilitating effective collaborative learning.

Overall, appropriate training, planning and support can allow sufficient time and opportunity for peer mentoring to occur and improve the quality of peer mentoring. It is possible that under these circumstances, a peer mentoring approach could deliver even better outcomes than those described in this study.

4.3. This study contributes to the existing knowledge base on effective professional learning

This study is particularly important for Australian professional learning research in ECEC because it was not only conducted in Australian ECEC services but was tailored to these settings by attempting to leverage the collaborative nature of these settings where educators work side-by-side in the same room. The findings can inform future research, policies and practices around professional learning. They could also be adapted to other education settings, such as schools, given that knowledge and skill sharing from professional learning programs is also relatively common in a school setting. Previous research on professional learning demonstrates its potential to significantly improve educator and teacher practice and boost child outcomes (Egert et al., 2018) – particularly when professional learning is sustained over time and includes certain effective mechanisms like modelling, feedback and social support (Sims et al., 2021). More research is needed to gain a more nuanced understanding of how effective mechanisms of professional learning can be best implemented to support increased use of evidence-based practices and how professional learning offerings can be scaled up so more can benefit.

We have shown promising evidence[25] that, with appropriate planning and support, peer mentoring can be used to disseminate skills and knowledge from a professional learning program. This study also demonstrates scalability as it utilises existing levers in Australian ECEC settings to peer mentor staff at a service. This evidence of promise and scalability justifies further research to replicate the study with a larger sample to determine the effect of a peer mentoring approach on professional learning with greater certainty.

While we have shown that the peer mentoring approach is promising for professional learning programs like those delivered by ALNF (which includes offsite professional learning with onsite mentoring), future research could also use alternate professional learning programs – particularly those that solely comprise offsite professional learning, to provide additional insight into the generalisability of the findings. Finally, any future research replicating this study could include strategies that reduce peer mentoring barriers to examine whether doing so can improve the effectiveness of the peer mentoring approach.

25 EEF evaluates the efficiency and effectiveness of small-scale studies and pilot programs by considering whether they show evidence of promise (EEF, n.d.). For a study to demonstrate promise, there needs to be a clear theory of change, evidence of impact on the study outcomes, and a shift of existing practice. In addition, the EEF assesses scalability based on whether a program is well-defined and developed, has been feasible, and can be delivered at a larger scale in the future.

4.4. More rigorous evaluations are needed to strengthen the Australian education evidence base

Rigorous evaluations use methods such as randomisation to reduce bias and comparison groups to attribute causation. These kinds of studies are required to provide evidence of whether an approach or intervention works, but they are uncommon in Australian education settings. Given that this study used rigorous methods, albeit on a small scale, our findings provide greater confidence about what works, for whom, and in what contexts. This study also employed qualitative methods to ensure that quantitative results were interpreted and contextualised using insights from the teachers and educators involved, improving the usefulness of the findings.

More rigorous evaluations, including both qualitative and quantitative methods, are needed to support evidence-informed decisions in schools, services and policy. Building the evidence base on what makes professional learning effective is important because it can help policymakers improve professional learning, help schools and ECEC services develop their own, in-house professional learning, and help schools and ECEC services make more informed decisions when selecting external professional learning programs.

To strengthen the evidence base, one particular challenge that needs to be addressed is measurement in research. Our experience was that current approaches to measuring changes in educator and teacher practice (individually and at the service level), as well as children's development, were limited. For example, some common tools that measure educator and teacher practice required in-service visits by researchers, which may be problematic for some services. Although the measure we used (ELLDI) was validated in Australia for the purposes of our study, it requires time to administer and some training for educators and teachers before it is used. Development of measures that can capture change while minimising burden on teachers, educators and services will be invaluable for evaluation research and, ultimately, in generating advice that advances children's learning and development.

Another challenge that needs to be addressed to continue to strengthen the evidence base is ensuring greater research participation. We experienced significant challenges in recruiting and retaining participants, which resulted in a smaller sample size than anticipated. Services we approached that chose not to participate noted issues including staffing allocation, existing time pressures and discomfort with being randomly allocated to one of the study groups. Services that dropped out of the study before commencing the professional learning cited staffing allocation and sourcing casual backfill as key constraints. For this reason, most dropout was seen in the direct participation group that required 4 staff members to attend external professional learning. To undertake rigorous evaluations and research on professional learning, there needs to be a positive influence on existing research cultures and meaningful engagement with expectations and aspirations for research among teachers, educators and leaders. This will assist with normalising research and reducing barriers to research participation among schools and ECEC services, and hopefully, increase the uptake of research studies to enhance the quality of professional learning in Australia.

Appendix A: Methods

A.1. Ethics and ethics approvals

The research was approved and conducted in accordance with the requirements set out in the National Statement on Ethical Conduct in Human Research 2007 (updated July 2018). Human research ethics review, monitoring and oversight were carried out by Macquarie University (HREC approval number #520221209944488).

A.2. Sample selection

This study was a small-scale two-arm cluster randomised trial. Services were randomly assigned to one of the 2 professional learning delivery approaches that varied in terms of the number of educators and teachers who participated directly in professional learning (direct participation approach or peer mentoring approach).

Centre-based ECEC services located in Western Sydney were eligible to participate in the study provided they met the following eligibility criteria:

- their maximum total places were between 30 and 100 children.
- they remained open throughout the study period from 27 February to 4 December 2024
- they were willing to support the educational leader and 3 educators and teachers in engaging in all professional learning activities.

Four hundred and fifty-one eligible services were randomly selected and invited to participate in the study. Sixteen of these services agreed to participate. Simple randomisation was used to allocate services on a rolling basis (as ECEC services signed up for the project). However, because of the small number of services in this study, there was a risk that simple randomisation would result in imbalanced group distributions. As such, when an allocation would result in a group difference of greater than 2 services, a service was allocated to the smaller group instead, using that allocation for the next service to sign up, then continuing with simple randomisation on a rolling basis. The 16 services were randomised evenly into the 2 study groups. However, a short time after the commencement of the study, 6 services withdrew, leaving 4 services in the direct participation group and 6 services in the peer mentoring group.

The 6 services that withdrew from the study before or shortly after commencing the professional learning cited staff turnover and workforce constraints (including the availability of casual relief) as key reasons for being unable to participate.

A.3. About the professional learning program

The professional learning program delivered to participants in this study included ALNF's EL&L course and ALNF's training in administering the ELLDI and interpreting ELLDI feedback and recommendations. Professional learning was delivered by ALNF through a combination of offsite training sessions to introduce content and ALNF-delivered onsite mentoring sessions to further support direct participants and peer mentors to apply their learnings to practice.

ALNF's Early Language & Literacy and Early Language and Literacy Developmental Index training and mentoring

ALNF's EL&L course is an example of professional learning that uses effective professional learning mechanisms and delivery methods (Cirkony et al., 2024; EEF, 2023). An independent evaluation states 'it is clear that the EL&L program has the potential to close achievement gaps, and can do so when the intensity of the program is higher' (Cloney et al., 2022).

The EL&L course is nationally accredited as the 11027NAT Certificate IV in Early Language and Literacy. It provides ECEC educators and teachers with training and mentoring to use evidence-based oral language and early literacy practices drawn from speech pathology and education. EL&L provides practical, multisensory strategies and resources to support the development of children's oral language and early literacy skills, including phonological awareness, oral language development (which includes clarity, fluency and volume), vocabulary and sentence knowledge, emergent reading and writing and early comprehension skills.

The EL&L course includes many mechanisms of effective professional learning, including presenting information from experienced trainers, revisiting prior learning, providing feedback and action planning. The EL&L course also distributes the information across sessions to manage cognitive load, models practices for and with the participants, and monitors and provides feedback once the participants return to their services. In addition, the course uses effective professional learning delivery methods, such as coaching and sustained delivery of training. As part of the EL&L course, educators and teachers were also required to implement EL&L practices in their daily work and log the number of hours they spent doing this.

Further to the EL&L course, participants were also trained in the ELLDI formative assessment tool that can be used to obtain feedback about children's oral language and early literacy development (see Appendix A.4). Recommendations for integrated strategies were included in both digital and paper versions of the ELLDI to provide guidance to educators regarding children's growth needs. The feedback and guidance provided by the ELLDI further supported educators and teachers with implementing practices taught throughout the EL&L course.

To meet the aims and timelines of this study, changes were made to the timing and sequence of ALNF training sessions. This included providing the ELLDI administration training before the EL&L course started to ensure educators could complete the ELLDI with the children as part of baseline data collection, and prior to beginning the main component of the professional learning. The course was also provided over a shorter period of time, however, it included the same content as usual.

In addition to ALNF training and ALNF mentoring, AERO provided educators and teachers participating in this study with peer mentoring guidance resources based on evidence of mentoring best practices. The resources – which were 2-page explainers on the core features of effective peer mentoring – were developed specifically for the study. The resources provided guidance based on research about peer mentoring, however, they were not intended to be comprehensive resources to instruct teachers and educators on this topic.

Delivery of external professional learning by ALNF and peer mentoring

The professional learning was generally delivered as intended, albeit with fewer peer mentoring hours than expected.

All direct participants and peer mentors reported attending all of the offsite training sessions and onsite ALNF-delivered mentoring sessions that were part of the external professional learning program. Educators and teachers from both groups exceeded the study's target for implementing EL&L practices in their daily work (40 hours). On average, the peer mentors logged 58 hours, whereas the direct participants logged 67 hours during the study period.

Direct participants and peer mentors reported sharing the skills and knowledge acquired in the external professional learning program with their peers who did not attend training. The methods used to share skills and knowledge across services varied, including using a buddy system, formal and informal meetings, observations, ongoing reflections, shared resources and staff message boards. In the peer mentoring approach, only 40% of nominated mentees reported they received at least 20 hours of targeted peer mentoring from their peer mentors at the end of the study period. Similarly, when we asked the educational leaders in the peer mentoring group – who, alongside the other peer mentor, were tasked with providing this peer mentoring – the same question, one reported that both the nominated mentees received less than 20 mentoring hours, 3 reported that one of the nominated mentees received less than 20 mentoring hours and one reported they were 'not sure'. It is worth noting that partway through the study, one nominated mentee resigned, and another was moved to a room with a younger age group, thus restricting peer mentoring opportunities.

A.4. Data sources

Early Language and Literacy Development Index

Children's oral language and early literacy outcomes were measured by ALNF's Early Language and Literacy Development Index (ELLDI). The ELLDI was selected as it has been found to be a fair, reliable and valid assessment of children's language and literacy development (Cloney et al., 2022; Cloney & Picker, 2021). Specifically, it is known to meet the principles that define quality early years assessments, to validly measure language and literacy constructs, produce consistent and valid results and accurately measure and allow for the mapping of language and literacy components onto a scale of difficulty (Cloney et al., 2022).

ALNF commissioned the Australian Council for Educational Research to develop the ELLDI Progression Scale as an independent measure of oral language and early literacy that can be used with or without the EL&L program.

The ELLDI includes the following subdomains:

1. Expressive Vocabulary
2. Phonological Awareness and Phonics
3. Comprehension
4. Oral Language (including Clarity, Fluency and Volume)
5. Print Conventions
6. Transition to Reading and Reading
7. Pre-Writing and Writing.

The ELLDI involves authentic, one on one tasks that are contextually appropriate for children and can be delivered by their educator or teacher (Cloney & Picker, 2021). Administration of the ELLDI takes approximately 20 to 30 minutes per child.

After each ELLDI assessment, the ELLDI generates an ELLDI Growth Profile for each child. ALNF has added tailored feedback to inform teaching and learning decisions based on growth progressions feedback for individual and groups of children aged 2 to 8 years.

In this study, ELLDI interviews with children were conducted by the participating educators and teachers at their service. The ELLDI administration training was therefore provided to direct participants and peer mentors before the EL&L course to ensure educators and teachers were trained to collect the baseline data. The ELLDI administration training did not include information on evidence-based practices.

There were approximately 6 months between the baseline and endline time points in this study. At each time point, children participated in an ELLDI interview and their ELLDI level was calculated based on their responses. Table 52 in Cloney et al. (2022) provides details of what children at each ELLDI level can typically achieve. ALNF encouraged participating educators to use insights generated from baseline ELLDI interviews to tailor their practices to the needs of the children at their service.

Educator survey

All educator and teacher participants (including educational leaders trained by ALNF and nominated mentees) completed an online, self-report survey before the professional learning and at the end of the study to measure change in the outcomes of interest.

Response-shift bias: A note on the use of self-report measures

Given self-reporting measures were used to capture educator and teacher outcomes, our results may have been affected by response shift bias – a type of self-report bias where increased knowledge leads individuals to recalibrate their self-assessment of a certain skill (Rosenman et al., 2011). For example, when individuals lack skills or knowledge in a certain area, they tend to overestimate their competence (the Dunning–Kruger Effect) (Dunning, 2011). Building skills in this area – for example, via a professional learning course – may reverse the Dunning–Kruger Effect and lead to more realistic self-perceptions of ability (Rosenman et al., 2011). This recalibration poses challenges for professional learning trials – such as this study – that rely on self-reporting to capture change in practice. Specifically, participants may seem to get worse over time, when they have really improved, they are just no longer overestimating their ability.

As the 2 conditions in this study both received training, any response shift effects that may have occurred were likely experienced equally across groups. Thus, as the degree of measurement error is likely similar for both groups, the significant differences between the groups remain valid. Additionally, if response shift effects did occur, this likely means the significant improvements in educator and teacher outcomes we found are only an underestimation of the benefits of the professional learning approaches.

Educator and teacher demographics

At baseline, we asked teachers and educators to report their tenure working in the early childhood sector, their formal qualifications and their English confidence. Table A1 shows the balances of these demographic variables across groups. These variables were used as covariates in the between-group analyses.

Table A1: Educator demographics by participant type

Demographic variables		Direct participants	Peer mentors	Nominated mentees	Sig.
Educators and teachers – *n*		15	12	10	-
Service tenure – *years*		7.62	9.18	6.4	>.05
ECEC sector tenure – *years*		12.5	15.08	11	>.05
Highest qualification *n (%)*	Working towards first qualification	1 (7%)	0 (0%)	1 (10%)	>.05
	Advanced Diploma/ Diploma	6 (40%)	3 (25%)	7 (70%)	
	Bachelor's degree or above	8 (53%)	9 (75%)	2 (20%)	
English confidence *n (%)*	Slightly confident	0 (0%)	0 (0%)	1 (10%)	>.05
	Mostly confident	4 (27%)	6 (50%)	3 (30%)	
	Very confident	11 (73%)	6 (50%)	6 (60%)	

Knowledge scenarios

Knowledge of evidence-based oral language and early literacy practices was measured using a bespoke scenario-based measure where educators and teachers provided short, free-text responses. This measure was developed to provide an indication of knowledge rather than comprehensively assess knowledge of evidence-based oral language and early literacy practices.

Educators and teachers were provided with 4 fictitious scenarios involving preschool children. For each one, they were asked what they could do to promote children's oral language and early literacy. Participants were tasked with giving up to 3 suggestions per scenario. We scored responses against the ECLLP tool (described further in Appendix C), to give a total score (max of 12), which

captured the number of strategies named across all scenarios. The knowledge measure – a combination of the scored responses to each scenario – has lower than acceptable internal consistency (α = .56 – Cronbach's Alpha). The reliability statistic of this measure is less than desirable. Still, it is unsurprising given the approach to measuring knowledge of evidence-based practices was not intended to be comprehensive and, secondly, there are only 4 scenario questions in the measure – having fewer questions is a known contributor to lower reliability statistics (Tavakol & Dennick, 2011). Further, as greater measurement error makes it *less* likely that we would detect a significant effect, it is notable that we still found significant improvements in knowledge over time in the peer mentoring group. Thus, if anything, our study may be a conservative estimate of the impact of the peer mentoring approach on growth in knowledge.

Confidence measure

Confidence in using evidence-based oral language and early literacy practices was measured using 3 bespoke survey items with a 5-point Likert scale (Not at all confident – Very confident). This measure had high internal consistency (α = .92 – Cronbach's Alpha).

Use of evidence-based oral language and early literacy practice (ECLLP tool)

The quality of evidence-based oral language and early literacy practices was measured using AERO's ECLLP tool – a self-report rubric. It identifies and measures the use of evidence-based strategies that contribute to quality oral language and early literacy educator practices – particularly those relevant to children aged 3 to 5 years. The oral language and early literacy practices outlined in the tool were compared to those taught in ALNF's EL&L program and were well-aligned. This measure had excellent internal consistency (α = .96 – Cronbach's Alpha). Please see Appendix C for further information on the development and validation of this measure.

Service work culture and collaboration

Ratings of service work culture, which included aspects of collaboration, were measured using 8 bespoke items with a 5-point Likert scale. This measure had excellent internal consistency (α = .97 – Cronbach's Alpha). This measure was used as a covariate in the between-group analyses.

Peer mentoring hours

The educational leaders and nominated mentees in the peer mentoring group were asked to report whether they administered or received the recommended amount of peer mentoring – 20 hours per nominated mentee. This variable was used to check the fidelity of the professional learning approach and as a covariate in the between-group analyses.

Readiness for change

Readiness for change was measured using 2 questions that asked to what degree participants were interested, ready and able to change their approach to supporting children's oral language and early literacy development.

EL&L practice logbook

The direct participants and peer mentors who directly participated in ALNF's EL&L program logged the time they spent implementing EL&L practices in their daily work. A minimum of 40 hours was suggested during the study. This variable was used as a covariate in between-group analyses.

Parent survey

Parents who consented to their child's ELLDI data being used for this research were invited to complete a short online survey before the professional learning to answer demographic questions about their child and family. These demographic variables were used as covariates in analyses where children's oral language and early literacy development was the outcome variable.

Service director survey

The director[26] of each service was invited to fill in a short online survey before the professional learning to answer demographic questions about their service, including the proportion of educators and children with English as an additional language or dialect (EAL/D). They were also asked to detail the structure of their service in terms of how many rooms they had, the age range, the number of children per room and the number of educators typically rostered. The research team conducted follow-up phone calls with service directors at the end of the study to check whether the information they reported had changed since the start of the study. These demographic variables were used as covariates in analyses where appropriate.

Interviews

Interviews were conducted to investigate the delivery phase of the study and to understand educators' experiences with the 2 approaches to implementing professional learning. Interviews also explored how peer mentors shared the skills and knowledge about using evidence-based oral language and early literacy practices learnt from the professional learning with other educators in their service. Interviews were conducted in the fourth quarter of 2023 with 8 direct participants (4 of which were educational leaders), 8 peer mentors (4 of which were educational leaders) and 4 nominated mentees. Data saturation was reached in the final interviews, and the key themes are presented in this report.

A.5. Sample description

This study included 37 Australian educators, teachers and leaders from 10 ECEC services in Western Sydney, New South Wales. We received parental consent for 152 preschool children who attended these services throughout 2023 to participate. As displayed in Table A1, educators were roughly well-matched across groups regarding tenure, qualifications and English confidence.

26 The service director is responsible for the overall planning of staff, administration, marketing and resourcing of the service, and ensuring government requirements are met.

Readiness for change

At baseline, we measured participants' readiness for change in their oral language and early literacy practices:

- 30 participants reported they were ready and able to make changes to the way they currently support children's early oral language and early literacy development
- 2 stated they did not want to change as they felt what they were doing was already working but reported they would be able to make a change if required
- 4 educators stated they were 'not sure' if they wanted to change but felt they would be able to make a change if required
- the remaining 1 educator preferred not to answer this question.

Educational leader role

There were 10 educational leaders in our sample – one from each participating service. Seven of these individuals were also the director and/or nominated supervisor at their service, while the remaining 3 held standalone educational leader roles. Educational leaders in our sample varied in how much time they spent in ratio in the preschool room at their service – ranging from doing so only occasionally in their working week to doing this all the time.

This study had a culturally and linguistically diverse sample. The proportion of educators with EAL/D at a service varied from 7% to 100%. The proportion of EAL/D children at each service ranged from 50% to 100%. As displayed in Table A2, the services varied in terms of overall NQS ratings. Of the direct participation group services, 50% were rated 'Exceeding NQS', with the remaining 50% rated as 'Meeting NQS', whereas only 33% of peer mentoring group services were rated as 'Exceeding NQS', with the remaining 67% rated as 'Meeting NQS'. The same proportions of 'Meeting NQS' versus 'Exceeding NQS' hold for Quality Area 1 – Educational program and practice, alone.

Table A2: Service demographics by professional learning delivery approach

Demographic variables		Direct participation	Peer mentoring
services – *n*		**4**	**6**
ACECQA's NQS overall rating *n (%)*	Meeting NQS	2 (50%)	4 (67%)
	Exceeding NQS	2 (50%)	2 (33%)
Average number of approved places		43	39
Service type *n (%)*	Preschool/ Kindergarten	1 (25%)	-
	Long day care	3 (75%)	6 (100%)

Demographic variables		Direct participation	Peer mentoring
Provider management type *n (%)*	Private for-profit	1 (25%)	3 (50%)
	Private not-for-profit	2 (50%)	-
	Government-managed	1 (25%)	3 (50%)
Provider size *n (%)*	Small	1 (25%)	3 (50%)
	Medium	1 (25%)	3 (50%)
	Large	2 (50%)	0 (0%)
SEIFA *n (%)*	Levels 1 – 3	1 (25%)	4 (67%)
	Levels 4 – 7	2 (50%)	1 (17%)
	Level 8	1 (25%)	1 (17%)
Proportion of EAL/D children		77%	80%
Proportion of EAL/D educators		67%	76%
Average number of educators in the oldest (preschool) room		5	4
Average number of children in the year before school		26	19
Average number of places in the oldest (preschool) room in the service		27	25

As displayed in Table A3 children in the sample were roughly well-matched across groups in terms of their age, number of days at their service, their parents' occupation and whether English was their main home language. However, the groups significantly differed regarding children's planned school commencement year and parents' educational attainment. Notably, children in the direct participation group had a greater proportion of parents with higher educational attainment than children in the peer mentoring group.

Table A3: Child demographics by professional learning delivery approach

Demographic variables		Direct participation	Peer mentoring	Sig.
children – *n*		**63**	**89**	**N/A**
Age – *years*	Baseline	4.27	4.16	>.05
	Endline	4.89	4.77	>.05
Number of days in service^		3.25	3.09	>.05
School commencement year^ *n (%)*	2024	40 (78%)	56 (72%)	0.04*
	2025	10 (20%)	10 (13%)	
	Undecided	1 (2%)	12 (15%)	
Parental education^ *n (%)*	Year 12 or some high school	7 (15%)	5 (7%)	0.013*
	Diploma, Grad Cert or Certs I–IV	11 (23%)	29 (39%)	
	Bachelor's degree	11 (23%)	28 (37%)	
	Postgrad Degree	18 (38%)	13 (17%)	
Parent occupation^ *n (%)*	Not in paid work	5 (11%)	4 (6%)	>.05
	Tradespeople, labourers and service staff	18 (38%)	38 (58%)	
	Managers and professionals	24 (51%)	23 (35%)	

Notes:
^This information came from the parent survey. Parent survey data was missing for 25/152 children participating in the research.
*Significant at the p<.05 level.

Missing data

As multilevel modelling is relatively robust to missing data and none of our outcome measures are missing more than 5% of data, no further steps were taken to explore the nature of the missing data or attempt to impute missing values.

A.6. Design

We explored the impact of the trialled professional learning approaches on our outcome measures using quantitative data from the educator, parent and director surveys and the children's ELLDI assessments. We used interview data to help interpret and bolster the quantitative data as well as understand the educators', teachers and educational leaders' perceptions of the professional learning delivery approach. We explored the time benefit of the 2 approaches, comparing the time spent by services to send educators and teachers to external professional learning and to mentor and upskill other staff when they return.

Statistical analysis

Paired sample t-tests were used to detect whether each group separately showed a significant improvement in outcomes following the professional learning. Independent samples t-tests were used to detect whether the groups differed significantly at either timepoint – before the professional learning and at the end of the study. Follow-up independent sample t-tests detected whether the peer mentors differed from the nominated mentees.

In addition to the t-tests, we used multilevel generalised linear regression models to detect whether the direct participation approach improved our outcomes of interest more than the peer mentoring approach. These models adjusted for clustering, the tendency for individuals within a 'cluster' to be more similar to each other than members of a different cluster. Clusters in this study were individual ECEC services.

These models also controlled for other variables or 'covariates' that are plausibly related to our outcome of interest. For example, children's main home language is likely related to their oral language and early literacy development, so this was included as a covariate. To avoid over-fitting models, a model-fitting process was undertaken. For brevity, we only discuss the models that found the approach to professional learning significantly impacted growth in our outcomes of interest. See Appendix B for the output of each model and for an explanation of the model-fitting procedure we employed.

The professional learning was likely to increase scores on our outcome measures for all participating educators and teachers, regardless of whether they were direct participants, peer mentors or nominated mentees. To determine whether there was an effect of 'dosage', or the proportion of educators and teachers who received training, we ran follow-up analyses to examine the impact of the proportion of directly trained participants on educator-level outcomes. For instance, in services where more than 4 educators (3 educators and one educational leader) work with children in the year before school, training 2 (one educator and one educational leader) may have had a diminished effect compared to services with only 4 eligible educators and teachers, where half of the total pool was being trained.

We also tested this proportional effect on the child-level outcome to determine whether the rate of increase of ELLDI scores over time depended on the proportion of preschool room educators who were directly trained. Comparing these proportion-based analyses with the analyses using the professional learning delivery approach variable (peer mentoring versus direct participation approach) indicated whether changes in outcomes depended on training a particular number of educators in the preschool room or reaching a specific proportion of educators who received training.

Thematic analysis

Thematic interview analysis aimed to understand the educators', teachers and educational leaders' perceptions of the program and how their practices had changed due to the professional learning. This information, along with information on organisational culture and professional collaboration within services, was collected from all participating educators and teachers through semi-structured interviews. The interview framework was developed based on the research questions.

Interviews were conducted using Zoom videoconferencing software and ranged from 11 to 31 minutes. The interviews were recorded and audio transcribed using SmartDocs Transcription Services and the transcripts were checked for quality by the research team.

Information gathered through these sources was analysed using thematic analysis and coding in Nvivo (Version 14) (Braun & Clarke, 2012). The authors familiarised themselves with the dataset by reading and re-reading the interview transcripts and taking notes about analytic ideas and insights. In the coding phase, segments of data were coded combining inductive and deductive approaches. Initial themes were identified and these were reviewed by the broader research team. Finally, the themes were refined and named, building a clearer story from the data. To ensure the reliability of the results, a subset of interviews was coded by 3 separate research team members. From this process, inter-rater reliability was determined to be satisfactory ($\kappa = 0.71$). Rigour of the data was achieved through transparent and complete recording, with the data organised around themes, including direct quotes, where appropriate.

Appendix B: Additional analyses

B.1. Analysing educator and teacher outcomes: T-tests

A series of t-tests were conducted to investigate whether educator and teacher outcomes were significantly different across professional learning approaches and over time.

Table B1: Welch two-sample t-tests[27] or Wilcoxon rank sum t-tests comparing professional learning delivery approaches at each timepoint

Outcome variable	Mean (*sd*)		*t* value (*df*) or W-value	*p* value	Effect size: Cohen's d
	Direct participation	Peer mentoring			
Baseline					
Knowledge	14.6 *(5.53)*	14 *(4.49)*	0.37 *(22.3)*	0.72	0.13
Use of evidence-based practices	74.9 *(18.7)*	59 *(22)*	2.37 *(33.1)*	0.02*	0.78
Confidence	11.3 *(2.79)*	11.2 *(2.76)*	170^	0.89	0.04
ELLDI scores	-1.87 *(1.18)*	-0.63 *(1.36)*	1.53 *(149.2)*	0.13	0.24
Endline					
Knowledge	14.5 *(4,41)*	16.4 *(4.43)*	-1.27 *(24.9)*	0.21	0.45
Use of evidence-based practices	77.1 *(20.9)*	72.3 *(15.6)*	0.76 *(24.3)*	0.46	0.26
Confidence	13.9 *(1.46)*	11.6 *(3.33)*	227.5^	0.046*	0.89
ELLDI scores	-2.25 *(1.80)*	-0.77 *(1.73)*	0.53 *(148.4)*	0.59	0.09

Notes:
^Wilcoxon rank sum test, a non-parametric version of an independent sample t-test.
*Significant at the p<.05 level.

27 Given unequal variances across groups we used Welch two-sample t-tests instead of independent sample t-tests.

Table B2: Welch two-sample t-tests or Wilcoxon rank sum t-tests comparing peer mentors and nominated mentees in the peer mentoring group at each timepoint

Outcome variable	Mean (*sd*)		*t* value (*df*) or W-value	*p* value	Effect size: Cohen's d
	Peer mentors n=12	Nominated mentees n=10			
Baseline					
Knowledge	14.8 *(4.54)*	13 *(4.47)*	0.91 *(19.4)*	0.38	0.39
Use of evidence-based practices	57.3 *(16.3)*	60.9 *(28.2)*	0.35 *(13.8)*	0.73	0.16
Confidence	11.9 *(2.71)*	10.4 *(2.72)*	41^	0.21	0.56
Endline					
Knowledge	16.2 *(3.41)*	16.6 *(5.40)*	0.18 *(14.67)*	0.86	.08
Use of evidence-based practices	75.5 *(17.3)*	68.4 *(13)*	1.10 *(19.8)*	0.29	0.46
Confidence	13 *(2.63)*	9.9 *(3.41)*	30^	0.047*	1.02

Notes:
^Wilcoxon rank sum test – a non-parametric version of an independent sample t-test.
*Significant at the p<.05 level.

Table B3: Paired sample t-tests or Wilcoxon signed rank test comparing growth over time for each professional learning delivery approach separately

Outcome variable	Mean (*sd*)		*t* value (*df*) or v-statistic	*p* value
	Baseline	Endline		
Direct participation (n=15)				
Knowledge	14.6 *(5.53)*	14.5 *(4.41)*	-0.10 *(12)*	0.92
Use of evidence-based practices	74.9 *(18.7)*	77.1 *(20.9)*	0.50 *(14)*	0.62
Confidence	11.3 *(2.79)*	13.9 *(1.46)*	<.0001^	0.002**
ELLDI scores	-1.87 *(1.18)*	-0.63 *(1.36)*	9.69 *(62)*	<.001***
Peer mentoring (n=22)				
Knowledge	14 *(4.49)*	16.4 *(4.32)*	2.50 *(21)*	0.02*
Use of evidence-based practices	59 *(22)*	72.3 *(15.6)*	2.73 *(21)*	0.01*

Outcome variable	Mean (*sd*)		*t* value (*df*) or v-statistic	*p* value
	Baseline	Endline		
Confidence	11.2 *(2.76)*	11.6 *(3.33)*	62^	0.51
ELLDI scores	-2.25 *(1.80)*	-0.77 *(1.73)*	10.8 *(88)*	<.001***

Notes:
^Wilcoxon signed rank test – a non-parametric equivalent of a paired sample t-test.
*Significant at the p<.05 level.
**Significant at the p<.01 level.
***Significant at the p<.001 level.

Table B4: Paired sample t-tests or Wilcoxon signed rank test comparing growth over time for peer mentors and nominated mentees in the peer mentoring group

Outcome variable	Mean (*sd*)		*t* value (*df*) or v-statistic	*p* value
	Baseline	Endline		
Peer mentors (n=12)				
Knowledge	14.8 *(4.54)*	16.2 *(3.41)*	1.53 *(11)*	0.15
Use of evidence-based practices	57.3 *(16.3)*	75.5 *(17.3)*	3.28 *(11)*	0.007*
Confidence	11.9 *(2.71)*	13 *(2.63)*	11.5^	0.21
Nominated mentees (n=10)				
Knowledge	13 *(4.47)*	16.6 *(5.40)*	1.99 *(9)*	0.08
Use of evidence-based practices	60.9 *(28.2)*	68.4 *(13)*	0.90 *(9)*	0.39
Confidence	10.4 *(2.72)*	9.9 *(3.41)*	21^	0.72

Notes:
^Wilcoxon signed rank test, a non-parametric equivalent of a paired sample t-test.
*Significant at the p<.01 level.

B.2. Regression models

Model building procedure

All covariates that had a univariate association with the outcome variable of $p<.25$ were included and then removed one by one from least to most significant until a final model that included a grouping variable (direct participation approach versus peer mentoring approach) and any significant covariates was reached. We ran separate models for each outcome variable.

Covariates used in models

The child-level, educator- and teacher-level, and service-level covariates considered in the models are as follows.

Child-level[28]:

- Language spoken at home
- Parental education
- Parent occupation
- Number of days they attend the participating service
- Age at baseline ELLDI interview
- Time between ELLDI assessments
- Baseline ELLDI scores
- School commencement year (parent-reported).

Educator- and teacher-level:

- Professional learning attendance
- Amount of peer mentoring received
- Hours of EL&L practices recorded in logbooks
- Years working in the ECEC sector
- Years working at the participating service
- Highest qualification related to early childhood education
- Confidence using spoken language (English) to communicate
- Baseline knowledge of evidence-based oral language and early literacy practices
- Baseline self-reported use of evidence-based oral language and early literacy practices
- Baseline confidence with evidence-based oral language and early literacy practices
- Preference for professional learning that leverages the educational leader
- Preference for professional learning that involves training a portion of educators at a service
- Ratings of service work culture
- Perceptions of feasibility, appropriateness and acceptability of the peer mentoring approach
- EL&L logged hours completed
- Confidence using ALNF EL&L strategies
- Confidence using ELLDI
- Use of peer mentoring strategies
- Use of collaboration strategies.

28 Children's gender was not considered a covariate as we did not have access to this data.

Service-level:

- ACECQA NQS overall rating
- Number of educators and teachers at service working with children in the year before school
- Number of approved places
- Number of children in the year before school
- Proportion of EAL/D educators
- SEIFA (a measure of socio-economic status)
- Average knowledge of evidence-based oral language and early literacy practices
- Average use of evidence-based oral language and early literacy practices
- Average confidence with evidence-based oral language and early literacy practices
- Average ratings of service work culture.

The analysis was conducted in R v.2022.554 using the lme() function from the lme4/blmr package.

Analysing educator and teacher outcomes: Regression models

Knowledge of evidence-based oral language and early literacy practices

A linear mixed-effects model was run to investigate whether professional learning delivery approach significantly impacted educators' and teachers' knowledge of evidence-based oral language and early literacy practices over time. Baseline knowledge, number of educators rostered in the preschool room and service work culture had univariate associations with growth in knowledge (p<.25). Only baseline knowledge was retained as a covariate in the final model. Controlling for baseline knowledge scores, there was no indication that the professional learning delivery approach significantly impacted growth in knowledge (p=.16). See Table B3 for the fixed effect parameters and standard errors of the model.

Table B5: Fixed effects output of a linear mixed-effect model regressing growth in educators' and teachers' knowledge of evidence-based oral language and early literacy practices on professional learning delivery approach

Fixed effect	Beta	Std error	*t* value (*df*)	*p* value	95% CI
Intercept	9.03	2.37	3.82 (*24*)	<.001***	(4.15 – 13.91)
Baseline knowledge	-0.63	0.14	-4.40 (*24*)	<.001***	(-0.92 – -0.33)
Delivery approach – *Peer mentoring versus direct participation*	2.19	1.41	1.56 (*8*)	.16	(-1.05 – 5.44)

Note:
***Significant at the p<.001 level.

Follow-up analyses were conducted replacing the professional learning delivery approach variable (direct participation vs peer mentoring) with a variable capturing the proportion of preschool educators per service who were directly trained by ALNF (i.e., the proportion of preschool educators who were direct participants or peer mentors per service). Controlling for baseline knowledge scores and number of educators in the preschool, there was no indication that the proportion of preschool educators directly trained significantly predicted growth in knowledge over time (p=.95).

Self-reported use of evidence-based oral language and early literacy practices

A linear mixed-effects model was run to investigate whether the professional learning delivery approach significantly impacted self-reported use of evidence-based oral language and early literacy practice over time. Baseline self-reported use of evidence-based practices, tenure at current service, service work culture, hours of logged EL&L practices, confidence using EL&L practices and perceptions of the professional learning approaches had univariate associations with growth in self-reported use of evidence-based practices (*p*<.25). Only baseline self-reported use of evidence-based practices was retained as a covariate in the final model. Controlling for this, there was no indication that professional learning delivery approach significantly impacted growth in self-reported use of evidence-based practices(*p*=.83).

Table B6: Fixed effects output of a linear mixed-effect model regressing growth in educators' and teachers' self-reported use of evidence-based oral language and early literacy practices on professional learning delivery approach

Fixed effect	Beta	Std error	*t* value (*df*)	*p* value	95% CI
Intercept	48.45	10.93	4.43 (*26*)	<.001***	(25.97 – 70.92)
Baseline self-reported use of evidence-based oral language and early literacy practice	-0.62	0.13	-4.63 (*26*)	<.001***	(-0.89 – -0.34)
Delivery approach – *Peer mentoring versus direct participation*	1.38	6.11	0.23 (*8*)	.83	(-12.72 – 15.48)

Note:
*** Significant at the p<.001 level.

Follow-up analyses were conducted to replace the professional learning delivery approach variable with a variable capturing the proportion of preschool room educators per service who were directly trained by ALNF (i.e., the proportion of preschool educators who were direct participants or peer mentors per service). Controlling for baseline self-reported use of evidence-based practices, there was no indication that the proportion of preschool educators directly trained significantly predicted growth in self-reported use of evidence-based practices (*p*=.66).

Confidence using evidence-based oral language and early literacy practices

A linear mixed-effects model was run to investigate whether professional learning delivery approach significantly impacted self-reported confidence in use of oral language and early literacy practices over time. Baseline confidence, highest qualification, service work culture, hours of logged EL&L practices, confidence using EL&L practices, number of educators rostered in the preschool room, number of children in the preschool room and perceptions of the professional learning approaches had univariate associations with growth in confidence (p<.25). Only baseline confidence was retained as a covariate in the final model.

Table B7: Fixed effects output of a linear mixed-effect model regressing growth in educators' and teachers' confidence on professional learning delivery approach

Fixed effect	Beta	Std error	*t* value (*df*)	*p* value	95% CI
Intercept	7.65	1.71	4.48 (*26*)	<.001***	(4.14 – 11.15)
Baseline confidence	-0.45	0.14	-3.20 (*26*)	.003**	(-0.74 – -0.16)
Delivery approach – *Peer mentoring versus direct participation*	-2.22	0.77	-2.86 (*8*)	.02*	(-4.00 – -2.22)

Notes:
*Significant at the p<.05 level.
**Significant at the p<.01 level.
***Significant at the p<.001 level.

Follow-up analyses were conducted that replaced the professional learning delivery approach variable with a variable capturing the proportion of preschool room educators per service who were directly trained by ALNF (i.e., the proportion of preschool educators who were direct participants or peer mentors per service). Controlling for baseline confidence scores, there was no indication that the proportion of preschool room educators directly trained significantly predicted growth in confidence (*p*=.18).

B.3. Analysing children's outcomes: Regression models

A linear mixed-effect model investigated whether professional learning delivery approach significantly impacted the rate of children's oral language and early literacy development (as measured by the ELLDI). Controlling for baseline ELLDI scores, the professional learning delivery approach did not significantly impact the rate of growth in children's oral language and early literacy development (p=.68).

Table B8: Fixed effects output of a linear mixed-effect model regressing growth in children's oral language and early literacy development on professional learning delivery approach

Fixed effect	Beta	Std error	*t* value (*df*)	*p* value	95% CI
Intercept	0.69	0.34	1.99 (*141*)	.048*	(0.01 – 1.37)
Baseline ELLDI scores	-0.31	0.05	-5.69 (*141*)	<.001***	(-0.42 - -0.20)
Delivery approach – *Peer mentoring versus direct participation*	0.18	0.43	0.43 (*8*)	.68	(-0.80 – 1.17)

Notes:
*Significant at the p<.05 level.
***Significant at the p<.001 level.

Follow-up analyses were conducted that replaced the professional learning delivery approach variable with a variable capturing the proportion of preschool room educators per service who were directly trained (i.e., the proportion of preschool educators who were direct participants or peer mentors per service). Controlling for baseline ELLDI scores, there was no indication that the proportion of preschool room educators directly trained significantly predicted growth in ELLDI scores (*p*=.59).

Appendix C: Validation of Early Childhood Language and Literacy Practice tool

AERO developed the Early Childhood Language and Literacy Practice (ECLLP) tool to describe and measure the use of evidence-based practices that promote oral language and early literacy learning and development. It was designed to measure the general use of these practices, which are not necessarily linked to any particular program or professional learning.

The tool can also be used to support ECEC educators and teachers in reflecting on their own and colleagues' practice and to promote evidence-based practices in oral language and early literacy learning and development.

The tool was designed by Australian subject matter experts in early oral language and early literacy practice based at the Melbourne Graduate School of Education, University of Melbourne. To ensure content validity, it was reviewed and revised in consultation with expert practitioners and researchers, including those from AERO and the Melbourne Graduate School of Education.

To ensure the tool was easy to use, the typical rubric structure was adapted so that indicative behaviours were grouped into sub-capabilities with consistent criteria within each sub-capability. Typically, the levels of quality within a rubric are different for each indicative behaviour. The levels of quality within the ECLLP tool describe levels of increasing competence in a particular indicative behaviour. Given that some indicative behaviours are only relevant to those working with children of specific ages, an option was added to allow respondents to indicate if they did not have the opportunity to use this behaviour or if they chose not to use it.

To ensure face validity, interviews were conducted with 4 ECEC educators and teachers. Interviewees were provided with the ECLLP tool and were asked to explain their thinking process (think-aloud) while completing the rubrics. Despite the small sample size, the interviews were valuable for providing some initial evidence of the usability and language of the tool. The findings confirmed that the wording of the tool was sufficient to support its use. One interviewee, who stated that all of the items were 'quite clear', commented that they felt the tool would provide them with a reference for where they were at with their knowledge and practice and areas they could focus on:

> 'Linking my experience to that, it would be a reference… I actually did this and this, or maybe I should have done more of that, so I think it could be a useful tool'.

In addition to the interviews, 2 workshops were held to collect data using the tool and to act as focus groups to explore the usefulness of the tools. In addition, each workshop attendee was requested to complete the full pilot tool. Participation rates for the 2 workshops were low, with one and 5 participants, respectively, attending. The workshop participants reported a wider range of different education levels than the interview participants and there was a mix of language backgrounds in the group. All participants agreed that the process of completing the tool was helpful for reflecting on their own practice.

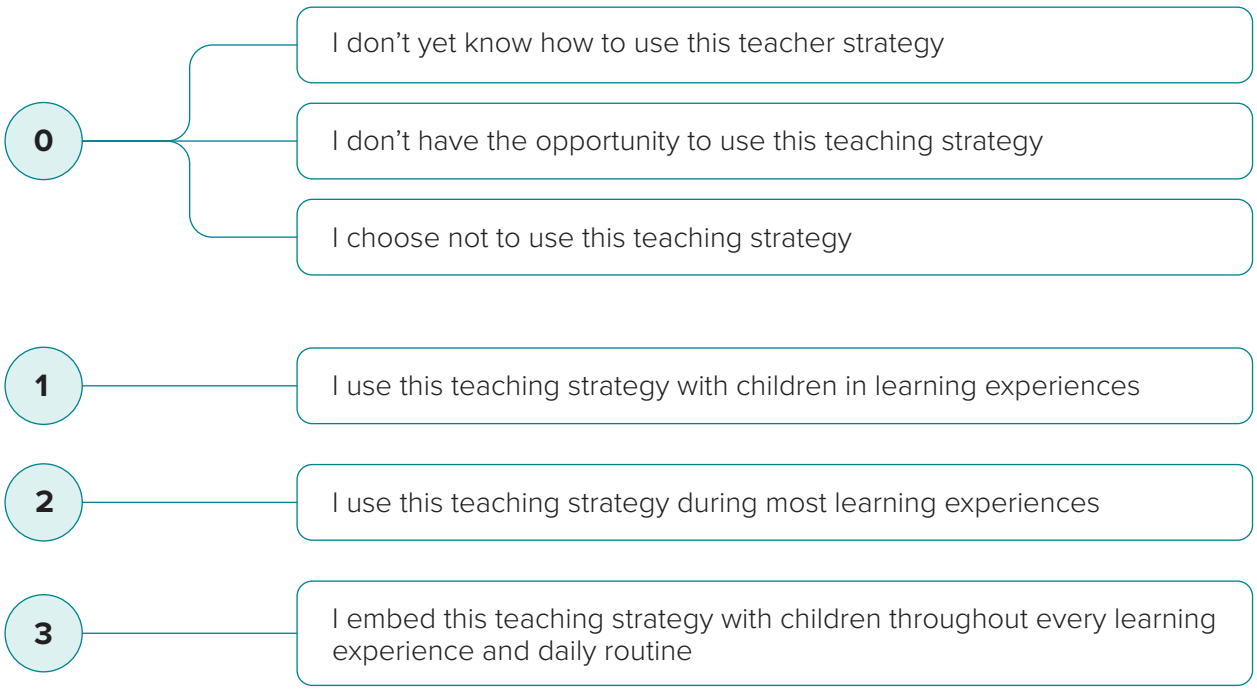
The tool was first used with ECEC educators and teachers as part of the baseline data collection for this study. The general comments on the wording and usefulness of the tool were consistent with the findings from the cognitive interviews and workshops. Participants with EAL/D and lower levels of education tended to take longer to complete the tool.

A Guttman analysis[29] (Griffin et al., 2014) of the baseline data showed the following:

- No floor or ceiling effects were observed, with educators and teachers scores well-spread.
- The patterns of responses for most items were within the acceptable range of regularity, suggesting they contributed to the underlying construct and without undue amounts of construct-irrelevant variance.
- Two items had irregular patterns that were likely to be attributable to the limitation of a Guttman analysis in which zero and missing data are coded identically, as both were practices that may not be appropriate to use with very young children. These items were retained for the present study as the sample was educators and teachers who work with children in the year before school.

Appendix D: Early Childhood Language and Literacy Practice tool

Scoring note: 'I don't yet know how to use this teacher strategy', 'I don't have the opportunity to use this teaching strategy', and 'I choose not to use this teaching strategy' are all scored as '0'. The other 3 options are scored '1', '2' and '3' in sequential order from left to right. The scores for each item are added together to give a total score with a minimum of 0 and a maximum of 99.



29 The Guttman analysis technique allows some information to be gained from response data in situations where there is insufficient data for a partial credit Rasch Item Response Theory analysis to be useful.

D.1. Language environment

Select the statement that best describes how you use each of these teaching strategies that promote a rich and varied language environment for children, regardless of language or means of communication.

Teaching strategies	0 I don't yet know how to use this teaching strategy	0 I don't have the opportunity to use this teaching strategy	0 I choose not to use this teaching strategy	1 I use this teaching strategy with children in learning experiences	2 I use this teaching strategy during most learning experiences	3 I embed this teaching strategy with children throughout every learning experience and daily routine
Build on children's interests to promote rich and varied language	☐	☐	☐	☐	☐	☐
Use language to comment on shared activities with a child, regardless of language or means of communication	☐	☐	☐	☐	☐	☐
Use a varied/rich vocabulary that includes Tier 1 (e.g., hello, drink), Tier 2 (e.g., exhausted, elongated) and Tier 3 words (e.g., chrysalis, larva)	☐	☐	☐	☐	☐	☐
Recap for children's comprehension and understanding (e.g., concepts, vocabulary)	☐	☐	☐	☐	☐	☐
Use labelling that is contextual (e.g., give children the names of things)	☐	☐	☐	☐	☐	☐

Teaching strategies	0 I don't yet know how to use this teaching strategy	0 I don't have the opportunity to use this teaching strategy	0 I choose not to use this teaching strategy	1 I use this teaching strategy with children in learning experiences	2 I use this teaching strategy during most learning experiences	3 I embed this teaching strategy with children throughout every learning experience and daily routine
Use emphasis which encourages a child to pay attention to new vocabulary/language structures (e.g., in tone, through pauses, through gestures, through voice)	☐	☐	☐	☐	☐	☐
Explain/describe my own actions and thinking (e.g., 'Taking the spade and putting sand in the bucket', 'I've been wondering why the chrysalis is not opening')	☐	☐	☐	☐	☐	☐
Describe children's actions or activities (e.g., 'You're climbing the steps')	☐	☐	☐	☐	☐	☐
Explain children's actions or activities (e.g., 'You're feeding the baby because the baby is hungry')	☐	☐	☐	☐	☐	☐
Extend the topic using decontextualised language (e.g., use of language to imagine, infer, predict, explain)	☐	☐	☐	☐	☐	☐

Teaching strategies	0 I don't yet know how to use this teaching strategy	0 I don't have the opportunity to use this teaching strategy	0 I choose not to use this teaching strategy	1 I use this teaching strategy with children in learning experiences	2 I use this teaching strategy during most learning experiences	3 I embed this teaching strategy with children throughout every learning experience and daily routine
Highlight the ways language is used in different contexts (e.g., varying language in different social situations)	☐	☐	☐	☐	☐	☐
Use a variety of grammatical structures in interactions with children	☐	☐	☐	☐	☐	☐
Total score						

D.2. Language interactions

Select the statement that best describes how you use each of these teaching strategies to encourage language interactions.

Teaching strategies	0 I don't yet know how to use this teaching strategy	0 I don't have the opportunity to use this teaching strategy	0 I choose not to use this teaching strategy	1 I use this teaching strategy with children in learning experiences	2 I use this teaching strategy during most learning experiences	3 I embed this teaching strategy with children throughout every learning experience and daily routine
Use repetition (e.g., directly repeat a word or sentence)	☐	☐	☐	☐	☐	☐
Expand on what children have said (e.g., add descriptive words or grammar)	☐	☐	☐	☐	☐	☐
Acknowledge a child's meaning/ intent, even when the child is not speaking English	☐	☐	☐	☐	☐	☐
Incorporate children's diverse communication practices in interactions	☐	☐	☐	☐	☐	☐
Use language that encourages thinking (e.g., 'What do you think is going to happen next?'; 'Imagine what if...?'; 'Is there another way to...?')	☐	☐	☐	☐	☐	☐

Teaching strategies	0 I don't yet know how to use this teaching strategy	0 I don't have the opportunity to use this teaching strategy	0 I choose not to use this teaching strategy	1 I use this teaching strategy with children in learning experiences	2 I use this teaching strategy during most learning experiences	3 I embed this teaching strategy with children throughout every learning experience and daily routine
Build the number of back-and-forth exchanges to extend children's knowledge of topics	☐	☐	☐	☐	☐	☐
Prompt children for more information to scaffold their thinking/expression (e.g., 'What might come next?')	☐	☐	☐	☐	☐	☐
Use pauses to allow a child time to respond/lead the conversation	☐	☐	☐	☐	☐	☐
Model correct grammatical structures based on children's language use, rather than telling them what is correct (e.g., Child says 'there is two mouses', teacher models 'Yes, there are two mice')	☐	☐	☐	☐	☐	☐
Scaffold children's knowledge of story structure	☐	☐	☐	☐	☐	☐
Total score						

D.3. Concepts of print

Select the statement that best describes how you use each of these teaching strategies that promote children's concepts of print.

Teaching strategies	0 I don't yet know how to use this teaching strategy	0 I don't have the opportunity to use this teaching strategy	0 I choose not to use this teaching strategy	1 I use this teaching strategy with children in learning experiences	2 I use this teaching strategy during most learning experiences	3 I embed this teaching strategy with children throughout every learning experience and daily routine
Point out and label aspects of a book (e.g., the cover, author, illustrator, layout of pages)	☐	☐	☐	☐	☐	☐
Discuss/explain that print relays a message (e.g., words, symbols)	☐	☐	☐	☐	☐	☐
Discuss the differences between fiction and non-fiction books	☐	☐	☐	☐	☐	☐
Provide children with opportunities to learn about directionality of print (e.g., point to print as read aloud, track print with finger as read, scans from top to bottom of page)	☐	☐	☐	☐	☐	☐
Provide definitions/labels for alphabet, letter, word, symbols, numbers	☐	☐	☐	☐	☐	☐

Teaching strategies	0 I don't yet know how to use this teaching strategy	0 I don't have the opportunity to use this teaching strategy	0 I choose not to use this teaching strategy	1 I use this teaching strategy with children in learning experiences	2 I use this teaching strategy during most learning experiences	3 I embed this teaching strategy with children throughout every learning experience and daily routine
Point out the conventions of print (e.g., spaces between words, punctuation, capital letters)	☐	☐	☐	☐	☐	☐
Focus children's attention on environmental print	☐	☐	☐	☐	☐	☐
Total score						

D.4. Emergent writing

Select the statement that best describes how you use each of these teaching strategies that build emergent writing.

Teaching strategies	0 I don't yet know how to use this teaching strategy	0 I don't have the opportunity to use this teaching strategy	0 I choose not to use this teaching strategy	1 I use this teaching strategy with children in learning experiences	2 I use this teaching strategy during most learning experiences	3 I embed this teaching strategy with children throughout every learning experience and daily routine
Encourage children's mark making (e.g., children have opportunities to write their name, group drawing opportunities)	☐	☐	☐	☐	☐	☐
Model writing for children to see (e.g., writing labels for items in the room with children, daily diary)	☐	☐	☐	☐	☐	☐
Provide writing opportunities for children (e.g., use a sign-in sheet)	☐	☐	☐	☐	☐	☐
Engage children in meaningful writing in their play (e.g., pretends to write a recipe)	☐	☐	☐	☐	☐	☐
Create shared pieces of writing with the children (e.g., use the structure of: experience, discuss, draw and then write together)	☐	☐	☐	☐	☐	☐

Teaching strategies	0 I don't yet know how to use this teaching strategy	0 I don't have the opportunity to use this teaching strategy	0 I choose not to use this teaching strategy	1 I use this teaching strategy with children in learning experiences	2 I use this teaching strategy during most learning experiences	3 I embed this teaching strategy with children throughout every learning experience and daily routine
Guide children in the process of writing (e.g., provide children with a writing activity and children independently take responsibility for the content and actual writing)	☐	☐	☐	☐	☐	☐
Build on a child's interests to promote writing opportunities	☐	☐	☐	☐	☐	☐
Support children to draw on their own writing knowledge and practices, including when a child draws on writing practices from languages other than English	☐	☐	☐	☐	☐	☐
Total score						

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