

Research summary

Linking quality and child development in early childhood education and care

June 2024

In 2023, the Australian Education Research Organisation (AERO) and researchers from the Queensland Brain Institute at The University of Queensland (UQ) partnered to examine how specific aspects of quality relate to learning and development outcomes for children in Australia. This research summary presents key findings from the project. Our [technical report](#) provides further information about this research, including methods.

This study contributes the first empirical evidence linking quality ratings of Australian early childhood education and care (ECEC) services with child development. It confirms the value of investing in improving the quality of ECEC for all Australian children, as well as in our national system for assessing and rating the quality of ECEC services.

Background

Moves towards universal access to ECEC are grounded in a substantial body of international evidence that high-quality ECEC contributes to better outcomes for children (Organisation for Economic Co-operation and Development [OECD], 2018; von Suchodoletz et al., 2023). With government investment for ECEC in Australia approaching \$15 billion annually (Productivity Commission, 2024), understanding associations between Australian ECEC programs and children's outcomes and the specific aspects of quality that make a difference to their development has never been more important.

In this study, we asked:

How does the quality of the ECEC service a child attends predict their developmental outcomes in their first year of school? Are there specific aspects of quality that matter most?

This study used 2 existing datasets:

- the First Five Years: What Makes a Difference? (2019) (Australian Government Department of Education), a large-scale national dataset within the Person-Level Integrated Data Asset (Australian Bureau of Statistics). The analysis used the National Quality Standard (NQS) as the measure of quality, and the Australian Early Development Census (AEDC) as the outcomes measure of child development. We also used a range of linked information on children and families, including income, education, health and employment, to adjust for other factors that might contribute to differences in outcomes.
- the Effective Early Educational Experiences (E4Kids) longitudinal research dataset. E4Kids provided more detailed measures of quality and assessments of children's development over time.

The NQS sets a national benchmark for ECEC and outside school hours care services in Australia and is part of the National Quality Framework (NQF). Services are assessed and rated by their regulatory authority against 7 quality areas, and receive an overall rating based on these results. These quality areas are outlined in the following textbox.

National Quality Standard Quality Areas

Quality Area 1. Educational program and practice

Educational program and practice of educators are child-centred, stimulating and maximise opportunities for enhancing and extending each child's learning and development.

Quality Area 2. Children's health and safety

Children have the right to experience quality education and care in an environment that safeguards and promotes their health, safety and wellbeing.

Quality Area 3. Physical environment

Physical environment is safe, suitable and provides a rich and diverse range of experiences that promote children's learning and development.

Quality Area 4. Staffing arrangements

Qualified and experienced educators, who develop warm, respectful relationships with children, create predictable environments and encourage children's active engagement in the learning program.

Quality Area 5. Relationships with children

Relationships with children are responsive, respectful and promote children's sense of security and belonging.

Quality Area 6. Collaborative partnerships with families and communities

Collaborative relationships with families are fundamental to achieving quality outcomes for children, and community partnerships based on active communication, consultation and collaboration are essential.

Quality Area 7. Governance and leadership

Effective leadership and governance of the service contribute to quality environments for children's learning and development. Effective leaders establish shared values for the service and set clear direction for the service's continuous improvement.

Services can be rated as:

- Excellent (services rated Exceeding NQS in all quality areas may choose to apply for this rating)
- Exceeding National Quality Standard
- Meeting National Quality Standard
- Working Towards National Quality Standard
- Significant Improvement Required.

While the first objective of the NQF is to ensure the safety, health and wellbeing of children attending an ECEC service, improving educational and developmental outcomes for children is another primary objective.

The AEDC is Australia's national data collection of early childhood development, conducted every 3 years in children's first year of full-time school. Teachers complete the Australian version of the Early Development Instrument for each child in their class. The responses provide information on 5 key domains of early childhood development:

1. Physical Health and Wellbeing
2. Social Competence
3. Emotional Maturity
4. Language and Cognitive Skills (school-based)
5. Communication Skills and General Knowledge.

Key findings

The NQS rating of Exceeding is the threshold for most effectively reducing developmental vulnerability through ECEC

Overall service quality ratings consistently predicted children's developmental vulnerability on each of the AEDC domains. We found that children in services rated as Exceeding NQS (or above) had consistently lower rates of developmental vulnerability than children in services rated Working Towards NQS or Significant Improvement Required.

Further, children in services Exceeding NQS also had lower rates of developmental vulnerability in some AEDC domains than children in services Meeting NQS – specifically, in the Communication Skills and General Knowledge, Emotional Maturity, and Social Competence domains. However, rates of developmental vulnerability in services Exceeding and Meeting NQS did not differ for the Language and Cognitive Skills (school-based) and Physical Health and Wellbeing domains. Nevertheless, these findings are broadly consistent with existing international and Australian evidence that higher-quality ECEC reduces risk of developmental vulnerability at school entry.

To understand whether certain *combinations* of quality ratings are better predictors of children's developmental outcomes than others, we used a data-driven process, identifying 6 distinct patterns of quality ratings into which services can be grouped. This is useful for understanding whether the same patterns of quality observed for overall service ratings are consistent at the quality area and standard level. We found the 6 groups mapped well onto the overall NQS ratings:

- **Group 1.** Exceeding all Quality Areas (18.4% of all services)
- **Group 2.** Exceeding in Quality Areas 1 and 5 (12.5% of all services)
- **Group 3.** Exceeding in Quality Areas 6 and 7 (14.5% of all services)
- **Group 4.** Meeting all Quality Areas (26.6% of all services)
- **Group 5.** Working Towards, more Standards Meeting (19.6% of all services)
- **Group 6.** Working Towards, more Standards Working Towards (8.3% of all services).

Children attending services in Group 1 were consistently less likely to be developmentally vulnerable on each of the 5 AEDC domains than children attending services in Group 6 in 2016 and 2017.¹ Group 1 was also less developmentally vulnerable than Group 3 in the Communication Skills and General Knowledge domain, and Group 5 in both Communication Skills and General Knowledge and the Social Competence domain in both 2016 and 2017. These results indicate that the NQS rating of Exceeding is the marker of the most effective quality to avert developmental vulnerability.

Quality Areas 1, 3 and 5 were stronger and more consistent predictors of developmental vulnerability than other quality areas

The quality of educational program and practice, physical environments and relationships with children predict children's development at school entry.

We analysed how service ratings in each NQS Quality Area predicted rates of developmental vulnerability in each AEDC domain. We found children who attended services rated as Exceeding NQS in Quality Areas 1, 3 and 5 were consistently less likely to be developmentally vulnerable.

To investigate this further, we drew on the complementary data on quality and child outcomes provided by the E4Kids dataset. Because this dataset has multiple measures of child development, they can point to the 'value add' of ECEC quality. We found ECEC contributed to greater gains in cognitive development among children whose teachers and educators maximised learning time through effective planning, clear instructions and short transitions between activities. Children whose ECEC educators and teachers provided a range of learning opportunities through physical environments and interactions appropriate to each child also had greater gains. Finally, children with better access to spaces and places that can support their learning also saw greater cognitive gains.

Quality Areas 2 (Children's health and safety), 4 (Staffing arrangements), 6 (Collaborative partnerships with families and communities) and 7 (Governance and leadership) were positively associated with children's outcomes, but less consistently so, suggesting that these areas assess aspects of quality less closely related to child development as measured by the AEDC.

¹ The effect for the Emotional Maturity domain was nearly identical for 2016 and 2017, but only statistically significant in 2017.

Implications

- 1. The skills of teachers and educators are central to promoting children's learning and development outcomes** (Gibson et al., 2023; OECD, 2018). The combined evidence from both datasets suggests quality interactions, learning opportunities planned and provided (process quality) are crucial for children's developmental outcomes at school entry. Achieving the highest quality in these areas requires educators and teachers to be highly knowledgeable and skilled in intentional and incidental teaching, critical reflection, child development, and supporting responsive and consistent interactions (Gibson et al., 2023; Torii et al., 2017). These findings provide further evidence to support the work underway as part of the National Children's Education and Care Workforce Strategy (2022–31) (Education Services Australia, 2021).
- 2. Pursuing Exceeding-level quality in Quality Areas 1, 3 and 5 could improve outcomes for children at risk of developmental vulnerability.** According to the NQF Snapshot for Quarter 3 2023 (Australian Children's Education & Care Quality Authority, 2023) only a quarter of services are rated as Exceeding NQS in Quality Areas 1 and 5, and fewer than 1 in 5 are rated as Exceeding NQS in Quality Area 3. Existing research into the characteristics of exemplary ECEC services can help guide investments in sustainable change for ECEC settings serving those at highest risk of disadvantage (Gibson et al., 2023; Tseng et al., 2019).
- 3. The design and use of built and natural environments in ECEC settings matter.** This study contributes important evidence to the Australian and international evidence base, which features few recent studies linking physical environments with cognitive and academic gains (Molloy et al., 2018). As the sector responds to increasing investment in expanding ECEC provision, consideration should be given to design, resourcing and use of indoor and outdoor physical environments and materials that are inclusive and engaging, in recognition of their important role in children's development.
- 4. This study demonstrates the benefits of linking data to generate insights and reinforces opportunities for improving ECEC data architecture proposed in AERO's report, Early Childhood Data in Australia (AERO, 2022).** For a complete picture, creating a data asset that enables linking child- and service-level data from preschool settings (Commonwealth, State and Territory datasets) with other ECEC datasets would enable a fuller analysis of the relationship between ECEC quality and children's developmental outcomes, as well as the investigation of important questions related to ECEC access, dosage and duration. Similarly, more frequent data collection and timely availability of data would provide greater confidence in findings.

Limitations

Our results may reflect who gets access to quality ECEC. That is, it's possible that children who are already developmentally vulnerable when they enter ECEC are more likely to attend lower-quality services. As our dataset doesn't include a measure of children's development before they enter ECEC, we can't rule that out. This would be consistent with Australian research that finds that children in low-socio-economic status areas have less access to high-quality ECEC services (Cloney et al., 2016; Tang et al., 2024). There's also evidence that children who are more developmentally vulnerable can and do access high-quality ECEC services – often through targeted models.

Group composition in ECEC settings may also affect program quality. For example, working with groups with a higher proportion of children with complex needs may place higher demands on educators and reduce the quality of interactions. Further research is needed to understand how group composition affects teacher and educator practice and overall service quality.

Conclusion and recommendations for further research

This study affirms the value of investing in improving the quality of ECEC for all Australian children, as well as investing in the national system for assessing and rating the quality of ECEC services. Further research is needed to understand how patterns of access to high-quality services, differences in ECEC dosage and models of provision, and group composition can affect both quality and children's outcomes. Moreover, a better understanding of the conditions and resources that help services get to Exceeding could inform the efforts of all key stakeholders to ensure every child has the ECEC experiences that support them to thrive.

Acknowledgements

This report was commissioned by AERO and made possible by the joint funding it receives from Commonwealth, state and territory governments.

AERO acknowledges the study authors: Dr Peter Rankin, Associate Professor Sally Staton, Alicia Jones, Dr Azhar Hussain Potia, Dr Sandy Houen, Bridget Healey and ARC Laureate Professor Karen Thorpe.

Part of this study was conducted at UQ using data from the [Effective Early Education Experiences \(E4Kids\) study](#) under license from the University of Melbourne. E4Kids was funded by the Australian Research Council (ARC) Linkage Projects Scheme (LP0990200), in collaboration with the Victorian Government Department of Education and Early Childhood Development, and the Queensland Government Department of Education and Training. The authors thank the ECEC services, directors, teachers/staff, children and their families who participated in E4Kids.

This research was supported (partially or in full) by the ARC's Centre of Excellence for Children and Families over the Life Course (Project ID CE200100025). Sally Staton is supported by an ARC Discovery Early Career Fellowship (DE230100687), and Karen Thorpe by an ARC Laureate Fellowship (FL220100137).

The research undertaken within this project was approved by the UQ Human Research Ethics Committee (ID 2023/HE001018).

Disclaimer

This report uses data from the Australian Early Development Census (AEDC). The AEDC is funded by the Australian Government Department of Education. The findings and views reported are those of the author and should not be attributed to the department or the Australian Government.

The results of these studies are based, in part, on data supplied to the Australian Bureau of Statistics (ABS) under the *Taxation Administration Act 1953*, *A New Tax System (Australian Business Number) Act 1999*, *Australian Border Force Act 2015*, *Social Security (Administration) Act 1999*, *A New Tax System (Family Assistance) (Administration) Act 1999*, *Paid Parental Leave Act 2010* and the *Student Assistance Act 1973*. Such data may only be used for the purpose of administering the *Census and Statistics Act 1905* or performance of functions of the ABS as set out in section 6 of the *Australian Bureau of Statistics Act 1975* (ABS Act). No individual information collected under the Census and Statistics Act is provided back to custodians for administrative or regulatory purposes. Any discussion of data limitations or weaknesses is in the context of using the data for statistical purposes and is not related to the ability of the data to support the Australian Taxation Office, Australian Business Register, Department of Social Services and/or Department of Home Affairs' core operational requirements.

Legislative requirements to ensure privacy and secrecy of these data have been followed. For access to the Person Level Integrated Data Asset (PLIDA; formerly MADIP) and/or Business Longitudinal Analysis Data Environment data under section 16A of the ABS Act or enabled by section 15 of the *Census and Statistics (Information Release and Access) Determination 2018*, source data are de-identified and so data about specific individuals has not been viewed in conducting this analysis. In accordance with the Census and Statistics Act, results have been treated where necessary to ensure that they are not likely to enable identification of a particular person or organisation.

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