SCIREARLY

High-Quality Early Childhood Education and Care in Europe

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List of Acronyms

AFE	Adequacy by Factors and Eigenvalues
DLG	Dialogic Literary Gathering
ECEC	Early Childhood Education and Care
EFA	Exploratory Factorial Analysis
ESL	Early school leaving
EU	European Union
PD	Professional development
SAQE	Self-Assessment Quality Instrument
SDG	Sustainable Development Goal

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Executive Summary

Objectives

This report aims to provide a clear, actionable roadmap to assess and elevate the quality of Early Childhood Education and Care (ECEC) across Europe, recognising its pivotal impact on children's future academic and life success. High-quality ECEC is a transformative force, shaping long-term academic and professional outcomes. Poor-quality early education can lead to persistent issues like underachievement and school dropout, especially among vulnerable children. In contrast, high-quality ECEC builds a strong foundation for successful learning and development, particularly for those at risk of early school leaving (ESL), offering a critical point in children's lives to break the cycle of educational and social disadvantage. It also supports children's right to a well-rounded, fulfilling educational experience, and contributes to building equitable and sustainable societies.

Methodology

The SCIREARLY project leveraged both quantitative and qualitative data to meet its key objectives by following a strategic, multi-phase approach. This included systematising knowledge through a comprehensive scoping review, applying insights by piloting and conducting a Europe-wide survey on ECEC quality with 2594 participants from 28 countries, and co-creating actionable policy and practice recommendations through focus groups involving 41 early years practitioners, 45 young children and 31 family members from 6 early years settings from 5 countries. This collaborative process ensures that findings are both evidence-based and rooted in real-world experiences, offering socially relevant results that can serve as a foundation for future reforms to have social impact. For this to happen, the research process capitalises on children's voices to acknowledge their right of participation, particularly in issues that have direct implications in their lives such as the ECEC they attend.

Key takeaways

1. The section **'What does scientific tells us about high-quality early childhood education and care in Europe: Key quality indicators'** draws on the findings of a scoping review. Following the PRISMA guidelines, it focuses on identifying the common indicators of successful intervention programmes, examining the characteristics of these educational interventions and understanding the overall effects of ECEC interventions targeting foundational skills on primary and secondary education. Relevant studies were selected based on criteria such as intervention characteristics, design, sample size, and measurable outcomes. Of 93 initially reviewed papers, 86 met the final inclusion criteria, encompassing a wide range of ECEC practices with measurable impacts on child development.

The findings highlight core indicators of high-quality ECEC that contribute to positive developmental and educational outcomes for children. Essential characteristics include:

- **High-quality adult-child interactions:** Programmes emphasising warm, responsive, stimulating and dialogic interactions between children, educators and other relevant adults showed significant positive effects on children's cognitive and socio-emotional growth.
- **Foundational skill development:** Many successful interventions focused on enhancing early literacy, numeracy, and science skills, while fostering a rich and stimulating learning environment in a safe and supportive space.
- **Engagement with families and community:** Programmes fostering family involvement and inclusive practices demonstrated added benefits for children's learning and social integration.
- **Evidence-based teacher professional development:** Effective ECEC settings prioritise ongoing professional development for educators, particularly in research-informed strategies for fostering foundational skills and responsive caregiving.

The scoping review underscores that high-quality ECEC environments are pivotal for both immediate learning outcomes and long-term educational success, particularly for children from disadvantaged backgrounds. The study advocates for policy and practical efforts to strengthen these indicators across Europe's ECEC frameworks.

2. The section **'Analysing the state of early childhood education and care quality in Europe'** presents findings from a European-wide survey designed to assess Early Childhood Education and Care (ECEC) quality through practitioner perspectives. Administered via an online platform to 2,594 ECEC staff across 28 European countries, the survey platform was structured to accommodate multiple languages, ensuring broad accessibility. Demographic and institutional details, such as age, gender, educational background, and work environment, were collected to provide context for evaluating responses regarding classroom quality indicators. Key survey findings reveal critical insights into the state of ECEC in Europe:

    - **Key Contributors to a Positive Classroom Environment**: Family involvement, effective teaching strategies, and support from ECEC organizations were identified as essential factors in fostering a positive learning environment.
    - **Impact of Teaching Strategies**: Teaching strategies had the greatest influence on classroom quality, with educators emphasizing the importance of using research-based, purposeful practices in early childhood settings.
    - **Family Involvement**: Family engagement was beneficial to children's experiences, but it was highlighted as an area with potential for further strengthening to maximize its positive impact.

- **Institutional Support**: While institutional support also contributed to a positive environment, responses indicated some variability, suggesting the need for more consistent support to fully back educators in their roles.
- **Emphasis on Comprehensive Support Systems**: Overall, the findings underscore the value of a balanced support system, with all three areas working together to create vibrant and engaging learning environments for young children.

These insights underscore the need for a comprehensive and balanced approach that integrates effective pedagogical strategies, family engagement, and consistent institutional support to cultivate high-quality, responsive ECEC environments that foster positive outcomes for young children.

3. The section **'Co-creating recommendations for high-quality early childhood education and care: Voices from children, families, and schools'** describes a co-creation approach to developing policy recommendations for high-quality ECEC, involving 16 focus groups across Finland, Italy, Portugal, and Spain. A total of 111 participants—children, families, and ECEC staff—contributed through a dialogic co-creation process. These focus groups, guided by a protocol from the SCIREARLY team, focused on creating a welcoming environment for open dialogue, enabling participants to voice their perspectives on enhancing ECEC. This method aligns with the United Nations Convention on the Rights of the Child, emphasizing children's rights to participate in decisions impacting their lives. It culminated with a set of policy recommendations that integrate insights from the scoping review and the European-wide survey with stakeholder views, highlighting key factors supporting high-quality ECEC in Europe:
    - Nurturing and responsive environments for whole child development
    - Shared activities between schools and families
    - Rich, purposeful and stimulating learning space
    - Developing the building blocks of learning
    - Thriving early years education workforce
    - Pathways for inclusive participation and decision-making

    At the immediate learning context level, high-quality, responsive teacher-child interactions are fundamental. Findings indicate that nurturing environments where children feel safe and engaged promote foundational skills and socio-emotional growth. Recommended practices include dialogic and personalised feedback to support children's cognitive and emotional needs. At the community level, collaborative family and community involvement is linked to improved learning outcomes and a stronger school-community relationship. Stakeholders recommend maintaining open communication and regular parent engagement initiatives, enhancing children's sense of belonging and community connection. At the structural level, professional development for ECEC staff, inclusive

governance in schools, and investment in systemic support structures are essential. By creating conditions for sustainable staff development and family participation in decision-making, policies can ensure consistent quality and inclusive practices in ECEC across Europe.

1. Background

Early childhood (from birth to age 7) is a pivotal period for physical, cognitive, and social development (Mustard, 2002). Research shows that negative experiences during these formative years can lead to lower academic achievement throughout schooling (Axinn et al., 1997). Neglecting the importance of high-quality early childhood education in building foundational skills for life can result in significant educational and societal obstacles, such as poor learning outcomes and premature school dropout, which may contribute to further challenges like juvenile delinquency and unemployment, among others, which a high economic cost and high potential loss for the entire society (Reynolds et al., 2007; Burger, 2010; McLeod et al., 2017). Conversely, studies on the effective use of ECEC in preventing ESL found that higher quality ECEC predicted higher cognitive-academic achievement at the age of 15 (European Commission, 2014). The benefits of participation in ECEC were maintained for as long as 6 to 22 years after finishing ECEC whereas the school enrolment rates increased by around 30 per cent (Melhuish et al., 2015; Siraj-Blatchford, 2004). This need has become even more urgent in the post-pandemic era, where the most vulnerable students such as those from lower socioeconomic backgrounds, refugees, migrants, and Roma communities, continue to be particularly excluded from acquiring essential competencies (Betthäuser, Bach-Mortensen & Engzell, 2023; Martínez-Lozano, Macías-Gómez-Estern & Lalueza, 2023).

Despite the growing number of children in early years attending ECEC in the EU - 92% of children between the age of 3 and the starting age for compulsory primary education (Eurostat, 2021), important challenges remain. For instance, some Member States are lagging behind with less than 80% ECEC participation rates, such as Greece (68.8 per cent in 2019), Romania (75.6 per cent in 2021), Slovakia (77.4 per cent in 2021), Croatia (77.8 per cent), and Bulgaria (79.4 per cent). Access to ECEC is also more challenging for children from disadvantaged backgrounds, for whom high-quality ECEC provision has been proven to be especially advantageous (Raikes et al., 2023; Dumas & Lefranc, 2010; Guerin, 2014, Van Belle, 2016). A report on the early childhood interventions and progression to higher education in Europe (Guerin, 2014) gathers significant evidence that good quality early childhood interventions with disadvantaged children had broader societal returns such as a higher university attendance rate and lower delinquency rates (Reynolds et al., 2007; Schmutz, 2023). For instance, in a long-term randomised controlled trial for the Abecedarian Program, it was found that 36 per cent of the children who had some form of quality ECEC were enrolled in higher education compared to 14 per cent for those who did not receive any form of early childhood education (Masse & Barnett, 2002). These findings are consistent with the Effective Provision of Pre-school Education (EPPE) in

the United Kingdom, which after following 2,800 children during 17 years concluded that high quality ECEC reduced the risk of anti-social or worried behaviour and improved attainment, with particularly relevant implications for children who had a less stimulating home learning environment or who were from families where parents had poor or no qualifications (Sammons et al., 2011). This longitudinal study points out the need to gather more information from different regions of Europe, since the ECEC landscape might differ substantially.

Early years professional workforce appears to be an asset to the equation of high quality ECEC provision. In this regard, fewer than half of European education systems mandate that at least one team member responsible for a group of children, regardless of their age, must hold a high level of education. In seven European countries (Czechia, Ireland, Latvia, Malta, Austria, Romania, and Slovakia), the minimum qualification required for core practitioners is below bachelor-level (Eurydice, 2023). In this regard, The European Care Strategy (2022), urges to track data on staff qualifications at ECEC, and monitor their capacity to respond to the specific needs (particularly of children from vulnerable groups), so that support strategies can be put in place at the right time (Eurochild, 2022).

Addressing these challenges, the European Commission has made improving ECEC a top priority. For instance, it has set a target for at least 96% of children between the age of 3 and the starting age for compulsory primary education participating in ECEC by 2030 (European Commission, n.d.). Internationally, the United Nations' Sustainable Development Goal 4.2 also aims to ensure that 'all girls and boys have access to quality early childhood development, care and pre-primary education' aligning with the broader Goal 4 of 'ensur(ing) inclusive and equitable quality education and promote life-long learning opportunities for all' (United Nations, n.d.). The SCIREARLY project is dedicated to identifying, systematizing, and replicating effective policies and practices, backed by scientific research, to combat underachievement and promote well-being, including digital skills. Funded by the European Commission for three years, SCIREARLY aims to use evidence-based findings to create and scale optimal learning environments, focusing on preventive measures for vulnerable groups. In this endeavour, Early Childhood Education and Care arises as one powerful protective and preventive equaliser (Raikes et al., 2023). Through an interdisciplinary approach, mixed-methods design, and a life course perspective, SCIREARLY is committed to ensuring that all children can thrive in school and complete their education, with a particular focus on addressing those challenges faced by students from vulnerable backgrounds who are at higher risk of early school leaving.

In line with this objective, the SCIREARLY project, within Work Package 2 "High-Quality Early Childhood Education and Care for Enhancing Learning Outcomes for Primary and Secondary Students", aims to **map the current landscape of Early Childhood Education and Care (ECEC) provision in Europe** and **provide a clear and actionable roadmap for enhancing quality ECEC across the region** by (1) identifying key

quality indicators of ECEC provision through a scoping review; (2) diagnosing the state of ECEC standards in Europe through the piloting and implementation of a European-wide survey; and (3) generating policy recommendations through a co-creation process with children, families, and schools.

Our report addresses a critical gap in the existing landscape of Early Childhood Education and Care (ECEC) by providing a comprehensive, European-wide perspective on what constitutes high-quality ECEC provision and the current state of play in the region. It not only synthetises what scientific literature says in the field (see Section 3.1) or gathers the situation of ECEC in Europe (Section 3.2), but it also puts these findings in dialogue with young children, families and early years staff across five countries (Section 3.3). While numerous studies and initiatives have examined aspects of ECEC quality at national or regional levels (Urban, 2009; Kascak & Koch, 2022; Alexiadou & Stadler Altmann, 2020) and a few at the European level (for instance, see European Commission, 2014), there has been a lack of cohesion in understanding these efforts across Europe as a whole. This fragmentation is compounded by the use of different frameworks, indicators, and measurement tools in various countries, making it challenging to develop a global picture of high-quality ECEC provision. Indeed, across Europe, there is significant diversity in how ECEC is defined, implemented, and understood, reflecting variations in cultural, educational, and policy perspectives (see Figure 1). ECEC may be centre- or home-based and publicly or privately provided. In some countries, childcare for younger children and pre-primary education for older children may occur in separate or unitary settings, or a mix of both (European Commission/EACEA/Eurydice, 2019). ECEC programmes in some contexts also emphasise the role of “pedagogues” or “childminders”—professionals who focus on child development and play-based learning—whereas others employ teachers who are trained in more formalised instruction, reflecting a focus on school readiness. The age at which children attend ECEC programmes also differs widely, with some countries offering programs from birth while others focus on ages 3 and up, usually prior to compulsory education. Additionally, there is a fundamental divide in the pedagogical approach: in certain European nations, ECEC is predominantly seen as a time for children to engage exclusively in play-based learning, prioritizing their social and emotional skills; meanwhile, other countries prioritise solely instructional approaches aiming to introduce young children to highly formalised early years pedagogies early on. Whereas this is still a longstading debate, research has shown that guided play has had greater positive effects than direct instruction in early maths skills; and than free play in some literacy skills (Skene et al., 2022).

Figure 1. Overview of early childhood education and care systems and terms in SCIREARLY Consortium's contexts (Eurydice, n.d., European Commission/EACEA/Eurydice, 2019; Vlaamse overheid (n.d.))

Country	Terms used for early childhood education and care	Stage	Age range	Terms used for teachers	Place guarantee
Belgium: French	Enseignement maternel	Pre-school education	2.5 to 6	Enseignant(e) de maternelle	3+
Belgium: Flemish	Kleuterschool/ Kleuteronderwijs	Pre-primary education	2.5 to 6	Kleuterjuf / Kleutermeester	3+
Belgium: German	Kleuterschool/ Kleuteronderwijs	Pre-primary education	2.5 to 6	Kindergärtnerin/ Kindergärtner	3+
Denmark	Vuggestuer	ISCED level 010: Day care	0* to 3	Childminder (if home-based), Pedagogues (Pædagog)	From 6 months
	Børnehave	ISCED level 020: Kindergarten	3 to school entry		
Finland	Varhaiskasvatus	Päiväkoti: Early childhood education and care	0* to 7	Lastenhoitaja (daycare worker)	From 6 months
		Esiopetus - pre-school education	Typically 5 to 6	Varhaiskasvatuksen opettaja	
Greece	Vrefikoi stathmoi, vrefonipiakoi stathmoi, paidikoi stathmoi	Pre-school education and care	0* to 4	Pedagogue	None
	Nipiagogeio	Primary education	4 to 5	Nipiagogos	4+
Ireland	Crèche, nursery, pre-school, naíonraí, playgroup, daycare services	Pre-primary education	3 to 5	Teacher	None
Italy	Sistema integrato	Servizi educativi per l'infanzia	0 to 3	Insegnante, maestra/o d'asilo	None
		Scuole dell'infanzia (pre-primary schools)	3 to 6		
Malta	Childcare centres	Childcare	0* to 3	Childcare educators	None
	Pre-primary school	Kindergarten	3 to 5	Kindergarten educators	
Portugal	Berçário	Creches	0 to 3	Educador de infância	Last two years of early years education provision
	Jardim de Infância	Pre-primary education	3 to 6		
Spain	Educación infantil	Primer ciclo	0* to 2	Educador/a infantil Maestro/a de infantil	3+
		Segundo ciclo	3 to 5		
England	Nursery	Educational day care	0* to 5	Teacher	3+

** starting month may vary*

While there is no one-size-fits-all configuration for high-quality ECEC, our work seeks to offer a systematic understanding of existing evidence by identifying common quality indicators to enable policymakers, educators, and stakeholders to discern trends, pinpoint best practices, and address disparities in ECEC quality across Europe. These showcase of common or frequent elements on high quality ECEC provisions, when put in dialogue with young children, practitioners and community members, helps us to understand the "how" and "why" behind these elements, overcoming the dichotomy between the learning and the wellbeing dimension. When purposefully designed and carefully delivered, certain early years settings have the potential of maximizing children's potential to its fullest, making the most of the preventive feature of high quality ECEC. Furthermore, our report offers practical tools, such as the Self-Assessment Quality Instrument (SAQE), which can be used by ECEC centres (or practitioners individually) across Europe to self-evaluate and improve their practices and services based on the shared indicators of quality. By providing this cohesive framework, our report not only fills the gap in the global understanding of ECEC quality in Europe but also equips stakeholders with actionable strategies to enhance outcomes for children across the continent. Because part of this content has been shaped with young children (and their families and staff), it's co-created knowledge what lays at the core of this deliverable.

This report presents the comprehensive findings of this pioneering research, detailing the processes and methodologies employed and highlighting their practical implications. To ensure clarity and consistency throughout the report—and while acknowledging the semantic, systemic, and practical variations across different national contexts—specific terminologies will be used for uniformity.

2. Methodology

This report aims to provide a clear and actionable framework to diagnose and enhance the quality of Early Childhood Education and Care (ECEC) across Europe. It does so through a multi-step process that involves the following:

1. **Knowledge systematisation.** Knowledge systematisation involves synthesising existing evidence to create a structured and updated framework for understanding the complex area of ECEC. In this case, we conducted a scoping review of the latest relevant research and evidence on factors that promote children's well-being and foundational skills development. This approach was necessary due to a challenge encountered in Work Package 2: the diverse interventions found in the scientific literature on early years education were difficult to compare because of varying independent and dependent variables, as well as differing measurement tools and instruments. The lack of

standardization across studies in the field highlighted the need for a cohesive method or a set of basic agreements to evaluate educational interventions in early years settings.

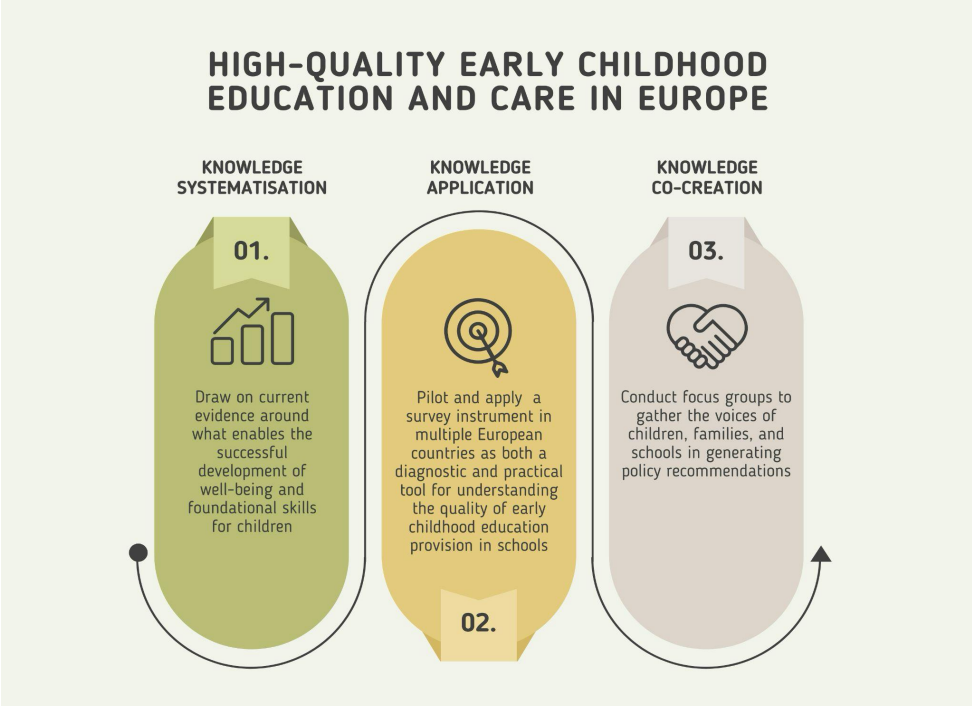
More specifically, the scoping review aimed to systematically analyse and systematise indicators of high-quality ECEC based on effective interventions that target the building blocks of learning and development. This report's focus on literacy and numeracy reflects findings from the scoping review, which highlights prevalent emphasis on interventions and quality indicators for these areas over science, socio-emotional development, or critical thinking skills, suggesting a narrowly focused landscape within effective ECEC. This method was selected for its ability to provide a comprehensive synthesis of evidence in a given field (Arksey & O'Malley, 2005), enabling us to understand the current state of successful early educational practices. Together with the findings from the systematic literature review conducted in Work Package 1, we identified a set of quality indicators that most effectively enable the successful development of foundational skills during ECEC.

2. **Knowledge application.** Knowledge application involves translating research insights into practical tools that can drive real-world improvements. The quality indicators of ECEC identified in the previous stage were integrated into the Self-Assessment Quality Instrument for ECEC Centres (SAQE). The SAQE serves two key functions: first, as a pilot survey tool for evaluating the quality of ECEC provision; second, as a standalone resource that helps teachers and centres improve their practices and outcomes. This instrument was designed as a user friendly online and open tool where early years practitioners can monitor their practice through a brief questionnaire that provides tailored and research informed feedback. Results from the SAQE were instrumental in shaping a broader European-wide survey, which was implemented across 28 countries to diagnose the quality of ECEC services on a larger scale. This process ensures that findings from research are directly applied to enhance educational practices across Europe.

3. **Knowledge co-creation.** Knowledge co-creation is a collaborative process where diverse perspectives come together to shape meaningful outcomes. We conducted focus groups to gather the voices of young children, families, and schools, ensuring that those directly impacted by ECEC policies were actively involved in generating recommendations. Rooted in dialogic co-creation principles, SCIREARLY engaged in an open and egalitarian dialogue with up to 117 stakeholders to discuss the results of high-quality ECEC provision and draft policy recommendations that are practical, inclusive, and reflective of real-world needs. This collaborative and dialogic approach ensures that policies are not only evidence-based but also grounded in the lived experiences of those

they aim to support, being socially responsive, culturally sensitive and fostering greater buy-in and long-term sustainability.

Figure 2. SCIREARLY's methodology for high-quality ECEC in Europe



3. Main Contributions

3.1. What does scientific research tells us about high-quality early childhood education and care in Europe: Key quality indicators

A wide breadth of literature illustrates the long-term benefits of engaging in ECEC. Socially and economically, it is seen to yield the largest return on investment in comparison to other educational levels (Heckman, 2006; Pholphirul, 2017; Raikes et al., 2023). Studies of certain ECEC programmes also showed enhanced academic performance, decreased likelihood of premature pregnancy, aside from long-term benefits such as enhanced skill development, work productivity or public health issues, among others. (Pholphirul, 2017). Early educational interventions were also found to lead to reduced rates of school dropout and increased rates of attendance especially in low-income countries (Berlinski et al., 2006), as well as better employment opportunities (Berlinski et al., 2008). Indeed, extant studies show that early education is a greater predictor of adult skills over other variables such as family environment and socioeconomic status (Parsons & Bynner, 1998; Schmutz, 2023).

In relation to basic academic skills, literacy, numeracy, and science are widely regarded as foundational for achieving personal fulfilment and development, employability, and social inclusion throughout one's life (European Commission, n.d.; Weiland & Yoshikawa, 2013). While everyone has the right to quality and inclusive education and lifelong learning that develops those basic skills, early childhood education is critical to set up the foundations for every single child to have better academic and social outcomes later in life (Sylva et al., 2004). These skills can be nurtured through high-quality ECEC, offering an invaluable opportunity to leverage young children's educational possibilities (Shonkoff & Fisher, 2013), and prevent attainment gaps (James-Brabham et al., 2023). Specifically, creating **rich and stimulating learning environments where children are safely exposed to high-quality and serve and return interactions (including those around literacy, numeracy and science) facilitates an increased wellbeing, positive development, and reduced risk for exclusion and adverse developmental outcomes.**

Despite the importance of ECEC and the development of these foundational skills from an early age, there appears to be a lack of systematization of quality ECEC intervention in Europe. As such, a systematic analysis of existing evidence through a scoping review of quantitative research in ECEC was conducted **to identify the common indicators of successful intervention programmes, examining the characteristics of these educational interventions and understanding the overall effects of ECEC interventions targeting basic skills (literacy, numeracy, science) on primary and secondary education**. The scoping exercise also aimed to inform the next stages in the WP2 workplan (and purposely carried out at the first place), specifically the elaboration of the SAQE, the European-wide survey, and set the foundations for the focus groups.

3.1.1. METHODS

Following the PRISMA Extension for Scoping Reviews (PRISMA-ScR) guidelines (Tricco et al., 2018), a scoping review was conducted to gather the state of robust quantitative research carried out in ECEC with a focus on the common indicators of successful intervention programmes, the characteristics of these interventions, as well as their common effects in primary and/or secondary education.

Search strategy and data sources

Bibliographic databases were searched on April 2023 including Web of Science, Scopus, PsycINFO and ERIC. Searches in each database included key terms and combinations among them. Table 1 shows the keywords used and how they were clustered. They were combined with the Boolean expression "AND" between clusters and "OR" within them. For example, we looked for (1.1 OR 1.2 OR 1.3 OR 1.4) AND (2.1 OR 2.2 OR 2.3) AND (3.1 OR 3.2 OR 3.3 OR 3.4 OR 3.5 OR 3.6) AND (4.1 OR 4.2 OR 4.3) in Web of Science, then the search was repeated in the rest of the databases and sources.

Table 1. Keywords and clusters

Population	Intervention	Outcome	Study design
1.1 Kindergarten	2.1 Program	3.1 Basic skills	4.1 Quasi-experimental
1.2 Early years	2.2 Intervention	3.2 Literacy	4.2 Randomised control trial
1.3 Early childhood education	2.3 Action	3.3 Numeracy	4.3 Longitudinal study
1.4 Preschool		3.4 Science	
		3.5 Digital skills	
		3.6 Emotional development	

For each search, the results were downloaded in .csv format. The following data were collected per scientific paper: author, title, year, source title, volume, source & doc type, DOI and abstract.

Study selection and data extraction

All articles had to meet the following criteria in order to be eligible for inclusion in this review (see Table 2).

Table 2. Inclusion and exclusion criteria used for the scoping review.

	Inclusion	Exclusion
Date framework	2013-2023	Before 2013
Methodology	Experimental / Quasi-experimental studies + type of assessment	Qualitative studies / Literature reviews
Language	English	Other languages
Population	Educational/Psychoeducational programs/interventions conducted in ECEC Sample of 10 participants or more	Not in ECEC Less than 10 participants
Intervention	Educational/Psychoeducational programmes/interventions conducted in school setting	Extra-curricular activities Home-based programs/interventions
Outcomes	Quantitative findings related to impact on basic skills in primary or secondary students	Impact on other variable (not considered basic skills)
Type of document	Peer-reviewed scientific articles and reports	Books, conference papers, reviews

The software Rayyan (Ouzzani et al., 2016) was used to collate the articles and detect potential duplicates for further consideration. This artificial intelligence powered software allowed collaborative work between the different institutions within the consortium. Once all the duplicates had been removed, UDEUSTO (WP2 leader) allocated an equal number of references to each reviewer, ensuring that each reference was screened by 2 reviewers from different institutions (i.e. reference 1 was screened by reviewer 1 from one institution and reviewer 2 from another). DCU, UH, UM and UNEW were equally involved in this task. At this stage, the reviewers only read the title and abstract of the papers. This step was done through Rayyan, which also allows for a logical and systematic tracking of the decisions made by each paper. UDEUSTO prepared the Rayyan workspace before starting the task, assisted by the inclusion and exclusion criteria. UDEUSTO also labelled the reasons for exclusion, with the partner reviewers marking the reason for exclusion for each paper. In this process, it is important to mention that only one exclusion reason was selected for each paper. In case of disagreement (i.e., Reviewer 1 suggests excluding Reference 1, but Reviewer 2 suggests including it) Reviewers 1 and 2 discussed via videoconference the reasons and reached an agreement. Each pair of reviewers arranged a short meeting to discuss the disagreements they might have during this first screening, when needed. In cases where agreements were not achieved, a third reviewer facilitated the decision.

Data analysis

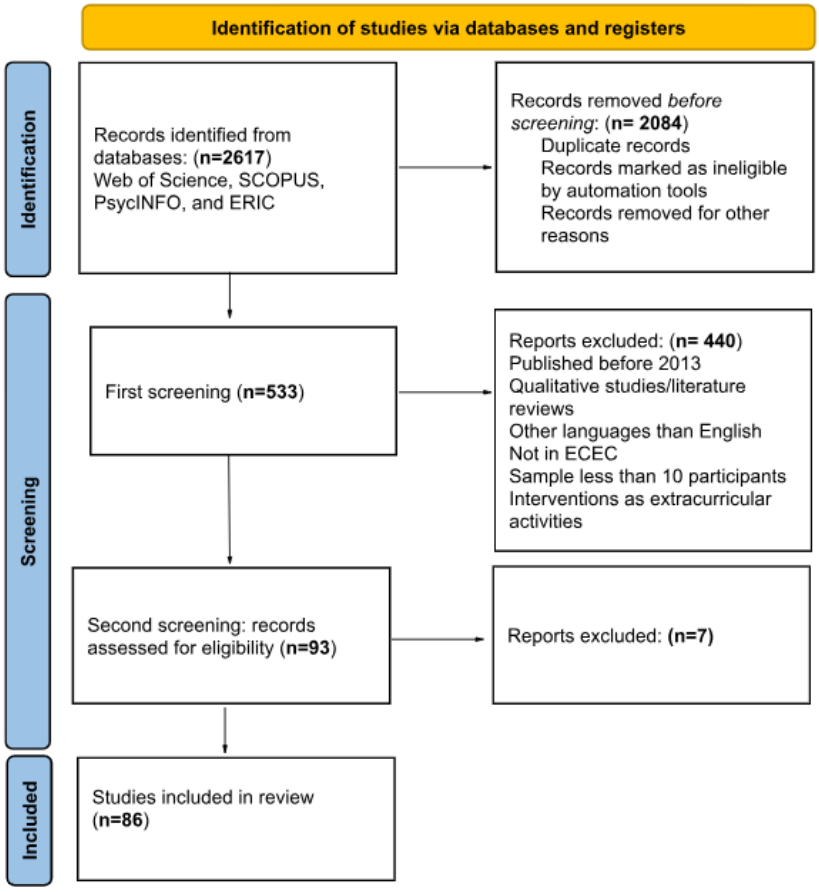
For the in-depth analysis of the selected papers, a full text screening was carried out through a shared group on Mendeley. The principal objective of this phase was to collect the relevant information required for each study included. For that purpose, an analytical grid for key information was elaborated, divided in these categories: APA Reference, Objective, Intervention/Program/Action, Methodological design, Participants, Instruments, Data analysis, Independent variable, Dependent variable, Results, Key findings.

Once the information was extracted and included in the analytical grid, an inductive thematic analysis of the content was done to extract the characteristics of these interventions and to identify common indicators of successful programmes, that were influencing basic skills, understood as dependent variable. This technique allowed us to extract emerging categories from the frequent, dominant and significant themes in the raw data, without the restraints imposed by other structured methodologies (Thomas, 2003).

3.1.2. KEY FINDINGS: INDICATORS OF HIGH-QUALITY EARLY CHILDHOOD EDUCATION AND CARE

Out of 93 papers that were found to meet the inclusion criteria, 86 papers were selected for analysis and finally included in the study. Figure 3 presents the PRISMA flow diagram of the study:

Figure 3. PRISMA Flow diagram



Data extracted and analysed from each study was included in the analytical grid mentioned above. This process culminated in a synthesised list for the 86 studies, which were grouped according to its main effects on basic skills.

Intervention characteristics

Out of 86 interventions analysed for the scoping review, 56 demonstrated statistically significant effect in developing early literacy skills in preschool children (see Figure 4); 16 out of 56 showed positive improvements in development of early numeracy skills; 3 in early science; and 11 proved improvements in more than one foundational skill. The preliminary analysis on papers focused on literacy interventions point out that in 11/56 of those studies included technology-aided interventions; shared and dialogic reading was at the core of 10/56 of the interventions and 5/56 targeted preschool educators and parents to facilitate early literacy immersion, while 5 more interventions offered supplementary instruction and tutoring. In addition, 5 interventions included large-scale versatile programs targeting early literacy skills. 5 interventions incorporated music, rhymes and physical activity to evaluate gains in literacy. Other interventions included in

the review focused on instruction of pre- literacy oral, reading, writing skills, in 9,4,2 out of 56 interventions respectively.

When looking at studies that focused on early numeracy (Figure 4), two of the interventions focused on instruction of number sense (number concepts, and relations). Four addressed remedial numeracy and tutorial interventions; those interventions mediated by digital media were behind 3 out of the 16 of the research papers. Numeracy supported or assisted by physical activity and literature (2 out of 16), emerged arose when analysing successful early numeracy interventions. The rest of the reviewed interventions included integrated school readiness math curricula (4 out of 16).

Lastly, the smallest proportion of early literacy interventions focused on early science skills (Figure 6). They included teacher training to support early science acquisition (2 out of 3) and play-based intervention targeting the development of science concepts among young children (1 out of 3). On the other hand, 11 of the 86 papers evaluated combined interventions, out of which 7 provided instruction for children and 4 analysed the effect of teacher professional development on children's early literacy/numeracy skill acquisition (Figure 6).

Figure 4. Interventions that improved literacy

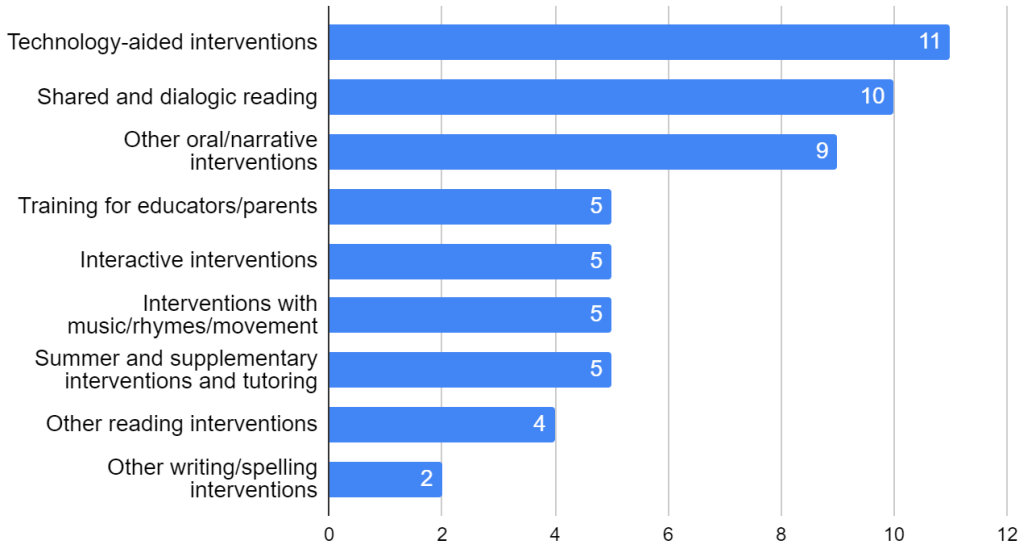


Figure 5. Interventions that improved numeracy

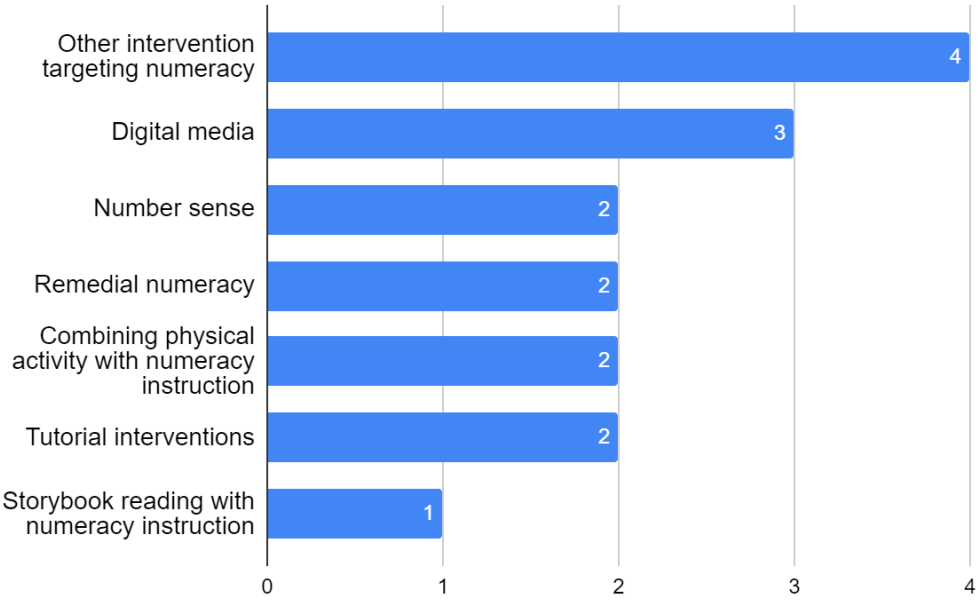


Figure 6. Interventions that improved science

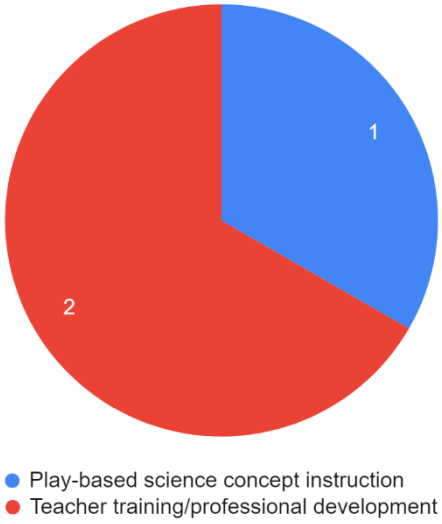
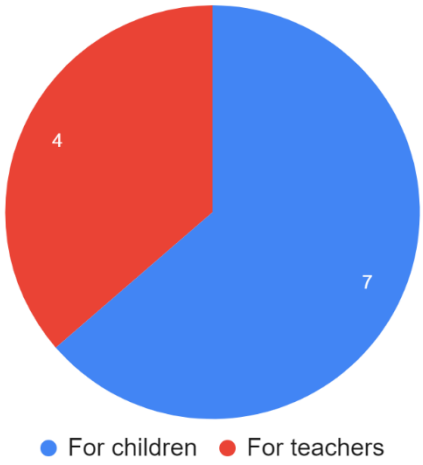


Figure 7. Interventions with combined effects



The analysis and data extraction were carried out through 4 tables, or analytical grids, one per each main outcome achieved: interventions targeting literacy (Annex 1), numeracy (Annex 2), science (Annex 3) and combined skills interventions (Annex 4). Just to provide an example of how this process was conducted, the following tables offer a glimpse into the analytical strategy followed at this stage (see Table 3, 4, 5 and 6 below).

Table 3. Sample of synthesised list of studies selected for the review

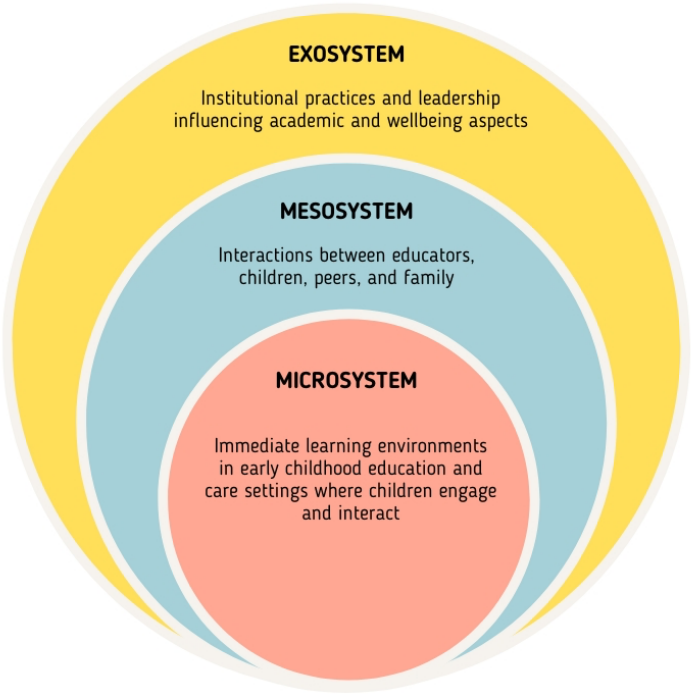
Interventions that have shown improvements in literacy						
Nº	**Reference**	**Objective**	**Design**	**Sample**	**Instruments**	**Key findings**
1	Chacko, A. et al (2018).	To evaluate the effects of the Fathers Supporting Success in Preschoolers: A Community Parent Education Program on improving key proximal outcomes (i.e., parenting), secondary outcomes (i.e., child behavior and language), and distal outcomes (i.e., parental stress and depressive symptoms).	A randomised controlled trial design with a waitlist control group.	126 father–child dyads, 4-5 years old	1)Attendance—Fathers' attendance at each FSSP session was coded as present or absent 2)Parent Behavior Checklist 3)Dyadic Parent–Child Interaction Coding System 4)Observed parenting and child behavior 5) Eyberg Child Behavior Inventory (etc.)	Acute benefits of the program compared to the waitlist control group were observed on several outcomes. The program did not result in significantly better outcomes on father reported expectations for their child. On secondary outcomes, significant benefits of the program wer found for father-reported intensity of child behavioural difficulties. There was a trend toward statistically significant improvement in observed child behavioural difficulties.
2	Özler, B. et al (2018).	To evaluate a government program in Malawi, which aimed to support child development by improving quality in community-based, informal preschools through teacher training, financial incentives, and group-based parenting support.	Cluster-Randomised control trial	2120 children, 3-5 years old	1) Malawi Developmental Assessment Tool(MDAT) 2)Peabody Picture Vocabulary Test-IV (PPVT-IV) 3)Leiter-R Sustained Attention task (LSA). 4)Kaufman Assessment Battery-Children, 2nd Edition (KABC-II) 5)Early Grade Mathematics Assessment (language and fine motor/perception subscales) 6)The Strengths and Difficulties Questionnaire (SDQ)	Children in the integrated intervention arm (teacher training and parenting) had significantly higher scores in assessments of language and socio-emotional development. There were significant improvements in classroom organization and teacher behavior at the preschools in the teacher-training only arm, but these did not translate into improved child outcomes at 18 months. In resource-poor settings with informal preschools, programs that integrate parenting support with preschools may be more (cost-) effective for improving child outcomes than programs focusing simply on improving classroom quality.
3	Vargas-Garcia, V. et al. (2020).	To study three processes of child development that can be stimulated and promoted through the use of dialogic reading of stories, introduced in everyday contexts such as school and family, significantly contributing to early childhood and corresponding to primary socialising contexts for their formation.	Quasi-experimental, pre test-post test design and a control group.	34 children, 4-5 years	1)Neuropsychological Battery for Preschoolers (BANPE) 2)The Colombian version of Conners' Test	The results indicate that the intervention in the school and family context had a significant impact, since some cognitive and emotional domains increased.
4	Amorim, A. et al. (2020).	This study examines the effectiveness of Escribo Play, a mobile based, game-enhanced educational program, that is used both at school and at home on preschool students' phonological awareness (PA), word reading, and writing skills.	Cross-sectional, pre-post test	749 children, 4-5 years old	1)Phonological Awareness Test by Oral Production (PAT-OP) 2)The Word Reading and Writing Test (RWT)	The children who studied using Escribo Play displayed improved word reading and word writing abilities.
5	Sa, M. et al. (2022).	To analyse the efficacy of the Phonological Awareness Digital Program (PADP) in typically developing preschool children.	Randomised control trial	49 children, 4-6 years old	1)Phonological Awareness Tasks	The Phonological Awareness Digital Programme promoted the development of Phonological Awareness (at different levels), with statistically significant results. These results are supported by the experimental group, showing a significant improvement over a control group, which was not a target of this program's implementation.
6	Albuquerque, A. et al. (2019).	This longitudinal study aimed at testing the long-term impact of invented spelling activities conducted in kindergarten on children's literacy skills.	Longitudinal	100 children, 5 years old	1) The Raven's Progressive Matrices Test. 2)Battery of Phonological Tests. 3)Children were asked to name the different letters of the alphabet, printed in uppercase and presented in small flashcards in a random order. 4) Different lists of words were applied in all assessment points to control learning effects.	Both experimental and control groups had similar scores in kindergarten before the training activities. In all other assessment tests, the experimental group outperformed the control group. Although there is a clear progressive approximation of their writing scores in primary school, children who participated in experimental activities seemed to show a better performance at the end of Grade 3. Thus, the results showed that the experimental group outperformed the control group in kindergarten and benefited more from formal school teaching instruction. Lasting effects were found as the invented spelling condition presented statistically significant higher scores in reading and writing in primary education.
7	Riordan, J. et al. (2022).	To compare two book-reading and conversation approaches for parents and preschoolers to an activity-based control group. The Rich Reading and Reminiscing (RRR) condition taught parents to converse about the storyline; the Strengthening Sound Sensitivity (SSS) condition taught parents to converse about word sounds.	Longitudinal	69 children, 5 years old	1)Dynamic Indicators of Basic Early Literacy Skills 2) Six comprehension questions that focused on identifying characters, plot features, and emotional 3)Parent book-reading coding 4) Parent-child reminiscing	The two conditions changed parent-child interactions in specific ways. The RRR condition increased parents' total on-topic talk and parents' and children's higher-level meaning-focused talk during book-reading in addition to parents' elaborations during reminiscing; the SSS condition increased parents' and children's print-focused and sound-focused talk during book-reading. Children's age moderated the benefits of the SSS condition for children's phonological awareness and letter recognition skills, with older children benefitting more than younger children.

Interventions showing improvements in numeracy						
Nº	**Reference**	**Objective**	**Design**	**Sample**	**Instruments**	**Key findings**
1	Mavilidi, M. F. et al (2018).	To study the effectiveness of integrating physical activities with preschool children's arithmetic skills acquisition.	A cluster randomised control	120 children, 4-5 years old	1)The assessments, adapted from Ramani and Siegler (2008) 2)A scale adapted from Mavilidi, Okely, Chandler, and Paas (2016, 2017). 3)ActiGraph accelerometer (model GT1M, Pensacola).	Children who performed task-relevant integrated physical activity performed better than children in all other conditions. In addition, children who performed physical activity, either integrated or non-integrated, reported higher scores for enjoyment of the instructional method than the two sedentary learning conditions. The math outcomes obtained for each task revealed that the performing integrated physical activity condition exerted the largest effects in the number line estimation and numerical magnitude comparison tasks.
2	Barnes, M. et al. (2016).	To investigate the effects of early maths intervention and attention training on preschool children with very low mathematics knowledge.	Randomised control trial	541 children, 4 years old	1)Early Mathematics Classroom Observation 2)Child Math Assessment 3)TEMA-3 4)Child-Attention Networks Test 5) Kaufman Brief Intelligence Test	There was a significant effect of the intervention on a broad measure of informal mathematical knowledge and a small but significant effect on a measure of numerical knowledge. Attention training was associated with small effects on attention. Although many children in the intervention conditions made considerable gains in mathematical knowledge over the prekindergarten year, there is also a subgroup of children who did not make sufficient gains to prepare them for mathematics instruction in kindergarten.
3	Nisan, M. K. (2019).	This study investigated the effect of Early Numeracy Program on the development of number concept in children at 48-60 months of age.	Quasi-experimental design	78 children, 4-5 years old	1)Early Numeracy 2)Number Development Assessment Tool	The mean post-test scores of the children in the experiment group were significantly higher than the mean scores of the children in the control group. The Early Numeracy Program significantly increases the level of development of number concept for children at 48-60 months of age.
4	Sood, S. et al. (2013).	The purpose was to examine the impact of early number sense instruction that focused on development of relationships among numbers in a high-poverty school of low-achieving students.	Quasi-experimental design with control	101 children, 4-6 years old	Stanford 10 Practice Tests—Level SESAT 1	Results indicated significant differences favoring the treatment students on all measures of number sense (e.g., spatial relationships, more and less relationships, benchmarks of five and ten, nonverbal calculations) at posttest and on a 3-week retention test. Furthermore, the effects were not mediated by at-risk status, suggesting that intervention may benefit a wide range of students.
5	Toll, S. et al. (2014).	To demonstrate the effectiveness of two remedial early numeracy interventions with different durations on kindergartners scoring below average. Comparing the two versions addresses the question of whether longer-lasting support brings about more positive effects than time-limited remediation started at a later age.	Randomised control trial	31 teachers and 1040 children (4 years old)	1) Early Numeracy Test Revised 2)Speeded Number Facts Test3) Cito 4)Raven's Colored Progressive Matrices	Early numeracy intervention over a period of 1.5 school years is effective for enhancing arithmetic, complex mathematics, and early numeracy skills in children with established risk of mathematical learning difficulties. Intervention over a shorter time frame also led to a better performance of early numeracy skills but showed less strong effects. This study confirms that it remains necessary to assist children at risk of math learning difficulties with remedial support throughout kindergarten.
6	Outhwait, L. et al. (2019).	To analyse how the math apps most effectively implemented in a classroom setting compared to standard instructional practice and which components of math development are supported by the math apps.	Randomised control trial	461 children, aged 4–5 years old	1)PTM5 (Math Assessment Resource Service, 2015).	The results showed significantly greater math learning gains for both forms of app implementation compared with standard math practice. The math apps supported targeted basic facts and concepts and generalised to higher-level math reasoning and problem solving skills. There were no significant differences between the 2 forms of math app implementation, suggesting the math apps can be implemented in a well-balanced curriculum. These novel results suggest that structured, content-rich, interactive apps can provide a vehicle for efficiently delivering high-quality math instruction for all pupils in a classroom context and can effectively raise achievement in early math.
7	Jylanki, P. et al. (2022).	The aim of this pilot study was to examine the immediate and long-term effects of an intervention program that aims to improve preschoolers' early numeracy skills by combining the learning of numerical relational skills via story reading with fundamental motor skill practice.	Quasi-experimental study design	36 children, 4 years old	1)Early Numeracy Test (ENT) KTK-test battery 3) Symbolic Magnitude Processing (SYMP Test)	Children's early numeracy, especially numerical relational skills, improved during the intervention, and the intervention had larger effects on children's early numeracy and numerical relational skills. The delayed post-test demonstrated that the effects were maintained for 4.5–8 weeks after the intervention. It is possible to support children's early numeracy skills with combined learning of numerical relational skills via story reading and fundamental motor skills despite the socioeconomic or language background, and narrow the gap between low- and average-performing children.
8	Merkelbach, I. et al. (2022).	This study was part of a larger research project which focused on promoting literacy. In the current study, we opted for a digital program with similar scaffolding characteristics but now in the domain of numeracy; a domain of vulnerability for children with mild perinatal adversities.	Randomised control trial	79 children, 5-6 years old	Cito Numeracy Test for Kindergarten Pupils (CNT)	Early numeracy skills in children born late preterm fell behind compared to term-born peers in the control condition. These children outperformed their peers in early numeracy skills, while those in the control condition fell behind. The program was effective for children born late preterm, showing stronger numeracy skills compared to term-born peers in the intervention condition: highly structured educational numeracy environment, using repetition and adaptive feedback benefited early numeracy skills of late preterm children.

An ecological model of high-quality ECEC indicators

Bronfenbrenner's model delineates the multiple layers of influence surrounding a child, ranging from immediate environments to broader societal contexts. By analysing studies across these different levels - microsystem, mesosystem, and exosystem - we gain a comprehensive understanding of what constitutes high-quality ECEC provision and how it can be optimised to support child development. The ECEC quality indicators found in the review were clustered accordingly. Figure 8 shows how ECEC quality indicators are oragnised into three levels using Bronfenbrenner's ecological system (1989).

Figure 8. Description of high-quality indicators of ECEC provision at the micro, meso, and exosystem levels



At the microsystem, the classroom offers high-quality adult-child interactions creating a safe and supportive space that fosters early literacy, numeracy, science, and socio-emotional development

In our analysis, the microsystem refers to the learning environment where the child learns and develops in the ECEC setting that may create or hinder conditions for positive growth, sound development, and resilience against exclusion so that children can reach their developmental potential (Britto et al., 2017). Offering **high-quality, warm and responsive interactions forms the foundation for their engagement in future**

educational activities and are associated with increased well-being (Ashdown & Bernard, 2012; Wustmann Seile,et al, 2022), **reduced risk for exclusion** (Frizelle, et al 2021; Bustamante et al, 2022; Gambaro et al, 2021), **and positive educational outcomes** in later years (Bakken et al, 2017; McCoy et al, 2017; Pazeto et al, 2020.

The scoping review identified several key areas where early interventions within the microsystem can enhance children's foundational skills, supporting their development and reducing their risk of exclusion. These include interventions that ensure **high-quality adult-child interactions in a safe and supportive space, where cognitive and socioemotional development occur simultaneously**. At the microsystem level, effective interventions create optimal conditions for learning and development, offering contextualized and meaningful **early literacy, numeracy, and science experiences** that align with the early years curriculum. These foundational skills are widely recognized as essential throughout one's life (European Commission, n.d.). While everyone has the right to quality and inclusive education and lifelong learning, early childhood education is especially critical for establishing the building blocks of learning and development. When basic skills are introduced in ways that make sense to young children, they are linked to improved academic and social outcomes later in life (Sylva et al., 2004; Pholphirul, 2016; Fricke et al., 2017; Choi et al., 2024).

WARM AND RESPONSIVE INTERACTIONS AND LEARNING ENVIRONMENTS

It is widely demonstrated that **social and emotional dimensions are intertwined with cognitive and academic performance** (Immordino-Yang, 2016), where instructional support and affective bonds positively influence the development of foundational skills for future success (Størksen et al., 2023; Sabol et al., 2013). More specifically, **warm and responsive relationships with teachers and a sense of perceived closeness** appear to play a role in children's self-regulation (Størksen et al., 2023), which in turn enables a healthy development and affects children's ability to perform and succeed in school activities. These relationships are also characterised by increased opportunities for **conversations and open talk** (Størksen et al., 2023; Cadima et al., 2016), which further develop children's linguistic and thinking capacities as well as equip them with the verbal tools for self-regulation (Bernier et al., 2010).

Conducive learning environments have also shown the importance of creating opportunities for children to engage in **meaningful interactions to foster inquiry skills** such as exploring, asking questions, making predictions, investigating, or observing, among others (Gropen et al., 2017). In this context, teachers created a collaborative climate in which children are actively engaged in class and are encourage

to link and challenge their experiences and ideas with in knowledge generated through in classroom activities (ibid.) **Appropriate scaffolding, tunned tuned? feedback** and instructional support are also crucial in ECEC contexts (Burchinal, 2018; Bulunuz, 2013; Størksen et al., 2023). That scaffolding can come from adults or even from more skilled peers when the setting is designed to enhance those peer-to-peer support and dialogues.Such stimulating environments, rooted on constant and tunned tuned? dialogues, supports children's **emotional connections** with the experience of learning, boosting their pleasure for discovering and rediscovering the world

A responsive and interaction-based ideal context for early learning is play. With endless benefits recognised by research, child-led and guided play that develops in purposeful spaces and with thoughtful materials have shown to expand their knowledge on foundational skills (Skene et al., 2022). During guided play and child-led play, teachers intentionally prepare and introduce books, activities, or toys for pleasurable explorations of core themes, and children engage in active, collaborative, and meaningful play. When these play, spaces are tailored to curriculum, the benefits increase exponentially through a "Playful Curriculum" (Størksen et al., 2023)

At the structural level, there is also evidence demonstrating that **integrated settings** been more effective in positively influencing academic and social outcome measures compared to less integrated ones (Oh-Young et al., 2015), alluding to the importance of fostering an inclusive environment that increases children's exposure and interactions with each other supported by effective pedagogies. Indeed, general aspects of the **quality for child interactions with caregivers, peers, parents, as well as their engagement with physical space and materials** shape global process quality in ECEC. Key factors in this context include the socioemotional atmosphere, the warmth and responsiveness of caregiver interactions, and the provision of developmentally appropriate stimuli to support important aspects of development (Ulferts et al., 2019).

EARLY LANGUAGE AND LITERACY

Process quality in ECEC, both global and domain specific – including quality of promotion and stimulation of early learning in various domains – lead to gains in language and literacy (Ulferts et al., 2019). Two interventions analysed in our review have proven to be particularly effective in this domain when focusing on phonological awareness, receptive and expressive language, and letter recognition (Albuquerque & Martins, 2019; Amorim, et al., 2020). Children benefited from these interventions

during preschool and later in schooling, showing a better performance at the end of Grade 3.

Reading and literacy skills in children were significantly improved among interventions that propose a **dialogic educational action** (Gutierrez Fresneda, 2017; Kim et al., 2021; Vargas-García et al., 2020). Approaches such as **dialogic story reading** and **shared reading** especially showed improvements in children with disabilities and those living in socially disadvantaged areas (Hodgins & Harrison, 2021). They have also proven to have a positive impact on children's ability to shift perspectives and understand others' emotional states (Gerhom et al., 2019). These learning developments emerged in many longitudinal studies, showing how quality education that offers enjoyable and meaningful learning experiences to promote different areas of learning from an early age have a significant impact on children's academic development, and can even mitigate learning difficulties in literacy skills, which is particularly relevant for at-risk children (Wake, et al, 2015; Vadasy et al. 2013).

It should also be pointed out that several educational interventions which showed to have a positive impact on learning processes had a direct correlation with reduced grade retention (Zvoch et al, 2013; Ulferts et al, 2019; Toll & Van Luit, 2014). Other interventions bearing positive results include: **dramatic play** (Hutagalung et al., 2020), **music and movement activities** (Augustine, 2015; Kempert et al., 2016; Kirk & Kirk, 2016), **rhyming and alliteration**, **visual processing** of pictures and letters (Both-de Vries et al., 2014), **one-on-one student tutoring** (Lindo et al., 2017), early intensive **supplementary reading intervention** (Kortecamp et al., 2023), and **phonics training** (Parpucu & Dinç, 2017). It is important to note that forcing early literacy learning through highly formalised pedagogies with young children may lead to undesirable reading and writing practices, which can negatively impact children's intrinsic motivation to learn. This approach may hinder the development of essential literacy skills required for active and effective societal participation later in life (Bonello, 2022). Meanwhile, gains in expressive language among pre-school children with disabilities have been shown for interventions based on **contextualised instruction**, whereby opportunities are set up for learning to occur in **interactive and meaningful contexts** (Cohen-Mimran et al., 2016). Spaces for meaning making can be built through community involvement in classroom activities and other school contexts, such as decision-making processes or educative participation. Similar benefits to early literacy have been found for children in foster care through a school

readiness programme that **maximises learning opportunities** in routine classroom moments and transitions between activities (Pears et al., 2013).

EARLY NUMERACY

In addition to literacy, numeracy skills—such as number sense and visual-spatial skills—are essential for cognitive development (Lewis Presser, et al, 2015; Nişan et al, 2019; Oughton et al, 2022). A key finding from control-experimental studies is that not all curricular programs equip students with mathematical skills from an early age. However, selected educational interventions have helped children improve their numerical skills, including number sense, spatial relationships, understanding of more and less relationships, benchmarks of five and ten, mental and nonverbal calculations, arithmetic enhancement, complex mathematics, math reasoning, and problem-solving skills (Davies et al, 2015; Barnes et al, 2016). Notably, these benefits were observed across all groups studied, regardless of socioeconomic background, level of basic numerical ability, parents' educational level, or established risk of mathematical learning difficulties.

Pedagogical approaches that have been shown to have a positive effect on numeracy skills involved integrating **physical activity and motor skills** into teaching (Jylanki et al., 2020; Mavilidi et al., 2017), using **mathematical mobile apps** and new technology (Merkelbach et al., 2022; Outhwaite et al., 2019), **story reading** (Durmaz, 2023; Green et al,. 2018; Jylanki et al., 2022), incorporating **repetition and adaptive feedback**, and engaging in **playful learning** (Grimes et al., 2021). As mentioned above, a curriculum that facilitates playful learning has been shown to positively contribute to children's math development, with a particular focus on **guided play** to stimulate school readiness skills (Størksen et al., 2023). Research involving children at risk for developmental delays have also shown that creating a highly **structured and intentional educational numeracy environment** benefits their ability to keep up with age-appropriate curriculum content (Hardy et al, 2019; Merkelbach et al., 2022).

EARLY SCIENCE SKILLS

Science and inquiry-based learning activities encourage children to explore, ask questions, make predictions, formulate hypothesis and engage with the world around them. Science skills include investigating, asking questions, observing, collecting and

recording data, and generating and reflecting on their ideas and coming up with new conceptions that better fit to children's realities (Cremin et al., 2018; Johnston, 2005).

The studies reviewed highlight interventions that found an improvement in the evolution of children's ability to make claims, give evidence-based support, knowledge of receptive science vocabulary, and use of vocabulary in a science context by the experimental group. They also found better academic performance and understanding of scientific concepts compared to traditional forms of teaching (Bulunuz, 2013; Gropen et al., 2017; Henrichs et al., 2014). Current evidence points to the effectiveness of **play** through **experimentation** and **hands-on activities** that use repetition and multi-sensory activities (Bulunuz, 2013). **Teacher training in scientific knowledge and language** as well as **teacher coaching** are also emphasised, leading to significant gains in children's learning outcomes (Skarstein & Ugelstad, 2020). Other interventions promote the use of educational apps and technologies in the classroom, highlighting that students can benefit from these regardless of their academic, economic, and family background. An adequate **use of technology** can alleviate difficulties and provide alternative learning opportunities when the school environment is not available, such as in summer, where some children do not have access to a rich and stimulating environment (Griffith et al., 2019; Cassady et al., 2018; Forné et al., 2022), or during unprecedented times, such as the pandemic (OECD, 2021). Finally, improvement in academic achievement and engagement in science can be significantly improved through **skillful instruction** by teachers, **purposeful content** and settings designed carefully to make the most of the available **materials and resources** (Brunsek at al., 2020; Arteaga et al, 2019; Bleses et al, 2020; Kermani et al., 2015).

TRANSVERSAL SKILLS

Transversal skills are transferable competences that can be applied in various settings, useful through their entire life. They include critical thinking, interpersonal skills, intra-personal skills, global citizenship, as well as media and information skills, among others (UNESCO, 2014). High quality early years settings offer an unvaluable opportunity for transversal skills to arise, since the ability to learn, to critically inquiry and challenge or test initial thoughts are at the core of these first years in education.

In this domain, **dialogic reading** has been found to improve emotional aspects, including children's management of sadness and anger in the classroom, their ability to recognise and express emotions (Vargas-García et al., 2020), as well as perspective taking and ability to understand others' emotional states or Theory of Mind (Grøver et al., 2020; Ebert, 2020). Effective **school readiness programmes** targeting self-regulatory skills were also found to **maximise learning opportunities in the setting**, such as transitions and snack times, in addition to structured sessions with consistent and culturally relevant routines. In this approach, **combining contextualised and meaningful early literacy learning experiences** (letter naming and letter-sound knowledge, phonological awareness, print concepts, and vocabulary acquisition), tuned **feedback and guided practice** is critical. Emphasizing self-regulatory skills is especially crucial for at-risk children, like those in foster care, due to the impact that changes in caregivers can have on their inhibitory control (Pears et al., 2013). As for thinking skills, current evidence shows that **physical activity programs/programmes?** are beneficial for metacognition, and **challenging cognitive functions** can increase focused attention, inhibitory control, working memory and planning (Erasmus et al, 2016; Gray et al, 2022; Jylänki, 2023; Alesi et al, 2021). As for critical thinking skills, classroom interaction including dialogue and questioning techniques, the use of thinking language and story based approached are mediators of supporting this important transversal skill since early years (O'Reilly, Devitt & Hayes, 2022).

At the mesosystem, warm and responsive environments, enabling shared and dialogic activities between children and adults are crucial, especially for low-income and at-risk students

At the mesosystem, high-quality programmes emphasise the **interconnectedness between different elements of a child's life**—particularly the relationships between home, school, and community. Creating **warm and responsive environments, trust-based, enabling shared and dialogic activities between children and adults, and providing targeted support for at-risk children are key components of this level**.

SHARED AND DIALOGIC ACTIVITIES BETWEEN CHILDREN, TEACHERS, AND FAMILIES

Several studies have pointed to the effectiveness of shared and dialogic activities in enhancing children's basic skills and socio-emotional development (Burgoyne et al, 2018; Chacko et al, 2018; Hirsh et al, 2018). For instance, one effective **shared reading** intervention among young learners incorporated **teacher prompts** to encourage reasoning, explore ideas, consider different viewpoints, build related topic knowledge, and expand on the book's theme through play and various meaningful and purposeful learning opportunities. Not only did it benefit children's vocabulary and grammar skills but also their ability to shift perspectives and understand others' emotional states (Grøver et al., 2020).

Meanwhile, **dialogic story reading** is an interactive approach to storytelling that involves both adults and children actively engaging in the reading process. It has been shown to improve children's early language and literacy skills (Gutierrez Fresneda, 2017; Hirsh et al., 2019; Kim, et al., 2021; Vargas-García et al., 2020), including for children with disabilities and children living in socially disadvantaged areas (Hodgins & Harrison, 2021). In the example of the Motheread/Fatheread early literacy intervention, the curriculum teaches caregivers - even those with limited literacy themselves - the techniques for engaging in dialogic reading such as **facilitating the active role of the child**, **expanding the story's content**, **reading aloud** instead of passive listening, and **guided reading** techniques. This culturally appropriate program encourages parents to increase the frequency, enjoyment, and effectiveness of storytelling, promoting vocabulary development, comprehension, and a secure reading culture (Hirsh et al., 2019). There is evidence that dialogic reading approaches have been successful where **teachers and caregivers engage in a joint project** of reading the same set of books in different contexts, where different avenues were explored to educate caregivers on the approach, and where materials and constant and free support are provided (Grøver et al., 2020; Hirsh et al., 2019).

This is consistent with a wide array of research on dialogic education that has identified interventions such as the **Dialogic Literary Gatherings (DLG)** as a successful educational action that have achieved positive results in many diverse contexts (Ruiz-Eugenio et al., 2023). Particurlarly in early childhood settings DLG have been found to promote high-quality interactions in the classroom by fostering

shared thinking and collectively building knowledge (Girbés-Peco et al., 2024). In this dialogic space, children, parents, and teachers engage in interactive reading sessions where **questions and discussions are encouraged** to deepen understanding and make the reading experience more meaningful. This intervention has proven the power of dialogic learning for achieving social impact (García-Carrión et al, 2020) and demonstrates the value of school-family partnerships for young children's learning and educational enrichment.

TARGETED INSTRUCTION AND SUPPORT FOR AT-RISK CHILDREN

Children from disadvantaged backgrounds, including those from low-income families, migrant backgrounds, or those with learning difficulties, often require additional support to ensure equal access to high-quality education. ECEC programs that provide targeted support—such as summer schools, remedial classes, or additional one-on-one tutoring—help close the achievement gap and promote inclusivity.

For children who are at risk of falling behind, additional programs can provide vital support. **School readiness** interventions (Pears et al., 2013), **summer schools** (Zvoch & Stevens, 2013), **remedial programmes** (Toll & Van Luit, 2014) **targeted reading programmes** (Graham, 2021), and **after-school structured tutoring** (Lindo et al., 2018) have been shown to improve outcomes for at-risk students including those from low-income households, in foster care, with disabilities, or those with learning difficulties, yet the extent of their effectiveness appears to be influenced by the quality of delivery. For instance, these interventions were characterised by **regular and intense provision**, a **small group size**, a high level of **teacher training and preparedness**, the provision of **skills modelling**, and mechanisms for **individualised learning and feedback**. In some cases, desirable outcomes were still achieved through a **structured learning environment** when addressing reading problems in children even with minimally trained but supervised tutors with **ongoing support** (Lindo et al., 2018). Other positive features of successful interventions include extending literacy **activities to the home setting**, providing **additional materials and support to families**, and **allowing students to choose** the reading material (Graham, 2021). These findings point to the interconnectedness between targeted support interventions as a quality indicator with other factors such as strong partnerships between the school and home contexts, optimal learning environments,

and research informed teacher training.

At the exosystem, institutional practices – such as fostering teacher professional development and guidance and training services for parents – positively influence academic and wellbeing aspects.

At the **exosystem** level of high-quality early childhood education and care (ECEC), institutional practices and leadership are crucial in shaping the broader contexts that influence both the academic and well-being outcomes of children. This system includes structures and policies that indirectly impact children through the support they provide to families, educators, and the wider community.

TEACHER PROFESSIONAL DEVELOPMENT

High-quality ECEC programs recognise the importance of continuous teacher professional development (PD). The meta-analysis conducted by Brunsek and colleagues (2020) found that PD programs focused on school readiness, social and emotional functioning through interactions, and language and literacy revealed significant **positive associations** with a wide array of child outcomes such as **basic and transversal skills**. For instance, school-readiness-focused PD is associated with gains in expressive vocabulary. Meanwhile, those targeting social/emotional functioning showed positive associations for children's outcomes on closeness and social skills, while PD activities focused on language and literacy revealed positive associations for expressive vocabulary, letter word identification, print awareness, sound recognition, and writing. As for the mode of delivery, a **collaborative relationship between the expert and the teachers** aiming at developing specific knowledge and skills related to instructional practice**,** incorporating **modelling** and **performance feedback** (Brock & Carter, 2017), were associated with positive outcomes (Brunsek et al., 2020; Eadie et al. 2024). These characteristics are embodied in an example of a professional development programme for teaching science literacy, which combines coaching with coursework through one-on-one and small-group meetings between coaches and teachers that occur between instructional sessions (Gropen et al., 2017). This exemplifies the benefits of engaging in an **evidence-based PD relevant and impactful into practice** (Brunsek et al., 2020).

However, when teacher training is coupled with group-based parenting education significantly higher scores in language and socio-emotional development are achieved (Özler et al., 2018) demonstrating the need to **explore synergies and**

overlaps in the various dimensions of quality in ECEC, **especially between the school and home contexts**. Additionally, it is also important to understand teachers' competences as embedded in a wider context, **systems and structures** in ECEC either **support or impede** their development and effectiveness in developing a competent workforce and, ultimately ECEC quality (Eadie et al., 2024; Urban et al., 2012). As such, it is important to take an ecological view of teacher's PD, **investing attention and resources** into **in-service teacher training** and **ongoing research** on the topic, as well as **designing policies** to support **evidence-based PD** (Brunsek et al. 2020).

GUIDANCE, COLLABORATION, RECOMMENDATIONS, AND TRAINING SERVICES FOR FAMILIES

Providing guidance and training for parents is a crucial dimension of high-quality ECEC, supporting their ability to foster children's learning at home. Programmes like the Motheread/Fatheread Early Literacy Intervention, aimed at enhancing **shared reading** and **parents' competencies** by teaching essential literacy skills and dialogic reading practices. It adopts a curriculum that elicits not only literacy-specific skills such as vocabulary and comprehension but also the socio-emotional aspects of learning such as children's **engagement in reading**, a **safe and secure reading culture**, and families' **access to personal and cultural narratives** through **multicultural award-winning children's literature texts** (Hirsh et al., 2019). Similar results were found in other studies that used **digital tools** to boost reading routines at home by providing statistical reports on their progress and guidance on the implementation of techniques such as dialogic reading, exhibiting gains in cognitive and socio-emotional domains (Vargas-García et al., 2020).

Overall, the SCIREARLY project's examination of high-quality ECEC through Bronfenbrenner's model reveals the complex, multi-layered factors that influence high quality provisions in such an important stage of live. At the microsystem level, fostering warm, responsive and high-quality teacher-child, child-child interactions in a safer and supportive learning space is vital for creating environments that stimulate early literacy, numeracy, science, and socio-emotional learning and development in meaningful ways and promote overall well-being. The mesosystem highlights the importance of social and emotional well-being, interactive activities, targeted support for low-income and at-risk students, and synergies with families and community members. Finally, at the exosystem level, institutional practices such as parental involvement, teacher training, and tailored interventions play a critical role in enhancing both academic and well-being outcomes. Together, these

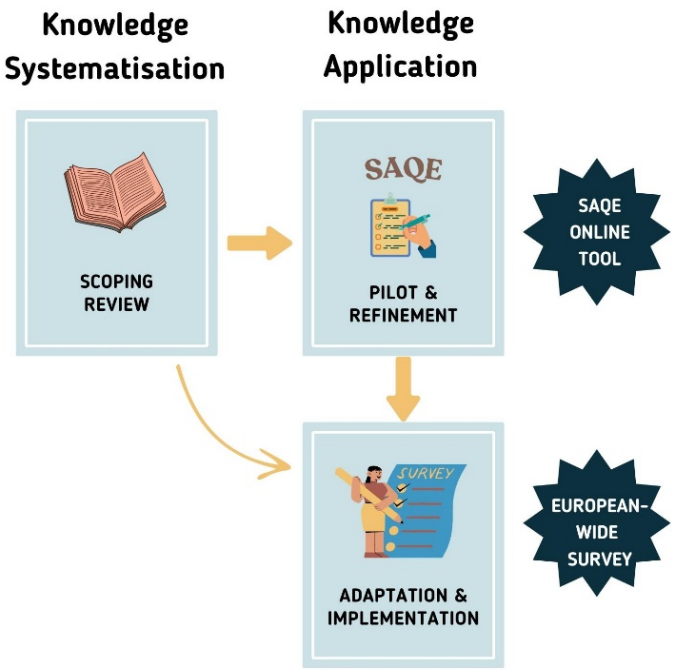
insights offer a comprehensive framework for understanding and improving ECEC provision across Europe, ensuring that all children receive the support they need for a successful start in life.

3.2. Analysing the state of early childhood education and care quality in Europe: Findings from a European-wide survey

The SCIREARLY team conducted a European-wide ECEC survey aimed at gaining a comprehensive overview of the quality of early childhood education and care (ECEC) services across Europe by gathering quantitative data on educators' and ECEC staff's perceptions. A total of 2,594 early years practitioners responded to the questionnaire across 28 EU countries. An ad-hoc online questionnaire was chosen for its flexibility and suitability for addressing specific research questions, while adhering to ethical and data-protection standards outlined in the SCIREARLY Ethics Protocol.

To elaborate the questionnaire, the SCIREARLY team drew on the scientific literature and in the Self-Assessment Quality Instrument for ECEC teachers (referred to as SAQE), both results from previous tasks conducted in the project. Figure 9 illustrates the process.

Figure 9. Development of the European-wide survey in SCIREARLY's Work Package 2 process



3.2.1. METHODS

The survey was conducted using a user-friendly online platform available in multiple languages, utilizing the CAWI (Computer-Assisted Web Interviewing) methodology. This approach allowed participants the flexibility to complete the survey at their convenience, enhancing accessibility and inclusivity across diverse participant groups. A subcontractor was engaged to set up and manage the online platform, ensure secure data storage, and support the SCIREARLY team in the survey's distribution. This included handling technical aspects, such as data encryption and secure access, to safeguard participant confidentiality and align with GDPR standards, as well as coordinating with the SCIREARLY team to maximise reach and engagement in survey dissemination.

Questionnaire Development

The SAQE instrument, which informed the development of the ad-hoc SCIREARLY questionnaire, was developed by adapting validated scales from previous studies and incorporating modifications tailored specifically for this study's objectives. In the pilot phase, the SAQE included key sections on I) Background information, II) Leadership in the ECEC centre, III) Professional support for staff, IV) Staff-guardian interactions, V) Staff-child interactions, and VI) Peer interactions among children. Following the pilot and a comprehensive review of the scientific literature under the SCIREARLY project, the final version of the questionnaire was refined to include: 1) Background information, 2) Group characteristics, 3) Staff-child interaction and relationships, 4) Staff-guardian relationships, 5) Professional support, and 6) Leadership practices.

To ensure the questionnaire was both concise and effective within a target completion time of 10 minutes, the instrument was refined to 29 items. This reduction was achieved through a rigorous, iterative process involving four rounds of review and feedback sessions among the SCIREARLY team, with input from experts and practitioners in the ECEC field. This collaborative refinement aimed to balance relevance, clarity, and brevity, increasing the likelihood of a high response rate. The initial questionnaire was developed in English and subjected to an in-depth review process by consortium members acting as expert judges, who resolved disagreements through structured discussion to finalise the tool. Once a consensus version was obtained, it was translated into 13 languages (Swedish, Danish, German, Spanish, French, Polish, Finnish, Romanian, Portuguese, Greek, Italian, Basque, and Catalan) and reviewed by native-speaking partners to ensure linguistic accuracy and cultural relevance.

Data collection

The survey was distributed from June through the first week of October 2023. During this period, the SCIREARLY team made extensive efforts to reach early years centres across various EU countries, promoting widespread participation among early childhood education practitioners. Achieving the final sample of 2,594 respondents was particularly challenging, given the typically low response rates associated with survey research in this field. In general, survey studies in early education contexts report response rates ranging between 10% and 30%, making our achievement significant within this challenging landscape. The team employed targeted distribution strategies, leveraging professional networks and partnerships to increase engagement, aiming to collect meaningful data representative of early years staff across the EU

Data analysis

Statistical analyses were conducted using IBM-SPSS Statistics (v28[1]), Jamovi[2] and Rstudio[3]. To explore the quality of ECEC services and identify the level of quality factors, the following statistical techniques and tests were applied:

Descriptive Analysis:

- Qualitative variables: Frequency tables and percentages.
- Quantitative variables: Measures of central tendency (mean, median), variability (range, standard deviation, interquartile range), and distribution (Kolmogorov-Smirnov test for normality, skewness, and kurtosis).

Exploratory Factor Analysis (EFA): To identify underlying structures and assess the interactions among components, EFA was performed using the minimum residual method to minimise residuals in model fitting, with an Oblimin rotation to account for potential correlations between dimensions.

Confirmatory Factor Analysis (CFA): CFA was used to confirm the factor structure identified in the EFA by assessing how well each item aligned with its respective latent variable, thus ensuring the construct validity of the identified dimensions.

Group Comparison Analysis:

- **ANOVA (Analysis of Variance):** ANOVA was conducted to compare mean scores across multiple groups based on sociodemographic variables such as gender, age, and experience in ECEC. The effect sizes were interpreted as follows:
- 0.010 (1%) – 0.059 (5.9%): Small effect

[1] IBM Corp. Released 2024. IBM SPSS Statistics for Windows, Version 28.0. Armonk, NY: IBM Corp.
[2] The jamovi project, 2024. jamovi. (Version 2.6) [Computer Software]. Retrieved from https://www.jamovi.org)
[3] R Core Team, 2024. R: A Language and environment for statistical computing. (Version 4.4) [Computer Software]. Retrieved from https://cran.r-project.org. (R packages retrieved from CRAN snapshot 2024-08-07))

- 0.060 (6%) – 0.139 (13.9%): Medium effect
- Greater than 0.14 (14%): Large effect
- **Kruskal-Wallis test**: When the normality assumption was not met, this non-parametric test was applied to compare median values across multiple groups.
- **Post-hoc tests** (Tukey and Mann-Whitney):
- **Tukey's HSD Test**: Following significant ANOVA results, Tukey's test identified specific group pairs with statistically significant differences.
- **Mann-Whitney Test**: This non-parametric test was used as a follow-up to Kruskal-Wallis, enabling robust comparisons between groups without assuming normality.
- **Predictive Linear Regression Model**: Linear regression analysis was applied to explore the relationship between key independent variables and specific outcomes, identifying significant predictors and providing insights into the influence of participant characteristics on survey dimensions.

Finally, a descriptive analysis was performed on the four key factors identified, each assessed across four rating levels. The composition and rating ranges for each factor are outlined below

Table 4. Factors of interest and ratings applied

Factor 1. Nurturing environment and responsive interactions	• Low: 5–10 • Medium-low: 11–15 • Medium-high: 16–20 • High: 21–25
Factor 2. Engaging pedagogical practices	• Low: 3–6 • Medium-low: 7–9 • Medium-high: 10–12 • High: 13–15
Factor 3. Family involvement in learning	• Low: 3–6 • Medium-low: 7–9 • Medium-high: 10–12 • High: 13–15
Factor 4. Research-informed professional development and collaborative leadership	• Low: 5–10 • Medium-low: 11–20 • Medium-high: 21–30 • High: 31–35

3.2.2. KEY FINDINGS FROM THE SURVEY

Overall, the results of this report demonstrate that high-quality ECEC encompasses several common elements identified in previous studies on effective ECEC provision. These elements include teacher-student and peer relationships, teacher professional development, leadership styles, and the types of learning activities aimed at improving basic skills and socio-emotional development in ECEC settings. The results of the European survey indicate that social-emotional well-being tends to be prioritised in European ECEC. Also, the findings suggest that teachers are willing to involve family in daily educative activities and allow them to collaborate in the educative decision making. Finally, it is also important to mention that the participating teachers consider that they have a good work environment and emphasise the good leadership and support of other colleagues and the centre's management. The quantitative results are presented below.

Descriptive analysis

This section presents the demographic profile of the survey participants and their responses to each questionnaire item. These findings help map the implementation of high-quality Early Childhood Education and Care (ECEC) practices across Europe, focusing on core dimensions such as classroom interactions and environment, family involvement, and institutional factors like decision-making participation and staff support.

SOCIODEMOGRAPHIC INFORMATION OF THE SAMPLE

Table 5 provides an overview of the demographic characteristics of the sample, which includes 2,594 early years staff from various European countries. Most participants identify as female (86.2%), with a notable 55.3% in the 31-50 age range. Experience levels in Early Childhood Education and Care (ECEC) vary, though a significant portion (44.3%) has over 15 years in the field. Geographically, the sample reflects representation from Northern, Central, and Southern Europe, with the largest group from Southern Europe (58.3%). In terms of educational qualifications, the majority hold a bachelor's degree (43.8%), followed by a master's degree (27.4%), while doctoral qualifications are the least common, representing 3.1% of respondents.

Table 5. Sociodemographic data.

Items (N=2594)		Descriptive
Q1. Do you identify as...	*1. Male*	13.3% (345)
	2. Female	**86.2% (2235)**
	3. Other	**.1% (3)**
	4. Prefer not to say	.4% (11)
Q2. Which of the following age groups do you belong to?	*1. Under 18*	-
	2. 18-30	17.6% (457)
	3. 31-40	26.3% (683)
	4. 41-50	**29.0% (751)**
	5. 51-60	21.8% (566)
	6. Over 60	**5.3% (137)**

Q3. How long have you worked in an Early Years setting?	*1. 0-6 years*	30.3% (787)
	2. 7-15 years	**25.3% (657)**
	3. More than 15 years	**44.3% (1150)**
Q4. I am staff in an ECEC centre in:	*01. Austria*	**.1% (1)**
	02. Belgium	.2% (5)
	07. Denmark	5.4% (141)
	09. Finland	1.2% (30)
	10. France	3.2% (82)
	11. Germany	5.9% (152)
	12. Greece	6.2% (161)
	14. Republic of Ireland	4.1% (106)
	15. Italy	16.2% (419)
	18. Luxembourg	.1% (2)
	19. Malta	2.1% (55)
	20. Netherlands	1.4% (36)
	21. Poland	4.2% (108)
	22. Portugal	6.8% (176)
	23. Romania	2.2% (56)
	26. Spain	**29.7% (770)**
	27. Sweden	4.0% (104)
	28. United Kingdom (UK)	7.3% (190)
Q4. Geographical area	*1. South*	**58.3% (1513)**
	2. Center	**19.7% (510)**
	3. North	22.0% (571)
Q6. What is your highest qualification?	*1. High school*	17.4% (452)
	2. Bachelor's degree	**43.8% (1136)**
	3. Master's degree	27.4% (712)
	4. Doctoral degree	**3.1% (81)**
	5. Other (please specify)	8.2% (213)
Q7. Select the qualifications you have to work in ECEC.	*Teacher*	59.3% (1539)
	Child career	25.6% (665)
	Special education teacher	15.7% (406)
	Personal care assistant	8.1% (211)
	Head of early education centre	13.6% (352)

Q9. How many children are in your group?	*01. 5 or less*	**4.7% (123)**
	02. 6-10	11.8% (305)
	03. 11-15	18.4% (478)
	04. 16-20	**30.8% (800)**
	05. 21-25	24.1% (626)
	06. 26 or more	10.1% (262)
Q10. How many different languages are spoken by the children in your group?	*01. 1-2*	**63.2% (1639)**
	02. 3-4	27.1% (703)
	03. 5-6	6.9% (180)
	04. 7-8	1.4% (37)
	05. 9 or more	**1.3% (35)**
Q11. How many children with special educational needs are in your group?	*01. None*	26.6% (689)
	02. 1-2	**34.3% (889)**
	03. 3-4	14.5% (377)
	04. 5-6	3.5% (92)
	05. 7-8	**2.0% (51)**
	06. 9 or more	19.1% (496)

MAPPING ECEC AROUND EUROPE

Table 6 presents survey responses on practices within early childhood education and care (ECEC), covering items Q12-Q20. These items were rated on a 5-point Likert scale, with 1 representing "Never" and 5 representing "Always," reflecting the frequency of each practice. A large proportion of respondents reported that **calm and high-quality adult-child interactions occur** "often" (42.4%) or "always" (40.6%), resulting in a mean score of 4.19 (±0.82), indicating that these practices are common across ECEC settings.
A strong commitment to cultural diversity is evident, with 52.5% of respondents stating they "always" **recognise and respect each child's language and culture**. This item had a mean score of 4.31 (±0.89) and a median of 5. Regarding free play with **diverse, open-ended materials that encourage curiosity**, 51.1% of respondents indicated that this activity is "always" provided, with a mean score of 4.30 (±0.85), underscoring also its value in ECEC.

When asked about organizing activities to **explore scientific ideas**, responses were more varied, with 22.8% indicating "always" and 41.8% selecting "often." The mean score of 3.80 (±0.89) suggests that scientific exploration, while present, may benefit from further integration. Classification activities by shape or colour were rated "often" by 43.1% of participants, while 29.6% stated this practice occurs "always," yielding a mean score of 3.94 (±0.93) and a median of 4, indicating moderate implementation with room for enhancement.
Literacy development through songs, rhythms, and reading is notably high, with 54.7% reporting "always" using these methods, resulting in a mean score of 4.38 (±0.82). This suggests that musical and reading activities are foundational tools for literacy in ECEC. Similarly, **creating a safe and supportive learning environment** is emphasised, with a mean score of 4.53 (±0.71) and 63.6% of respondents affirming they "always" ensure such an environment.

Time for guided play, with a mean score of 4.19 (±0.85) and 42.2% indicating "always," is a valued practice, though it is slightly less prevalent than practices supporting safety and cultural respect. Finally, the practice of encouraging social interaction—promoting mutual help and sharing among children—is the most frequently reported, with 71.7% stating this is "always" encouraged. This item received a mean score of 4.63 (±0.66), highlighting **a strong emphasis on social interaction within ECEC settings.**

Table 6. Frequency of Core Educational Practices in ECEC

How often do the following practices take place in your ECEC setting?							
Items / Responses	**1. Never**	**2. Rarely**	**3. Sometimes**	**4. Often**	**5. Always**	**Mean ± SD**	**Median (IQR)**
We develop a calm and unhurried environment that embraces high-quality adult-child interactions.	.5% (12)	3.3% (86)	13.3% (345)	42.4% (1099)	40.6% (1052)	4.19 ± .82	4 (1)
We acknowledge, respect and respond to every child's home language and culture	1.0% (26)	3.9% (101)	11.1% (289)	31.4% (815)	52.5% (1363)	4.31 ± .89	5 (1)
Children have opportunities for indoor and outdoor free play with a variety of purposeful materials, including open-ended materials, that encourage curiosity and discovery	.8% (20)	2.8% (72)	12.8% (333)	32.5% (843)	51.1% (1326)	4.30 ± .85	5 (1)
We organise classroom activities to explore science ideas.	.9% (23)	5.9% (154)	28.6% (741)	41.8% (1085)	22.8% (591)	3.80 ± .89	4 (1)
We use sorting activities by shape or colour.	2.0% (51)	4.9% (126)	20.4% (530)	43.1% (1119)	29.6% (768)	3.94 ± .93	4 (2)
We include songs, rhythms and reading as part of our daily practice for literacy development.	.8% (21)	2.5% (65)	9.3% (240)	32.7% (849)	54.7% (1419)	4.38 ± .82	5 (1)
We make sure to create a safe and supportive learning environment (for instance, by providing reciprocal, responsive, and secure interactions, celebrating everyone's' identity an	.3% (7)	1.2% (31)	7.5% (195)	27.4% (711)	63.6% (1650)	4.53 ± .71	5 (1)
We ensure time for guided play so that children's learning can be expanded beyond what they can achieve alone.	.8% (22)	3.2% (82)	13.9% (360)	39.9% (1036)	42.2% (1094)	4.19 ± .85	4 (1)
We encourage children to interact with each other, to help each other, and to share	.4% (11)	.8% (22)	5.3% (138)	21.7% (563)	71.7% (1860)	4.63 ± .66	5 (1)

The second item, which focuses on promoting learning opportunities at home with children, received predominantly "frequently" (41.0%) and "always" (33.9%) responses. This item achieved a mean score of 4.03 (± 0.89) and a median of 4, with an IQR of 2, indicating that it is generally a common practice within ECEC settings and implemented slightly more consistently than the previous item.

Finally, involving parents in decision-making regarding their children's care and learning also showed strong engagement, with 38.5% indicating "frequently" and 35.5% indicating "always." This item had a mean score of 4.03 (± 0.91), along with a median of 4 and an IQR of 2, further underscoring that parent involvement in decision-making is a prioritised and regularly implemented practice.

Table 7. Frequency of Family Engagement Practices in ECEC Settings

We encourage and support parents/guardians and other relevant adults to:							
Items / Responses	**1. Never**	**2. Rarely**	**3. Sometimes**	**4. Often**	**5. Always**	**Mean ± SD**	**Median (IQR)**
Spend time in the setting and experience the care and learning their children receive is encouraged, supported, and respected.	**1.8% (47)**	**7.8% (203)**	**22.8% (592)**	**36.2% (939)**	**31.3% (813)**	**3.87 ± 1.00**	**4 (2)**
Engage in meaningful learning opportunities with their children at home.	**.8% (22)**	**4.2% (110)**	**20.0% (520)**	**41.0% (1063)**	**33.9% (879)**	**4.03 ± .89**	**4 (2)**
Take part in the decision-making process on issues related to their children's education.	**.8% (21)**	**4.9% (126)**	**20.4% (528)**	**38.5% (998)**	**35.5% (921)**	**4.03 ± .91**	**4 (2)**

Table 8 presents a frequency analysis and exploratory study of variables related to the work environment in Early Childhood Education and Care (ECEC) settings, specifically focusing on staff perceptions of supportiveness and access to feedback. Regarding the supportiveness of the work environment, 38.6% of respondents (1,001) agreed that the environment is supportive, with an additional 28.9% (749) indicating strong agreement. This suggests a generally positive perception among staff; however, 9.1% (235) responded neutrally, and 9.2% (241) expressed some level of disagreement, indicating that not all individuals feel equally supported. The mean score for this item was 5.61 (± 1.43), with a median of 6 and an interquartile range (IQR) of 2, reflecting a trend toward agreement on a Likert scale of 1 to 7. For the second item, which examines staff perceptions of their ability to seek advice and receive feedback, 35.5% (920) of respondents agreed, and 29.2% (757) strongly agreed, indicating a generally positive view on this aspect of the work environment. However, 10.1% (261) responded neutrally, and 9.2% (239) disagreed to some extent, suggesting that feedback and communication practices may vary. The mean score of 5.59 (± 1.42), along with a median of 6 and an IQR of 2, similarly indicates a positive trend in responses.

Table 8. Supportiveness and Feedback in ECEC Work Environments

The working atmosphere in my ECEC is supportive of staff								
1. Strongly Disagree	**2. Disagree**	**3. Slightly Disagree**	**4. Neutral**	**5. Slightly Agree**	**6. Agree**	**7. Strongly Agree**	**Mean ± SD**	**Median (IQR)**
2.5% (65)	**2.2% (58)**	4.5% (118)	9.1% (235)	14.2% (368)	**38.6% (1001)**	28.9% (749)	5.61 ± 1.43	6 (2)
In my ECEC, staff can ask for advice and receive feedback								
1. Strongly Disagree	**2. Disagree**	**3. Slightly Disagree**	**4. Neutral**	**5. Slightly Agree**	**6. Agree**	**7. Strongly Agree**	**Mean ± SD**	**Median (IQR)**
1.8% (47)	3.0% (79)	4.4% (113)	10.1% (261)	16.1% (417)	**35.5% (920)**	29.2% (757)	5.59 ± 1.42	6 (2)

Table 9 provides a frequency analysis and exploratory overview of leadership practices in ECEC, focusing on three areas: staff participation in pedagogical decision-making, collaboration in developing action plans aligned with the centre's mission, and constructive feedback provided by leaders to educators.

For staff participation in pedagogical decision-making, 35.9% of respondents (931) indicated agreement, and 26.4% (685) expressed strong agreement, reflecting a positive view of involvement. However, 11.3% (292) remained neutral, and 10% (257) expressed some level of disagreement, suggesting that not all staff feel included in decision-making processes. The mean score for this item was 5.50 (± 1.46), with a median of 6 and an interquartile range (IQR) of 2, indicating a general trend toward positive perceptions.
Regarding collaboration on action plans aligned with the centre's mission, 36.5% of respondents (946) agreed, and 28.4% (736) strongly agreed, indicating widespread collaboration. Nonetheless, 9.9% (256) remained neutral, and 8.8% (228) showed some disagreement, suggesting that a small portion of staff may feel less involved in planning. This item's mean score was 5.59 (± 1.40), with a median of 6 and an IQR of 2, reinforcing a positive perception of collaborative action planning.

Finally, in terms of constructive feedback from leaders, 34.9% (905) agreed, and 26.9% (697) strongly agreed, suggesting primarily positive perceptions. However, 11.4% (295) remained neutral, and 9.9% (258) expressed some level of disagreement, highlighting that some educators may feel they do not receive adequate feedback. This item yielded a mean score of 5.49 (± 1.47), with a median of 6 and an IQR of 2, reflecting a favourable overall perception of leadership feedback.

Table 9. Leadership and Collaborative Practices in ECEC Settings

How is the leadership of your ECEC setting? Staff members at my ECEC setting are involved in decisions about using new pedagogical methods.								
1. Strongly Disagree	**2. Disagree**	**3. Slightly Disagree**	**4. Neutral**	**5. Slightly Agree**	**6. Agree**	**7. Strongly Agree**	**Mean ± SD**	**Median (IQR)**
2.4% (62)	3.2% (82)	4.4% (113)	11.3% (292)	16.5% (429)	**35.9% (931)**	26.4% (685)	5.50 ± 1.46	6 (2)
At my ECEC setting, together with the leader/ manager, we focus on the vision and goals of the setting and collaboratively create an action plan to move towards our vision and mission.								
1. Strongly Disagree	**2. Disagree**	**3. Slightly Disagree**	**4. Neutral**	**5. Slightly Agree**	**6. Agree**	**7. Strongly Agree**	**Mean ± SD**	**Median (IQR)**
1.8% (47)	2.9% (75)	4.1% (106)	9.9% (256)	16.5% (428)	**36.5% (946)**	28.4% (736)	5.59 ± 1.40	6 (2)
At my ECEC setting, the leader provides constructive feedback to Childcare Educators on their observation, planning and assessment pedagogical processes to support the holistic development of all children.								
1. Strongly Disagree	**2. Disagree**	**3. Slightly Disagree**	**4. Neutral**	**5. Slightly Agree**	**6. Agree**	**7. Strongly Agree**	**Mean ± SD**	**Median (IQR)**
2.2% (58)	3.7% (96)	4.0% (104)	11.4% (295)	16.9% (439)	**34.9% (905)**	26.9% (697)	5.49 ± 1.47	6 (2)

Finally, survey results on research-informed training at ECEC settings (item 24) reveal that most centres provide specialised training in key developmental areas. A majority (72.0%) indicated that their centre offers training in fostering basic skills, while 28.0% reported that such training is not available. Training focused on socioemotional development is also common, with 67.2% of respondents affirming its availability, though 32.8% reported its absence. Additionally, 70.5% of participants stated that their centre promotes training centred on child well-being, while 29.5% noted a lack of this focus. Training in diversity-related topics, such as supporting children with special needs or from varied backgrounds, was available to 66.0% of respondents, while 34.0% indicated this training was not provided at their centre.

Validation of the questionnaire

After examining the descriptive statistics, the next step is a more in-depth validation of the questionnaire to ensure it meets the study's objectives. This validation aims to confirm that the instrument is: (1) suitable for achieving the study's goals, (2) statistically valid (capable of accurately measuring the intended characteristics), (3) sensitive to detecting changes both across different individuals and within the same individual over time, and (4) clearly structured with well-defined components (factors) that contribute independently to the overall scale, ensuring construct validity.

To accomplish this, an initial exploratory factor analysis (EFA) was conducted (see Annex 5), revealing five factors. However, one of these factors showed low factor loadings and suboptimal goodness-of-fit indices,

suggesting room for improvement. Consequently, item 15, "We organise classroom activities to explore science ideas," was removed due to its low contribution to the factor structure. A revised EFA was then conducted (Table 10), followed by a confirmatory factor analysis (CFA) to finalise the model (Table 21). This final CFA model, with improved goodness-of-fit and statistical significance, is presented as the validated version of the questionnaire, included in Annex 7.

Table 10. Factor Loadings by Items (exploratory 4-factor without item Q15).

Items	Factor				Uniqueness
	1	2	3	4	
Q12	.146	.098	.100	.495	.546
Q13	.058	.044	.192	.465	.618
Q14	.170	.249	.048	.355	.591
Q16	.066	.625	.081	-.212	.623
Q17	-.018	.707	-.020	.024	.505
Q18	.030	.395	.056	.362	.517
Q19	.000	.617	.037	.076	.544
Q20	.014	.526	.012	.255	.513
Q21	.048	-.093	.583	.070	.648
Q22	-.014	.052	.763	-.057	.417
Q23	-.009	-.015	.633	.068	.578
Q25	.645	-.011	-.012	.077	.553
Q26	.653	-.001	.031	.026	.542
Q27	.777	.013	-.021	-.026	.417
Q28	.827	-.007	-.024	.019	.325
Q29	.793	-.009	.032	-.054	.382

Table 11 provides a summary of the variance explained by each factor in the exploratory model. The data indicate that, while the first two factors are the most prominent, the combined four factors account for nearly half of the variability within the studied construct.

Table 11. Summary of Factors, Explained Variance, and Percentage of Cumulative Variance (exploratory 4-factor without item Q15).

Factor	SC Loads	% of variance	% Cumulative variance
1	2.92	18.40%	18.40%
2	2.04	12.73%	31.10%
3	1.53	9.56%	40.70%
4	1.17	7.31%	48.00%

The following table shows the correlations between the factors. These indices, all significant, suggest that the factors are interrelated.

Table 12. Correlations Between Factor (exploratory 4-factor without item Q15)

Factor	2	3	4
1	.346	.439	.366
2		.471	.483
3			.364

Table 13 presents an RMSEA of .0329, indicating an excellent fit for the model. The TLI is .976, which also suggests a good fit, and the BIC is -252, suggesting that the model is competitive compared to other models.

Table 13. Model Fit for Exploratory Factor Analysis (RMSEA, TLI, BIC, and Model Tests) (EFA) (exploratory 4-factor without item Q15)

RMSEA	IC 90% RMSEA		TLI	BIC	Prueba Modelo		
	Inf	Sup			χ^2	gl	p-valor
.0329	.0285	.0374	.976	-252	236	62	<.001

Table 14 shows that Bartlett's sphericity test is significant, which indicates that the correlation matrix is suitable for factor analysis.

Table 14. Bartlett's Test of Sphericity (EFA). (Without item Q15)

Bartlett's Test of Sphericity		
χ^2	gl	p-valor
14206	120	<.001

Table 15 shows an overall KMO of .910, with MSA values of the items greater than .885, therefore, the data is appropriate for the factor analysis.

Table 15. Global Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and by Items (EFA) (exploratory 4-factor without item Q15)

Measure of Sampling Adequacy KMO						Global	.910
Ítem	MSA	Ítem	MSA	Ítem	MSA	Ítem	MSA
Q12	.930	Q17	.895	Q21	.885	Q26	.930
Q13	.931	Q18	.925	Q22	.867	Q27	.908
Q14	.947	Q19	.917	Q23	.878	Q28	.888
Q16	.887	Q20	.907	Q25	.932	Q29	.899

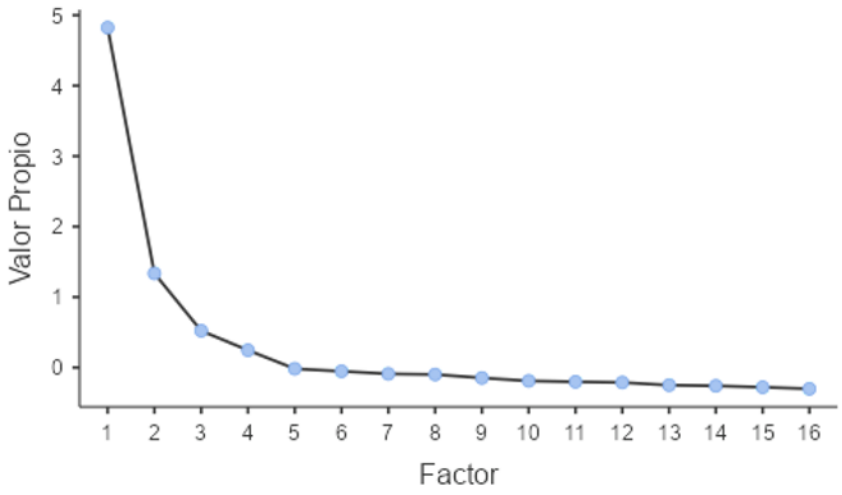
Table 16 shows that Factor 1 has a self-value of 4.823, which suggests that it captures a considerable amount of variance. Factor 2 shows a self-value of 1.336, which, although lower, still indicates that it has a moderate ability to explain the variance in the data. Factors 3 and 4 have eigenvalues of 0.521 and 0.245, respectively, indicating that their contribution to variance is low. Factors 5 to 16 have negative eigenvalues, suggesting that they are not significant and do not provide useful information for the model.

Table 16. Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy by Factors and Eigenvalues (EFA) (exploratory 4-factor without item Q15)

Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy							
Factor	**Eigenvalue**	**Factor**	**Eigenvalue**	**Factor**	**Eigenvalue**	**Factor**	**Eigenvalue**
1	**4.823**	5	-.017	9	-.148	13	-.250
2	**1.336**	6	-.053	10	-.190	14	-.260
3	**.521**	7	-.090	11	-.203	15	-.280
4	**.245**	8	-.099	12	-.212	16	-.302

Figure 10 shows the scree plot of the Exploratory Factor Analysis for four factors after excluding item Q15. The first factor has an eigenvalue greater than 5, indicating it explains a substantial proportion of the variance. Additionally, a sharp drop in eigenvalues between the first and second factors suggests that the first factor is the most significant. The eigenvalues for the remaining factors decline and stabilise at lower levels, reflecting their relatively minor contributions to the total variance. The simulated eigenvalues are lower than those of the actual data, indicating that the real data more effectively captures the structure compared to the simulated data.

Figure 10. Scree Plot of Factors and Corresponding Eigenvalues from the Exploratory Factor Analysis (EFA) (exploratory 4-factor without item Q15)



The model accounts for approximately 48% of the total variance, underscoring the influence of the first factor. Correlations between factors indicate significant interrelationships, while fit indices, such as RMSEA and KMO, confirm that the data are appropriate for this analysis.

Based on the preceding exploratory analyses and the scientific literature, a confirmatory factor analysis was conducted, focusing on the following factors:

- Factor 1. Nurturing environment and responsive interactions: items 12 + 13 + 14 + 18 + 20
- Factor 2. Engaging pedagogical practices: items 16 + 17 + 19
- Factor 3. Family involvement in learning: items 21 to 23
- Factor 4. Research-informed professional development and collaborative leadership: items 25 to 29

Table 17 shows the standardised factor loads of each item in the confirmatory factor analysis (CFA). Overall, items present statistically significant relationships with their respective factors, with high Z-values and low standard errors, which indicates the accuracy and stability of the estimates.

Table 17. Factor Loadings by Items (CFA) (Without item Q15)

Factor	Item	Standard stimator	Stimator (IC 95%)	EE	Z (p-valor)
F1	Q12	**.626**	.515 (.484-.546)	.016	32.5** (< .001)
	Q13	**.563**	.501 (.466-.535)	.017	28.6** (< .001)
	Q14	**.640**	.546 (.514-.578)	.016	33.5** (< .001)
	Q18	**.695**	.493 (.467-.519)	.013	37.3** (< .001)
	Q120	**.675**	.448 (.424-.473)	.012	35.8** (< .001)
F2	Q16	**.557**	.519 (.481-.557)	.019	26.8** (< .001)
	Q17	**.689**	.563 (.531-.595)	.016	34.4** (< .001)
	Q19	**.697**	.594 (.560-.627)	.017	35.1** (< .001)
F3	Q21	**.580**	.580 (.539-.621)	.021	27.7** (< .001)
	Q22	**.744**	.659 (.624-.695)	.018	36.1** (< .001)
	Q23	**.667**	.606 (.569-.642)	.019	32.3** (< .001)
F4	Q25	**.663**	.946 (.895-.998)	.026	36.0** (< .001)
	Q26	**.672**	.954 (.903-1.006)	.026	36.6** (< .001)
	Q27	**.762**	1.110 (1.061-1.160)	.026	43.5** (< .001)
	Q28	**.824**	1.153 (1.107-1.200)	.024	48.6** (< .001)
	Q29	**.786**	1.151 (1.102-1.201)	.025	45.5** (< .001)

Finally, Table 18 shows the key indicators of model fit in Confirmatory Factor Analysis (CFA). Overall, the model presents a good fit, showing an adequate RMSEA and TLI.

Table 18. Model Fit for Exploratory Factor Analysis (RMSEA, TLI, BIC, and Model Tests) (CFA). (Without item Q15)

RMSEA	IC 90% RMSEA		TLI	BIC	Prueba Modelo		
	Inf	Sup			χ^2	gl	p-value
.0459	.0425	.0493	.954	104206	633	98	<.001

Following the questionnaire validation, new dimensions were established to frame the analysis. Table 19 presents descriptive data, including average scores, for these dimensions to provide a comprehensive overview of these aspects at the European level. The study shows that most participants rated highly in terms of classroom environment and interactions, as well as in the educational strategies employed. In contrast, family involvement and institutional factors tended to receive medium-high scores. These findings align with evidence from the scoping review, which underscores the value of teaching foundational skills through diverse methods such as play, rhythm, and movement, and emphasises the importance of maximizing learning within natural contexts.

It is particularly important to examine the moderate scores on family inclusion in educational practices, as the literature highlights its essential role in both academic and psycho-emotional development. Additionally, the findings on institutional support suggest that it may not be as robust as expected. Given their significance, these areas will be explored further in the upcoming focus groups.

Table 19. Frequency Table. Factors.

Items (N=2594)		**Descriptive**
F1. Nurturing environment and responsive interactions	*1. Low*	4.0% (11)
	2. Low medium	3.8% (98)
	3. Medium High	21.1% (548)
	4. High	74.7% (1937)
F2. Engaging pedagogical practices	*1. Low*	1.2% (32)
	2. Low medium	7.7% (200)
	3. Medium High	35.3% (916)
	4. High	55.7% (1446)
F3. Family Engagement in learning	*1. Low*	1.6% (42)
	2. Low medium	12.9% (334)
	3. Medium High	43.8% (1136)
	4. High	41.7% (1082)
F4. Research-informed professional development and collaborative leadership	*1. Low*	1.3% (33)
	2. Low medium	10.7% (277)
	3. Medium High	52.5% (1362)
	4. High	35.5% (922)

Inferential analysis

To examine the significant differences among various sociodemographic aspects and dimensions of quality ECEC, and to understand which aspects influence others, several inferential analyses were conducted. This section highlights the differences in ECEC quality based on sociodemographic factors and explores how family involvement, institutional support, and specific pedagogical strategies contribute to fostering a positive ECEC environment.

SOCIODEMOGRAPHIC DIFFERENCES IN QUALITY DIMENSIONS

This subsection focuses on significant differences observed in quality dimensions across sociodemographic groups.

- **Gender differences**: Statistically significant differences were found in pedagogical strategies, with female practitioners more frequently employing these strategies (t = -2.46**; d = .142). Women also reported greater perceptions of support and shared leadership within their ECEC centres (t = 7.40*; d = .114).

- **Age groups**: Age was significantly related to perceived support from the institution, with practitioners aged 51-60 reporting the highest levels of support, while the youngest group (18-30) reported the lowest (ANOVA = 3.73**; Eta C. = .006).

- **Teaching experience**: Teaching experience positively influenced perceptions of institutional support and involvement in decision-making, with more experienced educators reporting higher levels of support (ANOVA = 8.59**; Eta C. = .007) and greater participation in decisions (ANOVA = 11.54**; Eta C. = .009). Additionally, greater teaching experience was associated with increased use of pedagogical strategies and promotion of classroom interactions (ANOVA = 20.43**; Eta C. = .016).

- **Academic qualification**: Interestingly, practitioners with a bachelor's degree scored significantly higher in the use of pedagogical strategies compared to those with a master's degree (ANOVA = 2.40*; Eta C. = .004).

- **Geographical region**: Regional differences also emerged, with Southern European countries scoring significantly higher on the use of pedagogical strategies (ANOVA = 23.70**; Eta C. = .018) and the creation of a safe classroom environment (ANOVA = 24.27**; Eta C. = .018). Notably, Italy had the highest scores in pedagogical practices and classroom environment, while France had the lowest (ANOVA = 12.18**; Eta C. = .067). For family involvement, the United Kingdom reported the highest levels, with France again reporting the

lowest (ANOVA = 12.18**; Eta C. = .067). Regarding institutional support, Italy also led with the highest scores in both perceived institutional support (ANOVA = 8.21**; Eta C. = .035) and participation in decision-making (ANOVA = 9.15**; Eta C. = .044), with France having the lowest scores in both areas.

REGRESSION MODEL: INFLUENCE OF FAMILY INVOLVEMENT, PEDAGOGICAL STRATEGIES, AND ECEC ORGANISATIONAL SUPPORT ON CLASSROOM INTERACTIONS AND ENVIRONMENT

A regression model was conducted to test the hypothesis that institutional factors, family involvement, and pedagogical strategies impact the environment and interactions within the classroom. The results indicate a moderate to high correlation between the predictor factors and the outcome variable, suggesting that these predictors are meaningful contributors to the classroom environment. The model explains 45.5% of the variance in the outcome variable, with statistical significance, indicating that these predictor factors collectively account for a substantial portion of the variance in classroom interactions and environment (Table 20).

Table 20. Model Fit Measures (Factors 2, 3, and 4 Predict Factor 1)

R	R^2	AIC	BIC	RMSE	Model Fit			
					χ^2	Gl1	gl2	p-valor
.674	.455	11252	11281	2.11	720	3	2590	<.001

Table 21 presents the estimators, standard error (SE), test statistic (T), associated p-value, and standardised estimator. The results indicate that educational strategies have the greatest influence on fostering a positive classroom environment, followed by family involvement and institutional factors. Consistent with previous findings, teachers surveyed reported a strong use of varied pedagogical strategies and research-informed educational practices in ECEC. However, while family involvement is recognised as important, it appears to require further enhancement. Although institutional support and training were also identified as predictors in the model, they contributed the least within the studied contexts. This finding suggests a need for further investigation, as responses in this area were varied, with overall levels tending toward medium-low.

Table 21. Model coefficients (Factors 2, 3, and 4 predict Factor 1)

Predictor	Estimator	SE	T	p-value	Standardised Estimator
Constant	7.667	.311	24.60**	<.001	-
F2	.585	.022	26.50**	<.001	.417
F3	.281	.020	13.50**	<.001	.217
F4	.131	.008	16.60**	<.001	.262

NS *Not significant,* † *Marginally significant (p<.10),*
** Significant (p<.05) and ** Highly significant (p<.01)*

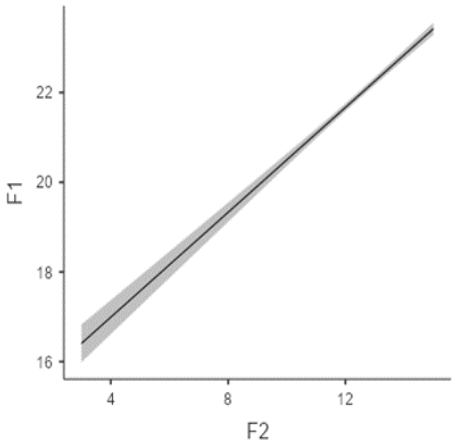
Regarding the collinearity diagnostics (see Table 22), the variance inflation factor (VIF) values for all predictors are moderate, indicating no collinearity issues within the model.

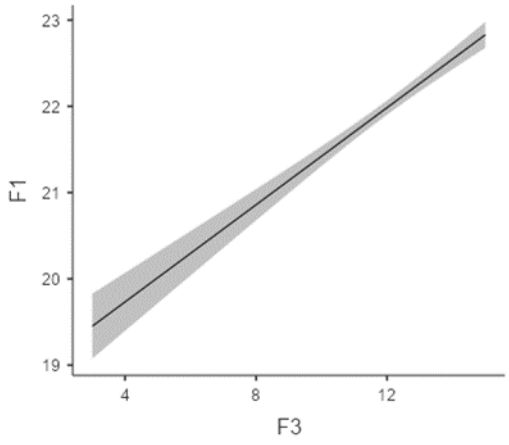
Table 22. Collinearity Statistics (Factors 2, 3, and 4 predict Factor 1)

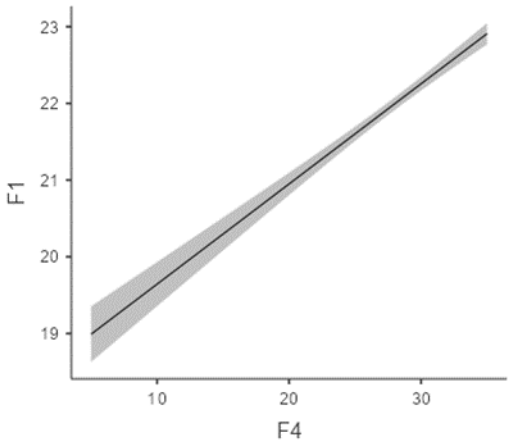
Predictor	VIF	Tolerance
F2	.585	.022
F3	.281	.020
F4	.131	.008

In conclusion, the model demonstrates an acceptable fit, with statistically significant coefficients and estimators across all predictors and no evidence of collinearity problems. Factor 2 appears to be the most influential predictor for explaining Factor 1. Figure 11 illustrates the relationship between the marginal measures of each predictor and Factor 1, showing a direct association for each factor.

Figure 11. Estimated marginal means by factor and according to the variable to be predicted







3.3. Co-creating Recommendations for High-Quality Early Childhood Education and Care: Voices from Children, Families, and Schools

The insights gathered from the previous knowledge systematization and application phases were shared in an open dialogue with diverse stakeholders—young children, families, and ECEC staff—through a co-creation process aimed at shaping policy recommendations to enhance ECEC quality in Europe. Adopting a collaborative and dialogic approach was essential for ensuring that these recommendations were socially responsive and had the potential for meaningful impact. By incorporating a range of perspectives, the process fostered shared ownership and empowered participants to contribute actively to the envisioned changes, aligning recommendations closely with the real needs and experiences of those directly involved in ECEC.

Furthermore, the inclusion of young children's voices highlights the importance of recognizing children's rights to express their thoughts, views, and opinions, particularly on matters that affect them. This approach aligns with the principles outlined in the United Nations Convention on the Rights of the Child (1989), underscoring the role of children as active participants in society. The dialogic co-creation process, therefore,

not only enriches the policy recommendations but also strengthens their social relevance and potential for lasting social impact.

3.3.1. METHODS

The voices and experiences of children, families, and staff from the participating centres are central to this study. A total of 16 focus groups were conducted with young children, families, and ECEC staff, involving 111 participants overall, in an environment that prioritised inclusivity and mutual understanding. A focus group protocol (Annex 8), developed by the SCIREARLY team at KMOP, was shared with four partners in Finland, Italy, Portugal and Spain. This protocol provided detailed guidance on focus group preparation and facilitation, ensuring representation across target groups (children, families, and ECEC staff). It included recommendations on group size, discussion structure, phrasing and adapting questions to each audience, ethical guidelines, and sample prompts.

Finland: The Finnish focus groups included a diverse array of teachers, children, and guardians, each bringing unique perspectives. Five female teachers aged 30 to 65 participated, all holding master's degrees in education, with some holding additional qualifications (one with a licentiate degree and another with a PhD). Their teaching experience ranged from 5 to 40 years across various Finnish schools, including one specializing in special education. The student group included six children (three boys and three girls), predominantly Finnish, with one child from Estonia. Among guardians, four of the five original volunteers participated (three females and one male), with three Finnish and one Estonian participant.

Italy: In Italy, six parents (five women and one man) of children aged 4 to 6 participated in the focus group. Participants were aged 33 to 47, mainly Italian, with one Czech parent who had lived in Italy for several years. All parents held at least a bachelor's degree and worked in fields such as finance, human resources, education, and training, reflecting a middle socioeconomic status and active workforce engagement. Most children attended private ECEC settings, with one family utilizing a public facility. These children, aged 4 to 6 and primarily Italian-speaking (with two bilinguals in Italian and Czech), represent a demographic focused on early socialization and foundational education in a middle-income context.

Portugal: In the Portuguese focus groups, specific details on participants' ethnic backgrounds, personal identifications, and socioeconomic status were not available due to data sensitivity considerations. Among the children, one recent migrant from a Portuguese-speaking African country had joined the educational setting shortly before the focus group, highlighting a transitional period as the child adjusted to a new cultural and educational environment within the group.

Spain: In Spain, focus groups were held across three schools, each serving a distinct population in terms of socioeconomic background, linguistic diversity, and cultural heritage. School A, in the culturally significant

Basque town of Gernika-Lumo, serves a predominantly local, medium-high socioeconomic population with strong ties to Basque culture. School B, a public school in Lleida, Catalonia, reflects the city's multicultural, economically diverse population and maintains a strong emphasis on inclusive education. It is a culturally and linguistically diverse school, where more than 40% of the students have a migrant background or belong to ethnic minorities, such as Roma. School C, situated in Irun near the France-Spain border, serves a medium-low socioeconomic community with a significant immigrant population serving 76% of students with migrant background, leading to considerable linguistic diversity. Each school provides early childhood through compulsory education and integrates unique cultural or pedagogical approaches: School A focuses on Basque cultural identity, School B emphasises public, inclusive education, and School C prioritises community involvement and supports linguistic diversity.

Table 23. Number of focus group participants according to country and stakeholder type

	ECEC staff	Children	Families
Finland	5	6	4
Portugal	7	10	3
Italy	0	6	6
Spain	23	23	18
Total	**35**	**45**	**31**

Given the diversity of participants in terms of age, profile, and language, the ethics clearance process was tailored to meet the requirements of each context. Each national report details the specific procedures (see Annexes 9, 10, 11). For young children, it was essential not only to obtain guardians' consent but also to ensure that the children themselves were well-informed and felt free from any pressure, allowing them to choose independently whether to participate in the discussion. Recognising that a child's willingness to participate may change over time, researchers remained attuned to nonverbal cues and regularly checked in to ensure the children were comfortable continuing. As a result, each focus group session was carefully adapted to accommodate the unique needs of each group of young children.

3.3.2. KEY FINDINGS

The focus groups highlighted transformative elements of ECEC from the perspectives of early years staff, children, and families, aligning closely with high-quality ECEC indicators identified in the scoping review (Section 3.1). Broadly, these findings are embedded within the social, physical, and systemic environments that surround young learners and support SCIREARLY's broader insights from the scoping review and the European-wide survey on factors that drive high-quality ECEC in Europe.

At the **microsystem** level, a key element is the development of foundational skills in contextualised and natural settings, which allows children to flourish throughout their lives. The **mesosystem** is strengthened by fostering nurturing and caring environments, promoting dialogic and meaningful adult-child interactions, and

creating rich, stimulating learning spaces. Finally, at the **exosystem** level, the focus is on building a strong education workforce and establishing inclusive pathways for decision-making within schools, ensuring that all stakeholders have a voice in shaping educational practices.

By understanding and enhancing these interconnected environments, we can develop a holistic framework that promotes high-quality ECEC and supports the growth and development of every child in Europe.

STAKEHOLDER VIEWS ON INDICATORS OF HIGH-QUALITY ECEC

This section presents the perspectives of various stakeholder groups in ECEC from four countries—Finland, Italy, Spain, and Portugal—regarding the presence and importance of high-quality ECEC indicators in their settings, along with the potential opportunities and challenges related to their implementation.

Views from families

Families in many focus groups place high regard in developing foundational abilities that will empower their children with a lifelong capacity for learning. The learning of **basic skills** such as literacy, math, and science were deemed valuable, but participants stressed the need to incorporate them in **age-appropriate activities** instead of being taught in a formal, school-oriented manner. They also must be fostered alongside children's **socio-emotional development** (e.g., self-regulation), **learning skills** (thinking skills and problem solving), **social skills,** and **well-being**. Examples of approaches cited are guided play, games that stimulate imagination and critical thinking reading challenges, exploration, and hands-on activities with manipulative materials such as crafts. As one caregiver points out:

> *"It is important to integrate basic skills in reading, math and science in early childhood education [...] However, the way it has to be done obviously should not be the canonical way: always in play mode and especially using hands, because I believe that the use of hands, manual, physical dexterity is an even more important thing now than before, because then all children will lose certain skills, which they will no longer develop, given the increasing importance of the use of technology. (Caregiver, Italy)*

> *"Learning to read, systemically, in a goal-oriented way, reading aloud, on their own. Reading challenges set by the teacher have been really motivating." (Guardian, Finland)*

> *"It is most important in ECEC and early school years to start learning, regulating own behaviours is essential. If these skills are not strong, there will be troubles in the future." (Guardian, Finland)*

These findings also resonate with the results found in the survey. For instance, the regression model shows how Factor 1, Environment and Interactions, is adequately explained by Factors 2, Pedagogical Strategies; 3, Family Involvement; and 4, ECEC Support and Institutional Organization. This illustrates how the meso and macro levels considered promote and predict a better quality of interactions and environments in the classroom, providing a holistic view of academic, psychological, and emotional learning from an early age. It is also important to mention that Factors 1, 2, 3, and 4 are closely interconnected, which reinforces this idea. In fact, all correlations among them have proven to be significant and positive, suggesting that they mutually influence one another.

Across the focus groups, families expressed **concern about the use of digital technologies** in pre-schools and the need to either limit or avoid its use. When incorporated into learning activities, caregivers in Finland mentioned that they expect that teachers teach intentional, controlled, and safe use of digital tools for their children. Given that several studies have shown the effectiveness of digital technologies in supporting the development of basic skills (Shamir, 2019; Greenwood, 2017), this finding from the focus groups highlight the need for the **purposeful, intentional, and evidence-informed use of digital technologies** for them to be both successful and valued. As one guardian from Finland shares:

> *"It is good that learning to use digital tools as tools for learning in a controlled way is done. The controlled use of digital technologies is important." (Guardian, Finland)*

Equally important, caregivers emphasised the need for **positive and inclusive relationships,** particularly regarding their children's motivation to attend school. Participants highlighted several aspects, including teachers' **respect and understanding for their children** (Portugal), **support for children from diverse backgrounds** (Italy), practices that **foster peer interactions**, and **attentiveness to children's interests** (Finland). These findings align with neuroscience research, which underscores the socio-affective dimension of learning (Immordino-Yang, 2016) and the advantages of integrated settings that enhance children's exposure to peers from diverse backgrounds (Oh-Young et al., 2015). Survey data also supported this, with a substantial majority (n=1937, 74.7%) scoring highly in fostering positive and inclusive relationships, suggesting a broadly favourable perception of the classroom environment and interpersonal dynamics. Only a small proportion (n=11, 4%) rated this domain unfavourably, indicating that **inclusive, supportive, and respectful relationships are key to mitigating early adverse experiences,** such as those faced by children in foster care.

In this regard, one mother from Italy shared how her daughter's preschool strives to include children from foster homes, a strategy widely appreciated by families:

> *"At my daughter's preschool, there are a certain number of reserved spots... there are three girls from a foster home, and a boy, who I believe is also from that foster home and clearly doesn't have Italian origins. I don't create educational programmes, but in my opinion, it's fine for them all to have the same programme at that age. In the sense that there aren't any gaps to bridge – they all start from the same point, even though there are some differences, like who goes home to mom and dad and who doesn't." (Caregiver, Italy)*

Caregivers also highly value the **design and optimization of the learning space** as part of a **stimulating environment that promotes children's development**. This includes incorporating meaningful resources and utilising available tools to maximise learning opportunities. For example, in Portugal, the "mud kitchen" activity within an ECEC setting facilitated early language and literacy skills, creativity, imagination, and social interaction through contextualised play:

> *Interviewer: What do you like to do in this corner of the mud kitchen?*
> *Student A: We like to fetch water, fill it up and make wet soil to give to the bugs.*
> *Teacher C: With what? You choose other things.*
> *Student A: With the pot.*
> *Teacher: We have real pots, which they brought from their parents' house, not toy pots, and wooden spoons and soup ladles, don't we? Look, what's your favorite cake that you make with (Student B) and that you used to make with (Student C)? What were you making when you sifted the soil?*
> *Student D: Omelettes.*
> *Student A: Strawberry tart.*

Additionally, caregivers across countries valued their involvement in both formal and informal spaces within ECEC settings. In Portugal, participants appreciated how teachers included them in special school events such as birthdays, festive occasions, and first-day-of-school receptions. In Italy, f**amily involvement through teacher-parent meetings and parent-child courses** created opportunities for socializing, contributing to a strong sense of community. Finnish families reported feeling well-informed about school practices, which **fostered trust and connection with teachers and the educational environment.** A similar pattern was observed in Spain, where families valued the feeling of closeness they had with the teachers and how it **made them feel welcome, respected, and important as parents**. This closeness and **strong sense of belonging** is built thanks to the multiple and dialogic interactions practitioners facilitate to engage with families, even if it's for 2 or 3 minutes, but everyday connection and interaction was defined as essential for families to feel part of the school. This close connections, built upon constant interactions, facilitates families' involvement in

school, which **fosters community building** on a wider scale, allowing them to enhance their sense of belonging and praise their agency and cultural intelligence at community level. As expressed by a 54-year-old woman who volunteers in ECEC classroom activities alongside her friend, a mother of a 5-year-old boy:

> *"We were like puppets waiting for children at the door, and now we have something more, we weave nice relationships with other families, we are actually building our community thanks to the school." (Adult volunteer, Spain)*

In settings where this community connection is lacking, caregivers from Italian focus group expressed a desire for more direct and accessible communication with the teachers. High-quality ECEC contexts thus take these factors into account, striving to **cultivate structures and practices that meaningfully involve families and caregivers in the children's educational lives**. For instance, a school in Spain that participated in the focus groups has recently become a **Learning Community**, which has been shown to serve as a driver to achieve meaningful family involvement (Flecha & Soler, 2013; García-Yeste, Morlá & Ionescu, 2018) and where families lie at the forefront of their ethos and transformation. This school model rooted in the power and values of the entire community, was first deeply analysed through the FP6 project INCLUD-ED (2006-2011).

Examples include family participants from the focus groups **participating as volunteers in Interactive Groups** with 4- and 5-year-olds. In addition to creating multiple opportunities for families to engage in school activities, the school organises its schedules around families' availability. For example, Interactive Groups and **Dialogic Literary Gatherings** are held both in the mornings and afternoons to accommodate working families. This flexible scheduling allows families who work in the mornings to volunteer in the afternoons, and vice versa.

> *"I now can come in the afternoons, but last month due to my work shifts I came in the mornings. That is nice for me because that way I get to come no matter what work shift I need to take." (Parent, Spain)*

This involvement in their children's educational activities not only enhances their relationship with the teachers but also makes it easier for them to gain an understanding and appreciation of their children's learning. For instance:

> *"When my son was 5… he never read like these kids do. Here they are 4 and they already know some letters, they show an interest in (depicting and drafting) the letters and some words..." (Mother, Spain)*

> *"My son studied in a private school, and the academic level I see here has nothing to do with it. Here are at the very top. My son began to read later on, never took a book until he was seven-ish, and then here you see children's excitement to read and to have a book in their hand. I find it fascinating, don't you?" (Mother, Spain)*

Regarding ECEC staff, concerns over teacher turnover in focus groups in Finland underscore the **importance of continuity** in teaching staff in supporting routines and practices that foster a sense of safety in the learning environment. As one teacher shared:

> *"Stability, continuity and safety are highly important. This is important to quarantee during the early years. Minimizing the changes and challenges is important." (Teacher, Finland)*

Views from ECEC staff

Similar to the perspectives shared by families, focus groups with practitioners emphasise the **importance of basic skills**. For instance, practitioners in Finland perceive that strong literacy skills form the foundation for learning throughout the educational path, as do those in Spain. They argue that it is never too early to start developing reading and writing, especially considering their importance in subsequent educational stages. As one teacher shared:

> *"It is essential to provide basic skills on a grassroots level, that can be reached by children with different backgrounds. It is essential to take into account versatility. It is essential to assure that everyone has adequate skills to proceed further." (Teacher, Finland)*

Furthermore, participants from Spain stressed that this focus should not be seen as an academic imposition but rather as a priority arising from the community itself, aimed at **promoting equality and expanding educational opportunities for every child**, both now and in the future. As one staff member explained:

> *"We share this goal with the families and the community. For instance, although Sara's mum did not finish school, she is very keen to see how her 5-year-old daughter does better than her from an early age. So, she volunteers, she comes to the meetings, she invites other mums to come to volunteer in interactive groups and in dialogic gatherings." (ECEC coordinator, Spain)*

This sentiment resonates with practitioner participants in Portugal, highlighting a holistic-oriented approach with the students and viewing **well-being as paramount** in ECEC. As such, **constructing emotional relationships with them** and **respecting their individuality** are equally as important. This runs parallel with evidence on the importance of the socio-affective dimension of learning and the element of **closeness** in developing transversal skills such as self-regulation (Cadima et al., 2016). In this scenario, practitioners in Spain alluded to **scaffolding, mindful feedback,** and **making children feel valued and important** during their interactions as crucial. As some of them shared:

> *”Encountering a child as an individual and a person. It is essential to find time for it. This is critical especially with those children who have specific needs. It requires time to find out why a child experiences some things as challenging. It is important to clarify the backgrounding factors.” (Teacher, Finland)*

> *“I try to notice every child individually every day. Every child is guided a bit differently, it is a key to know them all individually. When you learn to know all children, you can guide and teach them all together more comprehensively.” (Teacher, Finland)*

> *“Sometimes, children who say 'I don’t know' set a larger goal than what you are actually asking. It’s about helping them to understand that you are only asking for something small, and see, they do know how to do it. Supporting learning, for me, is not about giving the solution right away but breaking down the problem step by step into what they need to do to reach the goal.” (Teacher, Spain)*

> *“What really matters to me is that the children have good memories from here in 20 years. They won’t remember what I taught. They will remember, maybe, all the moments I tossed them up in the air or when I played with them. I think that’s what matters.” (Teacher, Portugal)*

> *“The most important thing is that the child feels good and, therefore, gains confidence.” (Teacher, Spain)*

ECEC staff in Spain also alluded to the need to **shape the space** to meaningfully engage all young children and to **maximise their opportunities for learning and wellbeing simultaneously.** They believe that the **physical layout of the learning space** can facilitate interaction and help students identify with their surroundings. For instance, recent renovations in one school allowed them to install windows instead of walls in many classrooms. This feature has resulted in a change in the way teachers interact with children, supporting more movement and freedom in the use of the space. In terms of the social and instructional components, they mentioned the need to **adapt the classroom materials and spaces** to each group and specific context to always ensure that **all children make the most of their time** in school, and where

experimentation, **dialogues**, **play**, and **songs** take a central role. In this scenario, the **capacity of teachers to adapt materials** to every child and every moment is highlighted, always bearing in mind its educational objective. Although renovations at this particular school were made recently, teachers recalled that before even the works were planned, their dynamic and in-classroom preparations kept the same In short, transforming the building and re-shaping it to the needs of each group might not always be an option, but is good to know that this physical component is just one more element that only works if human actions are well aligned with educational purposes.

Developing children's empathy is also highly valued by the practitioners, as it helps manage emotional conflicts and prevents those from happening. To enable these skills, they think that it is important to know how to motivate their students, for instance, by using activities such as **storytelling to connect with students**, and being ready to **learn from the students** as a way to **value their knowledge, or singing songs or rhythms created specifically for that very moment Peer work** was also an important element that practitioners from Finland, Portugal and Spain acknowledged as it fosters students' **autonomy,** enables **social interactions and puts to work children's abilities to communicate and interpret others' thoughts and mental states**. These findings align with evidence from literature showing the effectiveness of these initiatives for children's overall development (Gutierrez Fresneda, 2017; Hirsh et al., 2019; Kim, et al., 2021; Vargas-García et al., 2020; Durmaz, 2023; Green et al., 2018; Jylanki et al., 2022; Grimes et al., 2021):

> *"Emotional skills, peer skills, how to interact with others, how to take into account others. This has changed a lot during the recent years." (Teacher, Finland)*

As for the use of digital technologies, practitioners from Finland emphasised the importance of interaction and real encounters with children and the risk of digital tools disrupting this. Meanwhile, participants from Portugal are in favour of demystifying that the use of digital technologies for children is a problem. Early years staff at Spain built learning scenarios using bee-boots so that all children have access and opportunities to interact with such technologies, which is essential in the current century. Because robotics and technology are not something that all families can afford as after school activities, early years staff took the lead on learning how they could put this technology at the service of young children's computational thinking and development of early mathematic skills.

There is an overarching perspective among the practitioners that **digital tools help with children's engagement and motivation** and **may contribute to establishing adult-child connections** as teachers learn ways to work with these tools, which has grown ubiquitous in contemporary settings. As one participant in Spain explained:

"Since we live in a very technological world, [...] children cannot isolate themselves from this technological world. That's why we opt for a space that also involves technology." (Teacher, Spain)

"We need to be careful in using it [technology]. When using technology and digital tools, it is essential to notice, how I truly encounter children in the interaction." (Teacher, Finland)

Another key aspect highlighted by the practitioners is the importance of organising the classroom into **small groups**, a practice widely supported by scientific literature (Valls & Kyriakides, 2013). For instance, one of the schools in Spain divides its classrooms into five distinct learning environments dedicated to workshops, projects, and specialised and sustainable materials. The small group structure and the purposeful activities and challenges proposed in each learning environment enhance children's learning opportunities, and it also allows for closer monitoring of each student's development. As a practitioner shared:

"*When we work in learning environments , we do so in small groups, which allows us to dedicate more time to a particular learning environment, to delve deeper and better support or guide the children. It also enables us to observe their progress*." (Teacher, Spain)

Regarding their relationships with families, ECEC staff from Finland who participated in the focus groups reported the **importance of working with multicultural families** who may not be familiar with the Finnish educational system. Teaching staff make a concerted effort to **explain Finnish school practices and cultural norms** to ensure that families feel comfortable and informed. To foster a sense of community and engagement, teachers regularly organise events where **guardians can visit the school** during the day, providing a first-hand look at classroom activities and routines. These events help **build stronger relationships between educators and families,** allowing teachers to share educational goals, communicate openly about their approach, and address any specific needs that multicultural families might have. Similar practices were reported in the Spanish focus groups, where **daily meetings and interactions** with families have proven to be crucial in addressing the children's needs. They stressed how communication is viewed as a fundamental aspect of a smooth school-family relationship and, in particular, how **egalitarian dialogue** scaffolds teacher-family communication. This is consistent with Flecha's dialogic approach to education, where **communication based on honest principles with no power relationships** has a substantial effect on children's wellbeing and development (Flecha, 2000). Illustrative examples from staff include the following:

"I have experience in different schools, and what we have here, it's really genuine. The relationship we have with families, that constant interaction, is very unique. You always spend 10 minutes or so talking to mums and dads every morning, when they come to drop the children. They never leave without talking to us, and that is very important because it gives you tons of information and makes

our work much easier and enjoyable. Then, since we have these brief sorts of meetings on a daily basis, usually we don't really need an annual big meeting, because we both know everything already." (Teacher, Spain)

"They can enter, even into the classroom. That shows that when we're doing an activity, they can see, and not just come to pick up or drop off their children." (Teacher, Spain)

This is particularly relevant in schools that serve families from vulnerable backgrounds, as literature signals the important barriers that they encounter to be actively involved in school (Souto-Manning & Swick, 2006). ECEC staff believe that for this to happen, **trust** should be organically developed and fueled through **research-informed teacher training**. As one staff states:

"Here for instance, since we became a Learning Community back in 2019-2020, our training focuses on scientific evidence, dialogic learning approach and so on. So, whatever we implement at home has a scientific backup, it's not just me saying that this or that works, but is scientifically proven, we know that works and it's good to know we are heading in the right direction." (Teacher, Spain)

Participants from the Spanish focus groups also highlights the positive effect of a democratic and dialogic **school governance**. Far from being focused on a single individual who is expected to be on top of everything that happens in the school (as traditional headteachers do), the **governance is shared** among different people within the school. In one of the schools, although there is one person that acts officially as the headteacher, the workload is shared among a team of six teachers, who takes care of the coordination among the school staff, the pedagogical activities, the curriculum, and teacher training, as well as monitors the relationships with families and the wider community. This allows for a flexible and responsive structure to the school's and community's needs. As one teacher shared:

"It is very easy to be heard in this school, at any point. It's easy because we are very engaged, we are in constant communication. Every day, almost every time. So, if something happens in my class that makes me feel uncomfortable or not really prepared to address that issue, I immediately run to the team and share this. And maybe request a training session on something that I might feel weak or less prepared for. We've done that recently with feminism, and prevention of violence at school…" (Teacher, Spain)

However, **issues regarding ECEC staff preparedness** has been described in other focus group contexts such as Finland and Portugal. In some situations, childcare assistants are hired without insufficient training,

putting the onus on teachers to train them (Finland). Meanwhile, issues around **teachers' capacities to respond to diverse needs** of an increasing number of children was raised by the participants, especially in the focus group in Portugal where they were dealing with highly multicultural classrooms and including children with special needs. In their view, more qualified assistants are needed to provide individualised student attention given the higher levels of cultural and linguistic diversity. As one staff member shared:

> *"... After one or two teaching weeks we start noticing problems related to having assistants in the classroom that are not prepared. It does not help us to have three people in the classroom if they cannot help..." (Teacher, Portugal)*

Participants in Spain alluded to the crucial role of **school leadership** in providing such support, not only in **providing professional development and training opportunities** but also **ensuring that they are relevant and constant** across time. One of the teachers explained how the **headteacher and their team are always open to proposals** for organizing teacher training courses, especially when there is clear interest in specific topics or when an unusual classroom situation arises, prompting the need to explore ways to address it. As one teacher described:

> *"The management team is very involved. I believe they place great importance on a well-trained teaching team that stays up to date and doesn't fall behind. Continuous training for teachers is very important to them. In fact, each year we have two or three training sessions at the centre. We do them here, and practically the whole staff attends. We all go to one, and I think that from the management team this is highly respected, and they care about our training." (Teacher, Spain)*

Another dimension highlighted by focus group participants in Spain is the importance of a **supportive work atmosphere**. In one of the schools, teachers laughed, cheered on each other and shared many diverse anecdotes during the focus group, which gives a sense of a cohesive team. They also shared openly how easy it is to work with each other since they share the same purpose - to ensure the best education for all children, regardless of their family background or situation at home – and expressed gratitude to the team's readiness to support each other in daily situations. This runs parallel with what scientific literature suggests regarding the **key role of a shared purpose** to ensure a coherent educational path (Khalfaoui et al., 2020). As one teacher shared:

> *"Because we are here, right here, and we see each other almost all the time. When something happens with any children of my group, I can immediately reach Miren, or Roman, and ask for help.*

They are with me in a glimpse of an eye. It makes you feel really safe, really supported." (Teacher, Spain)

Views from children

Many of the children participating in the focus groups showed that they **feel safe and welcome** in their learning environment. During focus groups in Finland, the children described **learning useful things** in language and mathematics, as well as expressed **enthusiasm about science, mathematics, arts, crafts, and physical activities**. Their responses also reflected **good relations with peers** and alluded to the **presence of friends** with whom they spend time and play together within and beyond the school day. **After-school activities**, **being outside**, and **playing** were deemed particularly important. Children from focus groups in Italy also showed particular enthusiasm towards playful activities and **movement-based games**. Based on focus groups with children in Portugal, **positive relationships with adults and peers** within and beyond the classroom were also evident.

Reading and learning through stories were integral to children's experiences in Finland, Portugal, and Spain. They alluded to having multiple opportunities to engage in reading activities, both independently and with the teacher, primarily using physical instead of digital materials. Children in Finland also reported visiting the library and having joint reading challenges with peers. They also described the use of **digital learning tools** and **games** to practice counting and basic calculations:

"Many kinds of tasks. We read a lot, do writing exercises. ABC-book, reading book, own books, always when we have time. We go to the library, we have reading challenge…" (Child, Finland)

"We play calculation games quite a lot." (Child, Finland)

In Portugal, researchers' observations also noted that **access to multiple resources, educational materials, and activities** in the space as enabled by the teacher contributes to interactions and creativity, as does the **teacher's monitoring and care** when interacting with the children. In Spain, children signaled how their **interests intersect with the books they read**, thus becoming a source of **discovery** and **curiosity**:

"My favourite book is a firefighter book, it is good, I know, I read it. And another one about dinosaurs. The Tyrannosaurus appears in it, the Tyrannosaurus. Medium-sized. I read and then I learn." (5-year-old child, Spain)

The children also alluded to how they enjoy learning about numbers at school through various activities, purposefully designed and offered by the teacher as a proposal to enrich their knowledge on numbers. Thus,

discovering basic math concepts becomes children's conquest, amplifying the appeal of learning. During the focus group of one of the schools in Spain, three children got engaged in the following discussion:

> *Student A: "For instance, 20 plus 20 is 40, and 40 plus 40 is 80! We've learned it thanks to our teacher."*
> *Student B: "Yes and playing cards too."*
> *Student C: "It's true! we try to put the numbers together and then… and then guessing how much is all of that."*

While an enthusiasm for learning was also evident in some children from focus groups in Italy, others expressed a strong preference for staying home instead. This runs counter with their parents' reports emphasising how the school environment fosters enjoyment and stimulates their children's individual interests. In this case, a possible explanation is the structured school environment that might be limiting children's sense of freedom and reducing their opportunities for peer interactions is less appealing for them. Their limited capacity for decision making or freedom was also pointed out in a negative way. In these children's words:

> *"We don't play much; we can't, we also have desks far apart from our classmates..." (Child, Italy)*

> *"I don't like going to school because the teachers want to decide everything. I would rather stay home and play with my toys." (Child, Italy)*

This scenario echoes the findings from recent research in Maltese context (Bonello, 2022b) and points to the importance of guided **play, movement,** and **children's agency** in facilitating learning as well as having a **stimulating and responsive learning environment**, both in terms of **social** and **physical spaces**, to foster the development of children's basic and transversal skills as well as overall well-being and development (Augustine, 2015; Grimes et al., 2021; Gropen et al., 2017; Hutagalung et al., 2020; Kempert et al., 2016; Kirk & Kirk, 2016; Immordino-Yang, 2016; Jylanki et al., 2020; Mavilidi et al., 2017; Størksen et al., 2023). One way to achieve this is to incorporate **opportunities for children to have duties in daily routines** in an engaging way, such as in the example shared with great enthusiasm by a child in one of the focus groups in Spain:

> *"Today I am the delegate of the class, together with Daniel, and we have to write the names of the ones that did not come today to the school, or we lead the 'train' when we go to the playground… yesterday Miren and Markel did the job, and today is our turn." (5-year-old child, Spain)*

This responsibility is collectively shared, as every child in the group has the opportunity to assume this role. **Engaging in pairs** fosters a sense of support and reduces feelings of isolation. The rotation of this role occurs daily, facilitating children's recognition that they will eventually have the chance to take on this responsibility while also encouraging them to respect their peers during their turn. This also boosts autonomy. For instance, this excerpt reflects how the children are developing self-learning and decision-making skills, an important step towards their independence in the school setting:

> *"I sometimes spend time with my group, some other times I move to play with the other group. We choose, depending on the day... we choose. That is fun and good." (5-year-old child, Spain)*

The pleasure of discovering and re-discovering new knowledge has been also pointed out as a strong asset and explanation behind children's willingness to come to school every day. As the second school involved in the Spanish focus group, children eagerly stated that they enjoy learning and acquiring new knowledge, reading and participating in pictorial activities or concentrating to solve the scientific challenge that their teacher offers every day. As Olaia, a 5-year-old girl, explains:

> *"I like to come to this school because a learn lots of things (...). For instance, in the scientific space or the one in which we write words..."(5-year-old child, Spain)*

Section 4. Towards a High-Quality Early Childhood in Europe: Implications for Policy and Practice

Our work from the scoping review, European-wide survey, and focus groups with various stakeholders revealed **common key elements of high-quality ECEC provision**. They are embedded in the immediate learning context, community, and structural environments surrounding young learners. At the **immediate environment level**, fostering a nurturing and responsive learning environment, fuelled by high-quality interactions where children feel engaged, safe, and valued; leveraging learning moments in purposeful and carefully designed contexts to enhance skills development; and creating a rich and stimulating learning space all set the stage for children's future success and enable them to thrive across the lifespan. At the **community level,** involving meaningfully and organically families and the wider community in shared educational activities not only enhances children's learning and development but also the school's overall capacity to generate impact on a wider scale. Meanwhile, the **structural level** plays a vital role in supporting a thriving education workforce and establishing pathways for inclusive participation and decision-making in schools, ensuring that all stakeholders have a voice in shaping educational practices and priorities. By understanding and enhancing

these interconnected environments, we can create a holistic framework that promotes high-quality ECEC and supports the development and success of every child.

4.1. Fostering whole child development through a nurturing and responsive learning environment

Instructional support and affective bonds support the development of children's well-being and foundational skills for present and future success and wellbeing. This can be fostered through:

- **High-quality, responsive and dialogic interactions**. Creating high-quality, responsive and dialogic interactions in the classroom fosters learning, wellbeing and sets up the basis for quality relationships (García-Carrión et al., 2020). These relationships are also characterised by increased opportunities for conversations, tailored feedback, constant attunement, sensitive responsiveness, and interactional synchrony and exchanges, as reported in the CARE FP7 project (Melhuish et al., 2014). High-quality and responsive interactions between teacher and children lead to further develop children's linguistic and thinking skills as well as equip them with the verbal tools for self-regulation (Bernier et al., 2010). Building a sense of closeness and emotional connections plays a role in children's self-regulation and affects children's ability to perform and succeed in school activities.
- **Scaffolding and mindful feedback.** Appropriate scaffolding and instructional support are also crucial in ECEC contexts (Burchinal, 2018; Bulunuz, 2013; Størksen et al., 2023). This involves teachers providing appropriate prompts or tailored questions to encourage reasoning, explore ideas, consider different viewpoints, go beyond what is presented initially, build related topic knowledge and connect it with their own experiences in a dialogic space (Girbés et al, 2024).
- **Inclusive classrooms.** There is evidence demonstrating that inclusive settings have been more effective in positively influencing academic and social outcomes compared to less integrated or segregated ones (Aubert et al., 2017). This exemplifies the importance of fostering an inclusive environment that increases children's dialogic interactions with each other in a safe and supportive environment, as evidenced by successful educational actions (Flecha, 2015).
- **Children's agency.** Children's voices allude to the desire for greater involvement in decision-making processes. Children do not only have the right to be heard, but also to see that their contributions are taken seriously into account and actions are put in place consequently (Lundy et al., 2024). This runs parallel with the neuroscience behind leveraging the socio-affective aspect of learning (Oh-Young et al., 2015) and the role of teachers in enabling children's agency.

4.2 Fostering shared and dialogic activities between children, teachers, and families

Several studies have pointed to the effectiveness of shared and dialogic activities in enhancing children's basic skills alongside their socio-emotional development (Burgoyne et al, 2018; Chacko et al, 2018; Hirsh et al, 2018) as well as the overall capacity of the school to generate impact on a wider scale.

- **Joint involvement of children, teachers, and families in dialogic reading.** In the example of the Motheread/Fatheread early literacy intervention, the curriculum teaches caregivers - even those with limited literacy themselves - the techniques for engaging in dialogic reading such as facilitating the active role of the child, expanding the story's content, reading aloud instead of passive listening, and guided reading techniques. This culturally appropriate program encourages parents to increase the frequency, enjoyment, and effectiveness of storytelling, promoting vocabulary development, comprehension, and a secure reading culture (Hirsh et al., 2019). There is evidence that dialogic reading approaches has been successful where teachers and caregivers engage in a joint project of reading the same set of books in different contexts, where different avenues were explored to educate caregivers on the approach, and where materials and support are provided (Vargas-García et al., 2020).
- **Peer work and duties in daily routines.** Increasing children's opportunities to work with each other and have duties in daily routines in an engaging way is one example through which to enhance students' learning engagement. Qualitative data shows the experience of a 5-year-old child who described their role as a delegate, a responsibility shared with a peer (see section above). Their duties included noting the names of absent classmates and leading their class when transitioning to activities, such as going to the playground. This role rotates among students, allowing young students to experience leadership and responsibility in a structured, collaborative environment. Engaging in pairs also fosters a sense of support, trains them to respect their peers during their turn, and boosts children's autonomy while reducing feelings of isolation.

4.3. Creating a rich, purposeful and stimulating learning space

A stimulating and responsive learning environment—one that integrates both social and physical spaces with intentional, high-quality pedagogical processes—significantly enhances children's foundational and transversal skills while supporting their overall well-being and development.

- **Purposefully designed physical spaces.** The arrangement of physical space can amplify the impact of pedagogical strategies, fostering more frequent and meaningful interactions between children and their environment. Qualitative data from the study illustrates this synergy; by carefully organizing the classroom into five distinct "learning environments" designed to support children's learning and development, including multiple adults to

facilitate access to the early years' curriculum, higher-quality interactions between teachers, children, and peers emerged. Children made fuller use of the space and time to learn and engage meaningfully. Ultimately, the teacher's ability to intentionally shape the learning environment plays a critical role in creating a rich and stimulating space for thriving.

- **Availability of multiple resources.** Providing hands-on, exploratory, and multisensory activities that provide varied stimuli to the learning child. In this scenario, there appears a need to adapt the classroom materials and spaces to each group and specific context to ensure that children make the most of their time in school, and where experimentation, dialogues, play, and songs play a central role. To achieve this, materials and resources should be curriculum-aligned and offered with clear purpose. Additionally, the capacity of teachers to tailor these resources to each child, task, and moment is crucial.
- **Use of outdoor areas when available.** Although outdoor environments can offer benefits for young children (examples from the qualitative data show that learning activities in outdoor spaces, such as the 'mud kitchen' in a Portuguese classroom, facilitate early language and literacy skills as well as creativity, imagination, and social interaction through contextualised and child-initiated play), early years settings located in urban areas without safe access to outdoor areas lay no behind, since natural elements can be incorporated as resources and materials in classroom settings.

4.4. Harness the building blocks of learning for wellbeing and lifelong success

Harnessing essential skills in early years is vital as it sets the groundwork for children's future success. Basic skills—such as literacy, numeracy, and science—and transversal skills—such as thinking skills, creativity, and socio-emotional competencies—enable children to navigate and enjoy their educational journeys effectively, adapt to new challenges, and thrive in a rapidly changing world. For this, guided participation in contextualised settings allow teachers to leverage and maximise learning moments that not only attend to children's well-being but also their overall development and their inherent right to a well-rounded educational experience.

- **Dialogic educational actions.** Reading, literacy, and socio-emotional skills in children significantly improved through interventions using a dialogic approach. Dialogic and shared reading, in particular, demonstrated notable benefits for children with disabilities and those from socially disadvantaged backgrounds (Hodgins & Harrison, 2021). This approach has also been shown to positively impact children's perspective-taking and empathy (Grøver et al., 2020), which are essential skills for navigating today's social challenges.
- **Play and learning-in-context**. Naturalistic and contextualised instruction occurring in playful, interactive, and meaningful contexts and thats incorporates movement and art is paramount. This approach has been shown to lead to improved outcomes in the development

of basic and transversal skills especially among students from disadvantaged backgrounds such as children with disabilities (Cohen-Mimran et al., 2016) or are in foster care (Pears et al., 2013). Formal instruction time, transitions, and breaks should be taken as an opportunity to stimulate foundational concepts, language, curiosity, creativity, problem solving, and self-regulation skills.

- **Movement and physical activity**. Current evidence shows that physical activity programs are beneficial for children's literacy and metacognition (Augustine, 2015). In addition, it also showed improvements in children's numeracy, as well as a heightened sense of enjoyment (Mavilidi et al., 2017).
- **Purposeful and evidence-informed use of digital technologies.** The use of digital learning tools among children has been shown to support the development of basic skills (Merkelbach et al., 2022; Outhwaite et al., 2019) and help with children's engagement and motivation. Families and teachers highlighted the need for an approach to their use that is purposeful, intentional, and evidence informed.

4.5. Investing in a thriving ECEC workforce

High-quality early years programmes recognise the importance of continuous teacher professional development. Along with learning environments, it has shown to be the most consistent in influencing early years education practices, showing significant positive associations with a wide array of child outcomes such as basic and transversal skills (Brunsek et al., 2020). Specific elements of teacher training and development have been shown to be effective in this regard.

- **Evidence-informed teacher professional development.** Investing in in-service teacher training that is grounded in ongoing research and supported by evidence-based professional development is essential (Brunsek et al., 2020). There is broad consensus on the impact of teacher quality on student outcomes, and this is particularly true in ECEC, where staff training is critical to ensuring high-quality early education. When teachers base their decision-making on scientific evidence, the benefits extend to children's achievement, well-being, and even community development (Roca-Campos et al., 2021). Planning, designing, and delivering evidence-based training programs for ECEC practitioners is urgent, as these programs equip educators—and potentially families and communities, when training is inclusive—with the tools to effectively support every child's success (García-Carrión et al., 2020). Although professional pathways for ECEC staff vary across the EU, all educators need to master core skills, including critical thinking, group and individual engagement, and the ability to listen, communicate, and work democratically (Early et al., 2007).

- **Supportive work atmosphere.** Teachers highlight the importance of a work atmosphere characterised by team cohesion, professional support, positive relationships and shared vision of school. A supportive work atmosphere enables them to share resources, strategies, and advice that can enhance both teaching quality and job satisfaction. This environment also encourages open communication and mutual respect, which can reduce stress and promote a sense of belonging.
- **Policies for teacher recruitment and retention.** Concerns over teacher turnover among stakeholders underscore the importance of continuity in teaching staff in supporting routines and practices that foster a sense of safety in the learning environment.

4.6. Establishing pathways for inclusive involvement and decision-making in schools

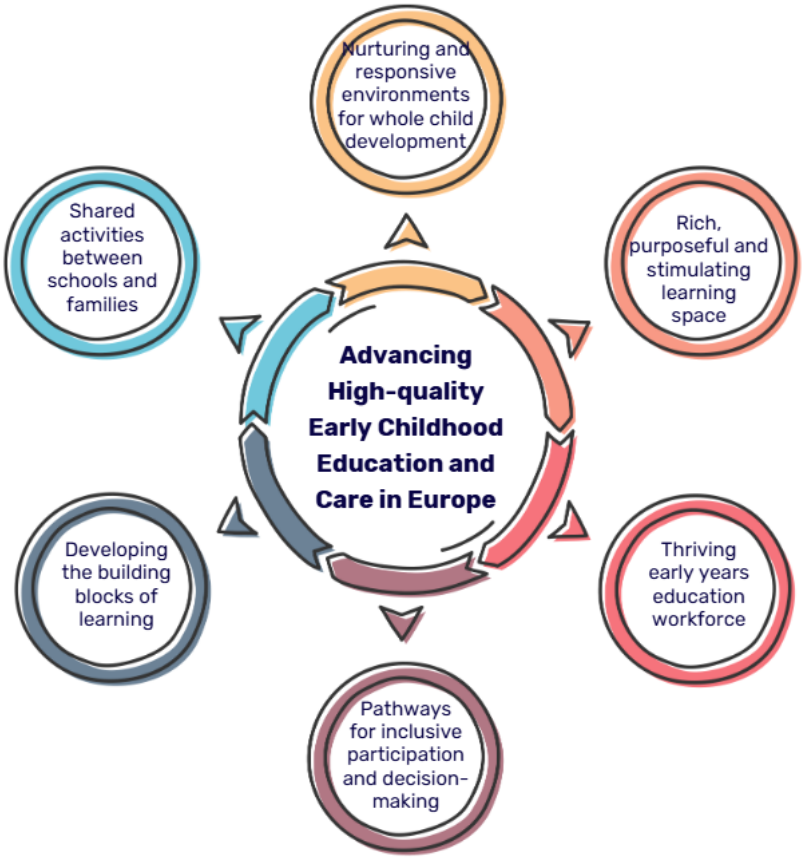
- **Families' participation in children's learning.** High-quality ECEC contexts strive to cultivate structures and practices that meaningfully involve families and caregivers in the children's educational lives, which enables not just mutual learning but for families to also feel valued. This is particularly relevant in schools that serve families from vulnerable backgrounds, as literature signals the important barriers that they encounter to be actively involved in school (Souto-Manning & Swick, 2006). To overcome these barriers, a school in Spain that participated in the focus groups has recently become a Learning Community, which has been shown to serve as a driver to achieve meaningful family involvement (Flecha & Soler, 2013; García-Yeste, Morlá & Ionescu, 2018) and where families lie at the forefront of their ethos and transformation. This involvement in their children's educational activities not only enhances their relationship with the teachers but also makes it easier for them to gain an understanding and appreciation of their children's learning.
- **Regular communication protocols.** Biweekly, monthly, or daily check-ins give families a chance to express concerns, celebrate milestones, and provide feedback, fostering a collaborative relationship. Open door policy and regular communication based on dialogic principles and more equal relationships is key to promoting high-quality early childhood education and care provision. Qualitative data from the study show that being well-informed about school practices contributes to a sense of connection and trust between families and the school, allowing them to feel welcome, respected, and valued.
- **Democratic structure of school governance.** Stakeholders alluded to the crucial role of school leadership in providing support for teachers and families, not only in providing professional development and training opportunities but also in cultivating a culture where teaching staff and the wider community are able to shape the vision of the school. This runs

parallel with existing evidence on the importance of the wider community's involvement in decision-making for educational transformation.

To conclude, a holistic approach to high-quality early childhood education and care across Europe demands integration across multiple levels. Addressing each of these drivers will foster an ecosystem that supports and advances benefits through synergistic effects while recognising and aligning the roles of educators, families, policymakers, and communities. Such a coordinated approach will maximise optimal learning and lay stronger foundations for lifelong success and well-being of children for generations to come.

To conclude, a comprehensive approach to high-quality early childhood education and care across Europe requires integration across multiple levels. Addressing each of these drivers will foster an ecosystem that supports and amplifies benefits through synergistic effects, while aligning the roles of educators, families, policymakers, and communities. Such a coordinated approach will maximise learning outcomes and lay a stronger foundation for the lifelong success and well-being of children for generations to come.

Figure 12. Common key elements for advancing high-quality early childhood education and care



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Annexes

Annex 1. ECEC interventions that hace shown improvements in literacy (n=56)

Literacy						
Nº	**Reference**	**Objective**	**Design**	**Sample**	**Instruments**	**Key findings**
1	Chacko, A. et al (2018).	To evaluate the effects of the Fathers Supporting Success in Preschoolers: A Community Parent Education Program on improving key proximal outcomes (i.e., parenting), secondary outcomes (i.e., child behavior and language), and distal outcomes (i.e., parental stress and depressive symptoms).	A randomized controlled trial design with a waitlist control group.	126 father–child dyads, 4-5 years old	1)Attendance—Fathers' attendance at each FSSP session was coded as present or absent 2)Parent Behavior Checklist 3)Dyadic Parent–Child Interaction Coding System 4)Observed parenting and child behavior 5) Eyberg Child Behavior Inventory 6)Preschool Language Scales (Fourth Edition 7)Parenting Stress Index-Short Form 8) Center for Epidemiologic Studies Depression Scale 9)Therapists, Training, Treatment Fidelity, and Supervision	Acute benefits of the program compared to the waitlist control group were observed on several outcomes. The program did not result in significantly better outcomes on father reported expectations for their child. On secondary outcomes, significant benefits of the program wer found for father-reported intensity of child behavioural difficulties. There was a trend toward statistically significant improvement in observed child behavioural difficulties.
2	Ozler, B. et al (2018).	To evaluate a government program in Malawi, which aimed to support child development by improving quality in community-based, informal preschools through teacher training, financial incentives, and group-based parenting support.	Cluster- Randomized control trial	2120 children, 3-5 years old	1) Malawi Developmental Assessment Tool (MDAT) 2)Peabody Picture Vocabulary Test-IV (PPVT-IV) 3)Leiter-R Sustained Attention task (LSA). 4)Kaufman Assessment Battery-Children, 2nd Edition (KABC-II) 5)Early Grade Mathematics Assessment (language and fine motor/perception subscales) 6)The Strengths and Difficulties Questionnaire (SDQ) for assessing children's behavioral problems and prosocial behaviors 7)Centre for Epidemiological Studies, Depression (CESD) 8) Parenting Stress Index-Short Form (PSI/SF), 9)Support for Learning and Positive Parenting module) 10) The CBCC questionnaire and observation measure	Children in the integrated intervention arm (teacher training and parenting) had significantly higher scores in assessments of language and socio-emotional development. There were significant improvements in classroom organization and teacher behavior at the preschools in the teacher-training only arm, but these did not translate into improved child outcomes at 18 months. In resource-poor settings with informal preschools, programs that integrate parenting support with preschools may be more (cost-) effective for improving child outcomes than programs focusing simply on improving classroom quality.
3	Vargas-Garcia, V. et al. (2020).	To study three processes of child development that can be stimulated and promoted through the use of dialogic reading of stories, introduced in everyday contexts such as school and family, significantly contributing to early childhood and corresponding to primary socialising contexts for their formation.	Quasi-experimental, pre-test-post test design and a control group.	34 children, 4-5 years	1)Neuropsychological Battery for Preschoolers (BANPE) 2)The Colombian version of Conners' Test	The results indicate that the intervention in the school and family context had a significant impact, since some cognitive and emotional domains increased.
4	Amorim, A. et al. (2020).	This study examines the effectiveness of Escribo Play, a mobile based, game-enhanced educational program, that is used both at school and at home on preschool students' phonological awareness (PA), word reading, and writing skills.	Cross-sectional, pre-post test	749 children, 4-5 years old	1)Phonological Awareness Test by Oral Production (PAT-OP) 2)The Word Reading and Writing Test (RWT)	The children who studied using Escribo Play displayed improved word reading and word writing abilities.
5	Sa, M. et al. (2022).	To analyse the efficacy of the Phonological Awareness Digital Program (PADP) in typically developing preschool children.	Randomized control trial	49 children, 4-6 years old	1)Phonological Awareness Tasks	The Phonological Awareness Digital Programme promoted the development of Phonological Awareness (at different levels), with statistically significant results. These results are supported by the experimental group, showing a significant improvement over a control group, which was not a target of this program's implementation.
6	Albuquerque, A. et al. (2019).	This longitudinal study aimed at testing the long-term impact of invented spelling activities conducted in kindergarten on children's literacy skills.	Longitudinal	100 children, 5 years old	1) The Raven's Progressive Matrices Test. 2)Battery of Phonological Tests. 3)Children were asked to name the different letters of the alphabet, printed in uppercase and presented in small flashcards in a random order. 4) Different lists of words were applied in all assessment points to control learning effects.	Both experimental and control groups had similar scores in kindergarten before the training activities. In all other assessment tests, the experimental group outperformed the control group. Although there is a clear progressive approximation of their writing scores in primary school, children who participated in experimental activities seemed to show a better performance at the end of Grade 3. Thus, the results showed that the experimental group outperformed

						the control group in kindergarten and benefited more from formal school teaching instruction. Lasting effects were found as the invented spelling condition presented statistically significant higher scores in reading and writing in primary education.
7	Riordan, J. et al. (2022).	To compare two book-reading and conversation approaches for parents and preschoolers to an activity-based control group. The Rich Reading and Reminiscing (RRR) condition taught parents to converse about the storyline; the Strengthening Sound Sensitivity (SSS) condition taught parents to converse about word sounds.	Longitudinal	69 children, 5 years old	1)Dynamic Indicators of Basic Early Literacy Skills 2) Six comprehension questions that focused on identifying characters, plot features, and emotional 3)Parent book-reading coding 4) Parent-child reminiscing	The two conditions changed parent-child interactions in specific ways. The RRR condition increased parents' total on-topic talk and parents' and children's higher-level meaning-focused talk during book-reading in addition to parents' elaborations during reminiscing; the SSS condition increased parents' and children's print-focused and sound-focused talk during book-reading. Children's age moderated the benefits of the SSS condition for children's phonological awareness and letter recognition skills, with older children benefitting more than younger children.
8	Cviko, A. et al. (2014).	The present study aims to provide insight into the value of different teacher roles in designing and implementing technology-rich learning activities for children's early literacy.	Longitudinal	383 children, 5 years old	1)Early literacy test	Significant learning gains were found for each teacher role, they conclude that involving teachers in the design of technology rich activities positively affected both the teacher's perceptions and the children's literacy learning outcomes.
9	Lake, G. et al. (2019).	This study developed, delivered and evaluated an interactive intervention, which targeted three- and four-year-old children's oral language: Let's Talk, which supported young children's oral language development in the areas of narrative (story-retelling) and vocabulary development twice weekly in a ten-week school term in Early Years settings.	Randomized control trial	94 children, 3-5 years old	1)The Naming Vocabulary sub-test from the British Ability Scales 2) Researcher Designed Vocabulary Test 3) The British Picture Vocabulary Scales II 4) The Bus Story Test 5) Test of Narrative Retell 6)Block Building and Picture Similarities sub-tests of the British Ability Scales 7)The Dimensional Change Card Sort	The Lets Talk intervention had a significant effect on the vocabulary and narrative skills of preschool children.
10	Grover, V. et al.(2022).	To investigate the effect of a shared reading intervention on teach talk quality and children's second-language outcomes.	Longitudinal	464 children, 4-5 years old	1)VOC_RECEPTIVE and TROG-2 assessment 2) Classroom Assessment Scoring System 3) Snapshot observations 4)Teacher Talk Quality 5)Teacher Syntactic Complexity	By the end of the school year teachers in the intervention group demonstrated significantly higher quality in their talk during shared reading, assessed as diversity of word types, use of word explanations and ratio of multi-clause utterances. These differences in teacher talk quality explained variance in children's second-language vocabulary outcomes by the end of the intervention year.
11	Vargas-Garcia, V. (2020).	To investigate the effect of dialogic reading (incorporated with pause time) on the language and preliteracy abilities of preschool children with disabilities.	Randomized control trial	42 children, 5 years old	1)Peabody Picture Vocabulary Test 4th Edition 2) Expressive One-Word Picture Vocabulary Test–4th Edition 3) Picture Naming subtest of the myIGDIs-EL 4) Get Ready to Read! Revised	The study showed that dialogic reading with pause time incorporated had a positive effect on receptive and expressive vocabulary growth in children with disabilities.
12	Hutagalung, F. et al. (2020)..	The purpose of this study is to investigate the effects of dramatic play on the enhancement of vocabulary learning among preschoolers in Malaysia.	Randomized control trial	50 children, 4-5 years old	1)Curriculum Based Measurement	The study showed there were significant differences in the vocabulary scores after the use of vocabulary instruction with dramatic play in the experimental group compared to the control group.
13	Frizelle, P. et al (2021).	To determine the effects of a targeted selective community-based child language intervention programme (Happy Talk), which simultaneously engaged with parents and early childhood educators, in the Republic of Ireland.	Longitudinal	81 children, 4 years old	1)Preschool Language Scale 5 (PLS-5) 2)Paediatric Quality of Life Inventory (PedsQL) 3)Parent report for Toddlers (ages 2–4) 4) Child Health Utility instrument 5) Maternal Responsive Behaviours Coding Scheme 6) Communication Supporting Classroom Observation Tool	The programme showed a significant effect on auditory comprehension and overall language score.This demonstrates that Happy Talk is an effective intervention that can improve language skills in young children from socially disadvantaged areas.
14	Cohen-Mimran et al. (2016)	To investigate the effect of the language program: an activity-based intervention, founded upon the naturalistic approach, which enables the clinician to set up opportunities for children to learn expressive language through age-appropriate interactive processes in natural settings.	Naturalistic approach with non-random cluster control trial	220 children, 3 - 5 years old.	1)Goralnik Test for children 3–6 years old 2) Narrative on the story telling subtest, children were required to generate an oral narrative based on a set of six pictures.	Children in the intervention groups showed significantly greater gains. Gains observed in the intervention groups were impressive when considering that the language learning rate among these children accelerated beyond the typical developmental rate in order to demonstrate standard score gains. Another important finding was that the program benefited children from different SES environments. The greatest progress in all children that participated in the program was in the area of vocabulary.
15	Neumann, M. M. (2018)	This study explored the effects of using literacy apps on emergent literacy skills in English speaking children.	Randomized control trial	48 children, 2–5 years old	1)Clay's Concepts About Print test (2005) 2) Story books	The tablets provided children with a platform to take ownership of their learning and explore print using a stimulating and engaging touch-based digital tool. This in turn positively fostered children's letter knowledge, print concepts, and name writing skills.
16	Zettler-Greeley et al. (2018)	To test an emergent literacy intervention for prekindergarten children at-risk for reading failure.	Randomized control trial	476 children, 4 years old	1)GRTR screener 2)the Test of Preschool Early Literacy 3)the Assessment of Literacy and Language Treatment outcomes	Results demonstrate benefits of high-quality emergent literacy instruction for children at risk. Growth in skills for both fall and spring treatment groups following this 18-lesson program supports some implementation flexibility among interventionists with delivery constraints during the year.

17	Tyler et al. (2014)	The purpose of this study was to determine whether gains would be observed in an integrated group of 4-year-olds when phoneme awareness skills were explicitly taught by trained early childhood educators.	Quasi-experimental waitlist control	24 children, 3-4 years old	1)Non-standardized tasks designed by Gillon 2)Evaluations of Language Fundamentals Preschool 2ndEdition 3)Core Language Subtests 4) the Goldman-Fristoe Test of Articulation 5) Pre-Reading Inventory of Phonological Awareness.	Immediate positive effect on higher level and may benefit the future literacy needs of 4-year-olds in integrated classrooms. When each classroom received the phoneme instruction, participants made gains in letter knowledge and phoneme level skills in comparison with group performance under regular instruction. These gains were statistically significant for phoneme blending and letter knowledge. Using an aggregate of all outcome measures, the gain for each classroom when under instruction was statistically significant as compared with when that same classroom was receiving the regular curriculum.
18	Gutierrez Fresneda (2017)	The purpose of this study was to analyze whether learning programs that integrate the development of phonological processing skills, naming speed along with dynamics that favor alphabetic knowledge through shared reading practices, favor the efficiency of the decoder process and acquire a better understanding of reading.	Quasi-experimental design with control group	402 children, 4-6 years old	1)Phonological Knowledge Assessment Test 2) Rapid automatised naming 3)The technique called RAN PROLEC-R test	Dialogical reading practices that take the development of phonological awareness, alphabetical knowledge and rapid automatised naming into account are an efficient tool to improve the reading process in the first years of school.
19	Parpucu, N., Dinç, B. (2017).	The aim of this study was to examine the effects of Colorful Worlds of Sounds Program on phonological awareness of preschool children.	Quasi-experimental pretest-posttest with control group	43 children, 5-6 years old	1)General Information Form 2)The Phonological Awareness Scale of Early Childhood Period	Colorful World of Sounds Program is effective to increase the scores of recognizing rhyme of the experimental group. Moreover, it is effective to increase the scores of beginning sound detection of the experimental group, and the scores of generating new words related to the desired phoneme of the experimental group.
20	Rogde, K., et al (2016).	The goal of the study was to enhance second-language learners' general language skills in their second language. The intervention targeted general language skills using a broad scope of activities, including training in vocabulary, grammar, and narratives.	Randomized controlled trial	115 children, 5-6 years old	1)The test included a random sample of 28 words from a list of 56 taught words. 2) Wechsler Preschool and Primary Scale of Intelligence-III and the Wechsler Intelligence Scale for Children-III. 3)British Picture Vocabulary Scale II. 4) The Renfrew Bus Story test	The learners in preschool increased their expressive vocabulary skills after small-group instruction. The results from the seven-month follow-up test (posttest 2) indicate that the effect on the taught vocabulary was maintained. There was also a follow-up effect on the expressive language construct, albeit reduced in size from the first posttest.
21	Shamir H., (2019).	This study adds to evidence in favor of computer-adaptive reading programs in early elementary school classrooms.	Randomized controlled trial	536 kindergarten children	1)Northwest Evaluation Association (NWEA) Measures of Academic Progress 2)Text Reading Comprehension (TRC).	At the end of the school year, students randomized to the experimental condition outperformed their control counterparts on two different literacy assessments, indicating that early literacy instruction in the format of computer-adaptive reading programs may be beneficial to kindergarten students. Experimental students also outperformed their control counterparts across demographics, demonstrating a benefit from the computer-adaptive program for all students.
22	Augustine, C. (2015).	The purpose of this study was to assess the effect of music and movement on the reading skills of preschoolers. This study sought to evaluate three reading skills or subtests — Print Knowledge, Definitional Vocabulary, and Phonological Awareness.	Quasi-experimental design with control group	40 children, 5 years old	1)Test of Preschool Early Literacy (TOPEL)	There were large differences between the experimental and control groups' posttest scores in the overall English reading skills. This outcome demonstrates a higher mean difference in the posttest of the experimental group, which indicates that music and movement activities did impact the five-year-old preschoolers on reading skills of the three subtests, Print Knowledge, Definitional Vocabulary, and Phonological Awareness.
23	Haley, A. et al (2016).	To examine the impact of one-to-one high-dosage tutoring on reading achievement of kindergarten and first grade students, many at risk of reading failure.	Randomized control trial	201 children, 5-6 years old	1)iReady 2) Chapter One's reading foundation stages (RFS) 3) Fountas-Pinnell (F & P) benchmark assessment system	Chapter One's high impact tutoring program is highly effective in helping at-risk kindergarten and first grade students achieve reading proficiency. Tutored students outperformed non-tutored students on multiple measures of reading achievement. Chapter One achieves similar results in multiple school districts with a larger sample population can be addressed by replicating this study in other Chapter One districts, all of which serve disadvantaged students, many of whom are at risk of reading failure.
24	Spencer, T. D., et al. (2015).	There are three distinct purposes of this study. 1. to investigate the effect of narrative intervention, delivered in a large group arrangement (i.e. whole class), on diverse preschoolers' narrative language skills. 2. to identify children for whom the low-intensity intervention was not sufficient. 3. To examine the extent to which DLLs benefited from the instruction compared to monolingual English speakers.	Quasi-experimental, pretest/posttest comparison group	71 children, 4-5 years old	1)The Narrative Language Measures: Preschool	Statistically significant differences between treatment and comparison groups were found on retell and story comprehension measures. Children who were dual-language learners did not have a different pattern of response than monolingual English speakers. Low-intensity narrative intervention delivered to a large group of children was efficacious and can serve as a targeted language intervention for use within preschool classrooms.
25	Snow, P., et al. (2013).	This study examined the impact of teacher professional development aimed at improving the capacity of primary teachers in	Longitudinal	1254 kindergarten children	1)Reading Progress Test	While improvements occurred in both study arms, findings showed significant advantages, across several oral language and reading measures for children in the research schools. Significant differences

		disadvantaged schools to strengthen children's expressive and receptive oral language skills and early literacy success in the first 2 years of school.			2) Picture Vocabulary and Syntactic Understanding sub-tests from the Test of Language Development: Primary–Fourth Edition (TOLD-4) 3)story grammar analysis 4)narrative analysis of story grammar and grammatical analysis of a narrative re-telling 5)The Renfrew Language Scales Bus Story Test and selected sub-tests including syllable counting, blending, and segmentation tasks from the Sutherland Phonological Awareness Test-Revised	were evident in vocabulary, syntactic understanding, and some aspects of phonemic awareness.
26	Both-de Vries, A. C., & Bus, A. G. (2014).	To test the effects of alphabet book sharing on children's ability to learn letters.	Cross-sectional	45 children, 4-5 years old	1)Naming letters, Rhyming-Passive, Rhyming-Active, Aggregate measure	Alphabet book reading stimulated letter knowledge although the make-up of the alphabet book moderated the effects. Relatively more visual attention to pictures of anthropomorphic figures interfered with learning letters from alphabet book sharing. Visual attention to letters also predicted letter knowledge and learning.
27	Chien, H. Y. (2020).	To investigate the impact of two teaching strategies on preschoolers' oral language skills: repeated read-aloud with question-and-answer teaching embedded, and repeated read-aloud with executive function (EF) activities embedded	Randomized control trial	53 children, 4 -6 years old	1)Peabody Picture Vocabulary Test-Revised 2) Head-Toes-Knees-Shoulders task 3) Oral comprehension test for young children, inferential comprehension test for young children 4) Curriculum-based picture vocabulary test	The study found that the experimental interventions improved participants' curriculum-based receptive vocabulary and oral comprehension. However, the scores in inferential comprehension in the three study groups did not differ significantly.
28	Kirk, S. M., & Kirk, E. P. (2016)	To evaluate the impact of doing 60 minutes of physical activity a day on preschool children's literacy skills.	Longitudinal	56 children, 4 years old	1)Early Literacy Individual Growth and Development Indicators 2) SOFIT Nader PR.	This study indicates that an academic program taught using may be an important step in improving early literacy in children. They found that alliteration and rhyming, both associated with greater early literacy skills and phonological awareness, were significantly improved in the PA group at 4 and 8 months compared with the control group. Improved literacy skill development in early childhood contributes to children's long-term academic success.
29	Grøver, V., et al. (2020).	To assess the effects of receiving a shared reading intervention, the Extend program, developed to support a broad set of skills hypothesized to result from book sharing: grammar, narrative skill, and perspective taking in addition to vocabulary.	Cluster-randomized controlled study	464 children, 3-5 years old	1) The HUG test, and the Test of Emotion Comprehension (TEC). 2) Targeted receptive vocabulary (VOC_REECEPTIVE), Targeted expressive vocabulary (VOC_EXPRESSIVE) 3)The Multilingual Assessment Instrument for Narratives (MAIN) 4)Test for Reception of Grammar, second edition (TROG–2) 5)British Picture Vocabulary Scale, second edition (BPVS–2)	Receiving the intervention had significant impacts on the children's second-language skills. In addition to supporting second-language vocabulary and grammar, the program with its focus on perspective taking during shared reading resulted in impacts on children's ability to shift perspectives and understand others emotional states.
30	Bleses, D., et al. (2018).	(a) To what extent does the SPELL early language and preliteracy intervention increase children's language and preliteracy skills relative to business-as-usual child care in Denmark? (b) To what extent does additional PD for educators or inclusion of a home-based companion program enhance the effects of SPELL on children's out-comes? (c) To what extent do child-level risk factors moderate SPELL impacts for children, specifically children's SES and language status?	Longitudinal	6,483 children, 3- 6 years old	1)Children's language and preliteracy skills: Language Assessment of Children	Pre- to posttest comparisons revealed significant impact of all three interventions for preliteracy skills but not language skills, with little differentiation among the three variations. Fidelity, indexed by number of lessons delivered, was a significant predictor of most outcomes.
31	Zvoch, K., Stevens, J. (2013).	To implement a randomized field experiment in order to ascertain the efficacy of a summer literacy intervention delivered in one Pacific Northwest school district. This examined the effect of assignment to and participation in summer school for two moderately at-risk samples of struggling reader.s	Longitudinal	93 children, 5-7 years old	1) the Dynamic Indicators of Basic Early Literacy Skills (DIBELS; Good & Kaminski, 2002) - The DIBELS nonsense word fluency (NWF) subtest 2) the Test of Oral Reading Fluency (TORF; Children's Educational Services, 1987).	Application of multiple regression models to difference scores capturing the change in summer reading fluency revealed that kindergarten students randomly assigned to summer school outperformed their control group peers by .60 of a standard deviation in an intent-to-treat analysis.
32	Graham, G. (2021).	This evaluation examines the types of support offered to parents, the effect the Reading Intervention program had on student performance, and how these outcomes vary based on demographic characteristics.	Quasi-experimental design	996 children, 3-8 years old	1)Istation's Indicators of Progress for Reading (ISIP™ Reading), measures student growth using computer-adaptive diagnostic and screening programs for prekindergarten to eighth grade 2) The STAAR, an annual state-mandated criterion-referenced assessment that measures students' academic performance and achievement. 3) Teacher survey.	Teachers observed that the program was beneficial to students: their grades improved and students displayed greater confidence in reading. First-grade students who participated in the Reading Intervention program showed a higher increase in the mean proficiency reading score.
33	Lindo, E. J., et al. (2017).	The goal of this study was to determine whether tutors without prior teaching experience or instruction could improve student reading outcomes with minimal	Longitudinal	44 children, preschool-10 years old	1. Dynamic Indicators of Basic Early Literacy Skills 2. Woodcock Language Proficiency Battery–Revised	Tutored students displayed significantly more growth than control students in letter-word identification, decoding, and passage comprehension.

		training, a structured reading curriculum, and access to ongoing coaching.				
34	Kim, Y. & Riley, D. (2021).	This study tested a preschool-home partnership intervention, in which early childhood teachers encouraged the parents/caregivers of preschoolers to engage in dialogic reading at home.	Randomized control trial	18 teachers, 87 children, 2-3-year-old children	1)Family Characteristics and Family Literacy: The Stony Brook Family Reading Survey 2) Children's taxonomic skills: The Expressive One Word Picture Vocabulary Test-Revised. 3)Print Awareness: the Story and Print Concepts Test, from the Head Start Family and Child Experiences Survey 4) Extent of Dialogic Reading (the frequency of using the dialogic reading method during the last week of the intervention)	The impacts of the six-week parent involvement intervention continued to grow during the six-week follow-up phase, and represented substantial gains of the intervention group in four aspects of early language and literacy skills. This study provides evidence that a simple homework assignment intervention can be an effective tool to promote child development when parents/caregivers are engaged. The intervention also had ongoing influence on children's early language and literacy skills, even after the intervention period had ended.
35	Hirsh, H. K., et al. (2018).	It tested whether the Motheread/Fatheread Colorado program increased the frequency and quality of parent–child reading behaviors and led to improvements in children's language and literacy skills.	Randomized controlled trial	148 parents—child dyads, 4 years old	1) the Parent Survey of Home Literacy 2) Teaching Strategies (TS) Gold 3) Early Literacy Parent Questionnaire	Parents in the intervention group reported spending significantly more time reading with their children and a significantly greater use of interactive reading skills than parents in the control condition. Children in the intervention group scored significantly higher on parent-reported language and reading skills immediately following the intervention. Up to 15-months after program completion, children in the intervention condition had greater gains in teacher-reported language skills than children in the control condition.
36	Schmitt, K., et al. (2017).	The purpose of this study was to formally determine whether the final version website with games based on these five media properties and played at home could meaningfully promote literacy development among low- and middle-SES preschool and kindergarten students.	Randomized control trial	96 preschool children and 42 kindergarten children, 5-6 years old	1) the Phonological Awareness Literacy Screening PreK assessment (PALS-PreK) 2) the Get Ready to Read! -Revised (GRTR-R) Screening Tool 3) Letter Identification and Letter Sound Knowledge: the PALS-PreK Alphabet Knowledge Task and the PALS-PreK Letter Sounds Task 4) Alliteration, a measure of phonological sensitivity: the PALS-PreK Beginning Sound Awareness subtest 5) Rhyming: the PALS-PreK Rhyme Awareness 4) Phonics were evaluated using another researcher-developed tool. This measure was based on an Island game in which a PBS character guides child through spelling a word. 5) Vocabulary was evaluated with a researcher-developed instrument. 6) Concepts of print, phonics, and phone-mic awareness: The Get Ready to Read! -Revised Screener (GRTR-R) 7) Parent questionnaires	Children in the intervention group outperformed control group peers on eight of these outcomes. Learning was most pronounced for alliteration and phonics, which are important early predictors of later reading abilities.
37	Burgoyne, K., et al. (2018).	This study evaluated the effectiveness of a parent-delivered early language enrichment programme.	Randomized controlled trial	208 kindergarten children, age not specified	1)Expressive vocabulary was measured using the CELF Preschool IIUK Expressive Vocabulary subtest 2) the Information Score from the Renfrew Action Picture Test (APT R) 2) Receptive vocabulary skills were assessed using the BPVS3 3) the CELF Preschool II 4) The Grammar Score from the APT provided a measure of expressive grammar. 5) Assessment of Reading for Comprehension and answer eight questions about each story. 4) Expressive narrative skills 5) the Movement Assessment Battery for Children 6) Children balanced on one leg for up to 30 s. 7) YARC Early Word Reading subtest	Children receiving the language programme made significantly larger gains in language and narrative skills than children receiving the motor skills programme at immediate posttest. Effects on language were maintained 6 months later, and at this point, the language group also scored higher on tests of early literacy.
38	Fricke, S., et al. (2017).	The study compared a 30-week oral language intervention programme starting in nursery with a 20-week version of the same programme starting in Reception. The intervention groups were compared to an untreated waiting control group.	Randomized controlled trial	394 kindergarten children	1)CELF Expressive Vocabulary subtest and the Information Score from the Renfrew Action Picture Test 2) Receptive vocabulary skills were assessed using the BPVS. 2) CELF Sentence Structure subtest and the APT Grammar Score. 3) Children's listening comprehension skills were tested by asking children to listen to two short stories adapted from the York Assessment of Reading for Comprehension 4) Picture Naming(t1–t3) and asking children to provide a definition of words. 5) the YARC Early Word Reading subtest 7) The two beginner passages from the YARC Passage Reading test	Oral language skills can be improved by providing suitable additional help to children with language difficulties in the early stages of formal education. Both the 20- and 30-week programmes produced improvements on primary outcome measures of oral language skill compared to the untreated control group. Effect sizes were small to moderate immediately following the intervention and were maintained at follow-up 6 months later. The difference in improvement between the 20-week and 30-week programmes was not statistically significant. Neither programme produced statistically significant improvements in children's early word reading or reading comprehension skills.
39	Fricke, S., et al. (2013)	To study whether children receiving a 30-week oral language intervention programme would out-perform an untreated control group on measures of language immediately after the intervention and there would be transfer to	Randomized controlled trial	180 children, 4 years old	1) CELF Preschool II UK Recalling Sentences and Expressive Vocabulary subtests 2) the Early Repetition Battery Word- and Nonword Repetition subtests 3) CELF Preschool II UK Sentence Structure	Children in the intervention group showed significantly better performance on measures of oral language and spoken narrative skills than children in the waiting control group immediately after the 30 week intervention and after a 6 month delay. Gains in word-level literacy skills were weaker, though clear improvements were

		literacy skills, fostered by the work on phoneme awareness and letter-sound knowledge.			4) The Renfrew Action Picture Test measures 5)CELF Preschool IIUK Word Structure requires the production of inflected forms of verbs and nouns. 6) the CELF Preschool IIUK Expressive Vocabulary test 7)) Listening comprehension was assessed by children listening to two short stories and answering questions about them 8) Narrative skills: a story retelling task 9)The vocabulary taught in the Nursery intervention was assessed using Expressive Picture Naming and Receptive Picture Selection 10)The vocabulary taught in the Reception intervention was assessed using Picture Naming and Definitions task 11) Alliteration Matching task in which one of two pictures had to be matched to a target picture based on first sound 12) YARC Sound Isolation 13) The YARC Early Word Reading 14)The Block Design subscale from the Wechsler Preschool 15) Primary Scale of Intelligence	observed on measures of phonological awareness. Importantly, improvements in oral language skills generalized to a standardized measure of reading comprehension at maintenance test.
40	Vadasy, P. F., & Sanders, E. A. (2013).	To investigate the longer-term treatment effects of an explicit, code-oriented intervention that was previously demonstrated to improve reading skills of lower performing English learner (EL) and native speaking (non-EL) first graders at immediate posttest.	Longitudinal experimental	180 children, 0-8 years old	1)Comprehensive Test of Phonological Processing	Word reading skills at entry to grade one strongly predicted word reading, spelling, and reading comprehension outcomes at end of grade three for both English learner and native English-speaking students.
41	Forné, S., et al. (2022).	To investigate the effectiveness of an intensive computerized phonological training program designed to improve reading performance in a sample of children with reading difficulties at the early stages of their reading learning process.	Randomized control Trial	32 children, 7 years old	1)The WISC-IV Vocabulary subtest 2) Digit span (WISC-IV) 3) measures to assess executive functioning verbal fluency. 4) Rapid automatized naming of letters and colours 5) TALE-C 6) PROLEC-R	The children with RDIR (reading difficulties following a computerized intensive remediation) and RDOR (reading difficulties following an ordinary remediation strategy) showed an increased reading performance after the intervention. Children in the RDIR group showed a stronger benefit than the children in the RDOR group, whose improvement was weaker. The control group did not show significant changes in reading performance during the same period. Results suggest that intensive early intervention based on phonics training is an effective strategy to remediate reading difficulties, and that it can be used at school as the first approach to tackle such difficulties.
42	Eghbaria-Ghanamah, H., et al. (2022).	To whether an intervention program, implemented in kindergarten, that familiarized the children with rhymes presented in modern standard Arabic MSA through recitation, facilitated reading and spelling in first grade.	Randomized control trial	136 kindergarten children	1)Peabody Picture Vocabulary Test (PPVT, administered in SAV) 2) The RAVEN matrices test.	In kindergartners, early structured interventions based on repetition-specifically, practice by reciting and listening to nursery rhymes, can significantly contribute to children's reading and spelling abilities in first grade.
43	McMahon-Morin, P., et al. (2021).	To measure the efficacy of an interactive book reading intervention targeting inferencing abilities, delivered by a school-based speech-language pathologist (SLP) in whole group kindergarten classes.	Quasi-experimental study	249 children, 5 years old	Adapted three subtests from Dupin de Saint-André et al. (2008).	Targeting causal and referential inferencing abilities through interactive book-reading activities seems to be effective in 5-year-old kindergarteners.
44	Cassady, J. C., et al. (2018).	To provide a direct test of the impact of the IL software program.	Longitudinal randomized control trial	1490 children, in kindergarten through Grades 5 or 6	1)Arizona English Language Assessment 2) Scantron Reading Foundations	The results demonstrated first-grade students in the experimental condition had greater gains compared in the domains of vocabulary, phonics, phonological awareness and text comprehension.
45	Greenwood, C. R., et al. (2017).	To iteratively develop and refine Literacy 3D based on evidence of implementation and teacher and child impacts.	Longitudinal randomized control trial	297 children, Pre-K	1)Get Ready to Read (GRTR) early literacy assessment	Literacy 3D was the ability to improve the duration of literacy instruction experienced by all children, including those with IEPs, with short, easily-implemented strategies used regularly over time. Literacy 3D was compatible with the curricula used including existing vocabulary, comprehension, and phonological skill development targets and teachers made choices with their coaches.
46	Engel de Abreu, P. M. J.et al. (2020).	The study evaluated a 12-week early literacy intervention for linguistically diverse children who are learning to read in German. The early literacy program included direct instruction in phonological awareness and letter-knowledge, while promoting print and book awareness and literacy engagement. To improve children's phonological awareness skills, develop their letter-knowledge, promote	Quasi-experimental	189 children, 5-6 years old	1)Self-completion questionnaires	The program was effective in enhancing children's letter-knowledge skills. A very large effect in favor of the intervention group was observed immediately and post-intervention.

		print and book awareness, and increase literacy engagement.				
47	Schryer, E., et al. (2015).	To contribute to the work on identifying highly effective early childhood television programming by developing and evaluating an animated book reading intervention that would yield significant effects on preschoolers' emergent literacy skill attainment.	Quasi-experimental	51 children, 3-5 years old	1) Early Language and Literacy Classroom Observation Pre-K assessment (ELLCO Pre-K)	Findings indicate that children in the experimental viewing condition demonstrated gains on standardized measures of vocabulary, alphabet knowledge, print concepts, and rhyme after participating in the book reading intervention over 5 weeks.
48	Hodgins, H., & Harrison, G. L. (2021).	To examine the impact of an early Phonologic Awareness intervention embedded within an oral language program designed for at-risk kindergartners.	Quasi-experimental	28 children, 2-11 years old	1)Curriculum-based measures (CBMs) assessing Phonologic Awareness and early reading	Children in the intervention group demonstrated a greater use of phonological awareness at posttest on overall composites of phonological processing, and on several individual accuracy and fluency measures targeting skills at the phoneme level.
49	Majorano, M., et al. (2021).	To assess the effectiveness of a 12-week intervention programme focused on enhancing pre-schoolers' language and early literacy skills.	Randomized control trial	109 children, 5-6 years old	1)The Talk assessment	The Talk-intervention might be an adequate programme to use with children in the last year of preschool; the combined use of this intervention programme and of the Talk-assessment throughout the year may help monitor pre-schoolers' early literacy skills development and may allow, whenever it is necessary, to intervene, with positive consequences for reading acquisition at primary school, especially for those children who have difficulties in phonological awareness.
50	Pinto, G. et al. (2018).	This study tested the efficacy of an intervention targeting children's conceptual knowledge of the Italian writing system, in enhancing early literacy skills.	Experimental study with pretest and post test	124 children, 3-5 years old	1)Invented Spelling 2)Invented Spelling of Numbers 3)Knowledge of the Alphabet 4)Orthographic Awareness 5)A drawing task 6)Visual-Motor Integration, VMI	The interaction between group and time was significant for all emergent literacy skills. More specifically, it was effective in improving both conceptual knowledge of the writing system (as assessed by the invented spelling of words task), and literacy-related skills (i.e., knowledge of the alphabet and orthographic awareness).
51	Lyster, S. H. et al. (2016).	This study examined the long-term effects of a morphological and a phonological awareness training programme delivered in preschool on later reading abilities.	Quasi Experimental	127 children, 5-6 years old; 115 children in the follow- up study.	1)Initial phoneme matching; 2)Phoneme blending 3)Phoneme counting 4) Deletion of initial phonemes 5)Mothers' educational level 6) Raven's Progressive Matrices 7)the WISC-R 8) Gjessing's standardized test for word reading and text reading, a part of a standardised Norwegian reading assessment battery	In Grade 1 children in the morphological awareness training group had significantly higher scores on both word reading and text reading measures, but no differences were found between the experimental groups. In Grade 6 children in the morphological awareness training group had significantly higher scores on a latent measure of reading comprehension, whereas the children in the phonological awareness training group did not differ from the controls; although the experimental groups did not differ significantly from each other. The results suggest that early training in morphological awareness can have long-term effects on children's literacy skills.
52	Zijlstra, H. et al. (2021).	To examine the effects of a two-year computer-based prevention program starting in kindergarten for children at risk for reading difficulties.	Randomized control trial	123 children, 5-6 years old	1)Grapheme test 2) CELF-4-NL (Clinical Evaluation of Language Fundamentals) 3) TAK 4)Raven's Colored Progressive Matrices 5)Drie Minuten Test	The intervention lastingly improved reading and spelling up till sixth grade, and reduced grade retention. These findings indicate that providing early intensive supplementary reading intervention is a cost-effective way to prevent reading difficulties. However, the intervention needs to be improved to make it successful for children in which a lack of preliteracy skills reflects a lack of learning opportunities.
53	Pears, K. C., et al. (2013).	This study presents the immediate effects on school readiness of a targeted, short-term intervention designed to improve children's early literacy, prosocial, and self-regulatory skills during the summer before kindergarten entry: Kids in Transition to School (KITS).	Randomized control trial	192 children, 5 years old	1)Letter Naming Fluency and Initial Sound Fluency subtests of the Dynamic Indicators of Basic Early Literacy Skills 2)Concepts About Print Test 3)Caregivers completed the Preschool Penn Interactive Peer Play Scale 4) Short vignettes	The results from structural equation modeling indicated that the intervention had significant, positive effects on early literacy and self-regulatory skills, but no significant effect on prosocial skills.
54	Wilkes, S., et al. (2020).	To improve reading proficiency in elementary school students through the use of digital technology as part of a blended learning program - the Lexia Core5 Reading - focusing on two basic components for strong reading comprehension: efficient word recognition and language comprehension.	Cross sectional	520 children, 5-6 years old	1)Basic Early Literacy Skills (DIBELS®)	Treatment students scored significantly higher. This main finding demonstrates the value of Core5 for literacy instruction in early grades. Teachers in treatment schools were able to use Core5's integrated online performance data and offline lessons to hone in ELA instruction time to meet the specific needs of students.
55	Wake, M., et al. (2015).	To test the effect of a Language for Learning, a large-scale randomized trial of a targeted year-long intervention for expressive and/or receptive language delay at age 4 years with primary outcomes in phonology, letter knowledge, and possibly expressive language.	Longitudinal	1464 children, age 4-5 years old	1) Wide Range Achievement Test (WRAT) 2) The Renfrew Language Scales: Bus Story Test 3) Comprehensive Test of Phonological Processing (CTOPP) 4) Children's Test of Non-Word Repetition (CNRep) 5) Peabody Picture Vocabulary Test (PPVT-4) 6) Children's Communication Checklist, 2nd edition (CCC-2) 7) Health Utilities Index (HUI-23P4En-15Q) parent proxy 8) Pediatric Quality of Life Inventory (PedsQL); parent proxy 9) Strengths and Difficulties Questionnaire (SDQ)	Although it proved feasible for non–speech pathologists to implement a relatively intensive home-based language program, this did not result in better language scores. Notably, by age 6, both groups showed improvements in mean expressive and receptive (approximately two-thirds and 1 SD scores, respectively). This suggests that language, at least as measured by standardized tests such remains fluid between these ages and that much of the observed changes we typically ascribe to treatment may actually be driven by child development.

56	Reese, E., et al. (2023).	The study aims to determine whether a book-reading and reminiscing program can enhance children's oral narrative skills and whether the program can be implemented by parents. The study also aims to investigate the long-term effects of the intervention on children's language and literacy skills.	Cross-sectional	62 children, 4-5 years old and their 62 parents	Children's oral narrative skills were assessed in a story comprehension and retelling task using a different age-appropriate book near the end of the second session at each timepoint.	The main finding of this study was that a 6-week combined reading-and-reminiscing (RRR) program with parents boosted children's narrative production (retelling) skills one year later relative to a control group, both for their memory of the story and their use of dialogue, a type of story quality.

Annex 2. ECEC Interventions that have shown improvements in numeracy (=16)

Numeracy						
Nº	**Reference**	**Objective**	**Design**	**Sample**	**Instruments**	**Key findings**
1	Mavilidi, M. F. et al (2018).	To study the effectiveness of integrating physical activities with preschool children's arithmetic skills acquisition.	A cluster randomized control	120 children, 4-5 years old	1)The assessments, adapted from Ramani and Siegler (2008) 2)A scale adapted from Mavilidi, Okely, Chandler, and Paas (2016, 2017). 3)ActiGraph accelerometer (model GT1M, Pensacola).	Children who performed task-relevant integrated physical activity performed better than children in all other conditions. In addition, children who performed physical activity, either integrated or non-integrated, reported higher scores for enjoyment of the instructional method than the two sedentary learning conditions. The math outcomes obtained for each task revealed that the performing integrated physical activity condition exerted the largest effects in the number line estimation and numerical magnitude comparison tasks.
2	Barnes, M. et al. (2016).	To investigate the effects of early maths intervention and attention training on preschool children with very low mathematics knowledge.	Randomized control trial	541 children, 4 years old	1)Early Mathematics Classroom Observation 2) Child Math Assessment 3)TEMA-3 4)Child-Attention Networks Test 5) Kaufman Brief Intelligence Test	There was a significant effect of the intervention on a broad measure of informal mathematical knowledge and a small but significant effect on a measure of numerical knowledge. Attention training was associated with small effects on attention. Although many children in the intervention conditions made considerable gains in mathematical knowledge over the prekindergarten year, there is also a subgroup of children who did not make sufficient gains to prepare them for mathematics instruction in kindergarten.
3	Nisan, M. K. (2019).	This study investigated the effect of Early Numeracy Program on the development of number concept in children at 48-60 months of age.	Quasi-experimental design	78 children, 4-5 years old	1)Early Numeracy 2) Number Development Assessment Tool	The mean post-test scores of the children in the experiment group were significantly higher than the mean scores of the children in the control group. The Early Numeracy Program significantly increases the level of development of number concept for children at 48-60 months of age.
4	Sood, S. et al. (2013).	The purpose was to examine the impact of early number sense instruction that focused on development of relationships among numbers in a high-poverty school of low-achieving students.	Quasi-experimental design with control	101 children, 4-6 years old	Stanford 10 Practice Tests—Level SESAT 1	Results indicated significant differences favoring the treatment students on all measures of number sense (e.g., spatial relationships, more and less relationships, benchmarks of five and ten, nonverbal calculations) at posttest and on a 3-week retention test. Furthermore, the effects were not mediated by at-risk status, suggesting that intervention may benefit a wide range of students.
5	Toll, S. et al. (2014).	To demonstrate the effectiveness of two remedial early numeracy interventions with different durations on kindergartners	Randomized control trial	31 teachers and 1040 children (4 years old)	1) Early Numeracy Test Revised 2)Speeded Number Facts Test3) Cito	Early numeracy intervention over a period of 1.5 school years is effective for enhancing arithmetic, complex mathematics, and early numeracy skills in children with established risk of mathematical learning difficulties. Intervention over a shorter time frame also led to

		scoring below average. Comparing the two versions addresses the question of whether longer-lasting support brings about more positive effects than time-limited remediation started at a later age.			4) Raven's Colored Progressive Matrices	a better performance of early numeracy skills but showed less strong effects. This study confirms that it remains necessary to assist children at risk of math learning difficulties with remedial support throughout kindergarten.
6	Outhwait, L. et al. (2019).	To analyse how the math apps most effectively implemented in a classroom setting compared to standard instructional practice and which components of math development are supported by the math apps.	Randomized control trial	461 children, aged 4–5 years old	1)PTM5 (Math Assessment Resource Service, 2015).	The results showed significantly greater math learning gains for both forms of app implementation compared with standard math practice. The math apps supported targeted basic facts and concepts and generalized to higher-level math reasoning and problem-solving skills. There were no significant differences between the 2 forms of math app implementation, suggesting the math apps can be implemented in a well-balanced curriculum. These novel results suggest that structured, content-rich, interactive apps can provide a vehicle for efficiently delivering high-quality math instruction for all pupils in a classroom context and can effectively raise achievement in early math.
7	Jylanki, P. et al. (2022).	The aim of this pilot study was to examine the immediate and long-term effects of an intervention program that aims to improve preschoolers' early numeracy skills by combining the learning of numerical relational skills via story reading with fundamental motor skill practice.	Quasi-experimental study design	36 children, 4 years old	1)Early Numeracy Test (ENT) KTK-test battery 3) Symbolic Magnitude Processing (SYMP Test)	Children's early numeracy, especially numerical relational skills, improved during the intervention, and the intervention had larger effects on children's early numeracy and numerical relational skills. The delayed post-test demonstrated that the effects were maintained for 4.5–8 weeks after the intervention. It is possible to support children's early numeracy skills with combined learning of numerical relational skills via story reading and fundamental motor skills despite the socioeconomic or language background, and narrow the gap between low- and average-performing children.
8	Merkelbach, I. et al. (2022).	This study was part of a larger research project which focused on promoting literacy. In the current study, we opted for a digital program with similar scaffolding characteristics (structure, repetition, etc.) but now in the domain of numeracy; a domain of vulnerability for children with mild perinatal adversities.	Randomised control trial	79 children, 5-6 years old	Cito Numeracy Test for Kindergarten Pupils (CNT)	Early numeracy skills in children born late preterm fell behind compared to term-born peers in the control condition. These children outperformed their peers in early numeracy skills, while those in the control condition fell behind. The program was effective for children born late preterm, showing stronger numeracy skills compared to term-born peers in the intervention condition: highly structured educational numeracy environment, using repetition and adaptive feedback benefited early numeracy skills of late preterm children.
9	Green, K. B. et al. (2018).	To examine the effects of an intervention that integrates mathematics and children's literature on the early numeracy skills of preschoolers with disabilities.	Quasi-experimental study	50 children, 4-5 years old	1) The TEMA-3 2) The IGDIS-EN 3) Test of Early Mathematics Ability	Children who received the intervention scored significantly higher in total math ability, quantity comparison, one-to-one correspondence counting, and oral counting.

10	Lewis Presser, A. et al (2015).	To investigate the Big Math for Little Kids curriculum's (BMLK) curriculum's effect on children's mathematics knowledge. Our primary research question for the study was whether BMLK produces gains in achievement above and beyond the mathematics instruction that typically occurs in preschool and kindergarten (BAU) for low-SES children, as measured by a nationally standardized mathematics outcome measure that is not aligned with the curriculum.	Longitudinal cluster-randomized controlled trial	762 children, 4-5 years old and their teachers.	1) ECLS-B mathematics knowledge assessment (Najarian et al.,2010)	The impact analysis shows that the children in the intervention learned more mathematics than did children in the business as usual control condition.
11	Jensen, P. et al. (2022).	To analyse the effects of a large-scale school readiness intervention on multilingual children's early numeracy and oral language skills in comparison to two matched monolingual control groups.	Quasi-experimental study	48 children, 3-5 years old	1) SFON Tasks (Hannula et al., 2005). 2) The Imitation Task with Disappearing Objects (Hannula & Lehtinen, 2005). 3) The Selection Task (Hannula et al., 2005). 4) The Imitation Tasks with Visible Items (Hannula et al., 2005). 5) Give-a-Number Task. 6) Number Sequence Production Task. 7) Expressive Vocabulary Task. 8) Story Comprehension Task.	Multilingual children's SFON tendency, cardinality skills, number sequence production abilities, and story comprehension skills developed at a similar rate as monolingual participants during the follow-up period. The results suggest that it is possible to enhance SFON tendency and cardinality-related skills in multilingual children before school age. Furthermore, the time spent supporting early numeracy skills does not take away from language learning.
12	Størksen I. et al. (2023).	To examine the effects of the Playful Learning Curriculum in ECEC on children's school readiness skills in the play-based ECEC context of Norway.	Randomized controlled trial	1,313 children, 5 years old	1)Ani Banani Math Test (ABMT) 2) The Preschool Early Numeracy Skills Screener (PENS) 3) the Norwegian Vocabulary Test (NVT) 4) the Weschler's Intelligence Digit Span Test (DS).	The Playful Learning Curriculum had a positive effect on 5-year-old children's math development. However, The Norwegian Preschool Curriculum did not produce significant effects on language. Results did not reveal any extra gains from the intervention for children with low pre-test scores, or children of parents with low education. This shows that a well-defined age-appropriate curriculum based on playful learning may strengthen children's preschool mathematics skills in a play-based ECEC context.
13	Toll, S. et al. (2013).	To test the effectiveness of the remedial program (TRTM) for kindergartners with below average early numeracy scores.	Randomized controlled trial	933 children, 4-5 years old	1) Working memory screening and early numeracy criterion measurement	The application of the early numeracy program did indeed influence the development of early numeracy of the participating children in the two intervention groups.
14	Davies, R. et al. (2015).	To see how the Michiana Daily Mathtracks Programme affected learning outcomes in	Longitudinal	1600 children, 3-9 years old	1)Indiana Statewide Testing for Educational Progress-Plus (ISTEP+)	Students who participated in the programme performed significantly better. Students from low socioeconomic background who took the

		mathematics comparing the differences by grade in the South Bend Community School Corporation (SBCSC), which serves a population of mostly low-SES students.			2) District math assessments	program gains were significantly larger. Student achievement was improved significantly for students participating.
15	Mera, C. et al. (2022).	The goal of this study was to design 4 digital learning app games to train specific cognitive bases of mathematical learning in order to create resources and promote the use of these technologies in the educational community	Longitudinal	193 children, 5 years old	1)Test of early mathematics ability 2) Symbolic and non-symbolic comparison test 3) Numerical estimation task)	The use of the app provided a statistically significant improvement in numeracy skills in both groups. These technological tools can be used for teaching math and helping early childhood educators to provide new experiences for their students.
16	Purpura, D. et al. (2017)	To assess the impact of improving children's mathematical language on their mathematical knowledge.	Randomized control trial	47 children, 3 - 5 years old	1)Preschool Early Numeracy Skills Screener—Brief Version (PENS-B) 2)The mathematical language subtest assessing comparative language and spatial language 3)Expressive One-Word Picture Vocabulary Test (EOWPVT) to measure children's expressive vocabulary ability	Students in the intervention group significantly outperformed not only on a mathematical language assessment, but on a mathematical knowledge assessment as well. These findings indicate that increasing children's exposure to mathematical language can positively affect their general mathematics skills.

Annex 3. Interventions that have shown improvements in science.

Science						
Nº	Reference	Objective	Design	Sample	Instruments	Key findings
1	Bulunuz, M. (2013).	To investigate kindergarten children's understanding of science concepts when experiencing science through play versus direct instruction.	Cross-sectional	26 children, 6 years old	Semi-structured Interviews	Kindergartners receiving the curriculum outperformed in their ability to make claims, give evidence-based supports, knowledge of receptive science vocabulary, and use of vocabulary in a science context. Findings indicate that with appropriate scaffolding and support, kindergartners can engage in sophisticated science talk and that integrated curriculum materials can impact young children's science learning and science discourse.
2	Gropen, J., et al. (2017).	To build preschool children's ability to engage in inquiry and use inquiry skills such as exploring, asking questions, making predictions, investigating, observing, collecting and recording data, and generating and reflecting on their science ideas.	A randomised control trial	142 preschool teachers and 1,004 children, 4-year-old	1) the preschool Assessment of Science (PAS) 2) the Dimensional Change Card Sort (DCCS) 3) Science Teaching Performance Tasks (STPTs) 4) an observation protocol called the Science Teaching and Environment Rating Scale (STERS)	FSL teachers demonstrated significantly higher quality science teaching in general and greater PCK in the 2 physical science topics. Children in FSL classrooms performed significantly better on tasks involving floating and sinking, and an instrumental variable analysis suggests that the quality of classroom science instruction mediated the relationship between teacher participation in FSL and student outcomes.
3	Henrichs, Lotte & Leseman, Paul. (2014).	To test if a teacher training that addresses teachers' knowledge of academic language use increases their use of scientific reasoning and of varied and sophisticated vocabulary during activities specifically designed for science education.	Cross-sectional	59 kindergarten teachers and 241 children, 5 years old	CHAT transcription format	Teachers' language input became more diverse and they used more general academic words, as well as more domain-specific words. The children did not show greater lexical diversity, but they did show an increased use of general and domain-specific academic word. Although the trained teachers did not show an increase in their use of more general academic words, there was a strong effect on the number of topic-related, domain-specific words.

Annex 4. ECEC Interventions that have shown improvements in more than one basic skills

Combined						
Nº	Reference	Objective	Design	Sample	Instruments	Key findings
1	Erasmus, M. et al. (2016)	To establish the effect of a perceptual–motor intervention programme on the school readiness of Grade R learners from deprived environments.	Cross-sectional	48 children between 4 - 6 years old.	Le Roux's Group Test for School Readiness: Visual perception; Spatial orientation; Number concept; Language and experience; Drawing human figure; Auditory perception; Fine motor ability; Gross motor coordination.	The results showed improvement in the school readiness. The research shows the benefit for young learners learning readiness if teachers focus on intensive intervention programmes to overcome backlogs of deprivation and that effective intervention programmes could rectify shortcomings before formal teaching in Grade 1 commences.
2	Gray, A. et al. (2022)	To test a method for improving literacy learning in kindergarten by integrating literacy and science instruction.	Longitudinal	71 kindergarten teachers and 1,589 children (6 years old).	RRC: Reading Readiness Cluster WA: Word Attack subtest WC: Word Comprehension subtest PC: Passage Comprehension subtest KRMS: Kindergarten Reading Motivation Scale LNF: AimsWeb Letter Naming Fluency WI: Word Identification subtest DRA: Developmental Reading Assessment KTEA: Kaufman Test of Educational Achievement	Significant impacts on comprehension, letter-naming fluency, and motivation to read. No main impacts were observed on decoding, word identification, or writing; however, exploratory analysis revealed that students whose teachers implemented the treatment with fidelity performed statistically significantly better in writing and decoding. Teachers reported positive effects from the integrated curriculum on student engagement, learning, and behaviour.
3	Alesi, M. et al. (2019).	The study aimed to assess the effectiveness of a teacher-led 'Enriched Motor Programme' (EMP) to enhance pre-literacy and motor skills in kindergarten children.	A randomized controlled trial	174 children, 4 - 6 years	IPDA (l'Identificazione Precoce delle Difficoltà di Apprendimento). Motor proficiency was measured through the Italian version of the Early Years Movement Skills Checklist.	Enhanced measures of behaviour, motor activity, linguistic abilities, linguistic comprehension and expression, metacognition and memory domains in the intervention group.
4	Kammermeyer, G. et al. (2016).	To investigate the extent to which 'Pyramid Approach' yields substantial effects on literacy and numeracy skills compared with the effects of the 'Letter & Number World' training, the Developmentally Appropriate Approach 'Kindergarten of the Future in Bavaria' and a control group.	Quasi-experimental pre- and post-test-control-group design	36 teachers and 397 children, 5-6 years old.	To measure vocabulary, the wortgewandt ('eloquent') part of the test of Moser and Berweger (2007). Non-verbal intelligence was measured with the the Coloured Progressive Matrices (CPM). Preschool process quality was also used as a control variable using KES-R-E (Kindergarten Scale-Extension).	The three intervention groups performed significantly better in terms of achievement in literacy and numeracy, but there were no significant effects between the three intervention groups. Promoting literacy and numeracy in kindergarten has positive results on children's development. For the post-test, the overall MANCOVA, including all three dependent variables (vocabulary, intelligence and pre test scores in phonological awareness and numeracy competencies), was significant.
5	Arteaga, A. et al. (2019).	The study analysed the effects of a coaching program that was part of Mississippi Building Blocks (MBB).	A randomized controlled experiment	195 children (3-4 years old), 24 teachers	1)Test of Preschool Early Language (TOPEL), 2) School Readiness Assessment (SRA), 3) Woodcock-Johnson III Applied Problems (W-JIII), 4) Devereux Early Childhood Assessment (DECA). 5)ELLCO Pre-K Tool (classroom quality, curriculum, the language environment, books and book reading, and print and early writing)	MBB coaching led to substantial improvements in child outcomes, particularly in gross motor skills, print language skills, and socioemotional development. MBB coaching also improved math skills. A mediator analysis indicates that improvements in the classroom learning environment brought about by MBB coaching improved child outcomes. The findings suggest that an intensive form of classroom coaching for teachers leads to significant gains in child outcomes.
6	Gómez, F. et al. (2013).	To analyse effects of small-group co-located collaborative learning on a single display computer improve oral language, logical-mathematical, and social skills learning for preschool children.	A quasi-experimental design, pre- and post-test	440 children aged 5 to 6 years old, and one teacher.	1)Oral language and logical-mathematical and quantification 2)Social skills.	Small-group co-located collaborative learning on a single display computer improves oral language, logical-mathematical, and social skills learning for preschool children.
7	Bleses, D. et al (2020).	To analyse how a low-cost teacher implemented intervention "Play and Learn" affects toddlers´ math and language skills.	Cross sectional	1116 children, 1.5 - 3 years old	1) The Classroom Assessment Scoring System-Toddler (CLASS-Toddler) 2) The CDI-Educator 3) A researcher-developed teacher-administered checklist on children's math development and content-specific language 4) The teacher version of a Danish adaptation of the standardized questionnaire, Social–Emotional Assessment Measure (SEAM)	"Play and Learn" intervention had a significant short-term impact on all the targeted language, math language and numeracy skills.

8	Griffith, S. et al. (2019)	To test the effects of providing high-quality educational apps to preschool children from low-income families.	Randomized control trial	22 children, 4-year-old	1)Test of Preschool Early Literacy (TOPEL) 2) Test of Early Mathematics Ability (TEMA) 3) Academic interest was assessed using the academic interest observations (i.e., puzzle task) and parent ratings of academic interest.	The use of educational apps promoted early academic skills in this low-income US sample. The educational apps were particularly effective in enhancing children's phonological awareness and emergent math skills, which are essential for later literacy and overall achievement. Parents reported increases in academic interest, which also predicts later academic outcomes. Educational apps can provide an effective informal home learning tool for preschoolers from low-income families which may be particularly important for ameliorating the "summer slump," in which children with less access to educational materials lose ground while out of school.
9	Kermani, H. A. et al. (2015)	To examine whether content-specific/purposeful and intentional math, science, and technology projects and activities (informally and via explicit instruction) would enhance Pre-K children's learning of math and science skills and concepts including technology.	Quasi-experimental, pre–post intervention design	58 children, 4-5 years old	1) Test of Early Mathematic Ability (TEMA-3) 2)The two researchers observed a total of 6 science activities centring on the following themes: Living and none-living, seeds and plants, and ocean animals. 3)Teacher Survey 4)Video Recordings	The experimental group made a significant improvement in their math skills. Young children from low socio-economic backgrounds can be successful in attaining higher levels of competence in math, science, and technology when supported by teachers' skilful instruction, purposeful content and quality materials and resources.
10	Kinzie, M., et al. (2014)	To compare the development of mathematics and science skills for children whose teachers were assigned to one of three conditions: 1) MTP-M/S curricula plus teacher support system (Plus), 2) MTP-M/S curricula only (Basic), or 3) Business as Usual (BaU).	Randomized control trial	444 children, 4-5 years old and 42 teachers	1)Test of Early Mathematic Ability (TEMA-3) 2) The Geometry and Measurement Assessment (GMA) 3)Number Sense and Place Value Assessment (NPV) 4) The Life Science Assessment (LiS) 5) Earth and Physical Science Assessment (EPS)	There were intervention effects for children's knowledge and skills in geometry and measurement as well as number sense and place value. Children in Plus classrooms made greater gains in geometry and measurement, compared with those in business as usual classrooms. Children in Plus classrooms also performed better on the number sense and place value assessment than did those in Basic or business as usual classrooms.
11	Whittaker, J. et al. (2020).	The study extends previous research to explore the effects of the My teaching partner - Mat/Science (MTP-M/S) curricula and teacher support system on teachers' practice and children's mathematics and science outcomes.	Longitudinal	1371 children (4-5 years old) and 140 teachers	1)Teachers filmed all of the mathematics and science lessons they taught each month. 2)Classroom Observation of Early Mathematics Teaching (COEMET) 3)Preschool Science Observation Measure (PSOM) 4)Classroom Assessment Scoring System (CLASS) 5)Classroom Snapshot Journal Of Research On Educational Effectiveness 6)Children's mathematics and science achievement were assessed using teacher rating scales and direct assessments: Academic Rating Scale (ARS) Math and Science for each child (ECLS-K) 7)Short Tools for Early Assessment in Mathematics (MTP-STEAM) 8)Number Sense and Place Value (NSPV). 9)LENS on Science (LENS) 10)Preschool Assessment of Science (PAS)	Results suggest that the MTP-M/S curricula and teacher support system have moderate to large positive effects on teacher practice. MTP-M/S is associated with children's knowledge and skills in mathematics and science, but only within the context of the quasi-experimental design in teachers' second year of participation in the intervention.

Annex 5. Initial Exploratory Analysis.

The following table shows the results of the first exploratory factor analysis. Five factors are obtained that explain the internal relationship between the items.

***Table** 1 Factor Loadings by Items.*

Items	Factor					Uniqueness
	1	2	3	4	5	
Q12.1	.103	.081	.064	.552	.025	.526
Q12.2	.031	.076	.168	.453	-.038	.626
Q12.3	.131	.193	.013	.439	.117	.558
Q12.4	.025	.072	.096	.302	.426	.620
Q12.5	.072	.505	.085	-.159	.306	.572
Q12.6	-.005	.671	-.001	-.003	.080	.526
Q12.7	.030	.490	.062	.260	-.119	.502
Q12.8	-.003	.565	.037	.088	.148	.537
Q12.9	.030	.683	.028	.093	-.175	.442
Q13.1	.043	-.101	.580	.078	.000	.647
Q13.2	-.006	.031	.765	-.053	.023	.424
Q13.3	-.008	.003	.641	.043	-.044	.573
Q15	.654	.054	.000	.015	-.104	.542
Q16	.667	.061	.046	-.041	-.101	.528
Q17	.770	-.013	-.021	.004	.040	.418
Q18	.816	-.029	-.027	.050	.033	.325
Q19	.788	-.033	.034	-.028	.039	.382

The following table shows the factor loadings of the items after carrying out the exploratory factor analysis, where only loadings greater than .300 are included.

***Table** 2. Factor Loadings by Items (Hiding Values Below <.300).*

Items	Factor					Uniqueness
	1	2	3	4	5	
Q12				.552		.526
Q13				.453		.626
Q14				.439		.558
Q15				.302	.426	.620
Q16		.505			.306	.572
Q17		.671				.526
Q18		.490				.502
Q19		.565				.537
Q20		.683				.442
Q21			.580			.647
Q22			.765			.424
Q23			.641			.573
Q25	.654					.542
Q26	.667					.528
Q27	.770					.418
Q28	.816					.325
Q29	.788					.382

In the following Table, you can see a summary of the loadings, the variance explained by each factor and the percentage of accumulated variance.

Table 3. *Summary of Factors, Explained Variance, and Percentage of Cumulative Variance.*

Factor	SC Loadings	% Variance	% Cumulative Variance
1	2.916	17.15%	17.20%
2	2.109	12.40%	29.60%
3	1.556	9.15%	38.70%
4	1.242	7.30%	46.00%
5	.430	2.53%	48.50%

The next Table presents the results of the correlations between factors as a study of the relationship between them to know if they are interdependent with each other.

Table 4. *Correlations Between Factors.*

Factor	2	3	4	5
1	.333	.434	.439	.105
2		.464	.546	.219
3			.441	.166
4				-.007

The next Table presents the model fit indices for the Exploratory Factor Analysis (EFA), using key measures such as RMSEA, TLI, BIC, and model tests.

Table 5. *Model Fit for Exploratory Factor Analysis (RMSEA, TLI, BIC, and Model Tests) (AFE).*

RMSEA	IC 90% RMSEA		TLI	BIC	Model test		
	Inf	Sup			χ^2	gl	p-value
.0282	.0237	.0329	.981	-293	187	61	<.001

Bartlett's tests of sphericity are presented in the following Table.

Table 6. *Bartlett's Test of Sphericity (AFE).*

Bartlett's Test of Sphericity		
χ^2	gl	p-value
14900	136	<.001

The Kaiser-Meyer-Olkin sampling adequacy measure can be seen in the Table, both at the global level and by item, in the context of Exploratory Factor Analysis

Table 7. *Global Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and by Items (AFE).*

KMO Sampling Adequacy Measure						Global	.912
Item	MSA	Item	MSA	Item	MSA	Item	MSA
Q12	.935	Q16	.892	Q21	.890	Q25	.932
Q13	.935	Q17	.903	Q22	.874	Q26	.929
Q14	.944	Q18	.928	Q23	.884	Q27	.910
Q15	.925	Q19	.920			Q28	.891
		Q20	.908			Q29	.901

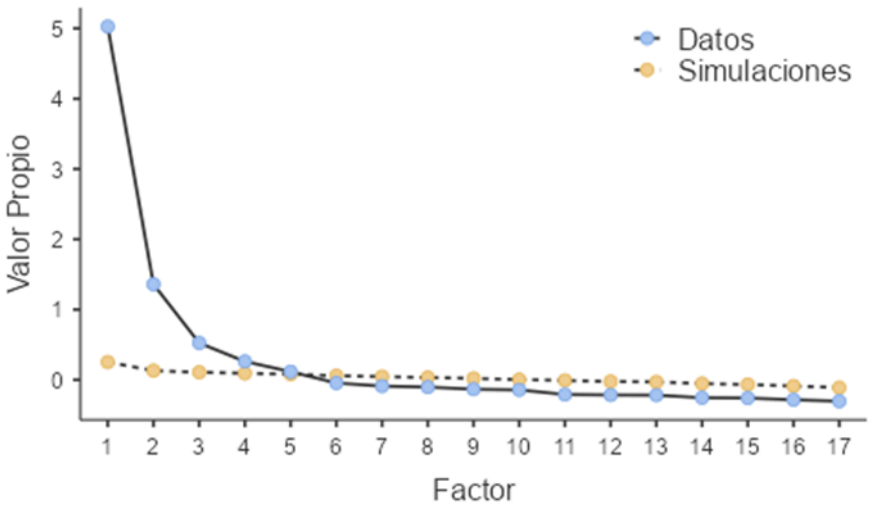
The next table presents the eigenvalues - these represent the amount of variance explained by each factor. Factors with eigenvalues greater than 1 are considered significant, which is to say, they explain more variance than a single individual variable.

Table 8. *Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy by Factors and Eigenvalues (AFE).*

Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy							
Factor	**Eigenvalue**	**Factor**	**Eigenvalue**	**Factor**	**Eigenvalue**	**Factor**	**Eigenvalue**
1	5.027	6	-.046	10	-.143	14	-.256
2	1.360	7	-.089	11	-.209	15	-.259
3	.524	8	-.104	12	-.216	16	-.284
4	.261	9	-.133	13	-.218	17	-.304
5	.116						

The next Figure presents a Scree Slot of this analysis. This tool determines the optimal number of factors to maintain by comparing the values obtained from our data (blue dotted line) with those generated randomly (yellow dotted line), to identify the number of factors that explain a significant portion of the variance.

Figure 1. *Scree Plot of Factors and Corresponding Eigenvalues from the Exploratory Factor Analysis (AFE).*



In conclusion, the exploratory factor analysis has identified five significant factors that reflect various dimensions of the perception of the work environment and the quality of interactions in the educational environment. However, adjustments are required in several items to improve the validity of the questionnaire. Some items present high uniqueness, indicating that a considerable part of their variance is not explained by the identified factors, which suggests the need to review their formulation.

Annex 6. Questionnaire

Section 1. Background Information

Instruction: Please complete the information regarding your background information.

1.Do you identify as:

- Male
- Female
- Other
- Prefer not to say

2.Select your age group:

- 18-30
- 31-40
- 41-50
- 51-60
- Over 60

3.How long have you worked in an Early Years setting?

- 0-6 years
- 7-15 years
- more than 15 years

4.I am staff in an ECEC centre in: Please select your country

5.Which region do you live in?

6.What is your highest qualification?

- High school
- Bachelor’s degree
- Master’s degree
- Doctoral degree
- Other [text entry]

7.Select the qualifications you have to work in ECEC. You can choose more than one:

- Teacher
- Child carer
- Special education teacher
- Personal care assistant
- Head of early education centre
- Other [text entry]

Section 2. Information About Yor Group

Instruction: Please answer the following questions about your ECEC setting (If you are not responsible for a group now, please respond based on your most recent experience).

8.How many adults (teachers, auxiliary, other staff) work in your group on a daily basis?

- 1, 2, 3, 4, 5 or more

9.How many children are in your group?

- 1, 2, …, 25, 26 or more

10.How many different languages are spoken by the children in your group?

- 1, 2, ... 9, 10 or more

11.How many children with special educational needs are in your group?

- 1, 2, ... 9, 10 or more

Section 3. Interaction and Relationships Between Staff and Children

Instruction: How often do the following practices take place in your ECEC setting? (If you are not responsible for a group now, please respond based on your most recent experience)

[Scale: 1=Never, 2=Rarely, 3=Sometimes, 4=Often, 5=Always]

12.We develop a calm and unhurried environment that embraces high-quality adult-child interactions.

13.We acknowledge, respect and respond to every child’s home language and culture.

14.Children have opportunities for indoor and outdoor free play with a variety of purposeful materials, including open-ended materials, that encourage curiosity and discovery and are accessible to them all the time.

15.We organize classroom activities to explore science ideas.

16.We use sorting activities by shape or colour.

17.We include songs, rhythms and reading as part of our daily practice for literacy development.

18.We make sure to create a safe and supportive learning environment (for instance, by providing reciprocal, responsive, and secure interactions, celebrating everyone's' identity and culture, or having 0 tolerance towards violent behaviours).

19.We ensure time for guided play so that children's learning can be expanded beyond what they can achieve alone.

20.We encourage children to interact with each other, to help each other, and to share.

Section 4. Relationships Between Staff and Parents/Guardians

Instruction: How often do the following practices take place in your ECEC setting?

[Scale: 1=Never, 2=Rarely, 3=Sometimes, 4=Often, 5=Always]

We encourage and support parents/guardians and other relevant adults to:

21.Spend time in the setting and experience the care and learning their children receive is encouraged, supported, and respected.

22.Engage in meaningful learning opportunities with their children at home.

23.Take part in the decision-making process on issues related to their children's education.

Section 5. Professional Support

Instruction: Please reflect on the professional support at your ECEC setting.

24.My ECEC setting offers research informed training in fostering… (please mark the ones that are relevant for you)

- Basic skills (i.e. early language, reading development, math, science, etc.)
- Socioemotional development
- Children's wellbeing
- Diversity (i.e. serving children with special needs, disabilities, trauma or other disadvantaged backgrounds)

- Other: _____

25.The working atmosphere in my ECEC is supportive of staff. [Scale 1. strongly disagree 2. disagree 3. slightly disagree 4. neutral 5. slightly agree 6. agree 7. strongly agree]

26.In my ECEC, staff can ask for advice and receive feedback (for instance, through regular meetings, performance evaluations, or informal communication). [Scale 1. strongly disagree 2. disagree 3. slightly disagree 4. neutral 5. slightly agree 6. agree 7. strongly agree]

Sectoin 6. Leadership

Instruction: How is the leadership of your ECEC setting? [Scale 1. strongly disagree 2. disagree 3. slightly disagree 4. neutral 5. slightly agree 6. agree 7. strongly agree]

27.Staff members at my ECEC setting are involved in decisions about using new pedagogical methods.

28.At my ECEC setting, together with the leader / manager, we focus on the vision and goals of the setting and collaboratively create an action plan to move towards our vision and mission.

29.At my ECEC setting, the leader provides us with constructive feedback based on their observation, planning and assessment pedagogical processes to support the holistic development of all children.

Annex 7. ECEC Validated Questionnaire

Section 1. Background Information

Instruction: Please complete the information regarding your background information.

1.Do you identify as:

- Male
- Female
- Other
- Prefer not to say

2.Select your age group:

- 18-30
- 31-40
- 41-50
- 51-60
- Over 60

3.How long have you worked in an Early Years setting?

- 0-6 years
- 7-15 years
- more than 15 years

4.I am staff in an ECEC centre in: Please select your country

5.Which region do you live in?

6.What is your highest qualification?

- High school
- Bachelor’s degree
- Master’s degree
- Doctoral degree
- Other [text entry]

7.Select the qualifications you have to work in ECEC. You can choose more than one:

- Teacher
- Child carer
- Special education teacher
- Personal care assistant
- Head of early education centre
- Other [text entry]

Instruction: Please reflect on the professional support at your ECEC setting.

8.My ECEC setting offers research informed training in fostering… (please mark the ones that are relevant for you)

- Basic skills (i.e. early language, reading development, math, science, etc.)
- Socioemotional development
- Children's wellbeing
- Diversity (i.e. serving children with special needs, disabilities, trauma or other disadvantaged backgrounds)
- Other: _____

Secction 2. Information About Your Group

Instruction: Please answer the following questions about your ECEC setting (If you are not responsible for a group now, please respond based on your most recent experience).

9.How many adults (teachers, auxiliary, other staff) work in your group on a daily basis?

- 1, 2, 3, 4, 5 or more

10.How many children are in your group?

- 1, 2, …, 25, 26 or more

11.How many different languages are spoken by the children in your group?

- 1, 2, ... 9, 10 or more

12.How many children with special educational needs are in your group?

- 1, 2, ... 9, 10 or more

Section 3.

Instruction: How often do the following practices take place in your ECEC setting? (If you are not responsible for a group now, please respond based on your most recent experience)

[Scale: 1=Never, 2=Rarely, 3=Sometimes, 4=Often, 5=Always]

13.We develop a calm and unhurried environment that embraces high-quality adult-child interactions.

14.We acknowledge, respect and respond to every child's home language and culture.

15.Children have opportunities for indoor and outdoor free play with a variety of purposeful materials, including open-ended materials, that encourage curiosity and discovery and are accessible to them all the time.

16.We make sure to create a safe and supportive learning environment (for instance, by providing reciprocal, responsive, and secure interactions, celebrating everyone's' identity and culture, or having 0 tolerance towards violent behaviours).

17.We encourage children to interact with each other, to help each other, and to share.

Section 4.

Instruction: How often do the following practices take place in your ECEC setting? (If you are not responsible for a group now, please respond based on your most recent experience)

[Scale: 1=Never, 2=Rarely, 3=Sometimes, 4=Often, 5=Always]

18.We use sorting activities by shape or colour.

19.We include songs, rhythms and reading as part of our daily practice for literacy development.

20.We ensure time for guided play so that children's learning can be expanded beyond what they can achieve alone.

Section 5.

Instruction: How often do the following practices take place in your ECEC setting?

[Scale: 1=Never, 2=Rarely, 3=Sometimes, 4=Often, 5=Always]

We encourage and support parents/guardians and other relevant adults to:

21.Spend time in the setting and experience the care and learning their children receive is encouraged, supported, and respected.

22.Engage in meaningful learning opportunities with their children at home.

23.Take part in the decision-making process on issues related to their children's education.

Section 6.1.

24.The working atmosphere in my ECEC is supportive of staff.

[Scale 1. strongly disagree 2. disagree 3. slightly disagree 4. neutral 5. slightly agree 6. agree 7. strongly agree]

25.In my ECEC, staff can ask for advice and receive feedback (for instance, through regular meetings, performance evaluations, or informal communication).

[Scale 1. strongly disagree 2. disagree 3. slightly disagree 4. neutral 5. slightly agree 6. agree 7. strongly agree]

SECTION 6.2

Instruction: How is the leadership of your ECEC setting? [Scale 1. strongly disagree 2. disagree 3. slightly disagree 4. neutral 5. slightly agree 6. agree 7. strongly agree]

26.Staff members at my ECEC setting are involved in decisions about using new pedagogical methods.

27.At my ECEC setting, together with the leader / manager, we focus on the vision and goals of the setting and collaboratively create an action plan to move towards our vision and mission.

28.At my ECEC setting, the leader provides us with constructive feedback based on their observation, planning and assessment pedagogical processes to support the holistic development of all children.

Annex 8. Task 2.4 Focus Group Protocol

Table of Contents

Introduction

As part of WP2, Task 2.4 is aimed at studying high-quality ECEC in Europe to, ultimately, maximize the positive influence of this determinant in later educational stages. In order to do so, it will systematize indicators of high quality ECEC based on the analysis of programmes that have demonstrated their effectiveness.

The voices and experiences of children, families and staff of the participating centres will be at the heart of this task. For this aim, fifteen focus groups with children (ages 4 to 6), families and ECEC staff will be carried out separately while guaranteeing an inclusive environment and mutual understanding among the participants. Once informed consents will be obtained (from the adult participants and from the children's parents/guardians), the focus groups will be audio recorded or video recorded (depending on the consent granted) for later transcription and analysis. The information gathered in these sessions will be included in a document about policy recommendations to achieve efficient actions that will assure good results in cognitive and social development for early years pupils, mainly those living in vulnerable situations. Five partners (UD, UPORTO, HELSINGIN YLIOPISTO, ASS PARENTS, CESIE) will carry out three focus groups, one with each target group (one with families, one with children and one with ECEC staff).

As a result, a project document on Policy recommendations to foster high-quality ECEC in Europe will be produced (D.2.3). This document will be disseminated and discussed in a seminar with policy makers organised by MEC, drawing on their background as a policymaking institution. A total of three seminars will be carried out (MEC, DCU, UNIVERSITY OF MALTA) across different EU countries (See WP7). These seminars can be conducted between M24 (October 2024) and M26 (December 2024), based on availability of policymakers.

This protocol provides the following:

1. A description of the content and objectives of the focus groups
2. Some considerations and tips as part of the preparation
3. General guidelines for the focus group with adults
4. General guidelines for the focus groups with children
5. Key ethical principles for conducting focus groups with minors
6. The list of semi-structured questions for the focus groups with ECEC staff, with families and with children
7. Consent form for adults
8. Parental consent form for minors
9. Report Template

Finally, the Annex includes the project information sheet that researchers should distribute to the participants ahead of the focus group.

Summary of focus group deadlines

T2.4 action	Date for completion
Selection of participants	By 31/07/24
Planning	By 31/08/24
Conduct focus groups	By 30/09/24
Submit reports	**10/10/24 the latest!**

1. Focus Group Description

The focus group technique involves speaking with more than one (usually at least four) interviewees at the same time. Essentially it is a group interview in which the interviewees can speak to and interact with one another.

Most focus group researchers work within a qualitative research tradition. They try to provide a fairly unstructured setting in which the person who runs the focus group, usually called the moderator or facilitator, guides the session but does not intrude.

Semi-structured interviewing offers researchers and interviewees a degree of flexibility in shaping the course and content of an interview.

At the same time, the role of the note-taker/observer is just as important.

Specifically, the role of the note-taker / observer has two functions: to record content (what was said, by who) and process (such as who did most of the talking, or whether children became especially animated or angry or whether they had difficulty answering a question etc.).

The note-taker/observer should be introduced to the group, and their role explained. This is important particularly in FG with children, so that the latter understand that they are not being ‘marked’ or assessed as this may make them feel unable to participate fully. It is helpful to explain that the note-taker/observer will not be participating and will not ask questions, although they may ask someone to repeat their answer if they did not understand.

It can be interesting for children to take part in focus groups and – depending on their age – they may prefer this to one-to-one discussion with an adult as they may feel more comfortable discussing with their peers present.

However, children may also feel constrained by the format of the focus group. Even though focus groups are a 'formal' process, their format should not be 'too formal', intimidating, and adult-controlled.

Children as young as 4 years old are capable of participating in focus groups when the methodology is adjusted accordingly. Using playful group activities - sometimes referred to as 'participatory methods with children' (Christensen & James, 2008) instead of conversation can facilitate the participation of younger children. Children in kindergarten and first grade are able to discuss their opinions with each other. They are beginning to understand metaphors (Stites & Ozcaliskan, 2013).

The following recommendations provide some general guidelines for the preparation and realisation of focus groups, while paying special attention to the various aspects around the participation of children in this process.

2. Preparation: Considerations and tips

Safety & Security:

Safety and security must be the primary consideration. This includes the physical and emotional safety for all participants and especially for children.
Children should feel free to participate and not fear retribution. Facilitators should specify that there are no right or wrong answers and that each participant may express and share their own thoughts, feelings and experiences.
It is useful to have an additional staff member or volunteer available who is not participating in the focus group, so that if children decide they do not want to participate and want to leave there is someone to supervise them/ensure they get back home safely.

Location:

Choose the right environment: The environment should be safe and comfortable for the children. Choose a room that is quiet, free from distractions, and has age-appropriate toys or materials available.

If possible, try to give children and/or families choice over location (i.e. a specific/ familiar room in the school).
The location must further guarantee privacy and confidentiality. For younger children, new environments and strange adults can cause anxiety. Children are likely to feel comfortable talking with people they know and in familiar settings.
Ideally let children decide on sitting arrangements. However, keep in mind that circular seating arrangements (so everyone can see each other) may be better for focus groups. With children, it may be more appropriate to sit on the floor, especially if this helps give a more relaxed and informal atmosphere.

Seeking consent:

Participation is voluntary. All adult participants should sign the consent form before the focus group.
Obtain parental consent: Obtain parental consent before conducting the focus group discussion, and explain the purpose and benefits of the discussion.
In some situations, the presence of caregivers or parents is appropriate or even necessary. If the child is afraid to stay alone or in the case of the participation of a disabled child, the presence of caregivers or parents can be beneficial. These children may also have specific communication or support needs requiring the presence of a caregiver or parent. In this case, the attending caregiver or parent needs to be coached carefully about their role within the focus group. The moderator should then ensure that these caregivers or parents keep their neutral role and do not attempt to influence or interpret the participants' responses (Shaw et al., 2011).
Respect the children's privacy by keeping the discussion confidential, and do not use their names or personal information in any reports or publications.

3. General Guidelines for Focus groups with adults

Size and time:

The ideal size of a focus group is between 6-12 participants, but this can vary depending on the topic and the nature of the discussion.
A focus group discussion may usually last 60–120 mins, though duration is of course flexible. Facilitators may allow participants to take breaks.
Careful time management is important, since you have to determine how much time you want to devote to answering each question, and how much time is available for each individual participant who wishes to express their view on the respective topic discussed.
Facilitators may also wish to keep an eye to participants who may take the conversation over. They should use their intuition and diplomatic skills to encourage a quieter participant to contribute to the conversation and, subsequently, to ask someone who talks a lot to wait for others to also reply.

Phrasing the questions:

Define the research question: Determine the research question or topic that the focus group will address.
Use open-ended questions, ask participants to think back and reflect on their personal experiences.
Avoid asking ‘why’ questions.
Keep questions simple and make your questions sound conversational.
Estimate the time for each question and consider: the complexity of the question, the category of the question, level of participant’s expertise, the size of the focus group discussion, and the amount of discussion you want related to the question.
You need to be prepared to manage difficulties as they arise: i.e. dominant participants during the discussion, little or no interaction and discussion between participants, participants who have

difficulties sharing their real feelings about sensitive topics with others, and participants who behave differently when they are observed.
Preparing additional questions or allowing for rephrasing of the question may be useful, in case participants do not have a reply for some of the questions asked initially.

4. General Guidelines for Focus groups with children

Size and time:

Though, as with focus groups with adults, the ideal size is between 6-12 participants, smaller groups may replicate natural and familiar forms of communication in which children interact together with peers.
Keep it short: Children in this age group have a shorter attention span, so keep the focus group discussion short, ideally no more than 30-45 minutes.
With children in particular, the time of day must be carefully planned because fatigue and restlessness typically occur at the end of the day, and children might have different, extracurricular activities in the evenings. Seek advice from the guardians/parents and teachers as to which time of day (weekday or during the weekend) would be best to hold the focus group (depending on the children's schedules, etc.).

Phrasing the questions:

Before starting with questions, sitting arrangements must be made: smaller children might prefer to sit in a circle on the floor or in their chairs, facing each other and the moderator.
For children, an activity where they each create their own name tag and say something about themselves could be useful to establish a warm atmosphere and a sense of trust of the researcher and of the rest of the group. Otherwise, you may start with an activity such as singing a song or telling a story. This will help the children feel more comfortable and relaxed.

Use age-appropriate language: Use simple, clear, and age-appropriate language. Avoid using technical terms or jargon.
Younger children may have difficulty understanding excessively general or vague questions. Questions starting with “what” or “how” are preferred to questions starting with “why” or to questions requiring “yes” or “no” answers.
Using prompts such as “What does everyone else think?” “Do others have different thoughts?” “Tell me more” or “How interesting” can improve the flow of a discussion, especially with shy individuals (Lund et al., 2016).
Expressions such as “Great!” “Terrific!” or “Cool!” should be avoided because they may discourage the child from telling the parts of the story that are less cool (Fargas-Malet, McSherry, Larkin, & Robinson, 2010).
Questions should not be repeated, as children might think their first answer was somehow wrong and then change their response. Rephrasing a question for the sake of clarification and to ensure that every participant understands it is encouraged.
If young children become excited and begin talking simultaneously, it may be useful to address each participant by name.
Using nonverbal feedback such as nodding or raising the eyebrows in surprise can help shy children feel secure (Lund et al., 2016).
To better understand a child’s intended meaning, participatory techniques, such as role-playing scenarios, can be helpful. Similarly, you may use props and visuals: Children learn better through visuals and props. Use pictures, toys (such as a teddy bear), or other visual aids to help them understand the questions.
Encourage participation: Encourage all the children to participate in the discussion, but do not force them. Use positive reinforcement to motivate them.

5. Ethical principles for involving children in focus groups

- Participation is safe
- Participation is voluntary
- Children are informed about the purpose of their participation in FGDs.
- The use of FGDs with children is meaningful and necessary.
- Participation is Inclusive and non-discriminatory.
- Participation is developmentally appropriate, gender sensitive and culturally relevant.
- Participation is ensured by professionals having the required competencies.
- In all situations the best of interest of children is the paramount consideration

We followed the EECERA code of ethics: https://www.eecera.org/about/ethical-code/#:~:text=The%20EECERA%20ethical%20code%20was,and%20dissemination%20of%20its%20results.

6. Semi-structured questions

All focus groups follow roughly the same basic format, and have four phases:

Beginning	• Welcome participants • Explain the why and the how • Confirm informed consent given • Set/agree ground rules
Opening	• Warm up activities
Discussion	• Semi-structured questions
Conclusion	• Wrap up • Follow-up questions

Drawing on the WP findings, the following semi-structured questions are meant to be used as helpful, indicative guidelines and as inspiration for the focus group discussions. Each facilitator/researcher may choose to adapt them or change them based on the specific country/school/institutional context.

The questions are roughly divided into **four thematic categories**:

A. Child attributes associated with increased well-being, positive development and reduced risk for exclusion/negative development

B. Educators-child/peer/educators family interactions

C. Institutional practices/leadership

D. Structures/resources/policies

Focus groups with ECEC staff:

A. Child attributes associated with increased well-being, positive development and reduced risk for exclusion/negative development

- Do you think it is important to incorporate early literacy, numeracy and science skills into ECE? If so, how do you go about incorporating them in your classes?
- Do you integrate technology and digital skills into your activities (i.e. basic navigation skills, understanding icons, exploring interactive e-books that enhance reading comprehension or age-appropriate apps for letter recognition or basic math concepts)?
- Do you think that the children enjoy and benefit from these activities?
- Are there any special activities or arrangements that you have for at-risk children or for children from disadvantaged backgrounds?

B. Educators-child/peer/educators family interactions

- How would you describe your relationship with the children? (encourage them to give examples and/or share a recent experience, mention different kinds of relationships: personal, care, pedagogical, etc.)
- How do you read with/to the children?

  (Follow up) Do you use dialogic reading connected to class activities and discussions (i.e. interactive, shared book reading and conversations about the book using prompts, etc)?
- Do you encourage collaborative work among children?

(Follow up) Could you share some examples?

- How would you describe your relationship with the students' guardians/parents?

  (Follow up) In what ways do you think your relationship with them affects the children's progress and well-being?

- Do you believe that your work is being appreciated by the children's parents/guardians?
- Do you exchange opinions and feedback with or offer advice to your colleagues and other ECEC staff members?

  (Follow up) Is there a mutual observation and feedback culture in your institution?

  (Follow up) In what kinds of situations has this been necessary or helpful?

C. Institutional practices/leadership:

- How would you describe the involvement of parents/guardians in the children's education? (Follow up) Is it frequent? What is it based on? Is it satisfactory?
- Do you believe that you have been provided with the necessary support and acquired the theoretical knowledge to be able to apply oral language concepts to your classroom practice?

D. Structures/resources/policies

- In your experience, how would you describe the resources offered by the institution?
- Do you feel that your opinion plays a role in the implementation of different approaches and the use of resources?

Focus groups with families:

A. Child attributes associated with increased well-being, positive development and reduced risk for exclusion/negative development

- Do you think it is important to incorporate early literacy, numeracy and science skills into ECE? If so, how/if at all would you say these are incorporated into your children's ECE?

- Do you think that your children enjoy and benefit from these approaches/activities?
- Does your children's ECE include activities for the development of their technology and digital skills (i.e. basic navigation skills, understanding icons, exploring interactive e-books that enhance reading comprehension or age-appropriate apps for letter recognition or basic math concepts)?
- Considering children who may come from more disadvantaged backgrounds or with more significant socio-economic deprivation, what do you think their needs are?

  (Follow up) Do you think these needs are addressed and met?

B. Educators-child/peer/educators family interactions

- How would you describe your relationship with the teachers/ECEC staff at your children's school/kindergarten?
- In what ways do you think your relationship with them helps the children's progress and well-being?
- To what extent and in what ways does the school encourage your involvement in your children's education and in the activities that they do at the centre?

C. Structures/resources/policies:

- To what extent are you satisfied with the resources at your children's kindergarten?
- Would you describe the knowledge and experience of the institution's staff as adequate for your children's education and well-being?

Focus groups with children:

Given the very young age of the children involved, we may need to keep in mind that a significant number of them may not have the social or language skills to be effective participants in focus groups and group discussions (Heary & Hennessy 2002). Besides questions, there exist other ways of engaging children before or during an interview and which may be particularly pertinent for the objectives of this task. Moderators of focus groups with children could integrate seeing, touching, and moving about. Such activities may include asking children to list things, rate items, sort or draw pictures, create mind maps or flowcharts, dream, or use their imagination (Berggren et al., 2017; Cammisa et al., 2011). Ronen, Rosenbaum, Law, and Streiner (2001) had good success using playdough as a research tool. Playing with toys has a positive and relaxing effect on children (M. Morgan et al., 2002). Similarly, to better understand a child's intended meaning, participatory techniques, such as role-playing scenarios, can be

helpful (M. Morgan, Gibbs, Maxwell, & Britten, 2002). For some ideas on the types of activities that can be used during the focus group, see below.

A list of indicative/guiding questions, which may also serve as a basis for the activities with the children, includes:

- Do you like going to school/kindergarten?
- What is it that you enjoy most at school?

  Is there something that you do not enjoy as much?
- Do you read books/stories at school/kindergarten with your teacher?

  (Follow up) Can you tell us how reading time was yesterday/the last time?

  What is your favourite book/story?

  Do you use ebook/interactive books?

  Activity: use educational app to explore their reading comprehension, letter recognition, etc.
- Do you play games with numbers at school?

  (Follow up) For instance, do you sing songs and rhymes with numbers (use depending on the national/local context and language)?

  (Follow up) Do you build towers with a specific number/colour of blocks?

  (Follow up) Do you play I Spy Number games? (matching the number with the same picture, etc)?

  Activity: you could ask children to list/rate items, also using age-appropriate apps.
- Do you role-play/pretend games?

  (Follow up and use examples/activities also using props, if possible) Super heroes; going shopping and “paying” for items”; having “adult” conversations on the phone, going to the restaurant and ordering; cooking and preparing meals, etc.
- Do you have friends at school?

  (Follow up) If yes, do you play together?

  (Follow up) How do you play with your friends and classmates at school?

  What are your favourite games to play with your friends at school?
- What other things do you enjoy doing with your teacher and classmates?

Annex 1: Consent form for adults

SCIREARLY – POLICIES AND PRACTICES BASED ON SCIENTIFIC RESEARCH FOR REDUCING UNDERACHIEVEMENT AND EARLY SCHOOL LEAVING IN EUROPE

Name: _____ Age: _____ Ethnicity: _____ Country of residence: _____

☐ Female ☐ Male ☐ Other ☐ Prefer not to say

Any preferred pseudonym?

☐ No

☐ Yes! Please use this name instead of mine: _____

I have read the information provided above, and I declare that I agree to participate voluntarily and confidentially in the focus group (please select the type/s of recording that you give permission for):

☐ **Focus Group**

☐ Audio ☐ Video ☐ Take notes

SIGNATURE: _____ DATE: ___/ _____/_____

If you have any doubts or you change your mind regarding your participation, please contact us at:

Name of the researcher

Email and phone number of the researcher

Thank you for your time!

Annex 2: Parental consent form for minors

SCIREARLY – POLICIES AND PRACTICES BASED ON SCIENTIFIC RESEARCH FOR REDUCING UNDERACHIEVEMENT AND EARLY SCHOOL LEAVING IN EUROPE

Parental Consent

INVITATION TO PARTICIPATE:

Dear Parent [or caregiver, guardian],

My name is [Provide your full name] and I am [Identify your role/title at the organisation, university, etc]. I am conducting a research study as part of the project SCIREARLY. The purpose of this form is to provide you with information that will help you decide if you will give consent for your child to participate in this research.

KEY INFORMATION ABOUT THIS RESEARCH STUDY:

The overall goal of SCIREARLY is to identify successful practices and policies to overcome underachievement and early school leaving. One of the main tasks of SCIREARLY aims at identifying successful practices that have provided evidence of reducing underachievement and fostering inclusion in early school education.

The purpose of this study is to explore high-quality early childhood education and care in Europe to, ultimately, maximize the positive influence of this factor in later educational stages. To this aim, we will conduct focus groups with children in early childhood education and care centers. If you agree, your child will be asked to participate in a focus group with other children [insert the total number of participants in the focus group]. The focus group will last approximately [insert duration]. It will entail the following activities: some introductory activities, including singing and story-telling; some questions about what children enjoy in their kindergarten/school and what kinds of activities they do [see list of questions provided]; engaging children in other activities, such as drawing, counting, using their imagination, playing with toys, etc.

CONFIDENTIALITY:

Your child's responses [or information] will be confidential. The participants' name or other identifiable information such as e-mail address, phone number, address, birthdate, student ID, and/or social security are confidential and the researcher will use pseudonyms during reporting of the data. The personal information is only accessed by the researcher who is doing the study.

The focus group will be recorded only with the consent of all participants and their guardians.

The results of this study may be used in reports, presentations, or publications but your child's name will never be revealed. The data will be stored in password-protected computers, to which only the research team will have access, for a period of up to 3 years after the project is completed.

VOLUNTARY PARTICIPATION:

Your child's participation in this study is voluntary. Your child may decline participation at any time. You may also withdraw your child from the study at any time with no consequences

CONTACT INFORMATION:

If you have questions about the study, please do not hesitate to contact us at:

Name of the researcher:

Email and phone number of the researcher:

PARENT'S/GUARDIAN'S CONSENT:

By signing below, you are giving consent for your child to participate in the above study. [Release statement for audio or videotaping must be inserted here]. Add the following statement: "Please check the option that applies to you before signing" and the following options if video and/or audio recording:

☐ I give permission for my child to be audio/video taped.

☐ I do not give permission for my child to be audio/videotaped.]

Your child's name: _____

Parent's/Guardian's name: _____

Parent's/Guardian's Signature:
_____Date:_____

Annex 3: Information sheet

Please read this document to ensure that you have been informed on the nature of the research study described here. Feel free to ask any questions or doubts to the researchers, so that your decision to participate or not is fully informed.

GENERAL INFORMATION OF THE RESEARCH

PURPOSE

You are invited to participate in a research procedure known as “focus group”, framed into the project SCIREARLY: Policies and Practices Based on Scientific Research for Reducing Underachievement and Early School Leaving in Europe (Funded by the European Commission under the Grant Agreement number 101061288). The overall goal of SCIREARLY is to identify successful practices and policies to overcome underachievement and early school leaving. One of the main tasks of SCIREARLY aims at identifying successful practices that have provided evidence of reducing underachievement and fostering inclusion (Grant Agreement, Description of Action, p.9).

The voices and experiences of children, families and staff of the participating centres will be at the heart of this task. For this aim, fifteen focus groups with children (age 4 to 6), families and ECEC staff will be carried out separately while guaranteeing an inclusive environment and mutual understanding among the participants. The information gathered in these sessions will be included in a document about policy recommendations to achieve efficient actions that will assure good results in cognitive and social development for early years pupils, mainly those living in vulnerable situations.

PROCEDURES FOR THE FOCUS GROUP:

A Focus Groups (FG) is an open exchange in small groups of 6-10 people, where the researcher shares some questions to prompt the conversation, and everyone is welcome to contribute to the discussion. FG will take place when and where the participants decide, prioritizing their comfort, preferences, and availability.

Estimated duration: Fully flexible, between 30 and 60 minutes.

If you decide to participate in the activity, we will share the results of the research with you and there will be an opportunity to contribute to the co-creation of findings.

CONFIDENTIALITY:

Your responses or information will be anonymized, and all the information collected will be kept confidential, so that only researcher could access it. None of your data will be shared in any scientific or non-scientific context without your consent.

VOLUNTARY PARTICIPATION:

You may choose not to take part or leave the study at any time. Leaving the study will not result in any penalty. Your decision whether to participate in this study will not affect your current or future relations with your school or [the corresponding university/organization]

BENEFITS OF TAKING PART IN THE STUDY:

Participating in this study relies on shaping optimal learning conditions and environments, with significant impacts on future outcomes for students and society in general. You might benefit from sharing your experiences and knowledge, resulting in -depth reflections and strengthen awareness on important topics such as early school leaving, underachievement and elements of your overall educational experience.

CONTACT INFORMATION:

If you have any questions about your rights as a participant in this research or if you feel you have been placed at risk, you can contact *NAME AND EMAIL OF THE RESEARCHER IN THE INSTITUTION*. You can also contact the General Coordination Team at scirearly@deusto.es.

If you would like to be involved in the case studies, please fill in and sign the form provided on the next page and give it back to the researcher.

Annex 4: National report template

1.0 Introduction

1.1 Demographic details of focus groups participants

[Provide information for the ECEC staff, the families and children who participated in the FGs, including, where possible include: the numbers in each group, age range, gender, socio-economic information, ethnicities and languages spoken, refugee/migrant, special educational needs, any other relevant information.]

1.2 Contextual information

[Provide contextual information for the focus group: where did they take place, how long did they last, how was the process, what were the main challenges and differences between the focus groups per target group]

1.3 Methodology

[Provide information about the methodology and types of tools that you used in each focus group]

2.0 Main findings from focus group with ECEC staff

2.1 CHILD ATTRIBUTES ASSOCIATED WITH INCREASED WELL-BEING, POSITIVE DEVELOPMENT AND REDUCED RISK FOR EXCLUSION/NEGATIVE DEVELOPMENT

2.2 EDUCATORS-CHILD/PEER/EDUCATORS FAMILY INTERACTIONS

2.3 INSTITUTIONAL PRACTICES/LEADERSHIP

2.4 STRUCTURES/RESOURCES/POLICIES

3.0 Main findings from focus groups with families/parents/guardians

3.1 CHILD ATTRIBUTES ASSOCIATED WITH INCREASED WELL-BEING, POSITIVE DEVELOPMENT AND REDUCED RISK FOR EXCLUSION/NEGATIVE DEVELOPMENT

3.2 EDUCATORS-CHILD/PEER/EDUCATORS FAMILY INTERACTIONS

3.3 INSTITUTIONAL PRACTICES/LEADERSHIP

3.4 STRUCTURES/RESOURCES/POLICIES

4.0 Main findings from focus group with children

4.1 CHILD ATTRIBUTES ASSOCIATED WITH INCREASED WELL-BEING, POSITIVE DEVELOPMENT AND REDUCED RISK FOR EXCLUSION/NEGATIVE DEVELOPMENT

4.2 EDUCATORS-CHILD/PEER/EDUCATORS FAMILY INTERACTIONS

4.3 INSTITUTIONAL PRACTICES/LEADERSHIP

4.4 STRUCTURES/RESOURCES/POLICIES

5.0 Key takeaways

[Please include a summary of the main issues (in the form of bullet points) that were raised from the focus groups]

References

[please use APA 7th edition referencing for this document]

SCIREARLY

National Report –Finland (Task 2.4)

Work Package	2, Task 2.4
Lead Beneficiary	UD
Authors	Auli Toom, Jaakko Hilppö & Kirsi Pyhältö, UH
Due Date	7 October, 2024
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History of changes

Version	Date	Created or modified by	Comments
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SCIREARLY

1. Introduction

1.1 Background information

To conduct the focus group interviews, we first contacted the school in late May 2024 just before the summer break in Finland. We agreed meeting to discuss the details of the research to be held in the beginning of August 2024. The school is in the city center of Helsinki. Socioeconomically, the surrounding area is significantly above the average in the Finnish context. Most of the children, families and staff members are Finnish, but there are children with multicultural background in the school as well. According to the teachers, the special educational needs of the children are diverse, and in their professional perspective, the most difficult what they have experienced within their teaching careers so far. These children receive extensive individual support for their learning, and their special needs in line with the official guidelines in Finland. The support is agreed in the individual pedagogical plans based on the careful needs analysis, and negotiations with multiprofessional experts and guardians. It is provided in the suitable format, either in the classroom, in the small group format or individually.

In early August 2024, we met with the coordinating teacher, presented the details of the study, and applied the research permits from the school. After receiving them, we approached the potential teachers more extensively, provided them information about the research, asked for their informed consents for research and agreed on the date for focus group interview.

We also agreed that the research project will be presented for the guardians as part of the school's official guardian meeting on September 4, 2024. We prepared a detailed presentation of the research for the guardians and provided them detailed information of the focus groups interviews. They read information carefully and made decision of their own participation and discussed together with their child about their participation in the research. After we received the informed consents for children and guardians, we agreed on the dates for their focus group interviews.

1.2 Demographic details of focus groups participants

Teacher focus group participants
Altogether five teachers participated in the focus group interview. All teachers were female, around 30-65 years and had completed their master level teacher education in university. One of the interviewed teachers was a special education teacher. One teacher had also a licentiate degree in education, and one had a PhD degree in education. They had 5-40 years' experience of teacher's work, and they all had worked in the several different schools in Finland.

Student focus group participants
Altogether six children participated in the focus group targeted for them. Half of the children were boys and half of them were girls. Most of the children were Finnish, and one was Estonian. We did not ask about the special educational needs of the children, because it was not an emphasis in the focus group interview questions.

Guardian focus group participants
Five guardians originally agreed participating in the focus group, but four of them finally participated. Three were female and one was male. Three of the guardians were Finnish and one was Estonian. We did not ask about the details of the special educational needs of their children, because it was not an emphasis in the focus group interview questions.

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1.3 Conducting the focus group interviews

Teacher interviews
Focus group interview with the teachers was organized on September 2, 2024, at the authentic school settings in one participating teacher's own classroom. Five teachers and three researchers from our team were involved in the interview. We put the chairs in the circle in the classroom to make the space more convenient for the discussion. Three researchers of our team were interviewing the teachers. The interview lasted about 1 hour and 15 minutes, and the discussion in the interview was lively. All teachers were engaged, participated actively and presented their viewpoints, some of them being much more talkative than others. The focus group progressed as a discussion, from one topic to another. We did not experience any significant challenges during the interview to be reported. After completing the interview, the teachers remained discussing the topics we touched upon in the interview.

Guardian interviews
The focus group interview for the guardians was organized on September 30, 2024, in the early evening in zoom. This format was recommended by the teachers to make sure that the guardians can participate after the workday. A researcher from our team conducted the zoom interviews. In the beginning of the interview, everyone introduced themselves, and they also wanted to tell whose guardians they were. They all had met before in the guardian events, so they knew each other. We showed the questions one by one in the power point slides, so it was easier to follow the discussion and questions in the online interview. In the beginning, the guardians were a bit reserved, but after the first question and first answers, the atmosphere started to become more relaxed, and discussion ended up being very intensive. The interview lasted about 65 minutes.

Children interviews
Focus group interview with the children was organized on September 23, 2024, in the afternoon in their own classroom. Six children participated in the interview, and two researchers of our team were interviewing them. We all sat in the same circle, so it was a good setting for the discussion. Before the interview, we talked about the purpose of the discussion and how we are going to proceed. Everyone introduced themselves in the beginning, and children had their name tags, so it was easier to call them by their names. The interview lasted about 45 minutes. Many of the children wanted to show their ABC-book with which they learn reading and other books that they read now. They also showed their art works and various learning materials they used in the class. The children participated extremely eagerly and talked a lot about their experiences despite the late afternoon time and their willingness to engage in afternoon club activities and snack after it.

1.3 Methodology

In each focus group interview, we followed the protocol, guidelines and questions provided for the focus group interviews. We translated the interview questions into Finnish and made necessary contextual adjustments. Children wanted to show the versatile books, artworks, and learning materials they use in the classroom, and it was natural to ask the questions while looking at them. Most of the questions worked quite well in the interview; some were awkwardly formulated and not that relevant for the purpose of the task. Guardians also mentioned that some of the questions were a bit challenging for them to respond extensively.

We aimed at building a joint conversation with the focus group participants. We presented the questions in the instructed order, but made small changes and asked additional questions, wherever it was necessary and relevant. We as researchers aimed at positioning ourselves on the same level in the discussion with the participants and took turns in presenting the questions. This allowed us to create good atmosphere in the discussions.

SCIREARLY

2. Main findings from focus group with teachers

2.1 Aspects related to children's learning of basic skills, well-being, and positive development

Regarding the aspects of children's learning, it was possible to extract five themes that teachers especially emphasized in the interview. This was mostly emphasized in the focus group interview with teachers.

Literacy, numeracy and science skills. Teachers emphasized the importance of strong literacy skills in Finnish. They perceived that learning gradually versatile skills in listening and speaking, but also reading, and writing is important. After learning the basic mechanical reading and writing skills, it is essential to progress further towards understanding, fluent mindful, critical and comprehension-oriented reading, and writing. Teachers perceived that strong literacy skills form a basis for learning throughout the educational path. This was found especially important since the situation regarding children's literacy skills has decreased rapidly in Finland in recent years. In mathematics and in science, teachers perceived that it is important to prioritize the learning contents and create a coherent wholeness for the children.

> *"Strong readings skills form a basis for all learning throughout the educational path. That's why it is so important."*

Skills for learning. Teachers perceived important to support children's skills for learning and to prepare them for the next phases in the educational path. This requires understanding of the heterogeneity of children and their versatile backgrounds. They emphasized that learning these skills by being and doing things together is essential. Teachers said that it is important to "equalize" children's skills in a positive way and prepare them for the next educational phases.

> *"It is essential to provide basic skills on a grassroots level, that can be reached by children with different backgrounds. It is essential to take into account versatility. It is essential to assure that everyone has adequate skills to proceed further."*

***Using activating pedagogical methods and practices*.** Teachers emphasized the use of activating pedagogical methods, concrete activities, demonstration materials and real tools as important with small children. They perceived it most important that learning is cultivated via versatile pedagogical methods during early years. They also highlighted importance of extending their repertoire of working methods and practices. Teachers described how important it is to construct and maintain children's enthusiasm towards learning and how this is particularly done in classroom interaction.

> *"It is critical to maintain will and enthusiasm on learning. This needs to be taken seriously, and constructed in the classroom interaction."*

***Differentiation and individual needs*.** Teachers emphasized that children can be heterogeneous in skills and abilities especially in early years, and according to them, this has changed a lot recently in Finland. This requires differentiation and considering children's individual learning needs. Teachers described a broad repertoire of differentiation methods they use in their teaching: forming different small groups based on children's skills, providing individual learning tasks for every child depending on their skills, providing different learning materials and demonstration tools depending on their skills, or co-teaching together with special education teacher and organizing differentiation with her.

SCIREARLY

”Differentiation is extremely important. This is especially realized in mathematics. This is also the thing that has changed significantly, and it is related to the increased heterogeneity of children.”

Use of technology and digital tools. Teachers emphasized importance of interaction and real encounters with children. They perceived that the use of digital tools may disrupt this. For these reasons, their use of technology and digital tools is limited, and extremely well considered and planned. They reported using ready-made digital learning materials and video materials connected to the textbooks, and perceived that digital materials can motivate children, and they can be good when repeating or rehearsing some themes.

”We need to be careful in using it [technology]. When using technology and digital tools, it is essential to notice, how I truly encounter children in the interaction.”

2.2 Teachers – child / peer / guardian interactions

***Noticing children as individuals*.** Teachers emphasized that learning to know every child individually and as a person is especially important in the teacher profession, even the core of the teacher’s work. They perceived it is essential to encounter them authentically and as real human beings and show interest towards the things that are important for them. This requires time and can only happen gradually in interactions and different contexts. Teachers told that they try to notice every child as individual every single day. They said that knowing the children is the key for supporting and teaching them. Teachers identified stress, and rush as potential obstacles in encountering children that they try to avoid.

”Encountering a child as an individual and a person. It is essential to find time for it. This is critical especially with those children, who have specific needs. It requires time to find out, why a child experiences some things as challenging. It is important to clarify the backgrounding factors.”

”I try to notice every child individually every day. Every child is guided a bit differently, it is a key to know them all individually. When you learn to know all children, you can guide and teach them all together more comprehensively.”

***Peer relations among children*.** Teachers perceived that it is important to socialize children to be together and do things together. It is essential to build a safe environment among children in the group and teach certain routines and practices for building and sustaining functional peer interactions. Everyone must work and play with everyone in the class and during the breaks. Supporting learning of social interaction skills and emotional skills has become critical in recent years. Teachers perceived that they must monitor and regulate peer relations significantly and in a variety of ways in small groups, teaching methods and many activities.

“Emotional skills, peer skills, how to interact with others, how to take into account others. This has changed a lot during the recent years.”

“Our important task is to socialise children. Here we do things together.”

Relations with guardians. Teachers perceived that their professional task and responsibilities are binding. Parents are interested in the daily work at school, and their child’s progress there. Teachers experienced that guardians’ conceptions of today’s school vary; some of them are very aware of school’s practices and curricula, some are not at all. Especially for the multicultural families, it is necessary to explain the details and practices of Finnish school. Teachers described extensively, how they inform guardians proactively about the forthcoming plans and activities and justify them. They also guide guardians how they can support children in learning. Teachers organize guardians’ events and invite them to visit school during the school day. Teachers emphasized that they explicate their role, tasks and responsibilities for the guardians.

They describe how they work as teachers and what are the guiding principles for their work. Teachers also said that they explicate what they expect from the guardians.

> *”I tell my professional borders fo the guardians, what are mys duties and responsibilities. I tell how I work as a teacher and what are my guiding principles. I also tell, what I expect from the parents.”*

> *”Some of them [guardians] appreciate teacher’s work a lot, others do not. Some perceive that we do good work, others do not.]*

> *”For the families with immigrant background, it is necessary to tell the details carefully, practices, absences, how we work. Really practical things, related even to cold temperatures…”*

3. Main findings from focus groups with guardians

3.1 Aspects related to children’s learning of basic skills, well-being, and positive development

Literacy skills. Guardians emphasized learning to read and reading versatile materials as essential in early years. They pointed out that goal-oriented and systematic reading alone and together with others is very important. Guardians also mentioned that children have become motivated about reading especially in school and are enthusiastic about it. The use of versatile methods and using reading challenges in encouraging children to read were found important.

> *”Learning to read, systemically, in a goal-oriented way, reading aloud, on their own. Reading challenges set by the teacher have been really motivating.”*

Skills for learning. Guardians perceived that learning skills for learning since the beginning of early years is essential for their children. They thought that it is important to start learning thinking skills, self-regulation skills, problem solving skills as early as possible, and build a strong basis for the forthcoming educational path. Guardians explicated that the contents are of course important, but even more important for their children is to learn strong skills for learning.

> *“It is most important in ECEC and early school years to start learning, regulating own behaviours is essential. If these skills are not strong, there will be troubles in the future.”*

Using activating pedagogical methods and practices. Guardians said that the early years have been motivating for their children and they have become enthusiastic about learning new things and skills. Playful approach, use of various games and reading challenges had been important, and inspiring for the children. Also setting optimal challenges and requirements were perceived important for children’s learning. At the same time, they emphasized regularity, completing the tasks and encouraging to conscientiousness as important. Guardians perceived that the learning activities had supported children’s self-regulation of learning in an ideal way.

> *”Reading challenges have been especially inspiring. Gaming and playful activities are highly important, motivating and inspiring.”*

Use of technology and digital tools. Guardians were critical towards the use of digital tools and technology and told how they restrict technology use at home. They were aware of their attractiveness and quite cautious in using technology with their children. Guardians perceived the use of regular books

important and described how it supports concentration, focusing and broader understanding of the contents to be learnt. Still, the guardians emphasized that it is important that children learn to use digital tools, applications and technology in a controlled way and for their learning in school. Guardians especially mentioned that they expect that teachers teach intentional, controlled and safe use of digital tools for their children.

> *"It is good that learning to use digital tools as tools for learning in a controlled way is done. The controlled use of digital technologies is important."*

3.2 Teachers – guardian interactions

Relations with teachers. Guardians experienced that they had good, frank and open relations with the teachers, and they thought that teachers are easily approachable, professional, and responsible. Guardians expressed that they trust in their children's teachers, and that is important. They felt that they had good connections with teachers, it's easy to communicate, and communication is professional. Even if they had had challenges, guardians felt that contacting teachers has been fluent. Guardians perceived that teachers inform them extensively and proactively about the forthcoming plans and activities in school. They receive monthly letter or weekly messages, and guardians feel that they are well-informed. This increases trust towards school and teachers, and there is no need to know all the daily details.

> *"Communication connections are important to maintain between school and home, can be in touch easily, communication is professional and reciprocal."*

3.3 Structures / resources / policies

Teachers' expertise and resources. Guardians perceived that the resources were excellent, the special educational needs are taken care of, and the class sizes are small. They thought that the quality of teaching and teachers' expertise is high. It was also mentioned as important that the stability of teachers is good. In contrast, the guardians reported that the resources in the earlier phases of the educational path had not been that good. There were challenges in the availability of professional teachers, teachers changed often, and it was stressful.

> *"Quality of instruction is especially high, and teachers remaining in the profession as well."*

Guaranteeing stability and continuity. Guardians especially emphasized the stability regarding the staff members, continuity in the routines and practices, and safety as important aspects of the learning environment for children. They found that continuous changes and unclarities should be minimized.

> *"Stability, continuity and safety are highly important. This is important to quarantee during the early years. Minimizing the changes and challenges is important."*

4. Main findings from focus group with children

4.1 Children's learning experiences

Children's positive attitudes and enthusiasm. Children were talkative in the focus group interview, and they eagerly talked about the various learning subjects and activities. They described learning useful things especially in mathematics, and mother tongue. They reported being enthusiastic about science, mathematics, arts, crafts, and physical activities. Also lunch breaks and other breaks outdoors we

considered engaging. Moreover, after school activities, being outside and playing were reported to be important.

> *”Basic every day things. We learn maths, mother tongue, useful things. Tasks, counting, identification, all kinds of things. Orientation, also with photos.”*

Versatile learning activities. Children reported that they do many kinds of activities and exercises regarding reading and writing. They said that they read a lot together with the teacher, but also independently. For example, they reported reading ABC-book, reading books, and own optional books. Children showed us their books, what they read now, and own diaries. They all were regular paper books, not electronic versions. Children also told that they regularly visit the library, and they have joint reading challenges together with the peers. In math, children reported to do basic calculations and practice geometric pieces, and play different games alone or with peers. They also reported doing animations with the plasticine creatures.

> *”Many kinds of tasks. We read a lot, do writing exercises. ABC-book, reading book, own books, always when we have time. We go to the library, we have reading challenge…”*

Use of technology and digital tools. Children described moderate use of technology and digital tools in their learning. They told that sometimes they play Bingel with the iPad, and train especially mother tongue, and mathematics. Another game mentioned was Math King, with which they count basic calculations.

> *”We play calculation games quite a lot.”*

> *”Maths is motivating. Tasks, play games with iPad, on paper, with peers or alone.”*

4.2 Children’s peer relations

Good relations with peers. Children experienced that they had lot of mates, and they got along with everyone in school. They also pointed out that they have few true friends with whom they spend more time, play together, do sports and tricks within and beyond the school day.

> *”In school we are with everyone.”*

> *“In school I am with everyone, then the real friends are a different thing.”*

5. Key takeaways

Key takeaways from teachers, guardians and children are partly similar and partly emphasize different things.

Key takeaways from teachers

- Teachers emphasised learning of basic, and learning skills.
- Teachers reported using activating methods, differentiation and digital tools in their teaching
- Teachers perceived encounters with every child and regulating children’s peer relations essential
- Teachers described how essential it is to build functioning relationships with guardians early on

Key takeaways from guardians

- Guardians emphasized literacy skills, and learning skills as important

- Guardians perceived activating methods and controlled use of digital skills important
- Guardians perceived teachers as responsible professionals and relationships with them extremely functioning and fluent

Key takeaways from children

- Children were enthusiastic about literacy, maths, and many other subjects
- Children had good relations with their teachers and peers

National report - ITALY

1.0 Introduction

1.1. Demographic details of focus groups participants

ECEC staff: During the months of July – August 2023, CESIE had created a list of potential stakeholders from Palermo (Italy) for the SAQE instrument Piloting. The original list of publicly and privately funded Early Childhood Education and Care facilities has been updated to include more facilities. Based on the specific requirements of the 2.4 task, upon re-opening of facilities in mid-September, 68 pre-schools were contacted via email and phone and a focus group was scheduled for 1 October. However, given the proximity to the start of the school year, it was not possible to gather the minimum number of 6 participants due to the heavy workload faced by the staff during this period. Several requests were made to reschedule the event for November, but this could not be accommodated without prior authorization from the task leader.

Parents: During the months of July and August 2024, CESIE has involved diverse parents in the focus group activity, sending invitation to parents of children aged 4 to 6 years old included in our contact lists. The focus group was conducted with a total of 6 parents, 5 women and 1 man, aged between 33 and 47 years, almost all of whom are Italian, with the exception of one participant who is from the Czech Republic but has been living and working in Italy for several years.
All participating parents hold Bachelor's degrees (or more) and are employed in the third sector, indicating a shared commitment to social causes and community development. Job profiles include finance, human resources management and education and training. The group reflects a middle socioeconomic status, with all parents actively engaged in the workforce and contributing to their households.
Almost all participants currently utilize private ECEC settings, only one has secured a spot in a public facility.

Children: The 6 participants are children of people involved in the parents focus group. They are all aged 4 to 6 years, and currently attending ECEC programs or are just entering first year of primary school. This demographic reflects a common stage in childhood development, characterized by a focus on socialization, early learning, and adjustment to structured educational environments. All children were Italian speakers, with two bilingual children (Italian-Czech). All group included children from middle-income households.

1.2. Contextual information

Parents' focus group: The focus group for parents took place at CESIE offices in Palermo (urban area) and lasted for 2 hours. The main objective was to gather insights about the ECEC facilities participants' children attend. The parents focus group setting layout was a room with a table: this created a sense of equality and promoted a more natural and open communication. Each session followed a structured approach but conversation tone was informal.

Process:

1. Introductions**:** Participants were invited to introduce themselves and give information about their children age and kind of preschool[1] attended.

[1] Note from researcher: Formal Early Childhood Education in Italy for children aged 3 to 6 is preschool (in it.: *scuola dell'infanzia*). The whole ECEC offer (including ECEC services for babies aged 0 to 3) is regulated by the Regions, which set standards for structures, services, human resources, access and quality. Settings are solely publicly funded, some solely privately funded and some receive a mix of public and private funding.

2. Semi-structured questions: The facilitators guided the discussion with the questions provided by Task Leader and ensured all relevant topics were covered.
3. Open Discussion: Participants were encouraged to share their thoughts and experiences openly, which fostered a collaborative environment.

Challenges: A significant challenge was the inability to have a group that represented a balanced mix of experiences between public and private ECEC, as most all participants were engaged with private services which are fully privately-funded or receive a mix of public and private funding [2]. This limited the diversity of perspectives and reduced the information available about publicly funded ECEC. Another challenge was obtaining comprehensive information about how facilities support learning and inclusion of children with vulnerabilities, as most private structures are not attended by this category.[3]

- Public facilities are the most economical choice, as they are funded by the government, and what families pay depends on their household income. Families can benefit from concessions, discounts or total exemption from enrolment and/or services costs, based on the indicator on the economic situation of families called ISEE. Access is by entering a ranked list through a yearly call, with reserved seats for children who enrolled in the previous years or given considering family situation.
- Private facilities offer additional services and are more flexible. Additionally, some follow specific educational philosophies or curricula (e.g. Montessori, Waldorf, Forest kindergarten). Where private facilities get a mix of public and private funding, some spots are reserved to cover the public waiting lists.

[2] Note from researcher: Contextual information is relevant here. Italy has not formally established legal entitlement or compulsory ECEC. ECEC offer in Sicily have a significantly low coverage rate (from 10 to 14 places available every 100 children, covering a mere 13% of the potential demand) and high costs (30% more expensive than rest of Italy), despite the contributions introduced by the State and various Regions. This scarcity of ECEC offer is mainly a reflection of the structure of the Italian care regime, which relies on a minimal supply of services, cultural factors as family solidarity and gender division of labour, and financial transfers meant only for to those most in need.

- In public facilities, access is basically given only to families in the most need. There may be a waiting list or no chance to get a spot. However, the access criteria often prioritize families where both parents work, because ECEC is a demand-driven service and not universally available, so access is more often guaranteed to working parents for work-life balance reasons, thus tending to exclude single-income families.
- In private facilities – which cover more than the 60% of childcare provision in Italy – there may be a waiting list and there it is usually a first come/first serve approach, whoever is able to pay the deposit first will be guaranteed a spot. The cost of fees along with barriers to access due to a shortage of places, still pose a challenge for many families. Single-income families are less likely to be able to afford the fees. Children attending are more often from families where both parents are employed, with higher levels of education and income.

There is still much progress to be made in ensuring universal and equitable access to services from a socio-economic standpoint.

[3] Note from researcher: Significant differences emerge between the inclusion levels of children with disabilities and foreign children and the ownership of services, with public daycare being the preferred option for families with these vulnerabilities.

- In public facilities, it is the school system that covers the cost of support teachers, whereas in private facilities, this cost is not covered and falls on the school itself or the families. As a result, the inclusion of a child or student with disabilities may be discouraged.
- Foreign population is underrepresented in ECEC compared to its relative presence in society. The inclination to use ECEC services is significantly higher among the Italian population, while a large portion of foreign families either choose or are forced to start their children's educational journey later. The reasons for this can vary, but certainly one factor to consider is the cost of these services.

Children's Focus Group: The children's focus group also took place at CESIE offices in Palermo (urban area). The primary goal was to understand children' feelings towards pre-school and to gather information about the activities they engage in. The focus groups took place in a training room, where both children and facilitators sat on the floor in a circle. The setting encouraged a relaxed and informal atmosphere, making the children feel comfortable and included. From facilitators' perspective, this arrangement allowed easy observation of non-verbal cues, such as body language and facial expressions, providing valuable context for understanding participants' emotions and reactions during the discussion.
The focus group lasted approximately 1 hour, which was deemed appropriate for maintaining the children's attention and engagement. It was scheduled at 5 PM, which is after the children had completed their day at pre-school but before they returned home. This timing was chosen because it allowed the children to reflect while still being in a school mindset, engaged but not overly tired.

Process:

1. Icebreaker Activities: The session began with fun icebreaker games to help the children feel comfortable and open up.
2. Prompts and discussion: The facilitators followed the list of questions provided by Task Leader and initiated each topic discussion offering children verbal (direct questions) or visual (books, images) prompts, from which an exchange arose about pre-school experiences, allowing children to express their thoughts freely.

Challenges: The main challenge was keeping the younger group (3-4 years) engaged, which required frequent shifts between activities. A significant challenge was to get details in answers. At this age, children often find it challenging to summarize. Brief replies can be a way to avoid diving into all the details when they don't know where to start.

1.3. Methodology

Parents' Focus Group: Each focus group began with a warm-up exercise to introduce participants and their experience within ECEC. Semi-structured interview questions and open discussions were employed.
Responses were recorded (audio).

Children's Focus Group: A child-friendly and interactive approach was used, leveraging toys and games to engage children throughout the discussion. Also, short stories or scenarios were introduced by the facilitators to initiate discussions about children' experiences.
Responses were recorded (audio).

3.0 Main findings from focus groups with families/parents/guardians

3.1. Child attributes associated with increased well-being, positive development and reduced risk for exclusion/negative development

- **Importance of basic skills (reading, math, science) in early childhood:** Most parents agree on the importance of integrating these skills, but they remark the importance of a non-formal approach centered on play and discovery rather than a formal teaching setting. Math and science are learned through hands-on experiences and observation of nature.

Quote: "Childhood for me is free play and socialization primarily, so these subjects should not be taught as classical 'subjects'."

Quote: "Science and mathematics are subjects that you cannot exclude from the knowledge process, however, they must be age-appropriate for children. For example, at [my son's pre-school] they went

through the entire life cycle of the butterfly, [..], the life cycle of the bee. Discovery, exploration, observation of the world around us."

Quote: "If a game is well structured or the activities they do are thought out, children can learn many things, such as letters and numbers. I don't like it when the school forces them and is too ambitious, because in my opinion there will be time to study."

- **Role of free play and motor skills:** Many parents emphasize the importance of free play and developing cognitive and motor skills in children, rather than focusing too early on reading and writing. This is seen as crucial for physical and mental development. Activities such as cooking, crafts, and science demonstration/projects are seen as very important for knowledge and skill development in children.

Quote: "It is important to integrate basic skills in reading, math and science in early childhood education [...] However, the way it has to be done obviously should not be the canonical way: always in play mode and especially using hands, because I believe that the use of hands, manual, physical dexterity is an even more important thing now than before, because then all children will lose certain skills, which they will no longer develop, given the increasing importance of the use of technology."

Quote: "Some parents insisted on [teaching] English when the children were just three years old, [..] but I prefer that children take things a bit slower during preschool."

- **Digital technologies and screens**: Parents are largely sceptical about the early use of technology, such as tablets and phones, in pre-schools.[4] Some see the devices as distractors and prefer that children develop practical skills before being exposed to technology.

Quote: "If I found out that the teachers were making the children use electronic devices, surely my children would no longer attend that school."

Quote: "I found out that at my son's previous preschool, the teacher was showing videos on her phone. I realized it because he knew by heart a song I had never played for him. During the last half-hour, the teacher was tired and would let them watch videos. This is one of the reasons why I changed preschool."

Quote: "We grew up in a time where everything was based on material things and physical activities, while nowadays, children as young as 6, 7, or 8 can completely lose the habit of building something or moving in certain ways because they are obviously more drawn to phones, tablets, and video games. So, in my opinion, at this point in time, giving more attention to manual skills, to help them discover things that [..] won't experience anymore later in life, is perhaps more important than knowing how to read or write. After all, everyone will learn how to read and write."

- **Individual differences among children:** It is emphasized that children have different approaches to learning and that the educational method should be flexible to suit each child. Some are more attracted to reading, others to math or hands-on activities.

Quote: "At preschool, teachers also need to be skilled in understanding the child they have in front of them. The child's willingness to accept certain things over others is definitely important, as this will be something they will face both at school and in life. A lot also depends on each child's predisposition toward certain subjects rather than others."

[4] Note from researcher: These criticisms are in line with the recommendations of the Italian Society of Paediatrics, which for some years now has been highlighting the documented risks to psychophysical health of early, prolonged and non-adult-mediated use of media devices in children aged 0 to 8.

- **<u>Impact of socioeconomic context in after school activities</u>**: The issue of educational inequalities for children from disadvantaged families was raised, and after an initial agreement among participants that at that age differences are minimal and children does not need much afterschool activities after spending long ours in preschool, they mainly focused more on describing their approach.

  Quote: "It's still the age where there aren't many differences yet; there isn't the need to teach them letters like in elementary school, where I think the approach definitely becomes different. Of course, to support children in their growth is key."

  Quote: "And it depends on the tools that the parent, guardian, or whoever it may be, has. [..] Anyway, when my kids come home, they don't want anything structured; they engage in free play. But, for example, on weekends, we organize activities for them, like going to the park or doing something else."

- **<u>Approach to diversity:</u>** The use of a same educational program for all children, regardless of their backgrounds or initial language skills is not seen as a problem, but rather as a way to provide everyone with the same opportunities for learning and growth."

  Quote: "There are children who don't speak, even Italian ones. It's not too unusual, so in these contexts, which are based on a different kind of learning, having a unified program is good. From what I've seen, it works well."

  Quote: "At my daughter's preschool, there are a certain number of reserved spots[5]. It's a somewhat picturesque environment because we're in the Matteotti neighbourhood in Palermo[6], and there are three girls from a foster home, and a boy, who I believe is also from that foster home and clearly doesn't have Italian origins. I don't create educational programs, but in my opinion, it's fine for them all to have the same program at that age. In the sense that there aren't any gaps to bridge—they all start from the same point, even though there are some differences, like who goes home to mom and dad and who doesn't."

3.2. Educators-child/peer/educators family interactions

- **<u>Direct interaction and mediation</u>**: There are two main modes of communication between parents and teachers: through face-to-face meetings (when dropping off and picking up children) and through apps or chats for general communications (only for those attending private funded facilities). The use of apps to receive updates on their children's daily activities is generally appreciated, but brings two different scenarios:
  - On one side, there are those who complain about the lack of more personal and direct interaction with teachers, saying that communications are too brief or superficial, without providing a complete picture of the child's experience.
  - On the other side, as parents have already received information about daily activities, meals, accidents, etc., communication during pick-ups focus more on the emotional sides of learning experience.

[5] Note from researcher: This facility receives a mix of public and private funding, meaning some places are reserved for children from the yearly public rankings who can benefit from concessions, discounts or total exemption from enrolment and/or services costs, based on the indicator on the economic situation of families called ISEE.

[6] Note from researcher: The Matteotti neighbourhood is a 'garden district' in a Liberty and Neo-Baroque style, developed in the 1930s by the initiative of the Istituto Autonomo Case Popolari (IACP). Although it was originally intended for railway workers, its location, structures, and unique features made it highly sought after, and it never took on the typical characteristics of social housing. After 93 years, it remains one of the most beautiful neighborhoods in Palermo.

Quote: "This year is nice because we have an app. It shows the activities they do every day, so I tell her, 'I saw you did this,' and then she tells me about it. I find it nice because it helps start a conversation about what she did."

Quote: "In my son's kindergarten, they organize an induction meeting at the beginning of the year where they introduce all the school staff. Until last year, we had two chats; now there's an app. In addition, every 3 months they have a teacher-parent meeting where they talk about the development the child has had. During the year, they organize both training and refresher courses for parents."

Quote: "Most of our communication happens during drop-off and pick-up times at daycare. They also use a chat for messages and have parent meetings twice a year. They're always in a rush. When I pick up my daughter, they just say she played and ate. They don't give me much detail about her day, they're too quick."

"We were never introduced to the teachers. We are happy, but we are not satisfied about the relationships, there is no confrontation between parents and teachers."

- **Different modes of interaction in publicly funded pre-schools:** Parents note that communication in public pre-school is highly mediated: classroom representatives (other parents) are the only recipients of general communications from teachers, which reduce direct contact with teachers. This leads to a perception of less attention to parents' needs, thus parents express a desire for more direct and accessible communication.

  Quote: "You can't relate to the teacher directly, but there is this figure of the class representative(s), who is the only person who can receive information about the class group. If there is a problem with an individual child, a parent is also involved, but all communications are mediated by these class representatives who act as spokespersons. It is a parent who is elected through official elections [...] all the parents are called in, minutes are opened, there are even witnesses [..]" [7]

  "I don't agree with that [...] Last year the representative called me to tell me that my son was crying, and the fact that the teacher didn't call me directly left me dumbfounded. I got very angry."

- **Parent involvement:** All facilities seem to encourage parent involvement through events and activities. These events not only provide an opportunity to meet teachers, but also to socialize with other parents, creating a sense of community.

  Quote: "Every 3 months they have a teacher-parent meeting where they talk about the development the child has had. During the year, they organize both training and refresher courses for parents."

  Quote: "At my son's preschool, they organize days for parents, children, and teachers to come together, and they also put on theatrical performances. So, they create informal moments where everyone can be together."

  Quote: "At my son's, preschool has organized various events, such as a spring festival, an autumn party, a mother-child art course, and an exhibition..."

- **Collaboration for child well-being:** It is acknowledged that good communication and a positive relationship with teachers are critical in dealing with any emotional problems or crises in children. Parents recognise the importance of sharing useful information with teachers and vice versa to support their children's development and well-being.

[7] Note from researcher: The emphasis with which this process is described by the participant (not perceivable from the present report) is due to the similarity with the procedures adopted for political elections in Italy. This similarity reflects the formal approach of public structures in managing representation.

Quote: "When my second child was born, the firstborn had a moment of crisis, as I think all children do when another human being enters the family, and the teachers noticed it right away. Together, we agreed on how to work with respect for his emotions."

Quote: "You can't do this without information from the school, and similarly, the school needs information about you to understand what is happening with the child."

3.3. Structures/resources/policies

- **Evaluation of available resources:** Parents express a good level of satisfaction regarding the resources available in the nurseries. The presence of dedicated staff, as well as outside experts, is mentioned and highly appreciated, especially when it comes with no extra costs or families.

Quote: "I am satisfied but I don't know the details. I know that in the classroom they have a teacher, an assistant and an extra person who brings food. But that's all I know; I don't know the details to be able to give a deeper opinion and to be able to evaluate."

Quote: "This year at my daughter's school, they hired a teacher specifically for the afternoon, with a certain level of experience and a specific profile, because my daughter is the youngest in the afternoon group. The day before starting, they held an introductory meeting. They explicitly asked me to bring the child to meet the teacher, to create a first impression so that she wouldn't experience any shock."

Quote: "I am very satisfied with the resources at the preschool. They have plenty of materials; in fact, they may even have too many things. But the school is not one of those full of toys and things."

Quote: [talking about a publicly funded preschool the child could not be enrolled] *"There, beside the enrolment fee they asked for around 100€ worth of materials."*

- **Extracurricular activities:** Parents favourably mention the additional activities offered by their pre-schools. This exchange has highlighted the striking difference from publicly funded facilities, where resources are limited. This is seen as a significant advantage for those children able to attend privately funded facilities as it is a sign of a well-structured educational environment.

Quote: "At my son's preschool [..] I never paid extra. Never. And that was private, too, just to clarify. It's not like public schools where they even ask you for toilet paper, for example, because I remember that for a year I tried to enroll at [a public preschool]*. My son didn't get in, but they even asked you to bring toilet paper."*

- **Staff experience and expertise:** The knowledge and experience of the educational staff attending participants' children are deemed adequate by parents, who recognize the positive results in children's behaviour and development. However, some parents feel uninformed about the staff's professional credentials. Anyway, they showed an interest in being sure the staff is trained and experience.

Quote: "There are results."

Quote: "I also think that we place too much value on what preschool can achieve. It's important that it's a comfortable environment where children feel good."

Quote: [talking *about* a publicly funded preschool the child could not be enrolled] *"In that case the teachers, let's call them that, were very young; there were more babysitters, while the teachers in the place where I am now are all trained."*

Quote: "What is definitely needed is the development of social skills, the fact that children socialize with other children their age."

Quote: "It would be crucial for me to know who is taking care of my daughter. What's her name, who she
is, what she does, how long she's been there."

4.0 Main findings from focus group with children

4.1. Child attributes associated with increased well-being, positive development and reduced risk for exclusion/negative development

- **Interest in learning**: Some children show enthusiasm for school, suggesting a positive predisposition towards learning. In contrast, other children exhibit a strong aversion, preferring to stay home.[8] The school environment is often structured and follows precise rules, which might limit the children's sense of freedom. They might prefer a freer and less structured environment, like that of home.

  Quote: "I really don't like going to school."

  Quote: "The thing I like the most [in school] *is studying."*

  Quote: "I like it when I get back home because I play with my toys".[9]

- **Approach to reading:** In their responses, all the children showed that they had been introduced to and encouraged in developing an interest in books, either through autonomous exploration of books available in their ECEC settings or through teacher-led guidance and reading. Every child mentioned having a favourite book and shared that reading is an activity done at home as well. No one referred to digital books or e-books, indicating that these tools are not used in any facility.

- **Numbers and songs**: While most children demonstrated familiarity with numbers when asked to count or identify objects, their ability to recall and sing number-related songs was limited. A possible interpretation is that children may be more familiar with the practical application of numbers (e.g., counting objects) than with the musical representation of numbers.

- **Free play**: During the discussion, movement-based games were those that generated the most enthusiasm among the participants. As for roleplay activities, only a child mentioned engaging in them, typically in a paired play context, but without providing many details about these experiences. The main focus of their attention and participation seemed to be on games that allow for physical movement and interaction, which indicates a propensity for social and playful experiences, which are essential for well-being and socialization.

- **Interaction skills**: Active participation in group games demonstrates social skills and the ability to work together.

4.2 Educators-child/peer/educators family interactions

- **Role of the teachers**: Children's main complain in school is that the teachers decide the activities, which can influence their perception of freedom and involvement in learning. Some complained about

[8] Note from researcher: A discrepancy emerged between the children's responses and the parents' accounts regarding school attendance. While most of the children expressed a preference for not going to school, the parents emphasized how the school environment stimulates their children's individual interests and that they actually enjoy the activities.

[9] Note from researcher: An interesting contrast emerged between the activities offered in educational settings and the experiences reported by the children. Parents described a variety of engaging activities, including meetings with an entomologist, school trips, hands-on activities, experiments, and observations of natural phenomena. However, surprisingly, the children did not mention these experiences during the focus group, even when prompted.
This phenomenon was also recognized by the parents, who shared that when asked about what happened at school, their children frequently respond with a simple "nothing."

a lack of freedom, mentioning a desire for greater independence in decision-making, highlighting the dynamic between educators and students.[10]

Quote: "I get a little bored at school; when the teachers talk, I rest on my desk".

Quote: "I don't like going to school because the teachers want to decide everything. I would rather stay home and play with my toys".

- **Shared reading**: Interaction with the teacher during book reading shows how educators can stimulate interest in reading and learning.

- **Connection between home and school**: One child mention learning numbers at home, suggesting that learning occurs in different contexts.

Quote: "I didn't learn the numbers at school with the teachers; I learned them at home".

4.2. Institutional practices/leadership

- **School structure**: The arrangement of desks and the decisions made by the teachers can reflect institutional practices that influence interaction among children and their sense of autonomy.

Quote: "We don't play much; we can't, we also have desks far apart from our classmates..."

- **Play activities and learning**: The presence of activities such as games and shared readings is essential for promoting a positive and inclusive learning environment.

4.3. Structures/resources/policies

- **Access to educational materials**: The children mentioned specific resources, such as books and games, that were available to them in school.

Quote: "At school, there is one. In my school, I think. We only have two that are the same."

5.0 Key takeaways

Parents' Focus Group:

- **Importance of play-based learning**: Parents emphasized integrating basic skills like reading, math, and science through play rather than formal instruction. They value hands-on experiences and creative exploration.
- **Skepticism about technology**: Many parents expressed concerns about the use of digital devices (e.g., tablets, phones) in early education, favoring practical and manual skill development over screen time.
- **Free play and motor skills**: Free play and the development of motor skills were considered essential for children's physical and mental growth, with a preference for crafts, cooking, and science activities.
- **Individual differences**: Parents highlighted the importance of tailoring educational approaches to individual children's learning preferences, noting that some children enjoy reading while others are more hands-on learners.

[10] Note from researcher: One of the children attends a Montessori preschool, with an educational approach focused on autonomy and free choice, so he has a different experience compared to the others.

- **Socioeconomic disparities**: Educational inequalities between private and public preschools were noted, particularly regarding resources and extracurricular activities, which are more abundant in private settings.
- **Diversity and inclusion**: Parents viewed the use of a unified educational program for children of different backgrounds and languages as a positive approach, ensuring equal learning opportunities for all.

Children' Focus Group:

- **Mixed feelings about school:** Some children expressed enthusiasm for learning, while others disliked the structured environment and preferred to be at home. They wished for more freedom in choosing activities.
- **School structure and autonomy**: Some children expressed frustration with the structured school environment, preferring more autonomy in choosing activities. They felt teachers made too many decisions on their behalf.
- **Preference for movement-based Play**: Children showed strong enthusiasm for games involving physical movement, which generated the most excitement during discussions.
- **Interest in reading**: All children indicated a positive introduction to books, either through autonomous exploration or teacher-led reading, and each had a favourite book. Reading was also an activity they did at home, with no references to digital books or e-books, suggesting these tools were not used.

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Task 2.4

National Report: Portugal

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1.0 Introduction

This task is devoted to attending to listening to children, families and staff of the participating centres, and understanding their experiences through focused group discussions. After analysis and after the data generated in different countries is put together, the idea is to produce policy recommendations that can contribute to efficient actions leading to good results in cognitive and social development for early years.

This report provides (1.) an account of what has been done and with whom; what was found in terms of main results from the focus groups with ECEC staff (2.), families or guardians (3.) and children (4.). It ends with a discussion of the key takeaways (5.).

1.1 Demographic details of focus groups participants

	ECEC Staff	Families/ Guardians	Children
Nr. of Participants	7	3	10
Age range	Men (between 35 and 55 years old); Women (between 35 and 61)	Man (46 years); Women (33 and 36 years)	6 years old - 3 children; 5 years old - 7 children
Gender	Male (2); Female (5)	Male (1); Female (2)	Male (5); Female (5)
Languages spoken	Portuguese	Portuguese	Portuguese
Nationality	Portuguese	Portuguese	Portuguese

We would like to emphasise that we were not provided with any information on aspects such as ethnic belonging or identification (which are considered sensitive data in Portugal) or information regarding the socio-economic characteristics in the participants in the different focus groups. In the children's focus group, we realised that one of the children is a migrant from a Portuguese-speaking African country, having arrived very recently in his educational context (he started this school year, so some weeks ago). In addition, there is a child needing special educational measures in the class, but who did not take part in the focus group – the children present where only a subgroup of those belonging to that class as the number of children exceeded the number indicated for inclusion in the group discussion.

1.2 Contextual information

The focus groups with the ECEC staff and parents were held online using the zoom colibri platform. We used online informed consent, reading through the informed consent protocol and clarifying what could be expected and the rights of participants and requested that participants explicitly stated their consent to be recorded. The focus group with the ECEC staff took around 90 minutes and seven ECEC staff were present. Of these 7 educators, 4 are from the same school cluster where data collection continued, namely with parents and children. The remaining 3 educators who took part work in other school clusters in different regions of the country.
The parent/guardian discussion group was also held online and followed a similar procedure for obtaining informed consent. It included 40 minutes of discussion, bearing in mind that there were only 3 participants. The main difference between these two discussion groups was the number of participants and we would like

to emphasise that this group was the most challenging, as we experienced some constraints in finding willing participants, and some of those contacted ended up not showing up at the moment of the discussion (of the 15 parents that had been first contacted and then sent the invitation to the focus group discussion, 3 participated).
The focus group with the children took place face-to-face, lasted around 30 minutes, and happened in the kindergarten context. The children were very collaborative and enthusiastic about their participation, they were also very organised and interventive. The challenge we highlight was related to questions probing literacy and numeracy-related learning among the children, since, being integrated into pre-school education, these competencies are understood as transversal to the pedagogical dynamics and the planned activities, however the discussion was very informative and an enriching shared experience. Informed consents for participation were sent in advance to the teacher, who collected them from the parents.

1.3 Methodology

The methodologies used followed the data collection guidelines established by the consortium. Focus groups methodology allows the participants to interact with each other, more than with the interviewer. This creates a setting where the views of the participants can emerge – the participants' voices predominate over that of the researcher's agenda: "It is from the interaction of the group that the data emerge." (Cohen, L., Manion, L., & Morrison, K. 2007, p.376)

In the case of the focus groups with parents' and ECEC staff, we used the guidelines as a document for generating discussion and collecting data. It was necessary to adjust it during the discussion group with the parents/ guardians, since there were only three participants and lower levels of interaction, making it closer to a group interview. This adjustment didn't interfere with the methodology, since the interviewer was interested in the group and their experiences (Amado & Ferreira, 2013) and not in the particularities of each of the participants.
The focus group with the children was face-to-face and the data collection schedule was used in conjunction with examples of 'make-believe' activities, acting and role-playing on the part of the children, which allowed us to understand their interaction and the activities they most enjoy and identify with. In addition, requested that they stated their names, and identify its first letter, to get them discussing and better understand their literacy, and the same for numeracy, asking about their ages and how old they will be next.

2.0 Main findings from focus group with ECEC staff

2.1 Child attributes associated with increased well-being, positive development and reduced risk for exclusion/negative development

Children's well-being was the main concern of all teachers participating in the focus group. They consider well-being more important in ECEC than developing school related literacies. All teachers affirmed they promoted a holistic-oriented approach with the students. They also considered that playing is a child's right.
Valuing children's abilities was also pointed out as one of the positive actions to promote well-being.

"What really matters to me is that the children have good memories from here in 20 years. They won't remember what I taught. They will remember, maybe, all the moments I threw them up or when I played with them. I think that's what matters." (Staff member).

Indeed, as these educators point out, childhood is an essential period of development, in terms of constructing emotional relationships that will have a long-term impact on children's socio-emotional development, and psychological well-being. As a matter of fact, one important developmental task in the early years is precisely forming an attachment with caregivers (Arace, Prino, & Scarzello, 2021). Also, evidence confirms that this teacher-child relationship is indeed very important to promote other fundamental psychological characteristics in children in ECEC. Cadima et al. (2016), after performing several in-class observations, concluded that teacher–child closeness stands out as a predictor for improvement in self–regulation skills, in the sense that children demonstrated larger gains in self–regulation in an environment where they experienced closer teacher–child relationships. Furthermore, children with initial low self-regulating abilities were found to gain the most from classrooms that showed higher educational quality (Cadima et al., 2016).

The participants demonstrated deep concern with the increasing number of immigrant students in the classroom, especially when combined with having larger numbers of children in classes, and the lack of help to support these students. They expressed the need for qualified assistants. It was said that the teachers usually must train the assistant, and higher levels of cultural and linguistic diversity demands more individualized student attention. The "Portuguese Multicultural School" was criticized by participants; they said it leaves the teacher with complex issues to deal with in their classes without adequate support because, besides students with special educational measures, immigrant students also often bring, in their view, special educational needs that they have to deal with in.

"We have too many immigrants and many problems we don't know in advance. After one or two teaching weeks we star noticing problems related to having assistants in the classroom that are not prepared. It does not help us to have three people in the classroom if they cannot help. Unprepared people are often hired in ECEC education." (Staff member)

2.2 Educators-child/peer/educators family interactions

2.2.1 Educator-child

The educators said that the children must be engaged in order to learn. To do so, they need to like their teacher. The teachers need to know how to motivate the students. To do so, they must be able to think from the perspectives of children and to not be ashamed of how others would think if they saw the teacher doing silly things (from an adult perspective). Teachers often use storytelling for connecting with students, developing empathy and engagement.

"Today, I welcomed a girl with her mother. The mother turned to me and said what have you been doing? My daughter came home last Sunday crying because she said she missed her teacher. But what have I done? I did nothing. I just relate to them, which is one of the most important things I can give them." (Staff member)

The participants also said that learning from the students was a very important way to value their knowledge and improve educational quality. In this regard, all examples given were related to uses of digital technology.

By dealing with high numbers of migrant students, teachers changed their teaching approach. They now use body expression associated with speech to overcome language barriers. They also changed the ways of communicating with children as they grow older, they play more with children and use gestures more.

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2.2.2 Peer

The teachers raised the issue that developing students' empathy is very important, from the first days they spend in class. They highlighted how it helps managing emotional conflicts with the newcomers, and the use of storytelling as a good tool to engage with it.

Peer work was considered an important aspect of developing students' independence from the teacher. It was considered a good thing that children could start developing crafting activities, and then starting to interact among each other changing from crafting to developing stories by themselves, freely with their creations, with no intended guidance from the teacher.

2.2.3 Educators family interactions

The teachers agreed that the interaction between families (or guardians) and educators and the school environment is fundamental for developing good quality education. They all share a communicative channel, that includes sharing a WhatsApp group, weekly scheduled appointments, and using Facebook to share students' school routines. The teacher chooses the communication channel by the start of the school year. Developing informal and closer bonds was said to be a good thing to engage students. The teachers said that guardians (or parents) tend to follow the defined agreement as when and how to contact each teacher.

Teachers raised an issue regarding guardians' difficulties in the education of their children. They explained that parents often think that education must happen through suffering. Therefore, parents suffer and become exhausted. That intensifies conflicts between parents and the school. Also, guardians demand the school to educate their children, and the school demands the same from the guardians. The teachers recognized the need to better handle a balance and manage these conflicts.

2.3 Institutional practices/leadership

The participant teachers had overall negative feelings regarding some Institutional practices. They highlighted issues with support from childcare assistants, and changes in expectations regarding their response time. Specifically they mentioned that the childcare assistants are hired from jobcentres without the prerequisites they consider necessary to work with ECEC. Therefore, the teacher has to train the assistants, making the teachers' work more difficult.
The teachers also highlighted the increased school pressure for responding quickly that came with the change from emails to WhatsApp groups, and the kind of more immediate interaction they entail.

2.4 Structures/resources/policies

2.4.1 Structures

The teachers explained that Portuguese ECEC schools vary a lot. It varies when comparing public schools with private schools, and when comparing public schools from different areas of Portugal.
Teachers said that in general, the school infrastructure is poor, and the buildings need to be restored.

2.4.2 Resources

Some highlighted some useful resources, and they identified a trampoline in a classroom that children can use at any time, a dollhouse, and a net. The books were seen as one of the most important resources for children to create connections with the teacher and with the classroom activities.

The teachers are in favour of demystifying that the use of digital technology for children is a problem. They use multimedia projector computers and cell phones. They say it helps with children's engagement and in connecting children with their teachers once they teach the teachers new ways to operate the digital tools everyone is working with.
It was highlighted that digital technology should be used carefully. If it were left for children decide, they say, children would use it all the time. Therefore, the main idea is not to forbid the use of these tools, but to teach children to use it in the right way, on their own, and with limits.

On the other hand, the teachers complained that the school computers are old and often the teachers must acquire the digital tools at their own expense to work with them. The complaints also included the lack of other common resources such as chairs and tables. They say that the furniture is often forty years old.

2.4.3 Policies

The teachers criticized the educational policies emphasising the development of literacies over the development of children's social abilities, self-knowledge and motor skills. They said that (the more school-oriented) literacies are important, but they must come after children's well-being and social abilities. The ECEC feels under pressure from the following levels of education, as if it should be the considered the fault of ECEC teachers if the children have not developed certain literacy skills.

The lack of digital resources was associated with government policies that do not favour the use of digital technologies in ECEC, because these resources are said to be much more common on higher levels of public education.

3.0 Main findings from focus groups with families/parents/guardians

3.1 Child attributes associated with increased well-being, positive development and reduced risk for exclusion/negative development

The study showed that, for guardians, ECEC education should care for developing children's social skills and self-competences before math or language literacy, and focus on children's well-being. They highlighted that literacy could be present while associated with the methods for developing the children's self-competences.

"Before literacies, I think there is very important work to be done, and it will be translated into future success, knowledge success." (Parent)

Guardians highlighted how skill development should be pursued carefully, considering adequate challenges, and recognizing children's abilities in order to support the development of their self-competence and self-esteem. Activities that could be interesting for the parents to see, but uncomfortable for the children, could have damaging results.

"I saw many children with high levels of affected self-confidence and self-esteem during the ECEC. Later on, I followed their lives up to the 9th grade, and their path was dramatic. I don't want to be simplistic, but I associate it a lot with the fact that in ECEC students had to paint Van Gogh paintings when they could have been left to play." (Parent)

Studies support this vision. Cognitive development is, indeed, influenced by social and emotional development and vice versa. Moreover, guaranteeing the social and emotional development and well-being of children, is essential to create a partnership with families, and parents' socio-emotional well-being needs to be taken into account too (SEED Project Consortium, 2019).

3.2 Educators-child/peer/educators family interactions

3.2.1 Educators-child

The importance of the good relationship between the educator and the child's guardians was repeatedly mentioned by all as turning point, that even changed the children's behavior from not wanting to go to school to wanting to go and having fun at school. They highlighted the importance of teachers that respect and understand their children, and that let children be themselves. They also said that the teachers' self-confidence was important for increasing the students' educational quality.

"I am absolutely certain that this teacher was the best thing that could have ever happened to us, parents and our daughters, she is a true educator." (Parent)

3.2.2 Peer

The peer interactions are considered by the participating guardians as the most important role of ECEC and the main difference between keeping children at home and in school. Respect for each other, and to society were said to be the most important aspects to be developed with children at ECEC.

3.2.3 Educators-family interactions

Guardians were very satisfied when sharing that they, and their families, have an intense interaction with their children at school, and with the ECEC teacher. The teacher was identified as the main driver in bringing families closer to the educational environment. This closeness was supported by sharing what happens in the classroom with guardians through Facebook, for example, and in teacher's self-confidence in her work. The interviewees also highlighted how the teacher involves them when there are situations related to children's well-being. In special activities, the teacher includes the participation of the whole family, such as birthday celebrations, the reception of students in the first days at school and in festive occasions.

"We end up feeling almost as if we were there. They [the children] tell us at home, but we already have the whole [day] story." (Parent)

"I think that the parents feel equally involved in the celebrations, these are relaxed and happy moments." (Parent)

3.3 Institutional practices/leadership

The guardians highlighted the institution's trust in the educators as one of the factors for increasing the educational quality and the well-being of the students. They cited that the teacher justified banning the use of smocks in the classroom, which was something present in the school's internal regulation, explaining in a letter how it was making some school activities more difficult. The institution also permitted the use of new school areas for younger students after teachers advocated for it. The guardians also highlighted that there has been a positive change in the whole school leadership because they have been seen happier students in all classes.

This aligns with the understanding that socio emotional traits and executive control abilities represent important predictors for student's academic and personal success. That is the case for regulation capacities, persistence even within uncertain scenarios, and when tasks are more challenging, or the ability to think of different solutions when faced with failure (Duckworth & Seligman, 2005; Oyserman & Destin, 2010, as cited Immordino-Yang, M. H. 2016).

3.4 Structures/resources/policies

3.4.1 Structures

The classroom space was said to be small but the external area was considered excelent. The guardians said that the teacher optimized the classroom space with useful resources, and that the teacher uses a lot the external space. The external area was also recently improved in a teacher, family and community action, counting with a local market support to develop what the school called a mud kitchen.

3.4.2 Resources

The guardians gave vague answers about the resources used in their children's education. They highlighted a trampoline often used by children from their class, and by children from other classes. The children's free access to the classroom resources was considered an asset for children's education. The guardians also highlighted the mud kitchen as a good resource of the external environment.

The uses of technology were not perceived as a tool extensively used, or of great importance. Occasional use of videos or songs with images associated were mentioned. However, guardians explained that tablets or similar digital devices are not used. They also consider that the use of digital technology (and digital as a theme) should not be emphasised in ECEC education. They consider that other resources may contribute more to children's happiness. Digital technology is used often for communication between the school and the family, with daily school reports on Facebook.

3.4.3 Policies

In Portugal, typically children leave ECEC to enrol in primary education when they are 6 years old (with some variations depending on the month the child was born). However, they may leave ECEC earlier, at 5 years old, depending on the parents' choice. According to the participating parents, this generates a social pressure on parents to make their children leave ECEC earlier. They see this practice as problematic as it may push forward some unprepared students. They say that it should be the teachers' decision instead of the decision of parents or guardians.

"Therefore, I even defend prohibiting five years old children to go to the first cycle (leave ECEC) ... prohibit that it is a parent's choice, but an educator's orientation, because there is, in fact, that social pressure" (Parent).

Political care for students in socioeconomic vulnerable situations and students with special educational measures due to cognitive or motor disabilities were raised as challenges to overcome still. Children in socioeconomic vulnerability were said to be tracked. However, the programs to aid them were considered discreet. Students were said to be lucky if getting good school support.

4.0 Main findings from focus group with children

4.1 Child attributes associated with increased well-being, positive development and reduced risk for exclusion/negative development

Throughout this focus group with the children, we were able to see how concerns with well-being are present in their daily lives, in the classroom space, with the teacher and their colleagues.
As a first aspect, which we'll develop later in the section on resources, we realised from being present in the room for the face-to-face discussion group with the children that they have access to various activities, provided by the multiplicity of resources that the teacher tries to fit into the classroom space, which contributes to the children's positive development, creativity and interaction.
We can see, for example, from the activity we describe below, how the children are involved in a stimulating and creative environment, activating their imagination and other social interaction skills.

The teacher says that there is a coffee shop day in the room, where the children play and stimulate their imagination:
Educator C.: “By the way, our coffee. What's our coffee shop called?
All the children: There's a cat here.
Educator C.: We have a coffee shop on Tuesday's [...] it's our day to go to the coffee shop.
Interviewer S: Well done! it's lovely.
C.: I want to come to this coffee shop.
Educator C.: What do you do go to the coffee shop to?
M.: To eat.
Educator C.: No, what are you going to order there? We even have trays now, don't we?
M.: What we want to eat.
Educator C.: What do you say to the person there?
Children: Good morning
Educator C.: Say hello. And then what do you say at the end?
Children: Thank you.
Educator C.: They say thank you. And when you're in the queue, while you're waiting? Do you push them?
Everyone: No, we wait.
Educator C.: And do you pass in front of your friends?
Everyone: No.
Interviewer S: And do you pay for the coffee?
Everyone: No.
Educator C.: It's a gift.

Another activity that illustrates how creativity is promoted with the children was also described to us during our visit to the kindergarten. During the group discussion they told us:

Educator C.: “And outside, then we're going to show you our mud kitchen, a kitchen with pots, which they brought from home, but real pots. We have a sink.
Interviewer S: What do you usually do there?
MA.: Play with the soil.
Interviewer S: And what's it like playing with the soil, can explain it to me because I don't know how it is?
D.: Like cooking for the animal hotel.
Educator C.: Oh, because next door we have the bug hotel and they like to cook.
C.: The insects are very hungry afterwards.
Interviewer S: So, what do you like to do in this corner of the mud kitchen?

M.: We like to fetch water, fill it up and make wet soil to give to the bugs.
Educator C.: With what? You choose other things.
M.: With the pot.
Educator C.: We have real pots, which they brought from their parents' house, not toy pots, and wooden spoons and soup ladles, don't we? Look, what's your favourite cake that you make with MA. and that you used to make with B.? What were you making when you sifted the soil?
D.: Omelettes.
M.: Strawberry tart.

In addition to activities that enhance creativity, imagination and social interaction, we also had the opportunity, through the discussion with the group, to verify that all the children could identify the first letter of their name, as well as verbalise it, and the same with numbers, where they could tell us how old they were and how many years old they are going to be next. They also have access to resources such as a light board that allows them to explore letters and numbers, the reading corner and many other educational materials. We could observe that the children feel included, and it was also very clear during the focus group how welcomed the children feel having this environment as their own.

4.2 Educators-child/peer/educators family interactions

The discussion group with the children took place in person, with the teacher present, as it was important for the children to feel more comfortable and confident in expressing their opinions.
So, regarding the interaction between the teacher and the children, we can see that the relationship is very positive, with lots of dialogue and interaction, like when we asked the children:

Interviewer S: “Do you like coming to kindergarten?’
All: ‘Yes, we like it.
Interviewer S: A lot?
All: Yes.

Similarly, later in the discussion group with the children, the teacher's monitoring and care in interacting with the children is visible, in the way she involves them in intervening, as we can see:

Educator C.: “C., what about you, dear? What are your favourite books?
C.: Cuquedo too.
Educator C.: Yesterday, MS. and C. brought two of the same books, and they were from the same collection, because people like books, don't they? They can buy the book to have at home.
C.: The disconnected family book”.

We can see that one of the interactions that is commonly encouraged in class is reading and interpreting stories, and the children are also involved, being able to take their favourite books to school and proposing that the teacher tells the story. This interaction is very important in terms of encouraging the children's involvement in their own learning process, valuing their experiences and preferences beyond the school/classroom and sharing them with their peers and the teacher.
Regarding interactions between peers, we should point out that children were very organised in their participation, i.e. they were very well adjusted to participating in an articulated way with their peers, respecting when they spoke and not speaking over others.
We had the opportunity, at the teacher's invitation, to accompany the children during their break, after we had finished the discussion group, and to see how they interacted with each other in moments of play and greater informality, and they demonstrated very positive relationships with each other, some playing together and supporting others in play, while others still playing more on their own, which is also typical for this age group.

4.3 Institutional practices/leadership

This point was not questioned directly in the discussion group with the children, but the short observation in the kindergarten context points to an existing proximity of practices and methodologies by the different teachers. The atmosphere and interaction between teachers, and with school coordinators, felt informal and collaborative.

4.4 Structures/resources/policies

4.4.1 Structures

As already mentioned, the children's classroom is small, but it's well organized and includes different resources. They have access to an interior courtyard, where the children have a slide and the chance to play. On the other hand, the outdoor space and the whole kindergarten/school space is quite large.,There is a canteen space for pre-school and primary school children; the outdoor space is ample, and in addition to the mud kitchen, they can have a 'hotel for the animals' that they feed through the mud kitchen and also a community garden that is frequented and taken care of by older people involved in a program by the municipality. In the school playground they still have space for outdoor play and very large patios. The kindergarten also has a common atrium, which supports the three kindergarten classrooms.

4.4.2. Resources

In terms of the resources in the room, the well-organized layout provides resources for different activities. There is a trampoline in the room, a corner dedicated to new technologies, with a TV screen which is connected to a computer, where the children can explore games, or educational activities on YouTube, such as the 'Aqui há gato' channel, which is a bookshop channel where they tell stories. They also have a hammock for moments of relaxation; a light board so they can explore numbers and letters; an old telephone that they can use in play; the means to create a coffee shop, where every Tuesday they organise a creative activity of going to the coffee shop, and interacting there. Outside the classroom, they also have a mud kitchen, which is highly valued by the children, and a vegetable garden that is taken care by older adults, with whom the children interact. From what we could see, the teacher activates the room in a very playful, interactive and creative way, making the most of the resources.

4.4.3. Policies

This point was not questioned directly in the focus group with the children, nor was it possible to observe it during the face-to-face visit to the kindergarten.

5.0 Key takeaways

- The focus group with teachers showed that the well-being of children is their main concern together with developing children's social skills and self-competences. That focus is shared strongly by the guardians, who value similar educational goals.
- From the teachers' perspective, storytelling is an essential resource to develop children's connections and engagement. They also value autonomous storytelling by children during play.
- The uses of digital technology caused a big transformation on the communications between school, teachers and parents. Even though it brings new pressures to teachers, it seems to support proximity and

trust between teachers and parents. Guardians feel engaged, recognise positive educational outcomes, and trust teachers and their judgement.
- Parents did not value or recognise the use of digital technologies by or with the children at school. However, the teachers reported that they use it often and that they would like to use it in better ways, if they had better resources.
- Guardians and teachers also disagree about the importance of using digital technologies at ECEC education. Parents consider it less important than teachers and believe that other tools could be used to generate the same engagement. Teachers believe it is important to teach the children to interact with digital technologies in a healthy way and report that digital technologies allow children to interact with teachers in ways where they are the ones showing and teaching new things.
- Interactions are positive (both those observed between children, and those referred to by and between parents and teachers) highly valued and a part of the educational effort including activities that foster children's creativity, imagination and involvement with the surrounding world. Parents and teachers see this as integral to the promotion of well-being and positive development.
- Teachers make intentional use of a diverse set of spaces and resources to support activities with children. They find particularly challenging having to deal with more diverse needs of an increasing number of children – children with special educational needs and measures and immigrant children – especially as they feel they don't have enough support, and especially enough trained supporting staff to help them.

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SCIREARLY

National Report Spain (Task 2.4)

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1.0 Introduction

1.1 Demographic details of focus groups participants

The strong focus on co-creation that vertebrates the SCIREARLY project makes it imperative to share and discuss preliminary findings with end users, even if they are 5 years old. Thus, eight focus groups were carried out in the Spanish context, within three different early years settings. During September and early October 2024, the UD research team conducted those focus groups involving families (18), teachers and headteachers (23) of early years and young children (23). The following information gives an overview of the context of each school, along with basic socio demographic information of the participants to frame the findings.

SCHOOL 1. SEBER ALTUBE

Seber Altube is located in Gernika-Lumo, a semi-rural area at the heart of Biscay, in the Basque Country, northern Spain. From a cultural point of view, Gernika-Lumo is one of the most relevant locations in the province and in the Basque Country, being home to the most important institutional entity in the region, Gernika Assembly Hall. The town currently has a population of approximately 16,847 inhabitants (Eustat, n.d.). Roughly, 20% of the population is below 20 years of age. With regard to the educational level of all the population, more than 20% holds a higher education qualification, 30% of the population has a primary studies and only 1.57% of the population have no studies at all.

The school is conveniently located near the center of town, surrounded by parks, museums, residential areas and all kinds of services such as a hospital, a courthouse and commercial establishments. It is a charter school, founded in 1966 by a cooperative formed by families of the area, committed to ensure education rooted in the basque culture. It is part of the network of schools known as '*Ikastolas*', with a total of 112 schools in the entire Basque Country, in which 57,322 students are enrolled. The common denominator of all these schools is the Basque language and culture, as the basis for building students' education and the foundation stone for their training and future. Currently, Seber Altube serves 713 students from 412 families and employs 56 professionals. The school covers all compulsory basic education grades. Therefore, it offers schooling from 0 to 16 years of age. Most students belong to families with a medium-high socioeconomic status. In this case, 91.3% (Eustat, n.d.) of the population is employed and is from local origin. A portion of the students come from the surrounding rural villages.

In this regard, with certain exceptions, there is widespread homogeneity in terms of knowledge and use of the Basque language both as a language of instruction and as a language of communication. Nevertheless, by the time they finish secondary school, most students are bilingual and also have an advanced knowledge of English and a basic level of French.

Seber Altube has 8 preschool classes, not including the groups of students enrolled in the nursery school. They have two groups for each educational level, ranging from 2 years old to 5 years old. For the focus groups, the entire teaching staff of the educational stage (9), were invited to participate. In the same way, students of 4 and 5 years of age took part (5), attending to the preferences of the school staff and families.

SCHOOL 2. FREDERIC GODÀS

Frederic Godàs is a public school located in Lleida, in Cataluña. This historic city has 143.094 residents and attracts people from different countries as it offers multiple work opportunities. The school hosts a variety of nationalities and attracts over 700 children each school year. The local administration tries to accommodate newcomers in different schools as they come to Lleida, although Frederic Godàs ends up as the main option

due to its big buildings and open spaces. The school borrows its name from an important pedagogue known for being one of the main founders of the Lleida's Lyceum, along with his wife Victoriana Villa Badia. Godàs and Villa devoted themselves to defending free, high quality and public schools as an alternative to expensive and exclusive schools of the beginning of the 20th century.

This particular school experienced a pedagogical re-orientation from 2012-2013, when some important principles were agreed upon. For instance, the idea that the school is for everyone and every boy and girl is welcomed there in the best possible way, whatever their personal and social status is at the core of all their educational activities. The center considers each student a person in their total dimension and each of their actions will be aimed at developing all the facets both personal and social, highlighting its whole school and holistic approach. In addition, the school sets the basis that education is the best path that can help each child achieve their own life project, acknowledging the continuous improvement and evolution of education. In addition, the school works for the development of the critical spirit of all students as it is a fundamental skill in the current society, along with autonomy of every individual. The school also prioritizes training for peace, cooperation and solidarity between people to achieve a better society. Moreover, the school defends that interaction and collaboration between the educational community and the environment is essential for the education of children and for democratic participation in society.

The Frederic Godàs school serves children from 3 to 16 years old, supporting students' learning and development through the entire compulsory education. As for its early years settings, the school has a separate new building, well connected with the old building of the school, that gathers around 108 young children and 6 teachers (plus teachers-to-be and practitioners in internship). The early years setting consists of 2 groups per age, and the main spaces designated for each age group are connected so that both teachers are close at any time.

The early years setting of the Frederic Godàs presents some particularities: all its spaces and activities are carefully and purposefully designed and planned to support students in their learning and development processes. After up to 2 years of training and specialization, practitioners achieved a global and agreed vision of what the main objectives and purposes of their work should be: to ensure the highest quality of early childhood education experience for all, and so they devote themselves to achieve that with every single child. All the early years settings combine spaces that offer stimulating challenges to children in the field of mathematics, science, early literacy and symbolic play. All the spaces are geared towards supporting and fostering children's learning.

SCHOOL 3. SAN VICENTE DE PAÚL

San Vicente de Paul (SVP) school is a religious charter and urban school. It is located in the center of the town in Irun (Guipuzcoa- Basque Country, northern Spain). It is the most populated town of the province after the capital city, San Sebastian, with 60.191 residents. The population of young people represents 18% of the total population of the municipality (Eurostat, 2023). Out of this population, in 2021, 30,7% had completed primary education, 26,3% secondary education and only 15,51% had higher education.

The school is located near the border of Spain with France. It offers all basic educational levels, from Early Childhood Education to Secondary Education. The school currently has 610 students enrolled, between 2 and 16 years old. Most students come from medium-low socio-economic levels. The employment rate of the population does not exceed 50.5% (EUSTAT, 2023). Students and families with great linguistic and cultural diversity attend this school. There is a significant proportion of students with a migrant background (76%). This reality opens up a vast variety of languages spoken, such as Chinese, Romanian, Ukrainian, Moldavian,

Bulgarian, French, Italian or Portuguese. Most of the students are bilingual. Despite this huge diversity, Spanish is understood by almost everyone. When it comes to Basque, the main language of instruction in the Basque Country, the majority of students are able to understand content in this language, but some of them have difficulties speaking in Basque. This reality sometimes hinders children's opportunities to reach their full potential.

As for its early years setting, San Vicente de Paul has 4 groups at the early childhood education stage: group of 2 years-old, group of 3 years-old, groups of 4 years-old and the group of 5 years-old. The focus groups were carried out in the group of 5 years old, following the schools' and families' preferences.

Families of all age-groups at ECEC were invited to take part in the focus groups, and 8 were involved in the discussion, which ensured a diversity of opinions and experiences. Similarly, teachers of ECE were invited to join the focus group, and they all agreed to participate (N=8).

Table 1. Overview of the focus groups conducted per school and target group.

	School 1	**School 2**	**School 3**
Young children	-5 (3 female, 2 male; 5 years old) -Duration: 11'54''	-10 (4 female, 6 male; 4-5 years old) -Duration: 19'35"	-8 (3 female, 5 male; 5 years old) -Duration: 12'03"
Families / Community members	-	-10 (8 female, 2 male) -Duration: 57'33"	-8 (7 female, 1 male) -Duration: 19'45"
ECEC staff	-9 (5 female, 4 male) -Duration: 54'25''	-6 (5 female, 1 male) -Duration: 36'05"	-8 (8 female) -Duration: 26'47''

1.2 Contextual information

While school 3 took part in previous research activity within SCIREARLY, school 1 and 2 were firstly involved in the project through these focus groups, and its positive experience made them keen to be involved in future research activities. The three schools were contacted by email firstly, to extend the invitation to participate in the focus groups, highlighting the implications of their involvement and the nature of the activity per target group.

Following the schools' priorities, all the focus groups were conducted in each school to facilitate participants' comfort and wellbeing. Between mid september and early october, all the eight focus groups were conducted and analyzed. Overall, teachers' discussion groups lasted 2h07' , families' focus groups took 1h16' and children's 43'.

Focus groups were carried out following the protocol facilitated by task leaders, KMOP, and the questions were translated into Spanish, Basque and Catalan because those were the official languages of the schools. Questions shared to trigger the conversation, and completed with some prompts to fuel the discussion.

Although all the focus groups were completed as planned, some challenges arose in the process. On the one hand, **scheduling the focus groups with families** took longer than expected initially, mainly because of their diverse work timetables and responsibilities. On the other hand, children's focus groups were conducted with the support of the teacher of the group. This ensured children's comfort and sense of safety, since they did not know the researchers but felt very comfortable with their teacher. Of course, questions were reformulated and rephrased as needed to ensure children's understanding, and positive reinforcement was also used to appreciate their thoughts and their experiences on high quality early childhood education. Following article 12 of the Convention on the Rights of the Child (United Nations, 1989), children have the right to participate in research processes that somehow concern their lives (Tisdall, 2016; McMellon & Tisdall, 2020). Thus, their willingness to participate was highly appreciated and framed in this important recognition of children's rights. On the other hand, **teachers' focus groups** were conducted with no particular difficulty in any of the three participating schools. On the contrary, the staff took part eagerly in the focus groups because it served as a space of reflection and discussion of internal issues of each school. On the other hand, because focus groups with teachers were conducted in Basque (school 1 and school 3) and Catalan (school 2), the only issue that raised some sort of difficulties were the translations in the analysis. But the research team overcame it by making the most of its diverse cultural backgrounds.

1.3 Methodology

All the eight focus groups were carried out following the guidelines of the protocol created for this particular task, by the Greek colleagues KMOP, whose extensive research experience involving end users ensured an accurate and sensitive procedure. As mentioned above, questions, consent forms and information sheets were translated into Spanish, Basque and Catalan to fully adapt to each context. Each translation was reviewed by native speakers and people familiar with the early years' jargon to maximize its accuracy.

Ethic clearance was obtained weeks before the focus groups were scheduled, which gave enough time and space to ask any questions and solve any potential doubts regarding children's, families' and teachers' participation. These previous conversations were essential to establish an egalitarian and trusting relationship with each schools' gatekeepers (headteacher and teachers).

As for teachers' focus groups, the questions were divided into three main dimensions: general information about their **groups of children** (in terms of age, demographic information, social interactions, academic achievement, types of play and academic activities they might prefer); questions about their **relationships with the children as teachers, and with families and community members** (whether they encourage collaboration between peers, how often and to what extent families are invited to participate in-classroom activities…); and questions at **institutional level** (if they feel supported by their headteacher, whether the training opportunities they have are research-informed, questions about their working atmosphere, among others).

Focus groups with families were rooted in their sense of belonging, their opportunities to participate in educational activities, if they felt supported by early years staff, and if they considered their involvement strong enough. We were also interested in knowing families' opinions on a school's resources, not only in terms of materials and physical resources, but also in terms of staff's training and capacity to ensure the best education opportunities for their children.

Children's focus groups were led by one or two researchers along with the teacher of the school to ensure the children felt secure and comfortable. The focus groups were presented as an optional activity, and

although permissions were granted beforehand, these focus groups relied on children's assent. They were completely free to be engaged in the focus group or to leave it at any point. The researchers introduced the topic of high quality in early childhood education, and they showed a high interest in sharing how they bring this concept to live in their daily lives. Audio recorders were presented as an element they could also access and manipulate should they feel they don't want to be recorded at any point. All children's focus groups lasted between 10 and 20 minutes, and all their contributions were highly appreciated by highlighting how sharing their ideas could make a change in other children's experiences in different ways.

2.0 Main findings from focus group with ECEC staff

This section includes results from the three focus groups conducted in the three schools. It gathers information from 2h07' with contributions from 23 early years professionals (aged 27-54). It is organized following the factors that are mainly acknowledged as essential in high quality early childhood education and care. On the one hand, structural factors are addressed, including leadership elements and work atmosphere. On the other hand, process factors are presented, which focuses on relationships between teachers and families, and teachers with children. Each section is feeded with quotes from the focus groups carried out in School 1, school 2 and school 3.

2.1. Structural factors

Leadership (democratic structure of school governance)

Across the three focus groups conducted with early years practitioners in Spain, one relevant aspect that arose was linked to the school governance. Far from being focused on a single individual who is expected to be at the top of everything that happens in the school, (as traditionals headteachers do), the governance is shared among different people within the school. Although a headteacher is designated, its responsibility is frequently shared among a team of teachers that work closely together during the entire school year, revisiting the mission and vision of the school and making sure all the pieces are well aligned to achieve it.

This important structural aspect is addressed in different ways throughout the focus groups with early years staff across the three schools. For instance, in School 1, the headteacher (who also took part in the focus group along with the teachers) shared that when a new school principal needed to be appointed, they agreed on sharing this responsibility among some of the teachers. This was to ensure a more democratic and effective governance structure, designed to cover all the sensitivities and aspects of the entire school. As they explained:

> "*That model or type of model, for many years, and in the end, he controlled many different areas. Of course, when he retires, what happens? Is there a big gap? Yes, it was thought about. Maybe it's a heavy burden, one person making decisions without listening to anyone. And when they take leave, we are left with an incomplete group*." (Victoria, 42 years old, teacher from school 1)

Thus, although there is one particular person that acts officially as the headteacher, the workload is shared among a team of 6 teachers. This team of 6 takes care of the coordination among the school staff, the pedagogical activities, the curriculum, teacher training, and monitors the relationships with families and the community. This pyramidal structure is acknowledged as well engaged, and very flexible and responsive to the school's and the community's needs. In other words:

> *"It is very easy to be heard in this school, at any point. It's easy because we are very engaged, we are in constant communication. Everyday, almost every time. So if something happens in my class*

> *that makes me feel uncomfortable or not really prepared to address that issue, I immediately run to the team and share this. And maybe request a training session on something that I might feel weak or less prepared for. We've done that recently with feminism, and prevention of violence at school…* (Roman, 31 years old, teacher from school 1)

This democratic structure also takes care of connecting the school with different stakeholders, projects and professional development opportunities. In this regard, one of the teachers explained how whenever they are interested in one particular topic, or when something unusual happens in the classroom and they do not know how to address that given situation, the headteacher and its team always welcomes proposals to organize teacher training courses. At school 1, teachers stressed the need to stay up-to-date with teaching practices through continuous development courses. Some of these courses are mandatory for teachers, promoted by the Basque Government, while others are optional and open to better respond to each school's needs. As Roman said:

> *"Some courses are mandatory. Others are optional. But well, if the last train comes and some are interested, perhaps because a proposal has reached the union of schools, and we have accepted it or because they are based on the interests of our team, we try to adapt to the needs of our students."* (Roman, 31 years old, teacher at school 1)

As they stated, teachers' proposals for training opportunities are always heard, and operationalized, whenever possible. This feeling of being heard enhances teachers' sense of belonging and confidence towards the governance structure. Which is closely related to the next subsection presented below. At school 3, training opportunities are also praised among early years practitioners, particularly when they are based on scientific evidence. Since early years settings are attracting more attention lately (globally but also in the Basque context), teachers at school 3 highlight how important it is to receive research-informed training rather than "experts" that come with training opportunities at a high economic cost.

This is also what teachers at school 2 experienced. While teacher training is important, its very relevant not only to provide opportunities for it but also to make sure that those opportunities are well tailored to the school's needs. This might be something that naturally changes with time, that is why a diligent and democratic school government ensures that those training opportunities are not only relevant but also constant across time. In their own words:

> *"The management team is very involved. I believe they place great importance on a well-trained teaching team that stays up to date and doesn't fall behind. Continuous training for teachers is very important to them. In fact, each year we have two or three training sessions at the center. We do them here, and practically the whole staff attends. We all go to one, and I think that from the management team this is highly respected, and they care about our training."* (Lucas, XX y-o, teacher at School 2)

Lastly, this democratic governance structure has proven to be effective in addressing community's needs and priorities, by reshaping the school's mission and vision along with families' and children's needs. In school 1, where the number of ECE students goes between 150 and 200, this is easily done through daily based interactions with families. According to teachers' views, traditional annual meetings are rarely needed because of the close relationships they build through those daily little meetings:

> *I have experience in different schools, and what we have here it's really genuine. The relationship we have with families, that constant interaction, is very unique. You always spend 10 minutes or so talking to mums and dads every morning, when they come to drop the children. They never leave without talking to us, and that is very important because it gives you tons of information, and makes our work much easier and enjoyable. Then, since we have these brief sort of meetings on a daily basis, usually we don't really "need" an annual big meeting, because we both know everything already.* (Guillermo, 37 years old, teacher from school 1).

Supportive work atmosphere

Scientific research consistently shows how a supportive working atmosphere correlates with a higher job satisfaction and better wellbeing of teachers (Aelterman et al., 2007). A unified teacher team has proven to be more effective in weaving vulnerable families' participation in early childhood education (Khalfaoui et al., 2020). In this regard, teachers of the three schools reported about the pivotal role mutual support among teachers play in their contexts, particularly when it comes to providing a coherent work approach focused on the best interests of the child.

As for school 1, teachers constantly laughed, cheered on each other and shared many diverse anecdotes while in the focus group, which gives a sense of a cohesive team. They also shared openly how easy it is to work with each other since they share the same purpose: to ensure the best education for all children, regardless of their family background or situation at home. This is something that scientific literature also supports: the key role of a shared purpose to ensure a coherent educational path (Khalfaoui et al., 2020).

In this regard, teachers at school 1 also showed thankfulness for the inclination of the team to support each other in daily situations. For instance, if a child falls and the teacher needs to take care of the injury, but cannot leave alone the rest of the group, they explained how easy they find support from the colleague next door to take care of the entire group while she is treating the children's injury.

> *"Because we are here, right here, and we see each other almost all the time. When something happens with any children of my group, I can immediately reach Miren, or Roman, and ask for help. They are with me in a glimpse of an eye. It makes you feel really safe, really supported"* (Guillermo, 37 years old, teacher from school 1).

2.2. Process factors

Relationship between teachers and families

Key role family involvement has in children's education has been widely investigated and proven (Díez, Gatt & Racionero, 2011). It emerges as an essential element of teachers' work: to ensure families are well informed, engaged and ultimately involved in school and education of their children. Moreover, beyond family ties, the community also is invited to join the school's activities in many different ways. As in school 1 was shared, the relationship between teachers and families is based on **transparency, communication, and flexibility**. Communication is discussed as a fundamental aspect of a smooth school-family relationship, particularly, how egalitarian dialogue scaffolds teacher-family communication. This is consistent with Flecha's dialogic approach to education, where communication based on honest principles with no power relationships has powerful effects on children's wellbeing and development (Flecha, 2000; Melgar et al., 2011).

> *"Families are always welcomed, and although we had good relationships with our community before becoming a Learning Community, we can tell it's better now. This approach helps us to weave better and more authentic relationships with families"* (Martina, 51, teacher at school 3).

Teachers shared they feel no cultural barriers are posed between teachers and families, so they always try to make the most of every opportunity to interact with each other, to ask about their children and their wider family. This is something that always gives a lot of useful information to an early years educator, since it might prevent potential problems from developing into actual problems. As one of the teachers at school 1 explained:

> *"It's very direct communication. Normally, if there's a problem or we see something worth addressing, we don't wait for parents to come to the official meetings. We have meetings with parents at the start of the year, at Christmas, after Christmas, and then in June. But we don't wait until the meeting to say something. There's communication with them every day."* (Julian, 27 years old, teacher at school 1)

This open approach also features how open the classrooms are to parents to join their children in their activities. While in school 1 this is something that happens exclusively at the beginning of the day (see first quotation below), at school 3 this is something that is constantly promoted to happen at any point during the day (see second quotation below)

> *"They can enter, even into the classroom. The relationship with the parents. That shows that when we're doing an activity, they can see, and not just come to pick up or drop off their children."* (Marta, 31 y-o, teacher at school 1)

> *"Our doors are always open for families to come. It's an educational kind of involvement, but furthermore, we share a genuine relationship with them. They might tell you something that nobody knows about their personal lifes, and they trust you to share that with you. This is something that since we became a Learning Community is part of our school approach: families are our allies"* (Frida, 46, teacher at school 3).

This is particularly relevant in schools that serve families from vulnerable backgrounds, since literature points out the huge barriers they encounter to be actively involved in school-live (Souto-Manning & Swick, 2006). However, school 2 and school 3 provide useful tips to tear down those barriers and build solid bridges of mutual trust and true understanding and collaboration. For this to happen, school 3 states how organic trust towards families is fueled through research informed teacher training. In their own words:

> *"Here for instance, since we became a Learning Community back in 2019-2020, our training focuses on scientific evidence, dialogic learning approach and so on. So whatever we implement at home has a scientific backup, its not just me saying that this or that works, but is scientifically proven, we know that works and its good to know we are walking on the right direction"* (Marina, 48, teacher at school 3)

Relationship between teachers and students

Teacher's interaction is a powerful element in shaping high quality early childhood education and care. It is indeed, one of the most important aspects when it comes to improving early years' education, since it is highly dependent on human agency and massive transformations can be triggered from a single teacher. In this regard, the focus groups revealed how teachers **shape the space** to meaningfully engage all young children, how they constantly rethink their interactions with children to **maximize their opportunities for learning and wellbeing simultaneously.**

School 1 sets the space to welcome all children's proposals every day, which capitalizes on young students' agency and freedom within a safe and supportive environment guaranteed by the teachers. As Miren, a 3 years-old teacher at school 1, stated:

> *"This is our method, which helps a lot along the way. Children's proposals are normally offered to all students in an open space. As I mentioned earlier, they can have different levels of difficulty, so they can always do it in general, right?"* (Miren, 47 years old, teacher at school 1).

In this regard, teachers mentioned the need to adapt the classroom environment to societal challenges, which implies a shift in teachers' mindsets. Constant changes and adjustments should be implemented in early years setting, and materials and spaces should be adapted to each group and specific context to always ensure that all children make the most of their time in the school. In this endeavor, learning and wellbeing are equally important; there is no intention to praise one and neglect the other. Indeed, high quality early years settings are featured by supporting both dimensions simultaneously. As teachers in school 1 shared very promptly:

> *"The most important thing is that the child feels good and, therefore, gains confidence"* (Roman, 31 years old, teacher at school 1).

> *"The child comes to school happy and content, eager to explore the world and learn new things."* (Miren, 47 years old, teacher at school 1).

> *"Once that is (children's sense of safety) achieved, learning happens naturally."* (Julian, 27 y-o, teacher at school 1).

Particularly teachers at school 1 noticed that a lot of work goes into design and follow-up of such contextual adjustments, but only because it definitely implies a change in their mindsets, a swift between their own educational experiences as children and their mission as early years educators.

> *"It has given us extra work. Actually, we come from a different system, and we've started to internalize it. We teachers also had to make a change because what we've experienced as teachers has changed compared to our experiences as students. Right? Many people find it difficult."* (Roman, 31 years old, teacher at school 1).

Although it was not pointed out as a major condition, the relationship between the design of the school space and the creation of a safe, conducive learning environment was also discussed. Particularly in school 1, teachers believe that a proper design can facilitate interaction and help students identify with their surroundings. They recognize that the way classrooms are organized might shape their interactions with young children. In this regard, recent school work had readjusted spaces of school 1, putting windows instead of walls in many classrooms. This physical adjustment has resulted in a change in the way teachers interact with children, because children are more free to move between spaces and teachers support their freedom. Additionally, this also resulted into an intensified collaboration between teachers, since they usually work in pairs to cover around 40 young children of the same age.

In the same vein, teachers from school 2 highlighted the importance of organizing the classroom in small groups. This is something that scientific literature has widely proven (Valls & Kyriakides, 2013). Particularly in school 2, classrooms are divided across five spaces, workshops, projects, and specific materials. The groups are small to monitor the development of each student.

> *When we work in spaces, we do so in small groups, which allows us to dedicate more time to a particular space, to delve deeper and better support or guide the children. It also enables us to observe their progress. This methodology allows for a lot of autonomy for the children while we can focus more on a space we want to observe and work on."* (Martin, xx, teacher at school 2)

This methodology emphasizes the learning process over content, encouraging autonomous learning through experimentation and discussion among students about events. It also involves indirect learning through play and songs, as well as aspects of psychomotricity and sensitivity. The capacity of teachers to adapt materials to every child and every moment is also highlighted.

> *"(…) materials are fundamental. Not all children reach abstraction; they need a series of materials to achieve it. With the help of materials, we can be present at each child's moment because I can offer each student what they need at that moment. It is also important that the materials are autonomous so they can take them and work independently. In the areas of letters, mathematics, science, art, and the home space, we use a lot of materials."* (Carla, xx, teacher at school 2).

The dynamics of the spaces allow for working on different areas; phonetics and literacy comprehension can be worked on, but also technology and robotics, for instance through "Bee-Bots." In this way, language and writing, as well as computational language, are developed simultaneously within a supportive environment designed by the teacher. In the words of Maria:

> *Although I think that in the science space and the experimentation workshop, everything related to computational thinking is worked on, here it is key, isn't it?"* (María, xx, teacher at school 2).

These sorts of spaces allow the development of technological and digital skills without using tablets and screens all the time. This way of including the digital world connects with literacy; in this regard, the use of stories, books and picture books is almost constant, without any conflicts between the digital and the paper based literary resources.

> *"The library in each class is composed of selected stories that change every term, enriching children's learning experiences."* (Pedro, xx, teacher at school 2).

All in all, teachers' interactions with children are fully focused on supporting them and making them feel valued and important. Thus, early years practitioners' interactions with young children are not based on correcting children's outputs by saying what is wrong and how to do it correctly. On the contrary, teachers' make titanic efforts to always guide and support children in their learning processes, making the most of every second while children are in the school. According to teachers in school 3, this is something that helps them to keep the main focus of their profession: since many children do not have rich and stimulating environments at home, early years practitioners need to ensure every minute and every interaction is meaningful to those children whose unique opportunities for breaking the cycle of social exclusion might be at school.

> *"We know that the earlier the better. We began to implement interactive groups and dialogic gatherings in a 5 years-old group, but then we decided that there is no reason to wait until children are 5. So last year we began to do it with our group of 4 years old"* (Carmen, coordinator of early childhood education at school 3).

In school 2, teachers addressed that working against children's frustration is one of the main challenges in early years settings. In this regard, set routines and clear and negotiated boundaries have been found to be helpful. Additionally, feeding children's autonomy and agency was also mentioned as important in teachers' interactions with young children. As one of the teachers in school 2 stated:

> *"Sometimes, children who say 'I don't know' set a larger goal than what you are actually asking. It's about helping them to understand that you are only asking for something small, and see, they do know how to do it. Supporting learning, for me, is not about giving the solution right away but breaking*

> *down the problem step by step into what they need to do to reach the goal."* (Maria, xx, teacher at school 2).
>
> *We need to guide them, it's about accompanying, not doing for them, thus fostering their autonomy. Always maintaining a distance, but without neglecting them."* (Pedro, xx, teacher at school 2).

All in all, there is a strong awareness of how early years play an important role in human development, and that is why in school 3 leave nothing to chance. Early literacy begins at 4 years old through dialogic gatherings and interactive groups, and these are key elements that early years staff are ready to expand in groups with younger children as they feel more comfortable with these educational actions. According to them, there is never too early to begin with the fascinating world of reading and writing. Since it's an important transversal skill to subsequent educational stages, early years educators at school 3 are devoted to engage young children in literacy at the earliest stage possible. Rather than an academic imposition, it is a priority that emerges from the community itself to ensure equality and wider educational opportunities in the present and the near future for every single child.

> *"We share this goal with the families and the community. For instance, although Sara's mum does not have finished school, she is very keen to see how her 5 years old daughter does better than her since the very beginning. So she volunteers, she comes to the meetings, she invites other mums to come to volunteer in interactive groups and in dialogic gatherings.."* (Carmen, 53, coordinator of early childhood education at school 3).

3.0 Main findings from focus groups with families/parents/guardians

The participation of families and community members in the focus groups was essential to better understand high quality ECEC settings from families' lenses. Since families are a stepping stone in education (and particularly in early years settings), their participation was instrumental to better understand the "hows" and the "whats" of high quality ECEC in the spanish context. Thanks to the voices of 18 mums, dads and friends, some important elements arose as critical in the field. On the one hand, the diverse **opportunities they have to be involved in the school;** on the other hand the **strong focus on learning and development**, and the **impact of their involvement at community level**.

Families at school 3 recognized that the school "*works really hard to reach to all families so that they can be and feel part of the school community"* (Mariana, 41, mum at school 3). Year by year, the school staff shows to be successful in involving family members from diverse backgrounds, a good reflection of the reality they have inside the school. If the school is meant to serve children from different parts of the world, it's better that people from those communities are also represented in the school so that children can easily identify themselves and feel welcomed.

This is something that, although it has been found as difficult in some contexts, some schools have achieved a high rate of family involvement (Gómez-González et al., 2024). In this regard, the schools as Learning Communities have served as a driver to achieve family involvement in meaningful manners (Flecha & Soler, 2013; García-Yeste, Morlá & Ionescu, 2018). Since school 3 has recently become a Learning Community, its ethos has been built along with the community, and family involvement has been at the forefront of this process of transformation.

A group of 8 mums and dads helped us to better understand how the school facilitated their involvement in such a manner that none of them missed a single day of volunteering in school. They not only take part in

festivities and other celebrations, but they also are deeply involved in-classroom activities on a weekly basis. For instance, all of the 8 participants of the focus group in school 3 were ready to get into the classroom to volunteer in Interactive Groups with 4 and 5 years olds right after taking part in this focus group. When delving into the foundations of their participation, they explained:

> *"There are multiple opportunities for us to take part in Interactive Groups or in Dialogic Gathering through the school year, another activity that our children do with 4 and 5 years old"* (Mikel, 42, dad at school 3).

Apart from opening multiple spaces for families to be engaged in school activities, the school also organizes its schedules following families' availability. For instance, by scheduling Interactive Groups and Dialogic Literary Gatherings both at mornings and afternoons to facilitate working families' participation. Thanks to this distribution of schedules, families that work during the mornings can volunteer in the afternoons, and the other way around. As Ingrid said:

> *"I now can come in the afternoons, but last month due to my work shifts I came in the mornings. That is nice for me because that way I get to come no matter what work shift I need to take"* (Ingrid, 36, mum from school 3) .

Thanks to these multiple opportunities, more families get to be involved in educational activities, which not only enhances their relationship with teachers but also makes it easier to understand what their kids are actually doing while in school. That is how, according to Sara, they got to see how her 5 year old son is able to read and is keen to draft his name and his friends'. This is a huge step forward according to Sara, because her experience with her older son have been very different: he didn't learn to read and write until he was 7, which resulted from a hard process as she shared:

> *"When my son was 5… he never read like these kids do. Here they are 4 and they already know some letters, they show an interest in deciphering and writing letters and some words…"* (Sara, 42, mum from school 3).

> *"My son studied in a private school, and the academic level I see here has nothing to do with it. Here are at the very top. My son began to read later on, never took a book until he was 7ish, and then here you see children's excitement to read and to have a book in their hand. I find it fascinating, don't you?"* (Silvia, 54, volunteer in school 3).

The families of all three schools agree on pointing out the **strong focus on learning processes** as a vital part of their children's daily lives in early years settings. Indeed, families point out how the school's way of working is pretty much centered on learning, and how emotional development is also instrumental. In addition to improving aspects such as reading, it allows them to work on communication between parents, children and the school, and to develop and enhance new relationships.

Families shared clearly that they are happy to see how their children progress with numbers, letters and technology, while feeling well and keen to go to school. In this regard, families of school 2 and school 3 agree on how beneficial and enjoyable it becomes when school offers well organized contexts for learning and development, and how these well thought spaces boost children's self-esteem and curiosity to continue learning.

> *"What surprises me particularly about the child is the curiosity that this generates in their; it's something that amazes me because he wants more, he's reading, he wants to read, he wants to write, they want to create new sentences and put them down, which is something I never imagined could happen (…)"* (Mina, xx, mum from school 2)

> *"Everytime I come to volunteer in Interactive Group, my child knows and she is very much looking forward to it because she is aware of how I notice she is progressing, and we both enjoy that moment"* (Maria, xx, mum from school 3).

Moreover, families from school 2 explain how computational thinking and the use of robots has become a central part of early childhood education in their context, and the benefits of incorporating these aspects are well recognized by mums and dads. Indeed, some families lack resources at home beyond mobile phones or computers, and while in school, young children have access to Bee-Bots to develop computational thinking and digital skills, which will be essential for the generations to come.

They explain that developing the necessary competencies for communication is also linked to more complex thinking. Therefore, they appreciate that the school enhances this knowledge at such early ages. Besides, families observe how school knowledge influences their children's behavior. Families notice how the school supports children in these stages and in their personal development.

Another common element that arises from the focus group with families was how closer they feel to the teachers thanks to the multiple opportunities they have to be meaningfully involved in their children's education. Although the staff might move from one academic year to another (due to administrative reasons), families at school 2 and school 3 recognize that the school always makes it easier to feel close to the teachers, and that closeness makes them feel welcomed, respected and important as parents. This might be something that the conditions created at school level may support. For instance, families at school 3 explained how although the teacher they got last year is different from who they have currently, they feel that the way the school operates is quite the same, so the new teacher just needs to jump into a rolling dynamic. This is something that the research has already proven, how certain school dynamics might ease teacher induction (García-Carrión et al., 2020)

In addition, families' involvement in school has an important role in fostering **community cohesion**, and bringing closer important topics that affect children and families from different backgrounds. Fors instance, at school 2, the issue of social justice is addressed by one of the mums that took part in the focus group. Thanks to being involved in classroom activities, she shared the following reflection:

> "My child has talked to me about, for example, a classmate who had a war in their country. So, I think this really contributes. You know, because I often tell them to appreciate the things they have, but it's very hard to tell a child here to appreciate what they have because, I don't know, their grandparents didn't have food on their plates and they're throwing yogurt away at night (...)."

While in the focus group at school 3, it was pointed out how participating in these educational activities and getting to know the children both outside the classroom and inside allows families to create a greater community. Although this community is cohesive, it helps them to get to know more families and to enhance their sense of community belonging. According to a 54 years old Cristina (who's children are in secondary education but she continues to volunteer in early childhood education to support her friend Sara):

> *"We were like puppets waiting for children at the door, and now we have something more, we weave nice relationships with other families, we are actually building our community thanks to the school"* (Cristina, 54 years old, community member from school 3).

They extend their gratitude to the teachers, whose constant work has enabled them to be (and feel) a vital part of the school. This is something that also happens in school 2, since families appreciate the teachers' work as professionals who, in addition to providing knowledge, support and fostering children's learning, make them -the families- feel confident.

4.0 Main findings from focus group with children

The Convention on the Rights of the Child recognizes children's right to participate (United Nations, 1989). While this participation is indeed a massive endeavor and a titanic challenge, it has implications in very different levels and contexts. Particularly when it comes to children's views on the quality of early childhood education (Lundy et al., 2024). Young children have the right to be heard always, but especially when it comes to issues that directly affect them such as the quality of early years settings. In this regard, focus groups at the three different schools reveal how these contexts **support children's agency, maximizes opportunities for peer interactions, and enhances transversal skills** (such as early literacy, numeracy and technology skills).

4.1. Children's agency

Children's focus groups revealed a strong sense of belonging to the school, and the multiple opportunities they have to be agentic in their classrooms. For instance, children at school 3 stated that everyday a pair of children is designated to be the delegates of the group. By doing so, everyday two children have the opportunity to represent the group in terms of keeping up with daily routines, help the teacher in general duties, or welcoming families when they come to volunteer in interactive groups. As Sina explained:

> *"Today I am the delegate of the class, together with Daniel, and we have to write the names of the ones that did not come today to the school, or we lead the 'train' when we go to the playground… yesterday Miren and Markel did the job, and today is our turn"* (Sina, 5 years old, school 3).

This is a shared responsibility since every child in the group has the opportunity to participate in this role, and by doing so in pairs, there is always the sense of not being alone. The rotation of this role happens on a daily basis, so it's easier for them to recognize that sooner or later they will have the chance to take on this role, and respect while it's on the others.

The sense of responsibility is also boosted with autonomy; as they explain in school 2, children show signs of autonomy in the learning process, such as choosing the books they read by themselves or being able to carry out activities without constant supervision or supporto from the teacher. This excerpt reflects how the children are developing self-learning and decision-making skills, an important step towards their independence in the school setting.

> *"I sometimes spend time with my group, some other times I move to play with the other group. We choose, depending on the day or on .. we choose. That is funny and good"* (Olaia, 5 years old, children from school 1).

This agency and autonomy is also enhanced through the multiple spaces each classroom has, so that they have the freedom to choose where to go (within the given boundaries), the activity they will focus on or the

colleagues they are keen to engage with. All these multiple and guided opportunities are acknowledged as *“very cool”*. As children explained, they like to have different spaces inside the class, fully available for them. This allows each of them to practice different activities, from playing in the play space to going to the alphabet space *‘because we do cool stuff’* as Sofia has expressed.

4.2 Opportunities for multiple interactions

Children’s agency and autonomy is boosted and supported through spaces and learning contexts specifically designed for ensuring multiple interactions. Rather than individual-focus activities or spaces, the three schools that participated in the focus groups stated that when designing the spaces, the classroom setting and the activities, they do so to facilitate and to nurture multiple peer interactions. As children in school 1 explained, learning at school is not just academic but also happens through games that involve counting, adding, and other educational elements. The children in school 1 talk about how they engage in these activities and how much they enjoy them, highlighting the importance of teaching methods that combine play and learning, always mediated by peer interactions. It is mentioned here how games are used as a tool to learn math skills. Learning is more accessible and appealing to children when presented in a playful way, and of course, when they can embark in doing so with their friends and classmates.

All these interactions are framed into a 0 tolerance to violence, which fully aligns with the priority of keeping ECEC settings safe and supportive to everyone. As children in school 2 shared, this school is a space where *"no hitting, no pushing, no hurting”* (Martin, 4 years old, children from school 2).

Children also stressed how enjoyable it is for them to get to interact with their parents (and others’) while in interactive groups. This is something that particularly arose during the focus group at school 3, where they explained how exciting it is for them when they get to share space and tasks with their own families, and how proud they feel when their mums or dads come to support them in interactive groups.

> *“Today my mum came to the interactive group and we were learning about the Flautist of Hamelin, she did not know him but we (the group) explained to her about this story and now she knows”* (Marta, 5 years old, children from school 3).

While in the focus group at school 3, the children took turns and regulated among each other, while making sure everyone had the opportunity to share his/her thoughts. When the focus group was getting towards the end, Daniel barely took part in the discussion and suddenly, Sofía took the turn to ask Daniel what he was thinking, and encouraged him to say something about the topic of discussion. Thanks to Sofia, Daniel shared that the thing that he enjoyed the most while in school was the literacy spaces, because he gets to play with letters and craft his name and the names of those who could not be at school today. This powerful example illustrates how ECE settings that capitalize on children’s voices and are specifically designed to maximize their opportunities for peer interactions enhance their solidarity and facilitate their coregulation.

EARLY LITERACY

Regarding reading and learning through stories, the children from school 1 express that reading plays an important role in their learning and mention some topics that interest them, such as firefighters or dinosaurs. This indicates that reading is not only present at school but also serves as a source of discovery and curiosity, and a powerful instrument that bridges their home with the school “universe”. . Reading becomes a means of expanding children's knowledge of the world, with diverse topics that capture their imagination and curiosity.

> *"My favorite book is a firefighter book, it is good, I know, I read it. And another one about dinosaurs. The Tyrannosaurus appears in it, the Tyrannosaurus. Medium-sized. I read and then I learn"* (Jon, 5 years old, children from school 1).

In this vein, children from school 3 also expressed how they like reading and letters. Appart from a space in the classroom with letters of the alphabet and different manipulative material about letters and words, there is a strong focus on storybooks and books. As Sara explains: *'what I like most are the letters';* an interest that Daniel also shares (as explained above). Thus, literacy turns into something enjoyable, an open door to endless universes that children can easily reach thanks to the opportunities they have in school.

OPPORTUNITIES FOR EXPLORING MATH

Numbers and math have also arisen as an activity that children of the three schools enjoy in different manners. Research on early years has widely proven how math academic achievement in early childhood education set a path towards better academic achievement at later academic stages (Melhuish, 2008; Melhuish et al., 2008). In this regard, young children of school 1, 2 and 3 stated how much they enjoy playing around with numbers at school, thanks to the spaces and activities the school sets focused on early numeracy, geometry and other important elements of mathematics. For instance, children from school 1 (5 years old) shared they recent discoveries in this regard:

> Eneko: *For instance, 20 plus 20 is 40, and 40 plus 40 is 80! We've learned it thanks to our teacher*
> Miren: *Yes, and playing cards too*
> Ana: *It 's true! we try to put the numbers together and then… and then guessing how much is all of that.*

Because technology and computational thinking is also closely connected with math skills, children at school 2 also have multiple opportunities to interact with numbers and logic, which fascinates them. At school 3, young children explained how much they enjoy playing with numbers (along with letters), and that they sometimes have the opportunity to play shops and change money so it is important for them to know if 2 is bigger than 1, or the other way around. Early numeracy and literacy are woven together, but children acknowledge that they really enjoy being involved in as many activities and spaces as possible, and those spaces become more appealing when numbers and / or letters are behind.

5.0 Key takeaways

- Learning and wellbeing are not decoupled: high quality ECEC embraces both
- Teachers' training, when research informed, fosters confidence on ECEC staff and feel more able to conduct an excellent job
- Daily based interactions with families favors families' educational involvement in early years settings
- Positive working atmosphere is mediated by dialogic/democratic leadership

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