

# **Improving young children's learning in economically developing countries: What works, why, and where?**

**SCOPING REVIEW**

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The ACER Centre for Global Education Monitoring supports the monitoring of educational outcomes worldwide, holding the view that the systematic and strategic collection of data on education outcomes, and factors related to those outcomes, is required to inform high quality policy aimed at improving educational progress for all learners.

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## Abbreviations

3ie	International Initiative for Impact Evaluation
ACER	Australian Council for Educational Research
ACER-GEM	ACER Centre for Global Education Monitoring
DFAT	Department of Foreign Affairs and Trade (DFAT)
BSID	Bayley Scales of Infant Development
CDW	Child Development Worker
CLASS	Classroom Assessment Scoring System
CWC	Council for the Welfare of Children
DMC-II	Developmental Milestones Checklist II
ECDI	Early Childhood Development Index
ECERS-R	Early Childhood Environments Rating Scale – Revised
ECCD	Early childhood care and development
ECEC	Early childhood education and care
ECCE	Early childhood care and education
FDCRS	Family Day Care Rating Scale
HIPPY	Home Interaction Programme for Parents and Youngsters
HDI	Human Development Index
ICDS	Integrated Child Development Services
JBI	Joanna Briggs Institute
MSCA	McCarthy Scales of Children's Abilities
MELQO-MODEL	Measuring Early Learning Quality and Outcomes—Measure of Development and Early Learning
OMEP	Organisation Mondiale Pour L'Éducation Préscolaire
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations International Children's Emergency Fund

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## Executive summary

This scoping review responds to the increasing interest in improving early childhood education and care (ECEC) in economically developing countries. As much of the research underpinning ECEC interventions has focused on economically developed countries, it is timely to review available research about the effectiveness of interventions in the economically developing world. This review aims to assist researchers and project teams in ECEC to draw on the available evidence when planning interventions. It also aims to set evidence-based suggestions for future research on ECEC interventions in these contexts.

### Study question

This scoping review examines available research in relation to the following question:

**What effective interventions have been implemented recently in economically developing countries to improve children’s learning in the years before school?**

### Study design

Studies included in this review cover interventions between 1998 and 2017 that actively sought to improve children’s learning before the commencement of formal schooling. Another key criterion for inclusion was that studies must have examined the effectiveness of an intervention using measures of children’s learning or cognitive development. Although this criterion excluded many studies that did not measure learning outcomes directly, it ensured a level of rigour and consistency in terms of the definition of effectiveness. Another inclusion criterion was that studies had to describe interventions with the potential of being scaled-up for system-wide implementation, which led to the exclusion of studies regarding specific teaching strategies or programs for children with specific needs. While not forming part of the current project, a future review of these excluded studies, may provide some valuable insights.

From an initial pool of 772 studies from a wide-ranging search, 109 studies met the inclusion criteria for full-text review and data extraction. Extracted data provided information on the a) nature and coverage of the intervention, b) assessment instruments used, c) strategies for sampling and controlling for confounding factors and d) any reasons given for the selection of the intervention, and why it was (or was not) effective. The extracted data revealed many challenges for a quantitative meta-analysis due to the wide variation of both ECEC interventions and outcome measures. The qualitative information about reasons for the selection and effectiveness of interventions provided richer possibilities for analysis, relevant to the interests of ECEC researchers. Therefore, this information is the focus of this report.

## Results: Overall

The 109 studies included in this review were grouped into six categories based on the types of ECEC intervention identified in a recent meta-analysis (Rao, Sun, Chen, & Ip, 2017):

### 1. *Income supplementation (n=8)*

Cash transfers to parents (often mothers), to combat the effects of poverty on learning.

### 2. *Parent-focused interventions (n=37)*

Interventions focused on improving the capacity of parents to support early learning.

### 3. *Child-focused education and nurturing care (n=35)*

Interventions involving the provision of support for learning directly to the child.

### 4. *Integrated interventions (n=4)*

Interventions combining multiple services or supports, in an integrated model.

### 5. *Quality (n=20)*

Interventions that sought to improve the quality of an existing ECEC intervention.

### 6. *Comparative (n=5)*

Comparisons of the effects of interventions in one or more of the categories above.

The studies were spread across geographic regions, although some types of interventions were more prominent in some regions than in others. An online interactive evidence gap map was created using 3ie software to provide an illustrative overview of the studies by type of intervention, DFAT region, year of publication and the age group of the children participating in the intervention. A static version of the map is provided as [Appendix A](#) to this report.

As well as geographic diversity, the studies showed wide variation in how children's learning was defined and assessed. Within the 109 studies, 46 different instruments for assessing children's learning were used (see [Table 4.2](#)), with many other studies using measures that were not clearly identified. This diversity in measurement poses challenges for meta-analysis and suggests the need for reliable, low-cost, fit-for-purpose measures of young children's learning that can be applied consistently in diverse international contexts to compare the effects of interventions.

## Results: By type of intervention

Results show that it is better to do something than nothing, as all types of interventions can have a positive impact on early childhood development as long as they are of a certain quality. The extracted data provided rich information about why interventions worked or did not work and the reasons for such interventions being implemented in economically developing contexts.

### 1. *Income supplementation (n=8)*

**Income supplementation may be most effective** when the value of payments to families is maximised and where participants perceive that payments are conditional on the provision of support for children's learning – whether or not conditions are enforced. Children experiencing greater poverty, or lower cognitive development, may be most



likely to benefit. Length of program – which varied widely across the programs (e.g. Oportunidades ran for a minimum of three years, with the possibility of extension; Atención ran for about a year) – did not appear to influence effects.

**Income supplementation may be most *applicable*** in contexts where poverty-related factors inhibit child development and where families need encouragement to access support services for early learning and development. These programs may also appeal to policymakers due to their relative ease in design and implementation in comparison to other intervention types, although they have their own set of complexities regarding choices around targeting and whether/how conditions should be applied to transfers, or not.

## 2. *Parent-focused interventions (n=37)*

**Parent-focused interventions may be most *effective*** when they focus on changing factors in the home environment that affects children’s learning, especially parent–child interactions. Higher intensity or ‘dosage’ improves effectiveness, although the timing and duration of the intervention have less clear effects. Quality of provision and cultural sensitivity are emerging as additional factors in the success of such programs.

**Parent-focused interventions may be most *applicable*** in contexts where children face a range of developmental issues, and support for learning in the home is limited – be it for social, cultural or economic reasons. Different parent-focused modalities (e.g. home visits, information sessions held in neighbourhood community locations, one-on-one counselling via health workers in hospitals/health care centres) may be suitable for parents who are unable to access other ECEC services or for parents who *do* access ECEC services and additional parenting support could be useful. This type of intervention is also notable for its low cost, relative to other intervention types.

## 3. *Child-focused education and nurturing care (n=35)*

**Child-focused education and nurturing care may be most *effective*** when attention is paid to optimal dosage – which may vary across contexts and age groups – and when inequalities in access to centre-based ECEC services are addressed. Training of staff is another key factor, although some programs achieve positive outcomes with relatively limited training as long as staff have close connections to the local community. Community buy-in contributes to the effectiveness of some child-focused programs and program quality is frequently raised as a success factor (discussed below).

**Child-focused education and nurturing care may be most *applicable*** in contexts where government or donor support for ECEC is sufficient to meet the resourcing needs of centre-based programs, which are often infrastructure-intensive, although one study suggested that child-focused programs may also be delivered effectively in home-based settings. Given that many economically developing countries already have some system of child-focused ECEC in place, the goal of interventions in this group tended to be addressing disparities in children’s access to these services.

#### 4. *Integrated interventions (n=4)*

**Integrated interventions may be most *effective*** when service delivery personnel are trained and motivated to support children's learning and where interventions enable existing tasks to be performed with greater cohesion or intensity without necessarily adding new tasks. Relevance to local communities is a strength of such programs, as is their potential to join up services to support holistic child development. Their effectiveness may be compromised if they are not well aligned with users' needs.

**Integrated interventions may be most *applicable*** in contexts where support for early learning already exists and there are opportunities to integrate or enhance it. They are especially relevant where services for children and families are fragmented and where cooperation and shared leadership from all relevant agencies can be secured.

#### 5. *Quality (n=20)*

**Interventions to improve quality may be most *effective*** when they focus on aspects of *process* quality (such as adult-child interactions), although improvements to *structural* quality (such as resources) may also have an impact. They may have greatest impact when the quality base is low, but they require adequate dosage to affect child learning outcomes. Any professional development provided to staff must be accessible and relevant, as well as responsive to their professional identities (whether oriented towards education or care) and respectful of their current capabilities.

**Interventions to improve quality may be most *applicable*** in contexts where increased participation in ECEC have raised concerns about sustaining quality at scale. These interventions are also important where known variability in quality exists (including variability in the training of ECEC service providers), or where the introduction of quality standards generates interest in improving consistency of service provision.

#### 6. *Comparative (n=5)*

**Comparative studies** constitute a cross-cutting category that helps to identify the relative benefits of the various types of interventions outlined above. This small group of studies demonstrates that both child-focused and parent-focused interventions can achieve positive effects on children's learning if they are implemented with sufficient quality.

### **Suggestions for follow-up based on the current review**

The above analysis is intended to assist with designing ECEC interventions that are effective and relevant to their contexts. Scoping reviews are also valuable in terms of assisting researchers to identify evidence gaps and future directions. Nine research gaps were identified in this review, showing opportunities to strengthen the evidence base:

#### *Research gaps: By DFAT region*

1. The current review found a reasonable evidence base of ECEC interventions in all DFAT regions but only one study from the Pacific. This demonstrates the need for further research to build up the evidence base in the Pacific. Australia intends to engage with greater intensity and ambition in that region to deliver more integrated and innovative policy and make further, substantial long-term investments in its

development (Commonwealth of Australia, 2017). Also, although much of the development and learning in early childhood may be universal and the skills and competencies required for school success widely agreed on (e.g. Rao, 2010), the review illustrates that the effectiveness of ECEC interventions depends greatly on how well they can be adapted to local contexts and communities. This makes insights from local implementations of ECEC interventions essential.

*Research gaps: Measurement of learning outcomes*

2. Focus on the measurement of learning outcomes as evidence of the impact of interventions on children's learning.
3. Increase the uptake of robust, cost-effective, fit-for-purpose tools to measure young children's learning that have been validated in economically developing contexts (see [Appendix B](#)).

*Research gaps: By type of intervention*

4. Expand the evidence base in relation to the effectiveness of income-supplementation programs in supporting young children's learning, for specific contexts and groups, and the mechanisms by which family income affects learning, including integration with other, non-cash-related support.
5. Deepen the evidence base in relation to parent-focused interventions aimed at supporting young children's learning, to identify specific design features of parent-focused programs that contribute the most to programs' effectiveness and can be sustained at scale.
6. Shift the focus of research in relation to child-focused ECEC, from *demonstrating* impact to *explaining* how it occurs. This includes improving understanding of optimal delivery options to meet the needs of diverse communities.
7. Pursue innovative approaches to strengthening the evidence base of the effectiveness of integrated ECEC interventions, to accommodate internal heterogeneity in program delivery and focus on responsiveness to local communities.
8. Continue to build evidence in relation to the importance of quality in all kinds of ECEC interventions, including context-specific understandings of quality and threshold quality improvements that can positively affect children's learning.
9. Take all opportunities to expand the comparative evidence base for ECEC interventions, wherever multiple interventions are implemented in parallel. Focus points for comparison may include cost-effectiveness, fitness-for-purpose and scalability.

## Conclusion

The review shows that a large and diverse evidence base exists in relation to interventions to support learning for young children in economically developing countries. It also illustrates that impacts on learning may be achieved through a variety of interventions. This challenges researchers to consider a broad array of possibilities when designing cost-effective, contextually relevant supports for young children's learning.

# I Introduction

In recent decades there has been a widespread increase in policy attention on early childhood education and care (ECEC).<sup>1</sup> A well-established body of research has demonstrated the importance of positive development in early childhood for subsequent development in the physical, cognitive and socio-emotional domains (Evans, 2000). This has led governments around the world to invest in improving young children's access to experiences that will support positive early development.

This increased attention on the importance of early childhood has included heightened awareness among governments of the learning that occurs in the years before school. The notion that children are learners from birth (not from when they start school) has taken hold in contemporary policy settings, and services for young children are now widely recognised as contributing to the crucial first stages of a learning trajectory that will continue throughout life. As such, parents and families have an important role to play in the learning process, as children's 'first teachers', alongside other early childhood services and programs. Investment in young children's learning is recognised as yielding high returns over time (James, 2006).

This study concerns such investment in the economically developing world. Its purpose is to review recent research on the interventions that have been implemented in economically developing countries to support children's learning in the years before school. It responds to the fact that much of the research literature on interventions to support early learning so far has focused on economically developed countries (Marc et al., 2012). Specific research is required on how ECEC interventions might best respond to the challenges and opportunities present in economically developing contexts.

Evidence of the effectiveness of ECEC interventions in developing countries in supporting young children's cognitive development has been reviewed by Rao et al. (2017). This study takes that review as a starting point to broaden and deepen the analysis of what works best, and in which contexts. While Rao et al. focused on quantitative evidence of effectiveness through effect sizes, this study probes more deeply into the nature of ECEC interventions, and how their design fits the specific context in which they are implemented. In doing so, this study recognises that economically developing countries constitute a diverse group, and that interventions must respond to cultural, social and historical, as well as economic, circumstances.

This report begins by briefly outlining the current context of ECEC interventions in economically developing countries, drawing on key literature. It then describes the rationale for the scoping review, and the study design. The next section provides an overview of results, including the location and quality of the studies, and approaches used to measure learning outcomes for children. Further findings from the review are presented in six sections, representing six types of ECEC interventions. The conclusion summarises key messages and broad implications for policy and research.

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<sup>1</sup> In this study, 'early childhood education and care' (ECEC) is used to encompass all services and programs to support learning and development for children in the years before school. Similar terms in the literature include 'early childhood care and development' (ECCD), or 'early childhood care and education' (ECCE).

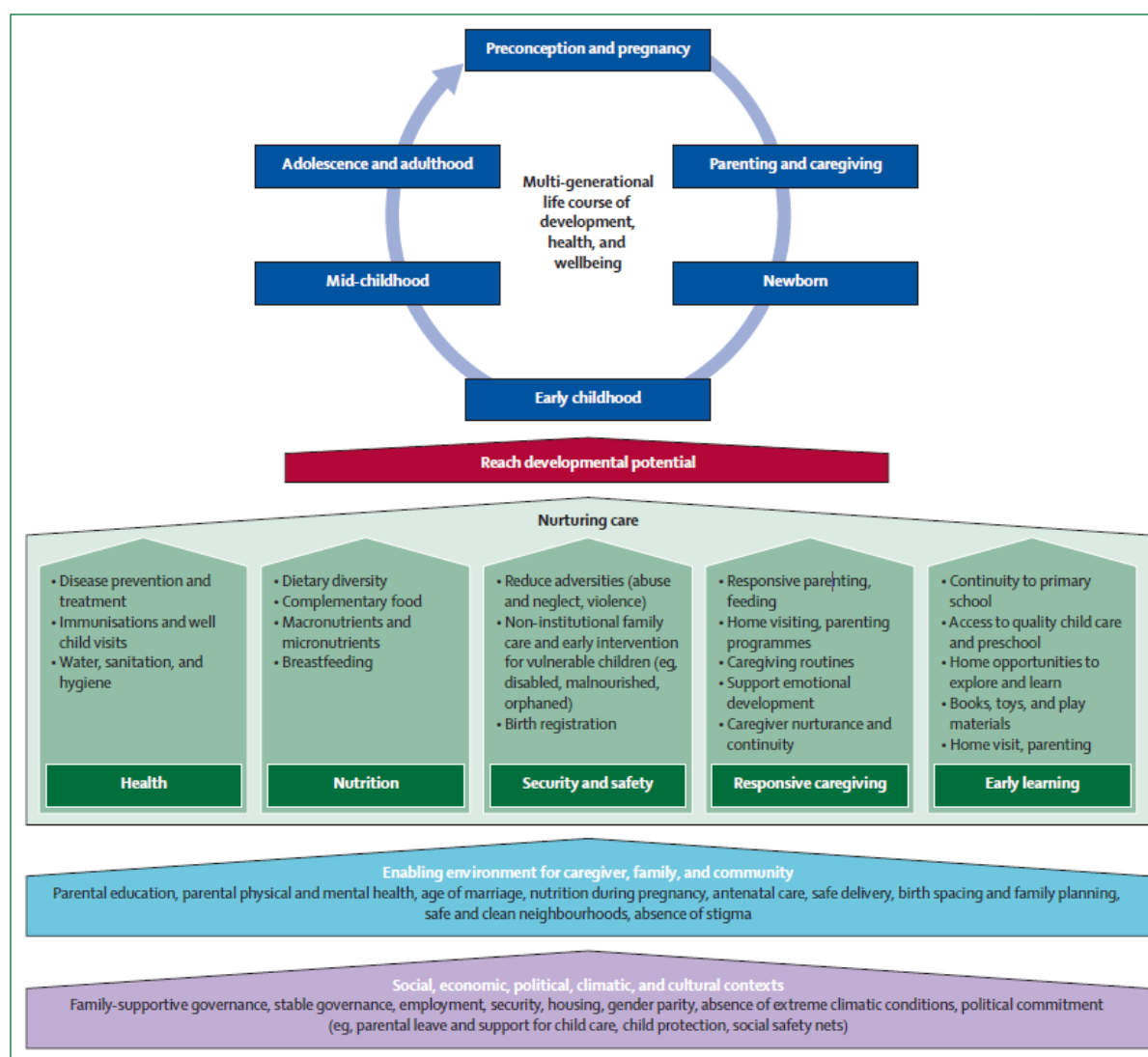
## 2 Background

This review responds to the increasing interest in ECEC interventions in economically developing countries, and among the development partners who support them. This interest has been influenced in part by increasing global recognition of the enduring benefits of quality learning and development in the crucial earliest stages of life. It also reflects a shift in emphasis in support for children affected by poverty and conflict. Since the influential report by Myers (1992), *The Twelve Who Survive*, there has been growing recognition of the need to look beyond child mortality and survival, and address children's quality of life and subsequent developmental trajectories. For example, current priorities for World Bank investment in education prioritise setting young children on positive trajectories of learning from the earliest moments of life (World Bank, 2018).

The loss of developmental potential caused by poor early childhood development in the economically developing world has been well documented. Over a decade ago, a major study found that more than 200 million children under 5 years old, mostly located in South Asia and Sub-Saharan Africa, are not fulfilling their developmental potential (Grantham-McGregor et al., 2007, p. 60). Poverty affects all aspects of child development, with the poorest children being most at risk of compromised development (Tran, Luchters, & Fisher, 2017).

The focus on children's learning in this study reflects the importance of cognitive development to improving children's lifelong developmental trajectories. Inadequate cognitive stimulation has been identified as one of the key psychosocial risk factors associated with poor child development in economically developing contexts – a factor that is modifiable, with the right interventions (Walker et al., 2007). It also reflects the global commitment to early learning, expressed in the United Nations (UN) Sustainable Development Goals Agenda (United Nations, 2016). Access to support for early learning is a human right for all children, whether this is provided through the family, community or institutional programs (UNESCO, 2013). The UN commitment creates a strong justification for research into how such support may be effectively delivered, in all international contexts.

The principles of effective support for early learning may be seen as common across both economically developing and developed countries. Children require a well-integrated network of holistic support, covering all areas of learning and development. Black et al. (2017) conceptualise this in their model of 'nurturing care', reproduced in [Figure 2.1](#). Support for cognitive development through both 'early learning' and 'responsive caregiving' are two distinct components within the nurturing care model, alongside health, nutrition, and security and safety.



Source: Reproduced from Black et al, 2017, p. 79.

**Figure 2.1: The effects of contexts, environments, and nurturing care through the multigenerational life course**

The universality of this model suggests that there will be some global commonalities in effective approaches to ECEC. Issues related to the implementation of ECEC interventions in economically developing contexts appear similar to issues arising in the economically developed world. These include equity and reaching the most vulnerable children and families; incorporating local contextual factors; monitoring; and 'attention to capacity and costing' (Black et al., 2017, p. 83). As in many economically developed countries, ECEC interventions in economically developing contexts also tend to be heavily oriented towards preschool-age children, with programs for very young children being smaller-scale with limited central funding (Atinc & Gustafsson-Wright, 2013). Greater investment in the earliest years of childhood has been identified as a priority in improving ECEC support across the full range of international contexts (UNICEF, 2017b).

Nevertheless, there are reasons to expect that ECEC interventions in economically developing contexts will have some distinctive issues and characteristics. Some of these issues arise in relation to program structure and quality: expenditure per child is lower, staff often have less training, and nutrition and physical health are often the primary focus, as opposed to developmental health more broadly (Wise, da Silva, Webster, &

Sanson, 2005). Cultural differences may also arise, and tensions are evident in the literature around the importation of ECEC models across cultures, especially in postcolonial contexts (Garcia, Pence, & Evans, 2008).

There may also be contextual differences in the effects of ECEC interventions. A comparison of effectiveness between ECEC interventions in high/middle-high and low/low-middle income countries revealed the ‘puzzling’ result that effectiveness was less in the lower-income country group (Nores & Barnett, 2010, p. 279). This suggests that the impact of ECEC interventions may be affected by environmental factors as well as by the availability of supporting services and resources. Conversely, another study using the Human Development Index (HDI) as a measure of development found that attendance at a preschool program had a greater effect on early childhood development in low- and middle-HDI countries, than in high-HDI countries (Tran et al., 2017).

A major Brookings Institution report on early childhood development identifies another research challenge in economically developing contexts. While the evidence base is growing, many programs remain ‘boutique’ in nature, and therefore questions remain about their scalability. According to the report, these questions include:

- the best delivery mode – centre, family or community based
- the delivery agents – community health workers, mothers selected by the community, or teachers
- whether or not the programs should be universal or targeted, national or local
- the frequency and duration of interventions, of training for the delivery agents and of supervision
- the relative value of nutritional versus stimulating interventions, and the benefits from the delivery of an integrated package of services versus sector-specific services that are coordinated at the point of delivery
- the most effective curricula and material to be used
- the relative effectiveness of methods for stimulating demand – information, group sessions, media, and conditional cash transfers (Atinc & Gustafsson-Wright, 2013).

The report adds that cost-effectiveness is a major concern and argues for more research that explores the possibility of using existing infrastructure for ECEC program delivery. Similarly, UNICEF (2011) argues for the development of a strategic program of ECEC research to strengthen the relationship between evidence and policy.

The current study aims to contribute to this body of research by investigating what kinds of ECEC interventions have been effective in economically developing contexts and the conditions under which various types of interventions may be most beneficial. As a scoping review, this study provides an overview of relevant literature and the dominant themes and issues that warrant deeper investigation. Its aim is to guide further strategic research in the ECEC field, which moves beyond evaluations of program effectiveness to provide more nuanced recommendations for policymakers and funders. Better decision-making in ECEC policy and programs can only enhance the impact of interventions on children’s learning and development, and help them to reach their full potential.



### 3 Study design

The study design is based on the enhanced methodology for scoping reviews proposed by Levac, Colquhoun and O'Brien (2010), which builds on the work of Arksey and O'Malley (2005). It also draws on the work of the Joanna Briggs Institute (JBI), which articulates a clear method for scoping reviews in health research (JBI, 2015). This method involves the a) development of a concise research question, b) identification of relevant studies, c) specification of inclusion and exclusion criteria for study selection, d) charting of the data and e) collating, summarising and reporting of the results. A further influence on this study was the aim of the co-funding body, the Australian Department of Foreign Affairs and Trade (DFAT) to produce insights that could guide evidence-based ECEC support for development partners. The result is a study that aims to bring value to a broad research and policy audience.

#### Research questions

In line with the JBI method, a precise research question was formulated to guide the study:

**What effective interventions have been implemented recently in economically developing countries to improve children's learning in the years before school?**

While research questions in scoping reviews are deliberately broad, effective searching is greatly assisted by the clear definition of key constructs, target populations and outcomes of interest (Levac et al., 2010). Key constructs in the question are defined below:

<b>Effective</b>	Effectiveness is defined as having demonstrated impact on children's learning (defined below), as shown in robust research.
<b>Interventions</b>	Interventions constitute any program or service aimed at the improvement of children's learning (defined below). This includes specific programs as well as systemic initiatives – such as preschool provision – to capture interventions already occurring at scale. The defining criterion is that at least one adult has to take a deliberate action to seek to improve learning outcomes for a child.  This definition includes interventions that support learning alongside other outcomes, as ECEC interventions in economically developing countries are often health focused. The determination of whether the intervention aimed to support children's learning was implicit in the outcomes assessed; if learning was assessed, it was assumed that the intervention had intended to improve it.
<b>Recently</b>	This review covers research published or released within a 20-year period from 1998 to 2017. Earlier studies are excluded since major contemporary meta-analyses (Grantham-McGregor et al., 2007; Rao et al., 2017; Yousofzai, 2014) suggested that the most relevant research had been published within the last 20 years.

<b>Economically developing countries</b>	Economically developing countries are defined by the latest available list released by the Australian Minister for Foreign Affairs (Department of Foreign Affairs and Trade, 2015b).
<b>Improve</b>	Improvement in learning is defined through the assumption that the amount of learning occurring in a given time would be greater as a result of participation in the intervention, relative to non-participation. This definition excludes studies in which children's learning is monitored over time but where no intervention is conducted that actively aims to increase the amount of learning.
<b>Children</b>	Children in this review are defined as aged from birth to the beginning of school. An upper age limit was not selected because the age of school commencement varies widely across economically developing contexts (up to 8 or 9 years old).
<b>Learning</b>	The construct of learning in this study is broadly defined to include any outcomes related to children's cognitive development. This includes domain-specific learning, such as early literacy and numeracy, as well as domain-general skills, such as problem-solving, working memory, motor skills and cognitive flexibility.
<b>Years before school</b>	<p>These are defined as the years before starting primary school education. This distinction is sometimes blurred by the location of ECEC programs within primary school settings; the intervention is considered to occur in the years before school if it was described as a preschool or ECEC program.</p> <p>In some longitudinal studies, the measurement of child outcomes occurred after the children had commenced primary school. These studies are still within scope, provided the intervention being evaluated had occurred prior to school commencement.</p>

In developing these definitions, there was considerable discussion of the decision that 'effectiveness' could only be ascertained by empirical assessment of children's learning outcomes. The research team recognised that assessment of children's learning is not as widespread in the early years as it is in the years of formal schooling and that many studies of effective interventions may therefore be excluded by this criterion. For example, Garcia et al. (2008), in their discussion of the use of evidence in informing ECEC in Sub-Saharan Africa, provide a strong example of how descriptive (rather than evaluative) program case studies may provide valuable evidence for policy development.

The decision was guided by the methodology of the scoping review, derived from methodological traditions in systematic reviews, which focus on empirically demonstrated effectiveness. Ang (2018) discusses the challenges of applying systematic review methodology, which has 'traditionally been applied in fields of research where positivist and experimental approaches are dominant', to early childhood research, in which qualitative research approaches are more prevalent (Ang, 2018, p. 27). The

researcher must choose between taking an inclusive approach, which creates substantial methodological challenges in analysing a wide range of studies, or taking a narrow approach in which valuable studies may be missed. This review aims to balance a selective and inclusive approach to yield a suitable group of studies for analysis.

## Search strategy

The search strategy was guided by the broad definitions of key constructs outlined above. In particular, the search aimed to draw together research on young children's learning and development from across the health and education disciplines; distinguishing it from prior reviews of ECEC-related research that had a stronger health focus (Engle et al., 2007). This required the key constructs to be used in a way that would facilitate searching in both health and education databases. For example, the concept of 'stimulation' is frequently used to describe interventions to support cognitive development in health research, but is seldom used in educational research.

The search followed the three-step JBI search method (JBI, 2015) with some additional steps taken due to the complexity of the evidence base for the study:

- An initial basic library search was undertaken to identify keywords from titles and abstracts of relevant studies. Because of the definitional challenges involved in ECEC research, this step also involved the identification of a small group of exemplary studies, which became reference points to assess the accuracy of subsequent searches.
- A skilled research librarian searched four major databases using broad keywords from the study: ERIC, PsycInfo, SCOPUS and A+ Education. This search confirmed that these databases provided good coverage of studies in the health and education fields.
- Two further databases, Education Research Complete and British Education Index, were also included in the initial search. Results indicated that the number of relevant studies in these databases did not warrant their inclusion in the refined search.
- The search terms for the four major databases were refined using thesauri (where available), and more tightly defined parameters. The final search reflected a balance between ensuring inclusion of key literature (checking against the exemplar studies), and minimising irrelevant references. The studies identified from each database (excluding duplicates) are shown in the adapted Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram in [Figure 3.1](#).
- Due to indexing limitations in SCOPUS, a further filter was applied to SCOPUS results, to manually exclude studies that were clearly not relevant, based on their titles.
- Scoping reviews can include any kind of source material that may be useful for answering the focus question, including academic and non-academic sources, and published and unpublished 'grey' literature (JBI, 2015). The search strategy, therefore, also included web-based searches in international development partner portals such as UNICEF, World Bank, USAID, UK Department for International Development and DFAT. A total of 26 additional studies were identified using this method.

- A further group of 42 references was identified from the reference lists of studies located in the searches, using a backward snowballing approach (Wohlin, 2014).
- The removal of duplicates yielded a total of 772 unique references.

The search for studies to be included in scoping reviews often involves a tension in terms of ‘the trade-off between breadth and comprehensiveness and feasibility’ (Levac et al., 2010, p. 5). A strength of the approach taken in this study is that it captured a wider group of studies than previous similar reviews. For example, Engle et al. (2007) restricted their systematic review to effectiveness studies and program assessments that met rigid quality standards in terms of study design. The more inclusive search strategy applied in this study reflected its different goal, namely to provide a broad view of the research landscape.

## Inclusion/exclusion of studies

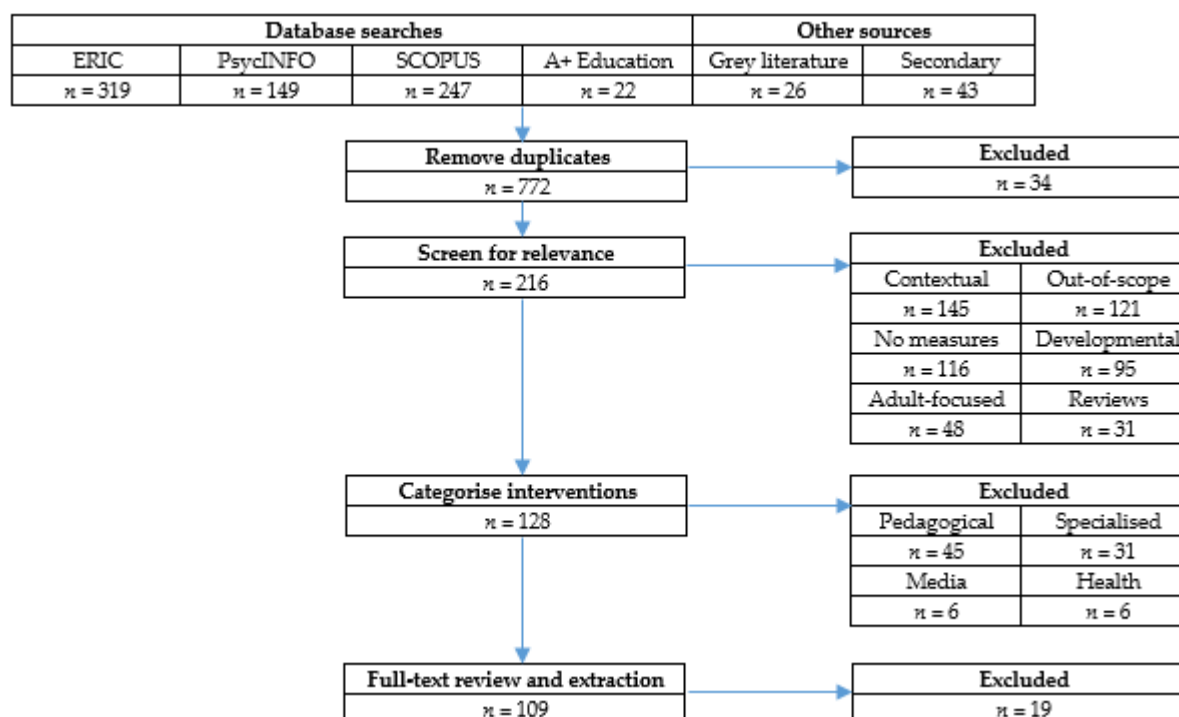


Figure 3.1: PRISMA flow diagram of search strategy and exclusion of studies

The large number of studies identified through the search required a multi-stage process for determining inclusion and exclusion, which is illustrated in the PRISMA diagram (Figure 3.1):

- Titles and abstracts of all 772 studies were collated for review after the removal of identifying information about author or publication to avoid any possibility of bias. Abstracts not available in English were excluded – an acknowledged limitation of the current study.

- Three members of the research team undertook the abstract review. A small group of abstracts ( $n=33$ ) was reviewed by all three reviewers, to check for consistency in include/exclude decisions. This step revealed a relatively high level of consistency across reviewers, with agreement evenly distributed across the reviewer pairs: no reviewer was a notable outlier. This confirmed that two reviewers would be sufficient for the remaining abstracts. Levac et al. (2010) recommended that at least two reviewers independently review abstracts for inclusion and that members of the research team meet regularly to discuss any issues or discrepancies.
- As a consequence, each abstract was assigned to two reviewers. The lead reviewer was a member of the pair for most abstracts. Once all abstracts were reviewed, consistency was again analysed and agreement reached through discussion between all three reviewers, including the non-reviewer for the abstract. Major reasons for exclusion are listed below, providing insight into the nature of research in the field:
  - *Contextual or descriptive studies* ( $n=145$ ) provided discussion about an ECEC service system or program, without explicitly evaluating an intervention in terms of effect on children's learning outcomes.
  - *Out-of-scope studies* ( $n=121$ ) were found to be non-compliant with the search criteria, demonstrating the difficulty of setting precise search parameters.
  - *Studies with no measures of children's learning outcomes* ( $n=116$ ) relied on perceptions of learning improvement rather than robust assessment.
  - *Adult-focused studies* ( $n=48$ ) investigated outcomes for adults, including educators or parents, rather than measuring learning outcomes for children.
  - *Reviews and meta-analyses* ( $n=31$ ) covered studies that were already included in the current review. These reviews and meta-analyses were used as background information for the current study.
- This process resulted in 216 studies being selected for inclusion. As this number was still too high for a full-text analysis, further parameters were applied to reduce the material included in the review. Studies were categorised by the type of ECEC intervention that they described, and the following exclusion criteria were added:
  - *Studies of particular pedagogical strategies* ( $n=45$ ) for use in ECEC programs were excluded, as it seemed unlikely that these small-scale studies could be scaled up to the system level. Examples included use of classical music to support children's drawing in Turkey (Gur, 2009) and a story-acting play strategy in Uganda (Goodman & Dent, 2017). Such studies may be a valuable area for future research.
  - *Studies of specialised interventions* ( $n=31$ ) targeting a particular group of children (such as children with a specific developmental delay) were excluded. While valuable, the focus of this study was on mainstream ECEC interventions for all children. The exception was where a specific condition was identified that was highly prevalent in the population, such as stunted growth or low birth weight.

- *Studies of media interventions* ( $n=6$ ) typically involving educational television broadcasts were excluded, as they did not involve active engagement between adults and children. These interventions have nevertheless been identified elsewhere as a type of program with significant potential for impact in the economically developing world (Engle et al., 2007).
- *Studies of health interventions* ( $n=6$ ) that aimed to improve learning were excluded if they provided no direct support for learning. This included interventions such as providing nutritional supplements and measuring their impact on learning.
- This resulted in 128 studies being selected for full-text review. A further 19 studies were excluded during the full-text review process as they were found not to meet one or more of the inclusion criteria. This reflects the diversity in the quality of abstracts and the need to review the full text before a final inclusion decision could be made.

## Extraction of results

Due to the large number of studies selected for inclusion, it was not possible for two researchers to read all full-text studies, as recommended by Levac et al. (2010). Instead, the studies were divided among three researchers for full-text review, according to the categories identified in the final inclusion/exclusion process. These categories were then further refined to become the categories discussed in detail later in this report.

The extraction process collected information about a) the nature and duration of each intervention, b) the target population (including the age of children, and any special demographic characteristics), c) the sample size and selection methods, d) the learning outcomes measured, e) the effects of the intervention and f) any confounding variables that were controlled for, in either sample selection or data analysis. The extraction also recorded any contextual information about why an intervention had been selected and any explanatory information provided by the researchers about why it had achieved its effects.

The extraction of data from the studies revealed considerable challenges in synthesising this information into a meaningful meta-analysis. Although the inclusion criteria ensured that the studies shared a similar methodological approach in terms of the empirical assessment of children's learning outcomes, they would require substantial further review to be suitable for the rigorous meta-analysis typical in the systematic review approach. Full-text review confirmed that there are 'precious few' ECEC studies in which a truly randomised experimental design has been used (Duncan & Gibson-Davis, 2006, p. 612). Complications arising from heterogeneity in both interventions and outcomes, as well as confounding variables arising from non-randomised selection, limited the possibility of conducting a meta-analysis – an issue that is revisited later in this report.

While the quantitative data that was extracted posed considerable analytic challenges, the qualitative data presented intriguing analytic possibilities. Where researchers provided explanations for the choice of intervention and offered reasons for the results, the studies provided valuable insights into the process by which effective interventions may be

chosen for particular contexts and the mechanisms through which they may be applied. This qualitative information responded well to the recognised need for research that goes beyond an analysis of impact and delves more deeply into ‘the decision-making process’ that determines ECEC policy and action (Glewwe, 2014, p. 11). Insights derived from this qualitative information are, therefore, the main focus of this report.

## Stakeholder consultation

Consultation with stakeholders is suggested as a desirable component of the scoping review method, using preliminary findings as a platform for discussion (Levac et al., 2010). To this end, the following stakeholder engagements were conducted:

- Presentation of the study design and initial findings to DFAT representatives at meetings of the ACER-GEM Board in 2017 and 2018.
- Presentation of initial findings at the Organisation Mondiale Pour L'Éducation Préscolaire (OMEP) Conference in Prague, Czech Republic, in June 2018, which included representatives from ECEC systems in economically developing countries.
- Discussion of findings at two local fora of early childhood researchers in Melbourne, Victoria, in May and October 2018.

These discussions contributed to deciding on the most useful focus for this report.

## Evidence gap map

Visual summaries of the studies in this review have also been presented in an online interactive evidence gap map, using software developed by the International Initiative for Impact Evaluation (3ie). Evidence maps are a visual tool for identifying the quantity of the available evidence, gaps in existing research, or directions for future research (Miakel-Lye, Shekelle, Hempel, & Shanman, 2016). They also enable policymakers to easily explore findings and the scope of existing evidence, to facilitate informed judgement and evidence-based decision-making (Snilstveit, Vojtkova, Bhavsar, & Gaarder, 2013, p. 20).

The evidence gap map for this review presents the studies by type of intervention, DFAT region, year of publication and the age group of children participating in the intervention. The map is intended to be used as a companion resource to this report to enable the quick identification of studies of interest. It provides ‘information at your fingertips’ by providing live links to the studies underpinning the evidence.

To view the evidence gap map (best with ‘Firefox’ browser), visit: <http://egmopenaccess.3ieimpact.org/evidence-maps/improving-young-childrens-learning-economically-developing-countries-scoping-review>.

A static illustration of the evidence gap map is also provided as [Appendix A](#) to this report.

## 4 Results: Overall

This section summarises the overall results of the scoping review. It includes the types of interventions found in the studies, the location of the studies and approaches to the measurement of children's learning outcomes. Each section concludes with an identified evidence gap, summarising the implications of the findings for future research. This section is supported by the interactive 3ie evidence gap map available at the link <http://egmopenaccess.3ieimpact.org/evidence-maps/improving-young-childrens-learning-economically-developing-countries-scoping-review>.

### Types of interventions

The studies were grouped into six categories, reflecting the five main types of interventions found in the research. The first four categories broadly map to four of the five categories used in the meta-analysis by Rao et al. (2017) to enable the reviews to complement each other. Rao et al's fifth category, *nutrition and health interventions*, was not used in the current review as interventions aimed at improving learning through better health were outside the primarily educational focus of this review. Also, Rao et al. report the smallest effect on children's learning from this type of intervention.

While the categorisation of the interventions described in each study may be open to debate, this approach provided a useful method for reducing a large and diverse evidence base into manageable groups (Glewwe, Hanushek, Humpage, & Ravina, 2014). The six categories of ECEC intervention used in this review are described below:

#### 1. Income supplementation (n=8)

This category includes studies of interventions that aim to improve children's learning through financial assistance in the home environment. These studies differ from general family financial support initiatives with their specific focus on children's learning and development as the object of the intervention. These interventions are frequently referred to as cash transfer programs, either *conditional* (with conditions placed on income support to achieve desired outcomes) or *unconditional* (no conditions on income support).

#### 2. Parent-focused interventions (n=37)

This category includes studies with the parent or wider family group as their focus. These studies also involve education and care for the child, usually provided directly by the parent or sometimes by another adult during the demonstration of positive parenting strategies. Measurement of outcomes from these interventions is likely to include change in the parents' behaviours towards their children as well as changes in children's development. In keeping with the search parameters of this study, parenting studies were only included where they involved some quantitative measurement of children's learning. This excludes the large number of parenting interventions in which measurement is focused on non-cognitive outcomes for children, or on parent-level outcomes alone.



### 3. *Child-focused education and nurturing care (n=35)*

This category includes all studies in which the intervention involves the provision of support for learning directly to the child. This support is typically provided either in centre-based or home-based ECEC services outside the child's own home. The term 'education and nurturing care' has been adopted in labelling this category, extending the commonly used 'education and care' dyad by recognising the 'nurturing' element of care that supports children's learning and development (Black et al., 2017). This term signifies that such interventions include an educative and caring component, and that the care component is actively development-oriented.

### 4. *Integrated interventions (n=4)*

This category includes all studies of interventions that combine multiple services or supports, including across health and education. Such interventions are typically larger in scale than those in any other category, requiring collaboration or coordination of multiple service providers within the community. Unlike interventions in other categories, which may be achievable with support from a single donor or community group, these programs are often backed by government investment and oversight necessary to enable coordination across agencies.

### 5. *Quality (n=20)*

The fifth category includes studies of interventions that seek to improve the quality of an existing intervention. Although Rao et al. (2017) did not identify this category, and instead included quality-enhancing interventions within the four categories above, it is a sufficiently distinct and important group of studies to be considered separately within this review. As children's participation in ECEC continues to grow across the economically developing world, there is a shift in focus from participation to the *quality* of the learning experience. This shift gives rise to studies that do not simply compare the effects of an intervention but endeavour to question the extent to which the effects of a program increase when its quality – in terms of staff, resources or processes – is improved.

### 6. *Comparative (n=5)*

This small group of studies compares the effects of interventions in one or more of the categories above. These studies are thought to warrant a distinctive category because of the uniquely valuable information they provide about the benefits of one intervention relative to another. Such studies fill a notable gap in the literature, given that most studies compare a positive and negative (intervention to non-intervention, or enhanced to non-enhanced intervention). The comparative group examines two or more 'treatments', providing insights into which may be most effective.

The ordering of the categories in this report reflects the increasing complexity of interventions, in terms of the distance from the child's home environment, and the number of people and resources involved. This increase in complexity can be understood with reference to the ecological model of child development proposed by Bronfenbrenner (2005). The model situates the child within an expanding environment, from the home and family, working outwards to the wider community.

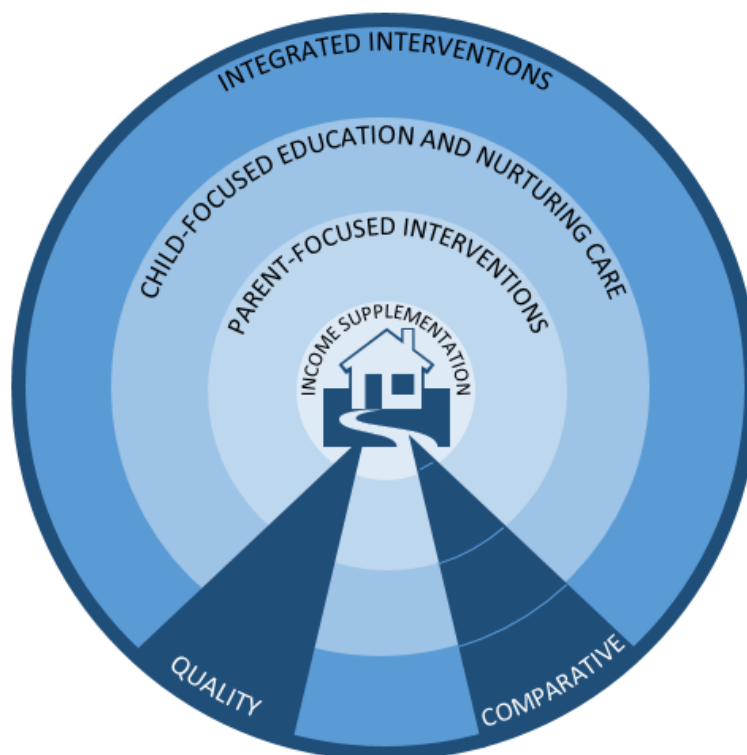


Figure 4.1: Ecological diagram showing six categories of studies in this review

Figure 4.1 illustrates the five categories of studies in this review in a representation loosely based on Bronfenbrenner's model – with the Quality and Comparative categories cutting across all types of interventions.

Research gap 1: Build up the evidence base for ECEC interventions in the Pacific region.

### Location of studies

The distribution of studies in this review by DFAT region is shown in Table 4.1, which also provides information regarding the type of the interventions themselves, although there are significant limitations in this information. Thus, a large number of studies may originate from a single intervention (or versions of that intervention). In addition, there may be interventions in countries and regions without a strong research tradition, or that do not meet the inclusion criteria for this review. This table is therefore valuable for identifying evidence gaps, where interventions may be underway, but have not been subject to research involving measurement of children's learning.

The total numbers of studies from each region point to variation in the volume of relevant ECEC research. Latin America and the Caribbean generated 40 studies, compared to 24 from the next most prolific region of Africa and the Middle East (nine of which come from

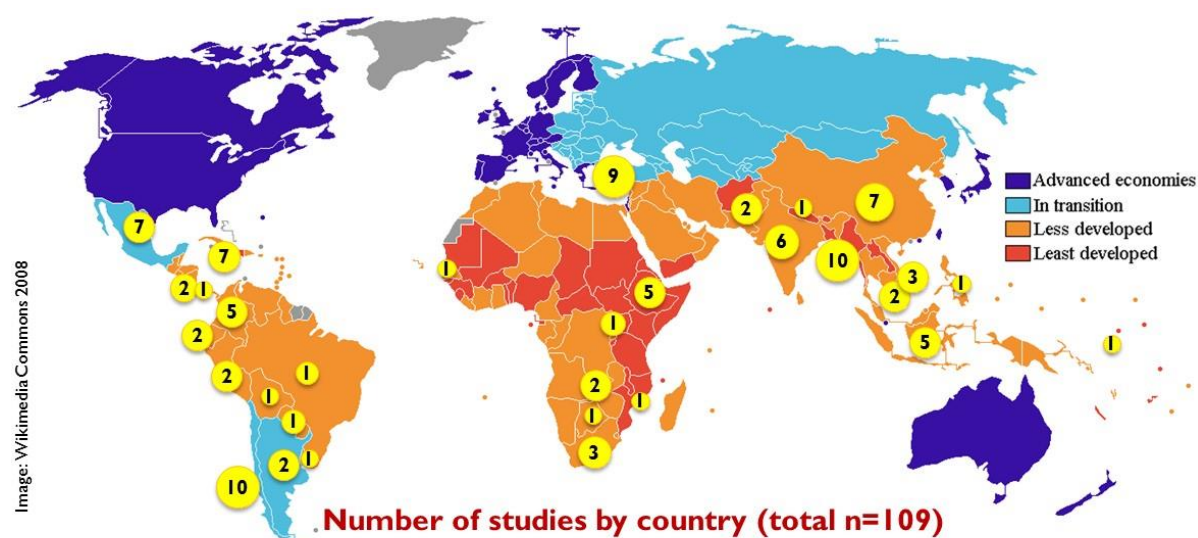
Table 4.1: Region of studies, by type of intervention

Region	Income supplement	Parent-focused	Child-focused	Integrated	Quality	Comparative	Total
Africa and the Middle East	1	9	8		3	3	24
East Asia		3	9	2	3	1	18
Latin America and the Caribbean	7	13	9	2	8	1	40
South and West Asia		8	5		6		19
The Pacific			1				1
Multiple countries		4	3				7
<b>Total</b>	<b>8</b>	<b>37</b>	<b>35</b>	<b>4</b>	<b>20</b>	<b>5</b>	<b>109</b>

the relatively developed economy of Turkey). This may reflect the proximity of Latin America and the Caribbean to the United States, where many measures of young children's learning have been developed, including Spanish translations. It suggests that more work remains to be done to improve measurement of children's learning in other regions and promote the use of such measures in research.

What is evident, is that while studies in the review span all DFAT regions only one study is located in the Pacific, namely the Solomon Islands, which demonstrates the need for further research to build up the evidence base in this region. This is particularly important in that although much of the development and learning in early childhood may be universal and the skills and competencies required for school success widely agreed on (e.g. Rao, 2010), further findings of this review illustrate that the effectiveness of ECEC interventions depends greatly on how well they can be adapted to local contexts and communities. This makes insights from local implementations of ECEC interventions essential.

Figure 4.2 illustrates that the studies in this review were spread across all regions of the economically developing world. Although this means that the review provides broad coverage of diverse contexts, this coverage is uneven across types of interventions (see Table 4.1). As can be seen, certain types of intervention have been pursued more in some regions than others, leading to parallel trends in the regional distribution of research. As noted above, for some types of intervention, a substantial proportion of available research has been generated through a single large-scale, long-running program. This unevenness in the location of types of intervention compounds the difficulty of determining which interventions are likely to be most relevant in which contexts, as few locations have a robust evidence base for ECEC interventions of more than one kind.



\*Multiple countries include Bangladesh, China, DRC, Ethiopia (1 study), Kenya, Zanzibar, Uganda (1 study), Kenya, Uganda, Tanzania/ Zanzibar (1 study), India, Pakistan and Zambia (3 studies), Jamaica, Antigua and St Lucia (1 study)

Figure 4.2: Studies included in this review by country

As regards types of interventions, it is noteworthy that only one type has been studied for its impact on children's learning in all DFAT regions: child-focused interventions (see Table 4.1). This is unsurprising, given the global recognition of the value of this kind of ECEC in supporting early learning. The effect of parenting interventions on children's learning has also been studied in most regions, as has the effect of improving the quality of existing interventions. The effects of income supplementation and integrated interventions have not been studied as widely with evidence on the effects of income supplementation on learning outcomes having an especially narrow regional focus in Latin American and the Caribbean (primarily from Mexico).

**Research gap 2:** Focus on the measurement of learning outcomes as evidence of the impact of interventions on children's learning.

## Measurement of child outcomes

The Sustainable Development Goal (SDG) 4.2 aims to ‘ensure that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education’ by 2030 (UNESCO, 2018). This target is quite complex and contains several concepts that have not been measured previously at the global level, such as quality of care and education, access to programs, and child development and learning at the start of school (UNESCO, 2018). Thus, measurement of this target is difficult but essential for evaluating the effectiveness of the interventions. It takes a broader approach to measurement, which is suited to a particular context, and takes into account country-specific skills and capabilities regarding data collection, availability processing, summarising and interpretation.

The broad definition of children's learning used in this review meant that a broad range of measures of children's learning and cognitive development were found in the studies. [Table 4.2](#) lists 46 measurement instruments that were used to report children's learning outcomes in the studies in this review. In many cases, these instruments were used partially – by employing selected tasks or subscales – or adapted or translated for the language and context in which they were applied. The variation in measures used is therefore actually even greater than [Table 4.2](#) suggests.

The number of studies using each instrument is also shown. In some cases, several studies used the same data from a single application of the relevant instrument. While more than half of the studies ( $n=68$ ) used a single instrument to measure children's learning, up to five learning measures were used in some studies ( $n=4$ ). Many studies also combined measures of cognitive development with other developmental measures, which are not included in the table due to this review's focus on learning. Where multiple measures were used, analysis was typically presented for each of the instruments, with only a small number of studies combining multiple measures into aggregated developmental scores.

These instruments frequently underwent adaptation to local contexts, as well as translation. For example, Singla, Kumbakumba and Aboud (2015) omitted the expressive language items of the Bayley Scales of Infant Development (BSID) in Uganda because children were too shy to speak to researchers. Most studies that adapted recognised instruments also involved efforts to validate the adapted version in the new context. Rempel, Rempel, Khuc and Vui (2017) provide a strong example, where the Developmental Milestones Checklist II (DMC-II) was adapted and extensively reviewed by practitioners and researchers to ensure that it was ‘conceptually equivalent to the original and culturally sensitive to the Vietnamese context’ (p. 1850).

Table 4.2: Instruments used to measure children's learning, showing number of studies (*n*)

Instrument	<i>n</i>	Instrument	<i>n</i>
African Child Intelligence Test (ACIT)	3	Gesell Developmental Schedules	1
Ages and Stages Questionnaire (ASQ)	3	Griffiths Mental Development Scales (GMDS)	6
Bayley Scales of Infant Development (BSID)	16	International Development & Early Learning Assessment (IDELA)	3
Bracken Basic Concept Scale (BBCS)	1	Kaufman Assessment Battery for Children (K-ABC)	1
British Ability Scales (BAS)	2	Language Environment Analysis system (LENA)	2
California verbal learning test (CVLT-II)	1	Local school assessment	10
Cambodian Developmental Assessment Test (CDAT)	2	MacArthur-Bates Communicative Development Inventories (CDI)	6
Child Development Assessment (CDA)	1	Marmara Development Scale	1
Child Learning Competency Test (CLeCT)	2	Mathematics Achievement Test	1
Children's Embedded Figures Test (CEFT)	2	McCarthy Scales of Children's Abilities (MSCA)	1
Clay's concepts of print / letter identification tasks	2	A Developmental NEuroPSYchological Assessment (NEPSY)	2
Cognitive Development Assessment–Quantity Test (CDA-Q)	2	Peabody Picture Vocabulary Test (PPVT)	14
Corsi block test	3	Ravens Progressive Matrices (RPM)	9
Denver Developmental Screening Test II (DDST-II)	2	Reading Recovery observation survey	2
Developmental Assessment Observation Form (DAOF)	1	Revised ECD Checklist (REC)	2
Developmental Milestones Checklist II (DMC-II)	1	Schedule of Early Number Assessment (SENA)	1
Developmental Screening Test (DQ) (Raj)	1	Stanford-Binet (SB) Intelligence Scales	2
Dimensional Change Card Sorting (DCCS)	3	Strengths & Difficulties Questionnaire (SDQ)	1
Draw-a-Man test	1	Test of Psychomotor Development (TEPSI)	1
Early Childhood Development Index (ECDI)	2	Turkish Expressive and Recipient Language Skills Test (TIFALDi)	1
Early Development Instrument (EDI)	6	Wechsler Scales (WISC/WPPSI)	11
Early Reading Assessment	1	Woodcock–Johnson Tests of Cognitive Abilities / Woodcock-Muñoz (Spanish)	12
Frostig Visual Perception Test	1	Zambian Child Assessment Test (ZamCAT)	1

A contrasting view can be found in Rao (2010). This study argued that ‘the universal nature of early child development’, as well as the ‘general agreement on the skills and competencies required for school success’, justified the use of the US-developed McCarthy Scales of Children's Abilities (MSCA) in the Indian context (p. 174). A similar view could be found in some studies using international measures of ECEC quality, as

discussed later in this review. Nevertheless, Rao (2010) still made minor adjustments to the MSCA to reflect Indian children's knowledge and experiences.

A further 19 studies used measures of learning and cognitive development customised for the specific project. The rigour with which these measures were explicated in the studies varied widely, from detailed explanation of each component, to a general reference to the expertise of the test developers. It was also rare for an explanation to be given as to why a customised measure was chosen over an existing measure, although researchers in Botswana noted that they had to develop their own instrument because a suitable one could not be found (Taiwo & Tyolo, 2002). Custom-designed measures ( $n=13$ ) were far more likely to be found in studies of child-focused ECEC interventions than in studies of any other intervention type.

Considering the importance of the measurement tool to the likely outcomes of the study, it was surprising that relatively few studies provided a clear rationale for their choice of instrument. Where studies did give reasons, these included the following:

- The instrument had either been validated in their context (Fernald, Weber, Galasso, & Ratsifandrihamanana, 2011; Nair et al., 2009; Powell, Baker-Henningham, Walker, Gernay, & Grantham-McGregor, 2004; Tessier et al., 2009) or in a similar context (Walker, Grantham-McGregor, Powell, & Chang, 2000).
- The instrument predicted later learning (Rolla San Francisco, Arias, & Villers, 2005).
- Children enjoyed the assessment (American Institutes for Research, 2013).

Overall, it appears that approaches to the measurement of children's learning in economically developing contexts are highly variable and draw, to differing extents, on the validated measures from the Global North. The reasons for this variability may be pragmatic, cultural or conceptual. For example, in Colombia, Bernal and Fernández (2013) reported that the high costs of standardised testing led them to use parent-reported child outcomes for most of their large sample. Another study reported that developmental assessments were confusing to implement for ECEC staff with limited training (Hodgson, Papatheodorou, & James, 2014). It appears that a gap exists in many contexts between rigorous and fit-for-purpose assessments.

In recent years, new measures of early childhood learning outcomes specifically designed for use in economically developing country contexts have been developed. Notable examples include the Early Childhood Development Index (ECDI) (UNICEF, 2017a), the Measuring Early Learning Quality and Outcomes (MELQO) and the Measure of Development and Early Learning (MODEL) (UNESCO, UNICEF, Brookings Institution, & World Bank, 2017). These measures have been validated in diverse contexts, and are cheaper and simpler to use than more complex standardised instruments. Other measures used in multiple countries in representative samples include UNICEF West and Central African Regional Office (WCARO) Prototype in West Africa, Programa Regional de Indicadores de Desarrollo Infantil (PRIDI) in Latin America, the East Asia and Pacific Child Development Scales, the Early Development Index, the Early Human Capacity Index and the International Development and Early Learning Assessment (IDELA) (UNESCO, 2018). All of these measures are mentioned in *A Toolkit for Measuring Early Childhood Development in Low-and Middle-Income Countries* which has been developed by

the World Bank (Fernald et al., 2017) as a helpful resource to guide the selection of assessments in ECEC. The toolkit not only proposes ten ideal characteristics of an early childhood development assessment but also describes existing measures, for the evaluation of programs or interventions as well as system-level monitoring and screening of individuals. Furthermore, it provides a step-by-step approach for the adaptation of existing instruments and the development of new instruments.

Still, the findings from this review suggest that the use of early childhood learning measures developed specifically for low- and middle-income contexts in research is still emerging, with only two studies using the ECDI, and none using the MELQO-MODEL. This is likely to be a result of the time required from the implementation of interventions, the publication of studies to their inclusion in the review.

#### *Variation in the use of instruments by intervention type and region*

The choice of instrument is clearly related to the age group of the children in the study. For example, the BSID is designed for children aged 2–30 months. Studies involving very young children were almost all in the parent-focused intervention category. Ten of the studies that used local measures of school achievement were longitudinal and measured outcomes for older children to investigate long-term effects of interventions they received prior to school. Another set of longitudinal studies took advantage of measures that could be administered at any age (including PPVT and Raven's Progressive Matrices) to repeat the same measures of cognitive development in multiple follow-up tests (Walker, Chang, Powell, & Grantham-McGregor, 2005; Walker et al., 2000).

Some evidence suggests that the use of particular instruments varies by geographic region, although this is likely to be related to variation in types of intervention (see above). Latin America is a notable region for two reasons. Firstly, Latin America had, by far, the fewest custom-designed instruments, with only one study taking this approach. Secondly, Latin America was the only region in which one instrument clearly stood out as more commonly used than others, namely the Woodcock-Muñoz (Spanish adaptation of the Woodcock-Johnson Tests of Cognitive Abilities). While this may reflect the concentration of studies in this region around one long-standing project, it may also illustrate the benefits of having a reliable, valid measure of learning available in the local language.

#### *Implications of diversity in outcome measures*

The diversity in outcome measures used in the studies causes issues for any meta-analysis of the impact of ECEC interventions on children's learning because the construct underlying the measured outcomes is likely to vary across studies. In their systematic review of the effectiveness of ECEC interventions, Rao et al. (2017) acknowledged that some of the measures of children's cognitive development that were used included psychomotor skills, but the variation in constructs found in the current review appears to be much wider. The measures used in the reviewed studies covered a wide range of cognitive development constructs, using an equally wide range of instruments originating from clinical (e.g. health centres, hospitals) and educational settings. While each of these instruments could be said to measure an aspect of children's learning, they may vary widely in their propensity to show improvement resulting from interventions because of the wide range of constructs measured.



Research gap 3: Increase the uptake of robust, cost-effective, fit-for-purpose measures of children's learning that have been validated in economically developing contexts.

## Quality of studies

Analysis of the quality of studies is typically a component of systematic reviews rather than scoping reviews (JBI, 2015). While systematic reviews include rigorous appraisals of research quality, scoping reviews provide an overview of existing evidence, 'regardless of quality' (p. 8). Some general comments about the quality of the research reviewed in this study are warranted, recognising that the absence of commentary on research quality can make the results of scoping reviews more difficult to interpret (Levac et al., 2010).

Many of the studies included in this review constituted high-quality research published in reputable peer-reviewed journals. Rigorous approaches to the research process included robust sampling strategies, use of validated assessments, efforts to control for confounding variables – noting that omitted variables can seldom be controlled for completely in ECEC interventions (Duncan & Gibson-Davis, 2006) – and transparent reporting of the study's limitations.

Some of the studies in the review reflected a desire to demonstrate the effectiveness of an intervention rather than the desire to apply rigorous research. These studies tended to be those with small or convenience samples where outcome measures were poorly defined or validated, or those in which a complex research question appeared to have been contrived in order to facilitate the demonstration of effectiveness from the data. Such studies – frequently rapid evaluations of donor-funded programs – were most likely to be among the 'grey literature' rather than peer-reviewed research. The value of these studies may be questioned if their conclusions are based on flawed evidence.

From the perspective of this review, the highest-quality studies included discussions of the mechanisms through which the effects of the intervention were achieved. This quality criterion reflected the substantial research challenge of isolating exactly which *part* of an intervention was most influential, when ECEC interventions typically involve multiple 'moving parts'. Even when a particular intervention has been shown to have an effect on children's learning, questions inevitably remain about which elements of the intervention are essential to its effectiveness and which may be modified, reduced or substituted, if it were to be replicated or scaled up. Where this information was provided in the studies reviewed, it has been summarised in the relevant sections of this report. It may be especially valuable for policymakers and funders in future ECEC planning.

## 5 Results: By type of intervention

The next section discusses each of the six categories of intervention in greater detail. This discussion constitutes a qualitative synthesis of the research in each area, to complement the quantitative analysis of the effectiveness of interventions provided by Rao et al. (2017). For each category, an overview of the nature of the research and its geographical coverage is provided, followed by details of the kinds of interventions that have demonstrated a positive effect. This is followed by discussion of why each type of intervention might be selected for implementation, drawing on information from the studies about how each type of intervention responded to identified issues in the local context. Each section concludes with suggestions for how future research can strengthen the evidence base.

### Income supplementation

The first category in this review involves interventions that provided cash transfers directly to the parents of young children, with the objective of improving learning and other outcomes. Interventions of this type directly address poverty as the origin of many of the challenges to children's learning in economically developing contexts. As well as its effects on child wellbeing and readiness to learn, poverty has been found to have an influence on the home learning environment across developing country contexts (Tran et al., 2017). Studies of income supplementation interventions provide insights into how the effects of poverty might be directly mitigated.

These studies are also of particular interest because of the scarcity of research in this area. In their analysis of ECEC interventions, Engle et al. (2007) identified conditional cash transfer programs as a promising area of experimentation in supporting early childhood development, but noted that research into the optimal design of such programs is still in its infancy. Only eight studies were identified where income-supplementation programs had been evaluated in terms of their effect on children's learning. These included high-quality research on major programs (especially in Mexico and Ecuador) as well as a smaller-scale study of a Zambian program, which was unable to draw strong conclusions due to data limitations.

#### *Interventions*

The eight studies in this category covered only four interventions (with five of the studies focused on a single long-running cash transfer program in Mexico). Due to the small number of interventions in this group, a description of each one is provided below:

- **Oportunidades (formerly Progresá, now called Prospera; Mexico)**

The program includes a monthly stipend paid to the household (approximately 20–30 per cent of household income) to improve food quality – with a food supplement for infants and underweight children – and an education stipend for school-aged children. Strictly enforced conditions include child health checks, and health information sessions for mothers.

- **Bono de Desarrollo Humano (BDH; Ecuador)**

BDH provides a monthly cash stipend of USD15 (approximately 6–10 per cent of household income) to low-income mothers. Although conditions such as taking children to health checks and school attendance are stipulated, there is no verification of compliance.

- **Atención a Crisis (modelled on the Red de Protección Social program; Nicaragua)**

Women in beneficiary households receive cash transfers every two months, averaging about 15 per cent of per capita expenditure. Conditions for ongoing eligibility include regular school attendance of school-aged children and regular visits to health centres for preschool-aged children. The program includes a social marketing campaign and a vocational skills-development component for parents.

- **Zambia Child Grant Program (Zambia)**

Any household with a child under the age of 5 years – initially under the age of 3 years – is eligible to receive US\$12 per month irrespective of household size, deemed sufficient to buy one meal a day for everyone in the household. No conditions apply.

#### *What worked, and why?*

The effects of income supplementation interventions on children's learning appear mixed and depend upon several factors.

- Unsurprisingly, the **amount of money** provided appears to make a difference to child outcomes. Ecuador's BDH program, which provided the least cash proportional to income, was found to have a positive effect on children's learning only in very poor or rural families (Fernald et al., 2011; Paxson & Schady, 2010). While evidence has been mixed about Mexico's Oportunidades' long-term effects on learning, an increase in the amount of cash provided was associated with an improvement in learning outcomes (Fernald, Gertler, & Neufeld, 2008, 2009).
- **Length of exposure** to the program did not seem to make a difference to the effects of Oportunidades on children's learning (Fernald et al., 2009; Gertler & Fernald, 2004).
- **Lower cognitive abilities** at the baseline were found to be associated with improvements in cognitive development in Oportunidades (Figueroa, 2014).
- **Conditions** appeared to influence effectiveness, although no program directly compared conditional and unconditional interventions. In BDH, the *perception* that the program had conditions appeared to increase impact (Fernald & Hidrobo, 2011). The absence of conditions related to educational support was identified as a reason for Oportunidades' lack of impact on learning (Gertler & Fernald, 2004).

#### *Why implement income-supplementation programs?*

The decision to implement and study the effectiveness of an income-supplementation program was influenced by various contextual factors.

- The two Ecuadorian studies simply cited a desire to alleviate the known impact of poverty on child development, with one also noting prior research about the impact of poverty on language development in Ecuador.

- The Mexican studies were similarly motivated. In addition, one study identified conditional cash transfer as a way to address the low participation of poor families in optional, non-cash-related interventions. In this way, the income-supplementation program became a mechanism for stimulating uptake of other interventions and supports.
- The African study noted a general increase in income-supplementation programs in the region but limited research evidence about their effectiveness.

These points suggest that the contextual factors that motivate implementation of income-supplementation programs include evidence of the impact of poverty on child development. Given that such evidence is likely to exist wherever children are affected by poverty, it does not provide a great deal of guidance for policymakers about the contexts in which income-supplementation programs are most effective. In fact, it appears that implementation of such programs is outstripping the evidence of their effectiveness, suggesting that they may be selected for reasons other than demonstrated impact. Given the mixed evidence of these programs' effectiveness in supporting children's learning, further research is required about the populations and circumstances for which they are likely to be most effective, and the potential for their integration with other, non-cash-related supports.

#### *Future directions for research*

Income supplementation is an area in which there is a clear need for more research on effectiveness and outcomes. Ideally, this would include a comparison of conditional and unconditional income-supplementation programs and the conditions under which such programs are most likely to achieve success. These not only include conditions within households, such as poverty levels, but may also extend to community-level factors, such as the availability of goods and services to support children's learning.

Studies of income-supplementation interventions also offer a valuable opportunity to examine the mechanisms through which poverty exerts an effect on children, mediated through the home and family environment. Some studies in this review include detailed analysis of how the additional income was spent, and family contextual factors that may influence their ability to support children's learning (Fernald et al., 2011; Paxson & Schady, 2010). Others discussed prior research on how additional income may support learning, including through the purchase of nutritious food, health services and early stimulation, such as availability of books, paper and pencil, or parents spending more time reading or telling stories to their children (Macours, Schady, & Vakis, 2012) or through parents having more available time (Seidenfeld, Prencipe, Handa, & Hawkinson, 2015). Further research on these mechanisms would be valuable to inform the design of effective income-supplementation programs.

Research gap 4: Expand the evidence base regarding the effectiveness of income-supplementation programs in supporting children's learning for specific contexts and groups, and the mechanisms by which family income affects learning, including integration with other, non-cash-related support.

## Parent-focused interventions

The second category in this review includes all interventions in which the primary recipient of support is the parent whose actions, in turn, affect their child's learning. These studies rely on a two-stage model of cause-and-effect, where the program must cause a change in the parent's behaviour, before improving outcomes for the child. Therefore, such studies typically include measures of outcomes at the child and parent level, with the parental outcomes often analysed as mediating factors on the child-level results.

The value of parenting interventions in economically developing countries is supported by evidence that parents in these contexts are less likely to engage in activities promoting learning for young children than parents in economically developed contexts (Atinc & Gustafsson-Wright, 2013; Bornstein & Putnick, 2012). This can arise from various cultural and economic factors. Even in contexts where female labour-force participation is low, unpaid labour may place significant demands on mothers' time, limiting opportunities to support early learning (Choi, 2002). Factors associated with poverty, such as maternal depression or ill health, may also negatively affect support for children's learning. On the cultural side, traditional child-rearing practices may not position young children as proactive learners, or adults as proactive supporters of learning (Weber, Fernald, & Diop, 2017). Thus, the issues addressed in parent-focused interventions are complex and diverse.

Several meta-analyses of parent-focused interventions have confirmed their effectiveness in supporting children's cognitive development, including in economically developing contexts (Baker-Henningham & Lopez Boo, 2010; Eshel, Daelmans, Cabral De Mello, & Martines, 2006). Effects may be greatest for the most vulnerable children (Nores & Barnett, 2010), although malnourished children remained behind their better-nourished peers on various outcome measures (Britto, Ponguta, Reyes, & Romilla Karnati, 2015). Some of these reviews have also interrogated factors that contribute to the effectiveness of different program designs, as will be discussed later in this section.

While the evidence base for this type of intervention is relatively strong, the effectiveness of parent-focused interventions must be considered against alternative interventions. According to Rao et al. (2017, p.19; see [Figure 5.1](#)), parenting interventions are more effective than income-supplementation programs but less effective than interventions that focus directly on the child. Choi (2002) argues that 'home-based and parent education programmes should not be considered permanent alternatives to government spending on professional care and education for disadvantaged children' (p. 6). With this caveat in mind, this section reviews the kinds of parent-focused interventions that have been effective and considers the contextual factors that make such programs a worthwhile investment in early learning.

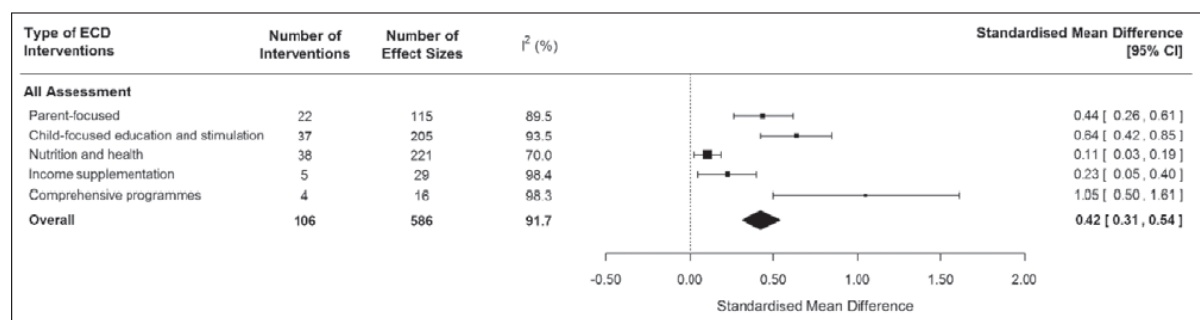


Figure 5.1: Results of meta-analysis of early childhood education and care interventions by Rao et al. (2017)

A total of 37 studies, covering 19 countries, were identified in this category. Countries most strongly represented in this group included Jamaica (eight studies, focused around a single long-running program, described below), Bangladesh (four studies), Turkey (four studies), Columbia (three studies, focused on one program) and three studies of a multi-country intervention in India, Pakistan and Zambia. The remaining studies were distributed across regions – excluding the Pacific – showing that the evidence base for parent-focused ECEC interventions has both depth and geographical breadth.

Some studies in this category described interventions that targeted parents of children with particular characteristics, such as low birth weight (Walker, Chang, Powell, & Grantham-McGregor, 2004) or birth asphyxia (Wallander, Bann, et al., 2014; Wallander, Biasini, et al., 2014). These studies were included because the characteristics constituted risk factors in child development rather than specific diagnosed conditions (see the inclusion criteria outlined earlier). In these studies, the parenting strategies were also applicable to children without the designated risk factors, making the interventions suitable for scaling up to a general population.

### Interventions

This large group of studies covered an almost equally large group of interventions. These can be mostly grouped into three major types of interventions:

- **Home visiting** was the most common type of intervention in studies in this group ( $n=22$ ). During visits, mothers were guided in parenting practices to support children's learning. The specific practices varied and included play using simple toys (Eickmann et al., 2003), responsive feeding and developmental stimulation (Vazir et al., 2013) or talking, singing and showing affection (Gardner, Walker, Powell, & Grantham-McGregor, 2003). A prominent example was the long-running home-visiting program in Jamaica, which has been subject to a randomised controlled trial (Gardner et al., 2003). This program, as well as interventions in other countries that included home visits as one element, were the focus of several studies in this review.
- **Group sessions for parents** – usually mothers – was the next most common intervention ( $n=18$ ). These sessions covered a similarly broad range of topics as the ones outlined under home visits. Eight studies combined group sessions with home visits and are therefore counted in both groups.
- **One-on-one counselling** or clinical support in early stimulation and learning, provided to mothers outside the home, was a less common intervention ( $n=5$ ). These

interventions were mostly integrated within out-of-home services already accessed by mothers, including hospitals (for newborn interventions) and health clinics. A prominent example was the Kangaroo Mother Care program, in which mothers and other family members supported stimulation and development for premature newborns through continuous skin-to-skin contact (Charpak et al., 2017; Tessier et al., 2009). This intervention was widely practised to protect the health of premature babies, but was analysed in these studies for its impact on cognitive development in the earliest stage of life. Another intervention in this category was an innovative, low-cost program in which new parents were shown short videos about support for learning during routine child health visits (Chang et al., 2015).

- Some interventions included other distinctive components in addition to these three methods. One Chinese study supplemented educational sessions with the use of an electronic device to provide feedback to parents on language interactions with their children (Zhang et al., 2015). A Vietnamese intervention for fathers included several innovative components, such as daily public loudspeaker broadcasts of positive parenting messages and a light-hearted competition about 'Who loves their wife and children the most?', which participants enjoyed immensely (Rempel et al., 2017).

Although most studies in this category fitted within the first two types of intervention, they varied considerably in terms of the scale and duration of the program, length and frequency of visits or group workshops, content of the learning activities for parents and qualities of personnel delivering them. Some studies also involved the provision of resources, ranging from homemade or everyday objects to professionally produced learning aides. Others incorporated micro-nutrient supplementation to reduce the impact of poor nutrition on children's learning ability.

A large majority ( $n=30$ ) of the 37 studies focused on mothers. Mother–infant dyads were often the unit of sampling, with one study mentioning that fathers' consent was also sought for the mother and child's participation (Gardner et al., 2005). Six studies focused on parents or caregivers more generally, with two noting that the majority of caregivers were female (Kotaman, 2013; Weber et al., 2017).

Only one study, in Vietnam, focused directly on improving fathers' engagement with their children (Rempel et al., 2017). Two further studies investigated the effects of primarily mother-focused interventions on fathers: In Colombia, Tessier et al. (2009) confirmed that mothers' participation in Kangaroo Mother Care also led to more involved fathering; while in a home-visiting program in Ethiopia, involvement from fathers and other family members in home-based learning sessions meant that they 'became more involved in interacting with the children' (Klein & Rye, 2004, p. 349).

### *What worked, and why?*

Almost all ( $n=35$ ) of the 37 studies in this group reported an effect on children's learning outcomes for the intervention group, relative to the control, after controlling for potential confounding factors such as maternal age and education or quality of housing. Some studies also suggested that parent-focused programs in early childhood may have had sustained effects over time (Altinkaynak & Akman, 2016; Bekman & Mother-Child Education Foundation, 1998; Charpak et al., 2017; Nair et al., 2009; Walker et al., 2005;

Walker, Chang, Younger, & Grantham-Mcgregor, 2010). Outcomes were sometimes mixed, however, with several of these studies reporting significant change in some, but not all, of the child-level outcome measures used. In these partially effective studies, no clear pattern emerged regarding which kinds of learning outcomes appeared most likely to be improved through parent-focused interventions.

A considerable challenge with parent-focused interventions was to identify *how* each program achieved its effect. As noted above, these interventions may have included multiple components, each of which may have varied considerably in terms of dose, intensity and quality. Some previous meta-analyses of parent-focused interventions have sought to isolate which characteristics of an intervention might have the greatest impact (Baker-Henningham & Lopez Boo, 2010; Britto et al., 2015). These findings are summarised below, incorporating relevant examples from studies in this review:

- Effects were most commonly explained by **mediating factors** at the parent level. These factors focused mostly on support for learning in the home environment (often measured as a parent-level outcome), but also included parental attitudes or mental health (especially maternal depression). Some studies used regression analysis to quantify the proportion of differences in child learning outcomes explained by parent-level variables. For example, Knauer et al. (2016) found that between 12 and 32 per cent of differences in various subscales measuring children's cognitive skills could be explained by observed changes in parenting behaviours. However, two studies reported effects of the intervention on the home learning environment without associated changes in child-level outcomes (Aboud, 2007; Tessier et al., 2009), suggesting that improvement in parental behaviour is not necessarily related to improved children's learning outcomes. Given the nature of the analyses, the authors also cautioned against interpreting effects as causal instead of correlational (Singla et al., 2015).
- **Family characteristics** may also act as mediating factors on program outcomes, although in more ambivalent ways depending on whether the effects on children or parents are examined. Parent-focused interventions have shown greater benefits for *disadvantaged* children compared to other children, whereas they have been shown to be of greater benefit to *advantaged* mothers than to other mothers (Baker-Henningham & Lopez Boo, 2010). The current review included examples of high-quality studies that showed greater benefits for children and families who were more disadvantaged (Bann et al., 2016) as well as less disadvantaged (Murray, Cooper, Arteché, Stein, & Tomlinson, 2016), confirming the ambivalence in the evidence base for this type of intervention.
- Unsurprisingly, the **intensity or dose** of parent-focused programs has been repeatedly found to increase their effects (Baker-Henningham & Lopez Boo, 2010; Britto et al., 2015). One study in this review deliberately set out to measure the effects of more frequent home visits and found a clear increase in impact on child mental development (Wallander, Biasini, et al., 2014). In contrast, another study found no association between the number of planned visits that were implemented and parent- or child-level outcomes (Powell et al., 2004). This suggests the possibility of a 'threshold dose', above which no additional benefit is gained.



- The effect of the **timing** of parent-focused interventions is less clear and often conflated with duration (Baker-Henningham & Lopez Boo, 2010). In this review, one study directly compared results for different age cohorts and found no difference in impact (Aboud, Singla, Nahil, & Borisova, 2013). Some studies aimed at very young infants described the benefits of targeting parents at that time including the fact that they were a 'captive audience' in neonatal services (Nair et al., 2009), capitalising on the excitement of new parenthood (Rempel et al., 2017) and the fact that older infants may receive more sibling or non-parental care (Weber et al., 2017).
- Insights into optimal **program duration** are similarly mixed. One study in which the intervention had not yielded results suggested the duration may have been too short (Gardner et al., 2005). Another study, which found that effects of the program at three months were not evident at six months, suggested fatigue with the program as a possible reason (Zhang et al., 2015). More detailed analysis would be required to ascertain which types of intervention would be best suited to longer or shorter durations.
- Although the **quality of provision** may be expected to have a strong impact on the outcomes of parent-focused interventions, results from this review confirm previous reports that this is seldom examined (Baker-Henningham & Lopez Boo, 2010). Training and assistance for parent support workers has been identified as a critical factor in program quality (Engle et al., 2007) and was addressed in a small number of studies. For example, in India and Pakistan, Bann et al. (2016) identified close supervision of parent support workers as a success factor, while Wallander, Bann, et al. (2014) noted the value of the same worker remaining with families throughout the program.
- **Cultural sensitivity** emerged as a success factor in parent-focused interventions that addressed culturally embedded parenting behaviours (Rempel et al., 2017; Weber et al., 2017). As two of the most recent studies in the review, this finding may indicate an emerging area of research interest. While it may be possible to achieve effects on child outcomes through changes to parent behaviours without change to underlying attitudes (Cárdenas, Evans, & Holland, 2015), these studies suggest that culturally sensitive interventions, which address underlying beliefs, may hold considerable promise for effecting lasting change in parent-child interactions.

#### *Why implement parent-focused interventions?*

Reasons given for implementing a parent-focused intervention fell into five main groups:

- Eight studies based their rationale on **developmental issues faced by children**, which could best be addressed through an intervention focused on the home environment. These studies were mostly associated with a health research paradigm and combined parent-focused training to support children's learning with nutrition or other health support (Aboud & Akhter, 2011; Charpak et al., 2017; Gardner et al., 2005; Gardner et al., 2003; Hamadani, Huda, Khatun, & Grantham-McGregor, 2006; Walker et al., 2004, 2005; Wallander, Bann, et al., 2014).
- Eight studies identified a **lack of support for learning in the home environment** as their rationale for a parent-focused intervention. This lack was variously attributed to

low parental education (Aboud, 2007; Aboud et al., 2013; Cooper et al., 2014), cultural norms (Rempel et al., 2017; Weber et al., 2017) or a combination of factors associated with poverty (Attanasio et al., 2014; Knauer et al., 2016; Singla et al., 2015).

- Four studies identified a **lack of access to formal early learning services** as the main reason for focusing on parents as the best opportunity to improve children's learning. These interventions were implemented in communities in which distance or poverty were barriers to access (Jin et al., 2007; Klein & Rye, 2004; Wallander, Biasini, et al., 2014; Zembat & Kuday, 2010).
- Four interventions focused on parents because **they were accessing other programs**, which provided an avenue for promoting early learning. These interventions typically integrated support for psychosocial stimulation into an existing support service accessed by parents, to enhance their children's nutrition or health (Powell et al., 2004; Vazir et al., 2013; Yousafzai, 2014). One Colombian intervention used the infrastructure of an income-supplementation program to integrate parent-focused support for psychosocial stimulation, demonstrating how the types of interventions in this study may build upon one another (Attanasio et al., 2014).
- Several studies noted the **low cost of parent-focused interventions**, relative to other kinds of support for early learning (Attanasio et al., 2014; Cárdenas et al., 2015; Chang et al., 2015; Gardner et al., 2003). Although not typically identified as a contextual factor determining the choice of intervention, this may nevertheless be an important aspect of these programs' appeal; especially in contexts where investment in ECEC may be limited (Eickmann et al., 2003). Where awareness of the value of parental support for early learning is limited, even a low-cost intervention may have an impact (Gowani, Yousafzai, Armstrong, & Bhutta, 2014).

In the remaining studies, the reason for the selection of a parent-focused intervention was either not stated or unclear. Some of these were follow-up studies to an established intervention and therefore did not re-state the rationale (Walker et al., 2005; Walker et al., 2000). Others were motivated by the desire to explore untested variations of a parent-focused intervention that had been demonstrated to be effective (Murray et al., 2016; Tessier et al., 2009).

As can be seen, the reasons for implementing parent-focused programs are varied, which makes them potentially applicable in a wide range of contexts. This does not mean, however, that parent-focused programs can be transported between contexts haphazardly. Context matters to the design of any parent-focused program, including the specific issues that it aims to address, or possibilities it seeks to capitalise upon.

In summary, parent-focused interventions may respond to a wide range of contextual opportunities and needs. They may be well matched to the needs of families who live far away from ECEC services (Wallander, Biasini, et al., 2014) or may be a cost-effective enhancement to ECEC in contexts in which 'established administrative capacity and local community networks' already engage parents through existing ECEC services (Attanasio et al., 2014, p. 2). While ostensibly simple, the design of parent-focused programs may require careful situation analysis to ensure that they are well matched to the families they aim to serve.

*Future directions for research*

Parenting programs stand out as having particular potential to affect young children's learning in economically developing contexts. They are relatively low-cost, are highly adaptable to different contexts and can address children's learning and development in the critical earliest stages of life. At the same time, Baker-Henningham and Lopez Boo (2010) note that many parent-focused interventions are small-scale and closely supervised by research staff, therefore research is required about which models are likely to sustain their benefits when taken to scale. Such research should include attention to dosage and other variables to identify the most cost-effective models.

While the effectiveness of parent-focused programs to support young children's learning in economically developing countries is quite clear from the available evidence, exactly how these programs achieve their effects is far less clear. Aside from the intensity of the program (such as frequency of home visits), no other structural factor emerged as unambiguously associated with greater program effects. Therefore, more research is required about the factors that influence program success, recognising that these may differ for different intervention modalities.

This research gap around how parent-focused programs achieve their benefits, why and for whom, has been noted in prior reviews (Baker-Henningham & Lopez Boo, 2010; Britto et al., 2015; Maulik & Darmstadt, 2009). Yet, it may be that this type of intervention is too diverse for such generalised findings to emerge. The level of variation in the interventions, as well as in the populations to which they are provided, suggests that a complex set of factors may confound consensus about how they achieve their impact.

A more worthwhile area for future research may lie in paying greater attention to the specificity of parent-focused interventions and relationship to their contexts. By detailing the interventions and their rationales, this review has found that clear logical pathways – from a problem to an intervention design to an outcome – are seldom articulated with precision. When they are articulated, the findings are compelling, and the success factors required for replicating or scaling up the intervention become far more visible.

Another promising area of research lies in the cultural responsiveness of parent-focused interventions to address beliefs about child-rearing that may inhibit deep-level change. This recalls a point raised by Myers (1992) whereby many programs aimed at supporting early childhood development fail to recognise and build upon traditional child-rearing practices as the foundation for learning and growth. More evidence-based accounts of the benefits of respectful cross-cultural engagement may improve the relevance and impact of all types of ECEC programs, especially in the parent-focused category.

Research gap 5: Deepen the evidence base in relation to parent-focused interventions to support children's learning, to identify specific design features of parent-focused programs that contribute the most to programs' effectiveness, and can be sustained at scale.

## Child-focused education and nurturing care

Provision of interventions directly to children is another prominent area of ECEC research, as illustrated by the fact that it is the second-largest group of studies in this review ( $n=35$ ). Many of these studies focus on centre-based preschool for children in the year before starting school, although this category also includes more diverse models that have emerged to meet the needs and opportunities of economically developing contexts, as described below. The common element of all interventions in this category is that they provide a targeted program to support children's learning development outside the child's own home. Studies in this category generally compare the effects of program participation to non-participation, to examine the effectiveness of child-focused ECEC programs for improving learning.

A strong body of evidence exists from economically developed contexts about the effects of participation in centre-based ECEC programs on children's short-term and long-term learning and development. Centre-based programs have also been shown to have a significant impact on children's developmental outcomes in economically developing contexts (Engle et al., 2007). At the same time, recent meta-analyses point to limitations in the evidence base. In reviewing the impact of day-care programs on child development in economically developing countries, Leroy, Gadsden, and Guijarro (2012) found only six studies that met their stringent criteria – around income/poverty situation, child's age, working parents, number of children in the household – for quality and relevance. Another recent meta-analysis attempted to isolate the effects of centre-based ECEC by only including studies with no complementary interventions, but found only one study that met this criterion (Brown, van Urk, Waller, & Mayo-Wilson, 2014).

Although these instances may be considered limitations from a research perspective, they are not necessarily weaknesses in policy and practice. The difficulty of isolating the effects of centre-based programs is perhaps an encouraging sign that ECEC interventions are typically being designed to include additional supports, such as provision of meals to children, medical support or support for parents and families. For the purposes of defining the category in this review, studies were included if the intervention *primarily* focused on the provision of a child-focused service or program, regardless of whether or not it included additional support.

The issues of quality and comparability in the evidence base appear to arise from the wide heterogeneity in ECEC programs and resulting challenges in reporting their effects clearly and consistently. This wide heterogeneity is visible in the studies compiled for this review, as discussed below. One of the advantages of a scoping review is that it allows for this heterogeneity to be displayed, without the constraints arising from a meta-analysis.

The 35 studies in this category are the most geographically dispersed of all the groups, covering 29 countries across all five DFAT regions. The most frequently represented countries are China (five studies) and Bangladesh (four studies), with three studies in Indonesia and Ethiopia. The wide coverage of studies in this group demonstrates the global interest in child-focused programs and their effects on children's learning.

### Interventions

Interventions were a heterogeneous mix of ECEC programs in terms of their settings, staffing, design and scale. Even among similar programs, such as centre-based preschools, considerable heterogeneity emerged in terms of their duration, dosage, resourcing and pedagogies. Unlike parent-focused interventions, which often involved delivery of a specific program directed by researchers, many studies of child-focused programs concerned system-wide interventions, such as government-funded preschool accessed by a large proportion of children in the population. Because implementation and participation were largely outside the researchers' direct control, more variation in children's experiences was also likely. Broad groups of intervention types are listed below:

- The largest group of studies ( $n=20$ ) evaluated the effects of **preschool** for children in the one or two years before starting school. Two Chinese studies described preschool as commencing even earlier, with options for children from 2 years old (Gong, Xu, & Han, 2016; Li, Lv, & Huntsinger, 2015). All preschool programs had an educational focus, and were mostly located in either centres or schools, although the Succeed Project in Bangladesh included school-based and home-based preschools (Aboud, Hossain, & O'Gara, 2008). Where dosage was specified, the dominant model was sessional (half-day) programs, delivered throughout the school week.
- Eleven studies addressed a **broader range of child-focused ECEC programs**, including programs for younger children, and programs without an explicit educational focus. These studies were split between centre-based programs ( $n=6$ ), such as day care and playgroups, and home-based programs ( $n=4$ ) or both ( $n=1$ ). These programs were usually full-day services to support parental workforce participation.
- Four studies addressed **short-term interventions** for disadvantaged children. Two Turkish studies evaluated a 10-week centre-based program for 4- and 5-year-olds, prior to nursery school (Celebioglu Morkoc & Aktan Acar, 2014) and a summer school-readiness program for 6-year-olds (Bekman, Aksu-Koc, & Erguvanli-Taylan, 2012). In Bangladesh, a 22- to 35-week program used Young Facilitators (fourth- to eighth-grade students) to deliver supervised school-readiness activities to young children twice per week (American Institutes for Research, 2013). In Argentina, a short-term cognitive training program for 3- to 5-year-olds was used to investigate the relationship between socioeconomic status and learning (Segretin et al., 2014).

### What worked, and why?

Most studies ( $n=27$ ) reported a positive impact on learning as a result of participation in child-focused education and nurturing care. Several studies found durable effects of the programs by examining children's learning outcomes in later years (Aboud & Hossain, 2011; Aguilar & Tansini, 2012; Berlinski, Galiani, & Gertler, 2009; Martinez, Naudeau, & Pereira, 2013; Nath, 2012; Taiwo & Tyolo, 2002), suggesting that participation in child-focused ECEC interventions may offer a protective effect on learning, even where the

quality of primary schooling is low. Five studies reported mixed effects, for different groups of children or for different cognitive outcomes.

Only three studies did not find an association between the intervention program and cognitive outcomes, although two investigated the effects of preschool participation as a mediating factor within other interventions, so results should be treated with caution due to other confounding factors (Angeles et al., 2014; Wong, Luo, Zhang, & Rozelle, 2013). The third, using longitudinal panel data from rural China, attributed the lack of impact to the low quality of preschools at the time (Gong et al., 2016).

Given the heterogeneity of child-focused interventions, a more pertinent question for policymakers may be what *kinds* of programs can achieve this impact, and why. The studies in this category varied widely in terms of the depth of information that they added to the evidence base for effective child-focused programs. Some less informative ones used generic definitions of preschool, especially those relying on large-scale datasets in which preschool participation was recorded as a binary variable (Cortázar, 2015; Duc, 2016; Gong et al., 2016). Others were more informative regarding the factors that may contribute to impact:

- **Dosage of participation** was analysed in many studies in this group. Longer participation in child-focused ECEC programs was often associated with better learning outcomes (American Institutes for Research, 2013; Behrman, Cheng, & Todd, 2004; Bernal & Fernández, 2013; Nakajima et al., 2016). Other studies offered more nuanced effects of duration, including differential benefits of longer participation for better-nourished children (Cueto et al., 2016) and non-linear relationships between dosage and outcomes (McCoy et al., 2016). One Indonesian study suggested that less frequent participation in ECEC could be offset by higher program quality (Brinkman, Hasan, Jung, Kinnell, & Pradhan, 2015).
- **Differential effects for different groups of children** were frequently cited as complicating factors in the effectiveness of ECEC programs. Most often, this resulted from wealthier children being more likely to access ECEC programs, which was challenging for a quasi-experimental research design aimed at investigating the effects of ECEC participation accurately. Förster and Rojas-Barahona (2014) found that preschool participation had effects for urban but not for rural children in Chile, for whom the family environment exerted a strong effect on learning.
- **Training of service providers** was identified as a success factor in several interventions, although program delivery varied widely. Highly trained staff were seen as contributing to the impact of programs in some contexts (Bekman et al., 2012; Rao, Sun, Pearson, et al., 2012) while other programs achieved results with minimally trained staff who had close connections to the local community (Behrman et al., 2004; Bernal & Fernández, 2013; Vaijayanti & Subramanian, 2015). This offers encouragement for affordable models of ECEC provision (Zuilkowski, Fink, Moucheraud, & Matafwali, 2012), including in contexts where trained staff are scarce.
- **Community buy-in** was identified as a factor in the success of three programs, in India (Vaijayanti & Subramanian, 2015), Zambia (Zuilkowski et al., 2012) and the Solomon Islands (Lee-Hammond & McConney, 2017). In the Solomon Islands, local community

members were involved in building the preschool and creating handmade learning and play resources, generating a sense of ownership and connection.

Some studies directly compared the effects of different child-focused modalities, such as centre-based, home-based or family day care. These studies are an especially valuable contribution to research on child-focused interventions, as they support informed choices between multiple models. They are summarised below:

- A Cambodian study compared participation in home-based, community-based and state-run ECEC programs (Rao, Sun, Pearson, et al., 2012, p. 864). The study found that children who participated in any kind of child-focused program achieved better learning outcomes than those who did not. The best outcomes were achieved in state-run preschools, with no significant differences between community-run and home-based programs. Likewise, a study in Bangladesh found similar outcomes for home-based and centre-based versions of the same preschool program (Aboud et al., 2008)
- A Chinese study compared the outcomes of preschool participation in either a kindergarten, a separate pre-primary class within a school or 'sitting-in' on a Grade 1 class (Rao, Sun, Zhou, & Zhang, 2012). The best outcomes were achieved in the kindergarten, which followed a developmentally appropriate program.
- In East Africa, the culturally appropriate Madrasa preschool program achieved better outcomes than a standard preschool program, with both types of preschool achieving better outcomes for children than non-participation in preschool (Mwaura, Sylva, & Malmberg, 2008). While differences in program quality were not explicitly analysed in the study, the Madrasa program was assumed to be of higher quality.

The program's success depended on the quality of services provided via that ECEC program. This issue is explored later in this report through studies that focused explicitly on the quality of ECEC interventions, rather than simply exploring the effects of participation.

#### *Why implement child-focused interventions?*

Investment in child-focused education and nurturing care may be motivated by structural factors at the country level. Analysis of the global expansion of ECEC service provision has suggested that several country-level factors contribute to ECEC growth, namely economic development, improvements in women's status (and consequent workforce participation) and connections between the country and global society (Wotipka, Rabling, Sugawara, & Tongliemnak, 2017). Pressure on the school education system may also contribute to expansion of child-focused ECEC interventions, as they help to ease demand for already overcrowded classrooms (Save the Children, 2003). Late school starting ages may also contribute to the need for preschool programs (Lee-Hammond & McConney, 2017).

In this review, the most frequently mentioned reason for implementing an intervention involving child-focused education and nurturing care was to address disparities in access to ECEC. This suggests that child-focused intervention was intended as a *redistributive* measure to combat the inequalities that arise from greater ECEC participation among wealthier groups (Atinc & Gustafsson-Wright, 2013). Some studies mentioned the growth

of private, fee-based ECEC services, which were exacerbating achievement gaps by providing wealthier children with a further advantage when they started school (Taiwo & Tyolo, 2002; Woldehanna, 2013, 2016; Wong et al., 2013). Disparities may also exist along other demographic lines, such as children who do not speak the dominant language of instruction at home and may therefore benefit from additional preparation for school (Bekman et al., 2012). Only a small number of studies identified limitations in children's home environments as a rationale for greater ECEC, which suggests that the international discourse on ECEC participation has moved beyond a *compensatory* view.

#### *Future directions for research*

This review indicates that the key research question in relation to child-focused interventions is shifting from whether they are effective (which seems well established) to which models are most fitting for which contexts. The studies in this category suggest that effects on children's learning can be achieved with relatively low-cost programs, raising questions about whether the relationship between investment and outcomes is linear or not. Such a question can only be answered through more transparent cost-effectiveness analyses of programs, including in relation to physical infrastructure. The finding that quality programs can be effective in home- or centre-based environments suggests the need for thoughtful consideration of all available alternatives for delivery.

An enduring challenge for research on child-focused programs is the skewed participation in such programs along socioeconomic lines. The challenge is not only to make programs more accessible for less wealthy families but also to ensure families are willing and able to support their children's attendance. In other words, policies aimed at providing universal access are only as effective as the attendance that results (UNESCO, 2006). Sustainable models of provision beyond short-term program investment are also required. One Chilean study described how the socioeconomic profile of children participating in an intervention became increasingly skewed, as withdrawal of donor funding led to fees being charged (Brinkman et al., 2016).

This review found many quasi-experimental studies that sought to control for skewed participation through various statistical methods. These methods will continue to be relevant as participation in child-focused ECEC increases. Large-scale, government-supported programs are unlikely to be amenable to randomised controlled research designs (Segretin et al., 2014). Evidence on the interaction between child-level and program-level factors may also be strengthened by the increasing research attention on the quality of child-focused ECEC, as will be discussed later in this report.

**Research gap 6:** Shift the focus of research in relation to child-focused ECEC, from *demonstrating* impact to *explaining* how it occurs. This includes improving understanding of optimal delivery options to meet the needs of diverse communities.



## Integrated interventions

In the field of ECEC, integration refers to ‘a coordinated policy for children under which kindred sectors such as social welfare, school systems, the family, employment and health services work together in integrated networks’ (Haddad, 2002, p. 25). Haddad continues that integrated programs are regarded as the most effective way to address young children's learning and development and break inter-generational cycles of poverty. This agrees with findings from Rao et al. (2017), that integrated programs have the largest effects of any kind of program in supporting young children's learning. They contrast with previous approaches to ECEC in economically developing contexts, in which different aspects of child development were often addressed through different programs, contributing to what Myers (1992) described as the ‘piecemeal child’ (p. 50).

Despite their effectiveness, integrated programs are relatively rare, due to the scale of effort required to design and implement them. Their scarcity in the research reviewed for this study also arises from the difficulty involved in evaluating their impact (UNESCO, 2006). Comparison between an intervention and control group is challenging in community-wide initiatives, and the multi-faceted nature of the programs creates wide variability in implementation. Although some integrated programs have demonstrated effects on children's development, the evidence base for system-wide programs is still emerging, and ‘additional models are needed at scale’, especially for services for the youngest children (Black et al., 2017, p. 86).

In this review, only four studies – covering four different interventions – were found that could be included in this category. A further integrated program – the long-running Integrated Child Development Services (ICDS) program in India – is covered in the later section on studies of intervention quality. While ICDS is a leading example of an integrated program, the effects of ICDS have not been formally evaluated because of difficulties in measurement (Kapil, 2002). Due to the size and heterogeneity of the ICDS, studies of the program are currently focused on quality improvements, with the effectiveness of the program itself taken as given.

The four studies in this category are located in only two regions: East Asia (Philippines and Vietnam) and Latin America (Peru and Paraguay). Similar interventions may exist, but they have not been examined in terms of their impact on child learning outcomes. This is especially likely for this type of intervention, given the difficulties associated with researching the effectiveness of large-scale integrated programs in improving children's learning.

### *Interventions*

The four interventions in this category differ considerably in scale and content:

- **Programa** in the Philippines aimed to intensify and integrate existing services for young children. Implemented in the late 1990s, the program did not involve new services, but instead took an integrated, multi-sectoral approach to delivering a combination of services, including centre-based ECEC (day care and preschool), home-based services (family day care and home visits by health workers) and community health stations. A Child Development Worker (CDW) was appointed in

each community to link centre-based and home-based services and to provide community-based parent education. Programa also involved a) improvements to national monitoring and referral systems, b) expansion of community participation and local ownership to ensure sustainability and c) establishment of a Council for the Welfare of Children (CWC) to be the national ECCD Coordinating Council (Armeccin et al., 2006).

- The **Wawa Wasi** program in Peru involved four models of support for young children and their families (Cueto, Guerrero, Leon, Zevallos, & Sugimaru, 2009):
  1. In the most common model, a family Wawa Wasi Mother Carer takes up to eight children into her home, usually for a full day (8am to 5pm, Monday to Friday).
  2. In another version of this model, two Mother Carers team up to take in up to 16 children at a community facility.
  3. In the institutional Wawa Wasi model, centre-based ECEC is provided by NGOs or other organisations that meet all expenses.
  4. In the new Qatari Wawa model for rural Andean children, home visits are combined with workshops and activities for the children, their parents and older siblings through a local community centre.

Each type of Wawa Wasi is overseen by a local office, with basic training and support for carers (including from Field Coordinators and experienced Guide Mother in many sites). The program also includes three meals per day for participating children.

- The Vietnamese intervention focused on **strengthening centre-based ECEC** through support for both educators and parents. Support for educators involved training in child-centred teaching methods as well as provision of material support. Parent support involved one-day training sessions for fathers and mothers separately every month, on 10 different topics concerning child development. The program also included the establishment of a small local library and play corners in homes (Watanabe, Flores, Fujiwara, & Tran, 2005).
- The **Pastoral del Niño** program in Paraguay encouraged parents to engage in early stimulation and covered nutrition and health. Trained community leaders each served between 10 and 20 families with children under 5 years old (including during pregnancy). The leaders met with families once per month to conduct training and parent discussions, visited the families in their homes and accompanied pregnant women to health check-ups. While this program focused on parent support, it is included in the integrated category because of its goal of mobilising communities to provide wraparound support to families with young children. Being a large-scale, volunteer-run 'fleet' program, the study provided limited information on the exact services provided as these varied in each site (Pearson, Austin, de Aquino, & de Burro, 2008).

*What worked, and why?*

As noted above, the impact of integrated programs can be difficult to ascertain due to their complexity and internal variability. Nevertheless, three of the four programs were able to demonstrate impact on various measures of children's cognitive development, compared to children who were not participating. The Wawa Wasi program was the only intervention to show no impact on cognitive (language) development, once propensity score matching was used to control for confounding variables (Cueto et al., 2009). The study of Wawa Wasi is therefore valuable in its discussion of factors that affected the success of the program, which were as follows:

- **Training and motivation of personnel** are key success factors for integrated programs. As programs are typically embedded within communities, they may rely on paraprofessionals or untrained volunteers with variable levels of expertise in child development. In the Wawa Wasi program, only six out of 16 Mother Carers whose practices were reviewed read to children regularly and none recognised singing as a language development activity (Cueto et al., 2009). Similarly, the use of 'minimally trained and minimally supervised' volunteers in Pastoral del Niño made the program heavily dependent on each individual's effort and skill.
- **Relevance to the local community** is an advantage of programs that are deeply integrated within local contexts. For example, one Pastoral del Niño site was able to reduce infant mortality by addressing the issue of pesticide use, which was a major local concern (Pearson et al., 2008).
- **Intensification of existing services** is possible through better integration. The Programa study found that workers performed existing tasks with greater intensity as the result of a joined-up approach (Armezin et al., 2006). The integration of a parent support program with a centre-based ECEC program also intensified the effects of support for early learning in the Vietnamese study (Watanabe et al., 2005).
- **Selection of children into the program** affects its impact. The Vietnamese study found the largest effects in children with stunting, suggesting that benefits were greatest for those most in need (Watanabe et al., 2005). Conversely, in Peru, some parents self-selected *out* of the Wawa Wasi program because of concerns about the quality of the program or a belief that they did not need it. Parents who did access the program were most interested in the health and nutrition (rather than cognitive) support, suggesting that the lack of impact on learning may have been affected by a misalignment of goals between program providers and users (Cueto et al., 2009).
- The **holistic focus of integrated programs** can enable multiple issues to be addressed simultaneously. The issues covered by the small group of integrated programs in this review ranged from stimulation and play, to health and nutrition, to environmental factors such as improving the quality of flooring to reduce the incidence of infection. The Vietnamese study found that addressing learning and nutrition together had a greater effect on cognitive development than nutrition alone (Watanabe et al., 2005).

In addition to these success factors, Rao et al. (2017) suggest that integrated programs achieve impact by empowering local communities and encouraging those who stand to benefit to become directly involved as change agents within their local contexts. This

benefit is also apparent in the ways in which the programs were implemented, in that broad models were adapted to local community needs.

### *Why implement integrated interventions?*

Integrated interventions appear most suited to communities in which some kind of support for early learning is already available. Their value lies in enhancing this support, by adding components (such as adding parent support to centre-based ECEC) or by creating coherence and coordination in a fragmented service system. The need for coordination may be especially great in economically developing countries, in which responsibility for young children's learning and development is often split between different ministries that may be competing for funding (Glewwe, 2014). The examples in this study show that this coherence may remain 'loose', to enable local models to thrive, but may still serve a valuable purpose in coordinating efforts for common aims and needs or supporting referrals between services.

### *Future directions for research*

While these studies suggest promising outcomes from integrated interventions, it is difficult to isolate which aspects of the interventions made the greatest differences. This research problem is common to other ECEC interventions, but is particularly applicable to integrated programs, which are founded on the assumption that learning is best supported through the interaction of multiple inputs, in a locally customised form. The very element through which the impact of integrated programs may be achieved – their variability – is also one of the factors that makes their impact so hard to demonstrate. This poses a significant challenge for evaluative research.

Moreover, the scale of integrated programs makes any design involving treatment and control groups particularly difficult. For this reason, quasi-experimental studies of integrated programs might be better suited to examining the impact of different components. This issue is revisited below, in reviewing studies that evaluated the impact of improving the quality of an intervention.

Research gap 7: Pursue innovative approaches to strengthening the evidence base on the effectiveness of integrated ECEC interventions, to accommodate internal heterogeneity in program delivery, and focus on responsiveness to local communities.

## **Quality**

The category 'quality' was identified to distinguish studies that involved an improvement to the quality of an existing intervention, service or program. These studies are of particular interest with the emphasis on shifts from access and participation to quality. Quality mediates the extent to which ECEC programs influence outcomes for children (Cloney, 2016). Higher-quality programs are empirically shown to have greater effects on children's learning and development (Sabol, Hong, Pianta, & Burchinal, 2013; Snow & Van Hemel, 2008) including in economically developing countries (Engle et al., 2007).

If higher-quality programs improve children’s learning and development outcomes, then the reverse may also apply. Low-quality ECEC programs may, in fact, pose a risk to children’s learning and development, especially if they remove the child from a home environment capable of providing better support. While this issue is relevant wherever the quality of ECEC programs is variable, it may be especially pertinent in contexts where severe resource constraints place strong downward pressure on program quality. This concern has been used to question ‘whether simply extending the number of years children spend in low quality, often overcrowded, badly equipped classrooms is in their best interests’, especially when teachers are untrained or otherwise unable to deliver quality programs (Woodhead, Ames, Vennam, Abebe, & Streuli, 2009, p. 79).

‘Quality’ encompasses many aspects of an ECEC program, including *structural* dimensions, such as infrastructure, training for personnel and adult–child ratios, as well as *process* dimensions, such as adult–child interactions and opportunities for play and exploration (Black et al., 2017). Such interactions and opportunities may occur in structured, centre-based ECEC environments, or in the less formal play-based learning and nurturing care that occurs in home-based or parent-focused ECEC interventions. The need for quality monitoring and improvement is relevant to all kinds of ECEC programs in economically developing contexts, whatever their setting (Choi, 2002).

To date, many economically developing countries have focused on access to early childhood services and programs rather than on their quality (UNESCO, 2013). The current review, however, found a considerable body of research that shows the benefits of attention to quality improvement. A total of 20 studies were identified in this group, addressing quality across a range of ECEC interventions. At least 10 more studies of program quality were identified in the initial literature search but were not included in the review because they did not measure the impact of the intervention on children’s learning. This larger number of studies indicates that the quality of early childhood programs is a subject of quite some research interest.

Still, the current review indicates that the evidence base is distributed unevenly across economically developing countries. Of the 20 studies in this category, six are from Chile, representing a relatively extensive program of research. Three studies are located in Bangladesh, including one stand-alone and two related studies, and three are from India. The remaining seven studies are from China, Colombia, Costa Rica, Ethiopia, East Africa (Kenya, Zanzibar and Uganda) and two from Indonesia.

### *Interventions*

The 20 studies in this category fall into three groups:

- **Comparisons of quality between different programs** evaluated the quality of two or more distinct kinds of ECEC services or programs and investigated the relationship between service quality and learning outcomes for children. These included six studies:
  - Three studies investigated the difference in quality between a donor-supported ECEC program and the government-supported model. The donor-supported programs included the Plan-funded enhancements to preschool in Indonesia

(Aboud, Proulx, & Asrilla, 2016) and the PROTEEVA preschool enhancement program in Bangladesh (Diazgranados, Borisova, & Sarker, 2016).

- Three studies compared the quality of different types of ECEC programs within an existing service system. These studies aimed to evaluate the quality of services rather than demonstrate the superiority of one program over another. They included a comparison of the quality of a) kindergartens and playgroups in Indonesia (Brinkman et al., 2016), b) 'educational' and 'custodial' day care services in Turkey (Bekman, 2002) and c) four types of ECEC services available in Tamil Nadu, namely donor-supported programs, privately funded services and two types of government-supported services (MS Swaminathan Foundation, 2000).
- **Comparisons of quality within programs** evaluated variations in quality among one type of ECEC service and their impact on learning outcomes. All four of these studies compared quality among preschool services in Bangladesh (Aboud, 2006), China (Li et al., 2016), Costa Rica (Rolla San Francisco et al., 2005) and Chile (Herrera, Mathiesen, Merino, & Recart, 2005). The Chilean study also evaluated the quality of learning environments for children under 3 years old, but without linking it to child outcomes.
- **Interventions to improve the quality of programs** went beyond a comparison of the quality of interventions and its effect on child outcomes, and actively sought to improve the quality of an existing intervention. Within this group were nine studies:
  - Two studies focused on professional development of paraprofessional ECEC service providers, including a two-semester vocational education program for *madres comunitarias* in Colombia (Bernal, 2015) and a 1.5-year program for *anganwadis* in India (Ade, Gupta, Maliye, Deshmukh, & Garg, 2010).
  - Two studies described interventions with a more holistic approach to quality improvement, including the provision of resources and mentoring in Ethiopia (Dowd, Borisova, Amente, & Yenew, 2016) and improvements to preschool programs in Bangladesh to give more prominence to language and literacy (Moore, Akhter, & Aboud, 2008).
  - Five Chilean studies explored the impact of the two-year Un Buen Comienzo professional development program for early childhood teachers. While two studies explored the overall effectiveness of the program (Arbour, Yoshikawa, Willett, et al., 2016; Leyva et al., 2014), the subsequent studies investigated this further; for example, by investigating the effect of educator attendance at the program (Yoshikawa et al., 2015) and the effect of fidelity of implementation of program activities (Mendive, Weiland, Yoshikawa, & Snow, 2016). Another study evaluated a one-year enhanced version of the program administered to a subset of educators (Arbour, Yoshikawa, Atwood, et al., 2016).

### *What worked, and why?*

As a group, the studies reviewed in this category supported the association between higher-quality interventions and better learning outcomes for children. Fifteen studies reported improved quality on children's learning, although four of these reported significant effects on only a subset of outcomes. Some studies sought to isolate specific

aspects of quality associated with impact. Several studies did not find a relationship between higher-quality interventions and better learning outcomes, which highlights some of the complexities in the relationship between quality and outcomes. These were some of the key findings regarding the factors that affect the effectiveness of quality-oriented programs:

- **Process quality** alone appears to exert an effect on children’s learning. In Ethiopian ECEC centres, Dowd et al. (2016) found that improvements to process quality (by enhancing adult–child interactions) affected learning outcomes, even when structural quality (infrastructure and resources) remained the same. In India, Rao (2010) found greater impact of ICDS services where there was also quality adult–child interactions, compared to programs where children were just ‘sitting around’ (p. 181). Two studies, in Bangladesh and India, observed a higher incidence of play as a characteristic of higher-quality services that resulted in children achieving better learning outcomes (Moore et al., 2008; MS Swaminathan Foundation, 2000).
- **Structural quality** remains important in some settings. For example, in Indonesia, Aboud et al. (2016) suggested that the greater impact on learning of Plan-supported preschools was due to their location in a school, which had flow-on benefits for resourcing, dosage (five days per week) and professional teachers. MS Swaminathan Foundation (2000) found that lack of resources and low salaries were impediments to quality improvement in Indian ECEC services.
- **Self-selection into programs** potentially inflates the effects of program quality on learning outcomes, for both adults and children. When higher- and lower-quality programs are compared within a single service system, it is likely that children in the higher-quality programs will come from more affluent backgrounds, although studies that controlled for home and family background still found that higher quality had an effect. Self-selection may also apply for adults, with one Indian study noting that *anganwadis* who had self-selected into the quality improvement program were likely to have been more motivated in the first place (Ade et al., 2010).
- **Dosage of quality programs** influences their effects on children’s learning outcomes. Two studies, one in China and one in Colombia, found greater effects on children’s learning from a longer exposure to a quality ECEC program (Bernal, 2015; Li et al., 2016). One Chilean study found that the effects of a professional development program for ECEC educators were apparent only among children with the highest attendance rates (Arbour, Yoshikawa, Willett, et al., 2016), demonstrating that investment in improving quality may be wasted if children are not attending enough to benefit.
- **Duration of programs** appeared to have mixed effects on learning outcomes. Moore et al. (2008) saw short-term improvements from a seven-month professional development program in Bangladesh, to both program quality and child learning outcomes. However, the authors also noted that deep change to entrenched practices may take longer. Studies of professional development for educators in the Un Bueno Comienzo program in Chile found that the two-year program improved program

quality but not child outcomes, concluding that more time was required for program effects to flow through to effects on children (Leyva et al., 2014; Yoshikawa et al., 2015).

- **Accessibility and relevance of professional development** also made a difference. Mendive et al. (2016) suggested that simple, modular professional development was more effective than overwhelming educators with unrealistic expectations. They also suggested that ‘native’ practices were more accessible than novel ones, highlighting the need for cultural relevance. This is supported by findings about the effectiveness of the Madrasa Resource Centre in East Africa, which delivers professional development for ECEC professionals in a way that carefully balances religious and secular ECEC curriculum and pedagogy (Malmberg, Mwaura, & Sylva, 2011).
- **Service providers’ perceptions of their roles** was another factor that made a difference to impact of quality improvement initiatives. Paradoxically, this problem could arise from too great an emphasis on *either* the educative or caring component of ECEC work. In Turkey, staff in custodial centres who saw their role as ‘minding’ children delivered lower-quality programs than staff who saw their centres as having an educative purpose (Bekman, 2002). On the other hand, Moore et al. (2008) noted that early childhood teachers in Bangladesh had great difficulty changing the didactic pedagogies in which they had been instructed. In addition, Arbour, Yoshikawa, Atwood, et al. (2016) emphasised the importance of respecting educators’ current capabilities. Their study illustrated that positioning educators as active agents in the quality improvement process – and using quality data to empower rather than blame them – brought powerful results.
- **A low base of quality** provides fertile ground for even modest quality improvement programs to have effects. Several studies noted that the overall quality of programs was generally low by international standards. A study in Costa Rica was primarily aimed at demonstrating that poor learning outcomes for children in ECEC were associated with low-quality programs, as a way to advocate for investment in quality improvement (Rolla San Francisco et al., 2005). As such, this study served the policy purpose of ‘agenda-setting’ (Sutcliffe & Court, 2005).

#### *Why implement quality-oriented interventions?*

The following reasons were identified for investing in quality-focused interventions:

- **Increased participation in ECEC** provides a natural impetus for addressing program quality (Arbour, Yoshikawa, Atwood, et al., 2016) especially when evidence exists that program quality has not kept pace with expansion (Leyva et al., 2014; Li et al., 2016). Even models of ECEC provision that have been demonstrated to be effective may suffer compromises in quality when scaled up (Diazgranados et al., 2016). Where increased participation has not resulted in improved outcomes, the quality of programs is also called into question (Rolla San Francisco et al., 2005).
- **Variation in service quality** is another common concern. This might arise in contexts where children can access different types of ECEC programs (Aboud et al., 2016) or where all children access similar ECEC programs, yet clear differences in outcomes are apparent for different groups (Arbour, Yoshikawa, Atwood, et al., 2016).



- **Inadequate training of service providers** motivated some professional development programs to improve program quality. This was evident where programs relied on untrained workers, such as the *madres comunitarias* in Colombia (Bernal & Fernández, 2013) or where service providers' training did not reflect effective ECEC pedagogy (Moore et al., 2008). In the integrated ICDS in India, training for *anganwadis* focused on health rather than learning and development (Ade et al., 2010).
- **Introduction of quality standards** for ECEC programs was mentioned in a small number of studies (Bernal, 2015; Brinkman et al., 2016). The implementation of standards generates interest in knowing more about how program quality and child learning outcomes are related, to guide investment in quality improvement.
- **A desire to better understand ECEC quality in diverse contexts** motivated two of the studies (Moore et al., 2008; Rao, 2010). As discussed below, understandings of ECEC quality in economically developing countries are often based on models from the United States (Dahlberg, Moss, & Pence, 1999), which may not fit the contexts and intervention details studied in this review.

#### *Future directions for research*

The studies that demonstrate a positive relationship between quality of ECEC and child learning outcomes are valuable for justifying funding to improve ECEC quality, not only access and participation. However, the question remain whether a threshold of quality exists, at which impact on child outcomes can be achieved. As several studies argue, even programs of modest quality by international standards may still improve learning outcomes – but as noted above, very low quality programs may do harm. One major recent review identified an ‘urgent need for population-level indicators of child development, especially for the youngest children [i.e. under 3 years old] to enable ongoing monitoring and improvement in quality’ (Black et al., 2017, p. 88). Better monitoring at the system level would strengthen the evidence base about the relationship between quality and learning.

Another area for further research is ECEC quality in diverse international settings. Well-established research findings that structural elements of ECEC quality, such as buildings and adequate resources, relate to better outcomes for children may amount to ‘little more than common sense’ (Glewwe, 2014, p. 4). However, they leave many questions unanswered about which of the many malleable variables of ECEC programs make the greatest difference to children’s learning.

Many studies in this group used internationally recognised measures of quality, especially for centre-based ECEC interventions, for which a range of evaluative tools exist. The most commonly used measure of quality was the Early Childhood Environments Rating Scale – Revised (ECERS-R) (or its variants, as discussed below), including a detailed validation of ECERS in the Chilean context (Herrera et al., 2005). Some Latin American studies used the Classroom Assessment Scoring System (CLASS), which has a stronger emphasis on process than structural quality, and has been translated into Spanish (Leyva et al., 2014; Rolla San Francisco et al., 2005). One study used the Family Day Care Rating Scale (FDCRS) to evaluate home-based care (Bernal, 2015).

Adaptation of these instruments varied between studies. Some researchers excluded a small number of items from ECERS-R because of lack of technology in ECEC services or lack of accommodation for disability (Moore et al., 2008). In India, a Tamil Nadu version of ECERS-R, known as TECRS, has been created which is considered more appropriate for services in low-resource environments. Three studies used this measure (Aboud, 2006; MS Swaminathan Foundation, 2000; Rao, 2010), with two also using quality measures from the economically developed world. Of these, one found that the international measure (Preschool Assessment Scale) was 'not appropriate for use with the resource-poor early childhood programs observed' (Rao, 2010, p. 175). The other argued that the usefulness of the international measure (ECERS-R) depended on how results were interpreted and that international measures had value as an aspirational standard when used alongside locally adapted quality measures (Aboud, 2006).

Diverse expectations for quality do not only arise from resource constraints, but may also reflect different cultural and pedagogical perspectives. A Chinese version of ECERS-R, known as CECERS, involved 'heavily substantive adaptations' including a new scale to evaluate the quality of whole-group instruction, which is prevalent in Chinese preschools (Li et al., 2016, p. 430). While one study in this group observed that 'there are certain characteristics of quality programmes that appear to be universal' (Rolla San Francisco et al., 2005, p. 113), there is scope for further research on how quality may differ. In a recent comparison of 10 countries – including one developing context – some aspects of ECEC programs had consistent positive effects on child learning outcomes across all settings (e.g. more years of full-time schooling of educators, free-choice activities, less time in whole-group activities), but the effect of others (e.g. amount of adult-child interaction, child-child interaction) varied across countries (Montie, Xiang, & Schweinhart, 2006).

Therefore, studies that provided information about the aspects of ECEC practices that contributed to quality - especially quality impacting children's outcomes - were especially valuable. Some of the studies that used ECERS-R or other measures included analyses at the subscale level, to help identify which practices made the greatest difference to children's learning. Some studies included detailed descriptions of specific ECEC practices that were improved through the intervention, including one study from Bangladesh that detailed the way in which the professional development addressed specific issues in educators' practices (Moore et al., 2008). This kind of descriptive information regarding children's skills, materials used (e.g. a 'maths' bag with matchsticks, buttons and string), program activities (e.g. morning 'news' sessions to encourage free verbal associations; journal drawing), instructions and inputs of staff (e.g. to encourage children to verbalise ideas and actions) at the different levels is likely to be especially useful for developing programs to improve ECEC quality.

A major limitation in this group was that only two studies addressed programs for children under 3 years old. This is, in part, because younger children are less likely to attend centre-based ECEC services where measures of quality are most likely to be applied. It suggests a need for robust measures of program quality in home-based or family-focused early childhood interventions, as these programs are likely to play a major role in supporting children's learning in resource-constrained contexts. A better understanding of quality, and its relationship to child outcomes, in all intervention types

would be a major step forward in helping governments and donors optimise ECEC investment.

**Research gap 8:** Continue to build evidence in relation to the importance of quality in all kinds of ECEC interventions, including context-specific understandings of quality, and threshold quality improvements that can positively affect children's learning.

## Comparative studies

The last group of studies ( $n=5$ ) compared the impact of multiple types of interventions. These studies could not be categorised in any single intervention group, as all five compared the impact of child-focused and parent-focused programs. They are summarised below:

- One Ethiopian study compared a standard government-implemented preschool program with a family-based model that aimed to engage parents and caregivers in bolstering school-readiness (Borisova, Pisani, Dowd, & Lin, 2017). The parent-focused program included book-sharing and daily activities (e.g. simple games such as 'making a story' together, memorising 'shopping lists' or helping to sort ingredients for cooking), including activities that could be used by illiterate parents. The study found no significant differences in children's learning outcomes between the two groups. Quality may have been a factor. The parent-focused intervention appeared to have high levels of engagement in hands-on activities with children, whereas the preschool classrooms were characterised by large class sizes, little teacher support, and high teacher absenteeism. The study suggests that a well-implemented, parent-focused program may yield similar outcomes, at much lower cost, to a centre-based intervention.
- A Cambodian study compared the effects of three interventions: state preschools located in primary schools, community preschools and a parent-focused program in which mothers met regularly with a 'core' mother to learn how to promote children's development and wellbeing (Rao & Pearson, 2007). Children receiving any of the interventions had better learning outcomes than children in the control group, who lived in areas with no early childhood programs. Children in state preschools had significantly better learning outcomes at pre-test and post-test than either of the other intervention groups. The study is limited by the non-randomised design, with a significant relationship between maternal education levels and the type of program attended by the child, suggesting that the results must be treated with caution.
- Two Turkish studies compared outcomes from three interventions: educational nursery school, custodial day care and home care (Kagitcibasi, Sunar, & Bekman, 2001; Kagitcibasi, Sunar, Bekman, Baydar, & Cemalcilar, 2009). The first two intervention groups included two subgroups – one included a program for mothers while the other did not – creating five groups in total. The mothers' program involved an adaptation of the Home Interaction Programme for Parents and Youngsters (HIPPY) program as

well as a Mother Enrichment Program, involving biweekly discussions to support coping and communication. The study found that children attending the educational nursery school had the highest educational outcomes once they reached school, but that the mothers' program also appeared to have lasting effects on children's learning. The complex design of this study demonstrates that choices about ECEC interventions are not simply comparative but may involve combined approaches.

- A Costa Rican study examined the effects of five interventions on the emergent literacy skills of low-income, preschool-age children: parent education, tutoring, classroom-based activities, provision of materials to teachers or a combination of all four interventions (Rolla San Francisco, Arias, Villers, & Snow, 2006) The study found that tutoring for children or the combination of all interventions had the largest effects on learning, after controlling for attendance. Provision of materials to teachers without associated professional development had no effect on learning. This study also supports the value of combined interventions to achieve greatest impact.

These comparative studies are valuable in illustrating the complexity of choosing between different options for ECEC interventions. They show that the impact of one program over another may be confounded by factors such as differences in quality and engagement, as well as differences in the groups of children who access different services. Most importantly, they point to the need for nuanced understandings of program design and effectiveness, and the need to sustain depth and rigour in future research in this field.

Research gap 9: Take all opportunities to expand the comparative evidence base for ECEC interventions, wherever multiple interventions are implemented in parallel. Focus points for comparison may include cost-effectiveness, fitness-for-purpose and scalability.

## 6 Conclusion

This study has shown that a rich and diverse evidence base exists in relation to interventions to support learning for young children in economically developing countries. It has aimed to identify strengths and gaps in the research knowledge base, clarify key concepts, and report on the types of evidence that address and inform policy practice in the field (JBI, 2015, p. 7). The results show that robust research has been generated across a wide breadth of contexts, and the research communities in some countries have well-established specialisations in in this field. Thus, economically developing nations can learn much from each other, through transferring and adapting effective interventions, as well as continuing to adapt relevant interventions and research tools from the economically developed world.

This review supports the effectiveness of different kinds of interventions beyond the centre-based ECEC programs that frequently capture policymakers' attention. In particular, the review points to the value of programs that effectively leverage existing resources within communities to support children's learning, including parents and volunteers. Programs to enhance parenting practices can strengthen foundations for early learning, without the high entry costs that capital-intensive centre-based programs require, helping to 'bridge the divide' between children who can and cannot access ECEC services outside the home (Dowd et al., 2016, p. 490). At the most basic level, direct income supplementation interventions can help to address barriers to early learning in the home environment, especially when they are used to actively encourage early learning support (Jung & Hasan, 2014).

At the other end of the intervention spectrum, integrated programs demonstrate that the most effective support for early learning requires a whole-of-community approach. By connecting multiple services for young children, including support services for health and education, these programs have the potential to offer coherent, efficient and accessible support for young children and their families. Such programs are likely to require the greatest involvement from coordinating bodies, including government and development partners working collaboratively with local communities (Richter et al., 2017). At their best, such programs can provide a cohesive framework into which new interventions can be seamlessly integrated, as has been demonstrated in some studies in this review.

Decisions about investment in ECEC programs do not only involve choices between different types of intervention. As has been shown in this review, investment in the quality of existing interventions is an increasingly important ECEC policy direction. The evidence suggests that such investment is likely to be most effectively targeted at improving adult-child interactions and play-based learning activities, with even modest investments in professional development yielding benefits in terms of children's learning. Although the evidence base is strongest for investment in improving quality in child-focused ECEC programs, it may have value for any type of ECEC intervention.

This study has also identified several limitations in the evidence base regarding the effectiveness of ECEC interventions to improve children's learning. The heterogeneity in interventions poses significant challenges for the measurement of learning outcomes and

comparing interventions. Thus, it is recommended that any meta-analyses of this body of evidence maintain a high level of transparency about how these issues are resolved. While there is an encouraging body of quality research, the field also includes less rigorous studies, including those generated by the need to show positive results for funded initiatives. Charting a course between rigour and responsiveness will continue to be a challenge in this diverse, dynamic field, and compromises are inevitable in the translation between science and practice (Black et al., 2017, p. 87).

This accentuates a key limitation of this scoping review, which includes only studies in which the impact of programs has been demonstrated through measurement of learning outcomes, although these outcomes are broad as they assess cognitive, behavioural and motor skill. As a consequence, a large body of literature was excluded from this report. Future work could involve a scan of the excluded studies to obtain insights into how ECEC interventions work in different contexts.

In summary, these are the conclusions of this scoping review:

1. **Build the evidence base** regarding the effectiveness of ECEC interventions in the **Pacific**. For the region, only one study in the Solomon Islands could be located for this review. This suggestion aligns with DFAT's (2015a) strategy for Australia's aid investments in education 2015–2020, which specifies, as a main priority, investment in better education outcomes for all children and youth across the Indo-Pacific region.
2. **Focus on learning outcomes as evidence of the impact of interventions on children's learning**. This suggestion aligns with DFAT's (2015a) strategy for Australia's aid investments to be based on evidence wherever possible.
3. In order to a) obtain information on the effectiveness of ECEC interventions and b) compare the effectiveness of interventions, **tools to measure learning outcomes need to be applied** whenever possible, preferably from the beginning of an intervention. These tools need to be 'fit-for-purpose' in terms of children's age, cost-effectiveness, the skills of the person administering the measure, and the types of learning outcomes assessed, and preferably have been validated in the context in which they are used or in a similar context. An overview of tools used in the studies in this review, as well as tools developed specifically for use in economically developing countries, is provided in [Appendix B](#). The overview contains information about the specific domains assessed, administration of the assessment, age of child and the countries in which a tool has been validated.

This suggestion aligns with DFAT's (2015a) strategy for Australia's aid investments in education 2015–2020 which a) acknowledges the need to strengthen measurement and reporting on learning outcomes and b) seeks to assist partner countries in translating expenditure on education into strong learning outcomes.

4. **Increase the evidence base regarding income-supplementation programs**. In the current review, there is mixed evidence of these programs' effectiveness and the evidence base is much smaller than for other types of interventions. Thus, the actual mechanisms by which the income supplement affects learning need to be

studied in greater depth. Moreover, due to the small number of studies, the current scoping review could not focus on the interaction of the demand side (family income) and supply side (complementary support) constraints. Such detailed investigation would require analysis from a different angle as all cash-transfers may not have been classified as ECEC interventions, which was the primary focus of this review.

5. For **parent-focused interventions**, future work should focus on their **cultural responsiveness**, which has been shown to contribute the most to their effectiveness, and to explore how they can be sustained at scale. This would appear particularly desirable given the relatively low cost of parent-focused interventions.
6. For **child-focused interventions**, move the focus from demonstrating their effectiveness – which is well established – to **explaining in detail how** the processes and elements involved in these interventions affect learning outcomes. This includes improving understanding of optimal delivery options to meet the needs of diverse communities.
7. **Strengthen the evidence base** on the effectiveness of **integrated ECEC interventions** so that ‘fit-for-purpose’ programs can be developed using successful program models from similar contexts.

This aligns with Australia’s aid strategy document (DFAT, 2015a), which identifies as a key aim the investment in integrated early childhood development services to develop early childhood health, nutrition and educational outcomes as a complementary package. [Table 6.1](#) illustrates some of DFAT’s desired outcomes in the area of early childhood development and some indicative interventions.

Table 6.1: Desired outcomes and indicative interventions by strategic priority

Strategic priority	Desired outcomes	Indicative interventions
<b>Priority 1</b> Getting the foundations right	<ul style="list-style-type: none"> <li>• Improved maternal, child and family health, including nutrition.</li> <li>• Affordable, high-quality, early childhood education and care, including cognitive stimulation.</li> <li>• Integrated support services for children and families, including parental education.</li> <li>• Effective transitions from pre-school environments to child-centred primary schools.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduce the effects of stunting and the prevalence of micronutrient deficiencies through early intervention programs.</li> <li>• Increase access to or improve quality of child care and pre-school education services, to improve school readiness and educational performance.</li> <li>• Foster an integrated approach to child development through policy dialogue.</li> <li>• Increase coordination and move from disparate services into unified provision (from household or community level initiatives through to whole-of-system early childhood development delivery).</li> <li>• Build strong connections between the pre-school and school systems, to ensure children do not miss a rung as they climb the learning ladder.</li> </ul>

Source: DFAT, 2015a (p. 27)

8. Continue to build evidence in relation to the importance of quality in all kinds of ECEC interventions, including **context-specific understandings of quality, and threshold quality standards** that can improve children's learning. Also, to develop further fit-for-purpose measures of quality, not just in terms of the facilities and resources, but also processes.
9. Take all opportunities to **expand the comparative evidence base for ECEC interventions** wherever multiple interventions are implemented in parallel. **Focus points for comparison** may include cost-effectiveness, fitness-for-purpose, and scalability.

This review has shown the breadth of possible ECEC interventions and provides evidence aimed at assisting researchers and project teams to choose which are best suited to support children's learning in a particular context.



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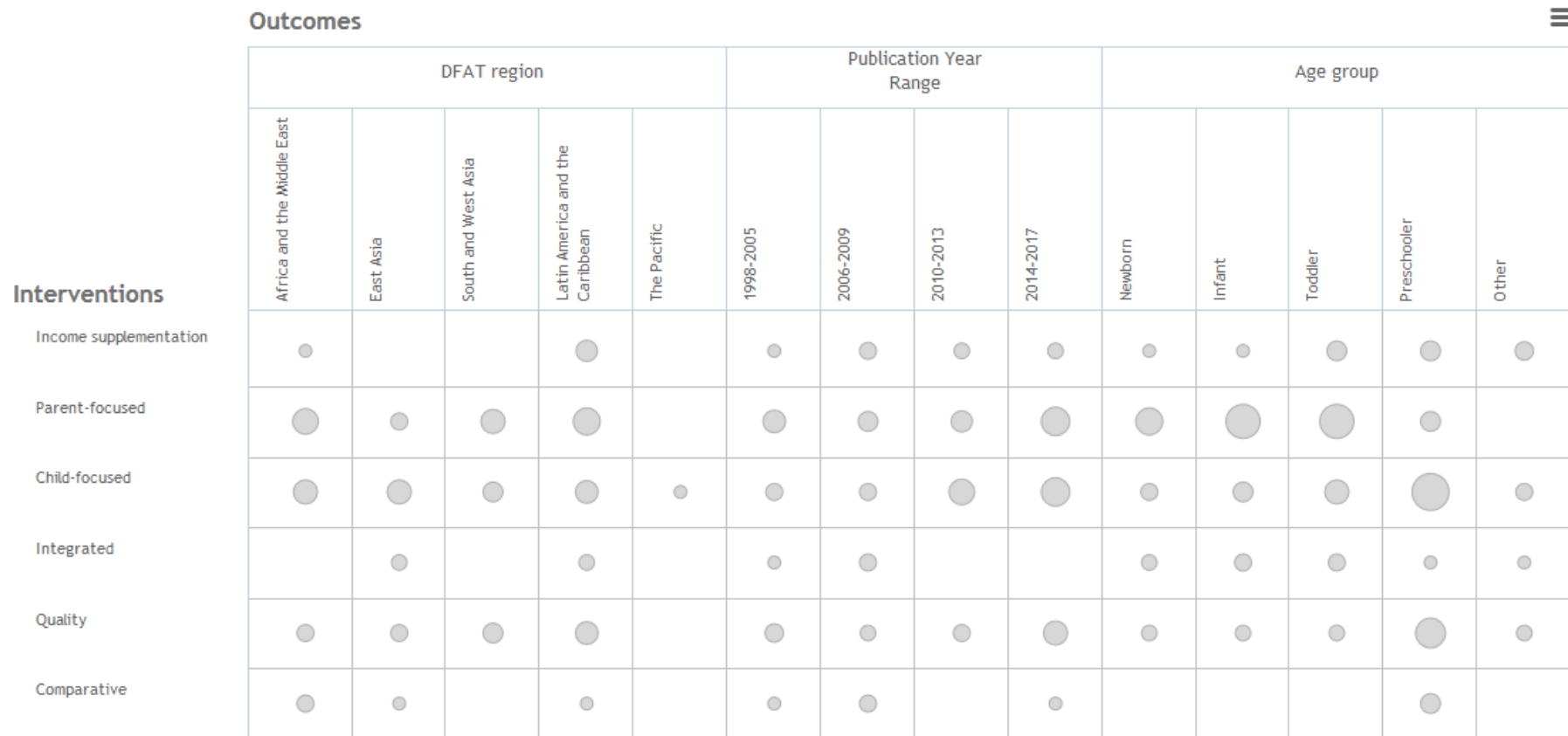
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## Appendix A: Evidence gap map

This is a static illustration of the online interactive evidence gap map at:

<http://egmopenaccess.3ieimpact.org/evidence-maps/improving-young-childrens-learning-economically-developing-countries-scoping-review>

The evidence gap map was created using open-source software developed by 3ie and can best be viewed using the Firefox browser.



## Appendix B: Early childhood assessment tools used in at least three of the review studies

Table B1: Early Childhood Development Tools/Measures used in at least three of the studies in this scoping review

Tools	Age range (years)			Administration				Area assessed														Validated in countries	Adapted to other languages/countries				
	0–3	4–6	6+	Professional	Teacher	Parent/Caregiver	Child	Global communication and development	Speech	Language	Expressive language	Receptive Language	Executive functioning	Mental development	Cognition	Reading	Writing	Social emotional	Social communication	Motor	Gross motor skills			Fine motor skills	Adaptive behaviour	Non-verbal communication	ICT skills
Bayley Scales of Infant and Toddler development (Bayley-III)	●					●	●			●	●	●			●			●		●	●	●	●			US, Malawi *	Bangladesh, Colombia
Bayley Scales of Infant Development, Second edition (BSID-II)	●						●							●	●					●						US	Bosnia, Argentina, Bangladesh, Brazil, Chile, China, Costa Rica, Czech Republic, DRC, Egypt, Ethiopia, Guatemala, Indonesia, India, Italy, Jamaica, Japan, Kenya, Lithuania, Malaysia, Mexico, Nicaragua, Nigeria, Philippines, Poland, Romania, Seychelles, South Africa, Taiwan, Tanzania, Turkey, Thailand, Vietnam, Zimbabwe
Peabody Picture Vocabulary Test (PPVT)	●	●	●				●	●	●																	US	Brazil, Chile, Nicaragua, Ecuador China, Jamaica, France, New Zealand, South Africa, Translated and adapted in Peru, Vietnam, India, Ethiopia, West Indies
Woodcock–Johnson Tests of Cognitive Abilities	●	●	●				●							●												US	Costa Rica, Seychelles

Tools	Age range (years)			Administration				Area assessed														Validated in countries	Adapted to other languages/countries				
	0-3	4-6	6+	Professional	Teacher	Parent/Caregiver	Child	Global communication and development	Speech	Language	Expressive language	Receptive Language	Executive functioning	Mental development	Cognition	Reading	Writing	Social emotional	Social communication	Motor	Gross motor skills			Fine motor skills	Adaptive behaviour	Non-verbal communication	ICT skills
Wechsler Scales (WISC and WPPSI)			●				●		●	●			●	●												Spain, Thailand, Turkey, US, Venezuela	Arabic, Bangladesh, Belgium, Czech, Chile, Chinese (Hong Kong, Taiwan), Colombia, Croatian, Denmark, Dutch, Ecuador, English (United States, Canada, United Kingdom, Australia), Finnish, French (France and Canada), German (Germany, Austria and Switzerland), Greek, Icelandic, India, Iran, Israel, Italian, Japanese, Korean (South Korea), Mexico, Netherlands, Norwegian, Peru, Portuguese (Brazil and Portugal), Romanian, Russia, Slovenian South Africa, Spanish, Swedish, Welsh
Ravens Progressive Matrices (RPM)		●	●				●							●												US, Nigeria	Australian, and Indian English; French, Dutch, Uganda, US, UK,
Early Development Instrument (EDI)		●		●				●		●				●			●			●						Canada, Australia, US, Jamaica	Portuguese for use in Brazil, as well as several versions of Spanish (Mexican, Peruvian, and Chilean)
Griffiths Mental Development Scales (GMDS)**	●	●	●	●				●	●				●	●			●			●	●	●				UK, Ireland,	Chinese, Italian, French, Malawi, Pakistan, Portuguese, Russian, South Africa,

Tools	Age range (years)			Administration			Area assessed															Validated in countries	Adapted to other languages/countries				
	0-3	4-6	6+	Professional	Teacher	Parent/Caregiver	Child	Global communication and development	Speech	Language	Expressive language	Receptive Language	Executive functioning	Mental development	Cognition	Reading	Writing	Social emotional	Social communication	Motor	Gross motor skills	Fine motor skills	Adaptive behaviour	Non-verbal communication	ICT skills		
MacArthur-Bates Communicative Development Inventories (CDI)	●					●		●	●	●	●													●		US	Britain, New Zealand, Australia and also adaptations in more than 100 languages, including Spanish

\*Reliance on US norm-based standardised scores resulted in misclassification of the neurological development of Malawian children, with the greatest potential for bias in the measurement of cognitive and language skills.

\*\*GMDS has been used in the Philippines where socioeconomic status, genetic predisposition and lack of familiarity with test materials influenced performance of Filipino children on the Griffiths test. These factors should be taken into consideration when comparing their performance with other ethnic groups.



Table B2: New tools which were constructed for economically developing countries

Tools	Age range (years)			Administration			Area assessed														Validated in countries	Adapted to other languages/ countries							
	0-3	3-6	6+	Professional	Teacher	Parent/Caregiver	Child	Global communication and development	Speech	Language	Expressive language	Receptive language	Executive functioning	Mental development/health	Cognition	Executive function	Reading	Numeracy	Writing	Social emotional			Communication	Motor	Gross motor skills	Fine motor skills	Adaptive behaviour	Non-verbal communication	ICT skills
Measuring Early Learning Quality and Outcomes (MELQO)		●	●		●	●	●									●	●	●	●	●								Lao PDR, Madagascar, Mongolia, Tanzania, Nicaragua	Bangladesh, Cambodia, Kenya, Kyrgyzstan, Lao PDR, Madagascar, Mongolia, Nicaragua, Sudan and Tanzania
Early Childhood Development Index (ECDI) *		●								●					●		●	●	●	●		●					Jordan, Philippines and Kenya		
Caregiver Reported Early Development Instruments (CREDI)	●					●				●				●	●	●				●		●	●				Brazil, Tanzania	Bangladesh, Brazil, Cambodia, Columbia, Chile, Ghana, Guatemala, Hong Kong, India, Jordan, Laos, Lebanon, Nepal, Pakistan, Philippines, Tanzania, USA, Zambia	
Regional Project on Child Development Indicators (PRIDI)	●	●		●		●				●				●						●	●	●					Costa Rica, Nicaragua, Paraguay and Peru		

\* In 2010, the Early Childhood Development Index (ECDI) was added to MICS-4.

In recent years, several measures of children's ECD status have been developed for large-scale use, including the **Early Childhood Development Index (ECDI)** from UNICEF's Multiple Indicator Cluster Survey (rounds 4 and 5; UNICEF, 2009–2015) and the Inter-American Development Bank's Regional Project on Child Development Indicators (PRIDI). The **Regional Project on Child Development Indicators (PRIDI)** (2009) is an initiative launched by the Inter-American Development Bank that aims to generate high-quality and regionally comparable data on the development of children aged 24 to 59 months. PRIDI created a new tool, the Engle Scale, for evaluating development in children in four domains: cognition, language and communication, socio-emotional and motor skills.

**Measuring Early Learning Quality and Outcomes (MELQO)** (post 2015) was designed in response to demand from governments, civil society and researchers for an approach that reflects these shifting priorities. MELQO modules look at both children’s development and the quality of their learning environments, creating a more holistic picture of influences on early childhood development. MELQO’s MODEL and MELE modules are designed to establish a baseline of skills and competencies for groups of children and the quality of their learning environments, which could then be used to identify inequities between groups of children (such as disadvantages linked to family income, cultural background or geographic location), and potentially to evaluate programs, if the modules are deemed consistent with the program model and sensitive enough to detect program effects. MODEL – which stands for Measure of Development and Early Learning – measures children’s learning and development through two tools – a direct assessment and a teacher/caregiver survey – designed to assess the basic domains of children’s development at the start of school, including executive function, social–emotional development and pre-academic skills (early mathematics and literacy skills). MELE – which stands for Measure of Early Learning Environments – includes seven domains for quality in early learning environments and sample items that may be useful in indexing them.

However, no measures of population-level ECD have been validated specifically for children aged 0–3 years across developing countries, making cross-national comparisons of developmental status and progress for the youngest – and potentially most vulnerable – children impossible. **The Caregiver Reported Early Development Instruments (CREDI)** were designed to serve this purpose. A population-level measure of early childhood development (ECD) for children from birth to age 3 years, CREDI exclusively relies on caregiver reports, and thus primarily focuses on milestones and behaviours that are easy for caregivers to understand, observe, and describe.

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