Department for Education

Study of Early Education and Development (SEED): Study of Quality of Early Years Provision in England (Revised)

Research Report

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SEED Study of Early Education & Development

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[1] This revised report, published May 2018, includes corrections to the multivariate analysis of process quality by structural characteristics for two-year-old settings and for three- to four-year-old settings

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Glossary

CPD
: Continuing Professional Development.

ECEC
: Early Childhood Education and Care.

ECERS-E
: Early Childhood Environment Rating Scale (Extension). An observational rating scale for ECEC settings for the over-threes; assessment is across 3 domains: Literacy, Mathematics and Diversity.

ECERS-R
: Early Childhood Environment Rating Scale (Revised). An observational measure of ECEC settings overall quality for over-threes; assessment is across 5 domains: Personal Care Routines, Language Reasoning, Activities, Interaction and Programme Structure.

IMD
: Index of Multiple Deprivation; a measure of area deprivation.

ITERS-R
: Infant / Toddler Environment Ratings Scale. An observational measure of overall quality of ECEC settings for under-threes; assessment is across 6 domains: Space and Furnishings, Personal Care Routines, Listening and Talking, Activities, Interaction and Program Structure.

SEN/D
: Special Educational Needs and Disability provision.

SD
: Standard deviation (SD) is a number used to tell how measurements for a group are spread out from the average (mean), or expected value. A low standard deviation means that most of the numbers are very close to the average. A high standard deviation means that the numbers are spread out.

SSTEW
: Sustained Shared Thinking and Emotional Well-being scale. A measure of the quality of interactions between staff and children in ECEC settings; assessment is across 5 domains: Building Trust: Confidence and Independence; Supporting and Extending Language and Communication; Supporting Emotional Well-being; Supporting Learning and Critical Thinking and Assessing Learning and Language.

Executive Summary

Background to the study

The Study of Early Education and Development (SEED) includes a major longitudinal study that investigates the impact of early childhood education and care (ECEC) on children's school readiness and longer-term outcomes, including its impact on the most disadvantaged children.

Early publications from the longitudinal SEED study indicated that ECEC at age two is associated with improvement in children's cognitive and socio-emotional development at age three (DfE, 2017). This finding is in line with previous findings from the Effective Pre-school, Primary and Secondary Education (EPPSE) study, which found that ECEC continues to relate to improved cognitive and socio-emotional development through primary and secondary school (Sylva et al., 2008; 2012).

Research findings have also indicated that the quality of ECEC received may also relate to child development and learning (Sylva et al., 2012). Quality is often measured as (a) process quality, which includes the quality of the curriculum, pedagogical practices and child experiences that support children's development; and (b) structural characteristics, including adult-child ratios, staff qualifications, group size and characteristics of the physical space (Sylva et al., 2004). These factors may be inter-related so that structural characteristics such as staff qualification have been found to be associated with measures of process quality (Sylva et al., 2004).

Aims

This report deals with findings of the study of quality of provision for early years settings within the SEED project.[2]

The main objectives of this report were to explore:

1. The distribution of quality of ECEC in different group settings for two-year-old and three- to four-year-old children in England
2. The relationship between the characteristics of a setting and the quality of care and education it offers.

Methods

To assess the quality of provision for two-year-old and three- to four-year-old children, structural characteristics (including adult-child ratios, staff qualifications, group size and

[2] Findings from a separate study of quality in childminder settings is available at https://www.gov.uk/government/collections/study-of-early-education-and-development-seed

characteristics of the physical space) were measured through a questionnaire for the manager, Early Years Foundation Stage Lead or head teacher.[3]

Information about process quality (including the curriculum, pedagogical practices and child experiences that support development) was collected through observations lasting half a day and was measured using scales detailed in Table 1.

Table 1: Scales used to assess process quality for each age group

	Two-year-olds	Three- to Four-year-olds
Infant and Toddler Environment Rating Scale (ITERS-R) An overall measure of quality	✓	
Early Childhood Environment Rating Scale (ECERS-R) An overall measure of quality		✓
Early Childhood Environment Rating Scale Extension (ECERS-E) Focuses on educational aspects		✓
Sustained Shared Thinking and Emotional Well-being Scale (SSTEW) Focuses on the quality of interactions between staff and children	✓	✓

From May 2014 to the end of April 2016, 1000 visits were carried out: 402 room visits for settings for two-year-olds and 598 room visits for settings for three- to four-year-olds.

The overall SEED longitudinal study sample was recruited from the most complete sampling frame available at the time; Child Benefit records (see Speight et al., 2015 for details). For the quality study, the number of settings selected in each type (private, voluntary, children's centre, nursery class/school, local authority nursery) were chosen to provide a similar percentage to the overall number of settings in that category as used by the longitudinal sample of children. The sample of settings used in this quality study can therefore be regarded as reasonably representative of group settings in England.

Overview of the quality scales

The ITERS-R[4] is an overall measure of quality, and was used to assess settings for two-year-old children across six domains:

I. Space and Furnishings

[3] See Technical Report Appendix B.

[4] Harms, Cryer & Clifford, 2006.

II. Personal Care Routines
III. Listening and Talking
IV. Activities
V. Interaction
VI. Program Structure

The ECERS-R[5] is an overall measure of quality, and was used to assess settings for three- to four-year-old children across five domains:

I. Personal Care Routines
II. Language Reasoning
III. Activities
IV. Interaction
V. Programme Structure

The ECERS-E[6] focuses on the educational aspects of experience, and was used to assess settings for three- to four-year-old children across three domains:

I. Literacy
II. Mathematics
III. Diversity

The SSTEW[7] focuses on the quality of interactions between staff and children, and was used to assess settings (for two-year-old as well as three- to four-year-old children) across five domains:

I. Building Trust, Confidence and Independence
II. Supporting and Extending Language and Communication
III. Supporting Emotional Well-being
IV. Supporting Learning and Critical Thinking
V. Assessing Learning and Language

Analyses

Findings are presented separately for two-year-old settings and three- to four-year-old settings as these settings differ in their characteristics and different measures of process quality were used.

Descriptive statistics for structural and process quality are presented, as well as a comparison of structural and process quality for different types of settings.

[5] Harms, Cryer & Clifford, 2005.
[6] Sylva, Siraj-Blatchford & Taggart, 2011.
[7] Siraj, Kingston & Melhuish, 2015.

Because it is useful to understand which factors generally improve quality overall, but also which factors are related more specifically to 'good or better' or 'excellent' quality scores, the relationship between structural and process characteristics was considered in three ways:

1. Whether structural characteristics of ECEC settings were associated with continuous process quality scores (i.e. which characteristics are associated with higher quality scores).
2. Whether structural characteristics of ECEC settings were associated with achieving excellent process quality (score of 6 or more).
3. Whether structural characteristics of ECEC settings were associated with achieving good or better process quality (score of 5 or more).

Variations in the quality of settings by region, setting type and area deprivation are also presented.

Variation in process and structural quality over time is considered through comparison with data from the Effective Provision of Pre-School Education (EPPE) study.

Key findings

Settings for two-year-olds

The majority of assessed ECEC settings for two-year-olds (89%) were either private or voluntary settings, with smaller numbers of children's centres (6%), nursery classes / schools (3%) and Local Authority nurseries (2%), see Table 2. The numbers of Local Authority nurseries (N = 7) and of nursery class / school settings (N=11) were small and these were therefore omitted from the analyses of process quality in terms of structural characteristics of settings, because conclusions based on such small groups are unlikely to be robust.

Table 2: Breakdown of settings for two-year-olds by type.

Type of setting	N	Percent
Private	256	64%
Voluntary	103	26%
Children's Centre	25	6%
Nursery Class / School	11	3%
Local Authority Nursery	7	2%
Total	402	100%

Structural characteristics of settings for two-year-olds

Overview of settings

Most settings accepted children from under two years of age (66%), while some only accepted children from two years of age upwards (34%). Sixty-one per cent of settings

made provision for children with special education needs and / or disabilities (SEN/D) whilst 37% did not. The mean staff to child ratio was 1 to 4.[8]

Staff characteristics

The most common level of Manager's qualification was Level 6, which is degree or NVQ Level 6 or equivalent. The mean level of staff qualifications for settings was 3.0 (A-Level / NVQ Level 3 or equivalent). The percentage of staff replaced (staff turnover) in the last year had a mean of 11% (SD = 12.6),[9] with 42% having staff turnover of 10% or greater.

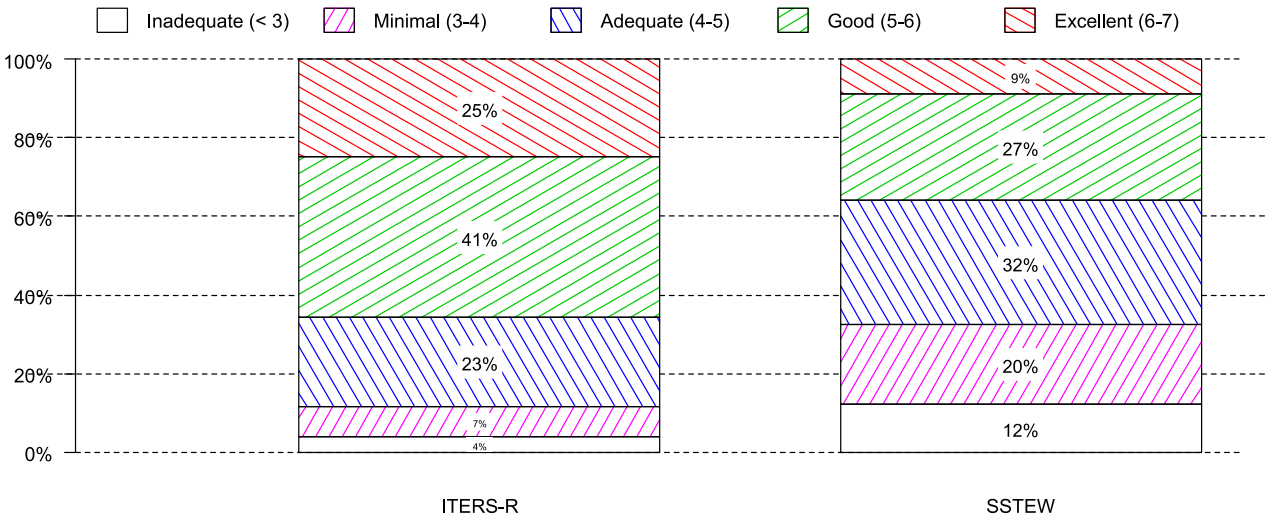
Continuing Professional Development (CPD), supervision and training

The frequency of CPD ranged from 1 to 24 times per year, mean 4.8 (SD = 4.1). The frequency of staff supervision ranged from annually to weekly. The mean number of supervisions per year was 8.7 (SD = 11.0). Eighty-seven per cent of settings had a training plan in place, 12% did not. Forty-five per cent of settings had a training budget, 56% did not.

Process quality of settings for two-year-olds

Settings quality was usually at least adequate, with 89% of settings being rated adequate or better on the Infant / Toddler Environment Ratings Scale (ITERS-R) and 68% of settings being rated adequate or better on the Sustained Shared Thinking and Emotional Well-being scale (SSTEW). See Figure 1.

Figure 1: Breakdown of ITERS-R and SSTEW scores for settings for two-year-olds by quality band.



On average, process quality scores tended to be higher at nursery classes / schools and

[8] For children age two the statutory ratio requirement is one staff member for every four children. Further details on statutory ratio requirements are available in the technical report Appendix D.

[9] Standard deviation (SD) is a number used to tell how much measurements for a group are spread out from the average (mean), or expected value. A low standard deviation means that most of the numbers are very close to the average. A high standard deviation means that the numbers are spread out.

at children's centres than at the private and voluntary settings. See Figures 2-3. Any differences between nursery classes and nursery schools cannot be established in this report due to small numbers of these settings.

Figure 2: Breakdown by quality band of ITERS-R scores for settings for two-year-olds by type.

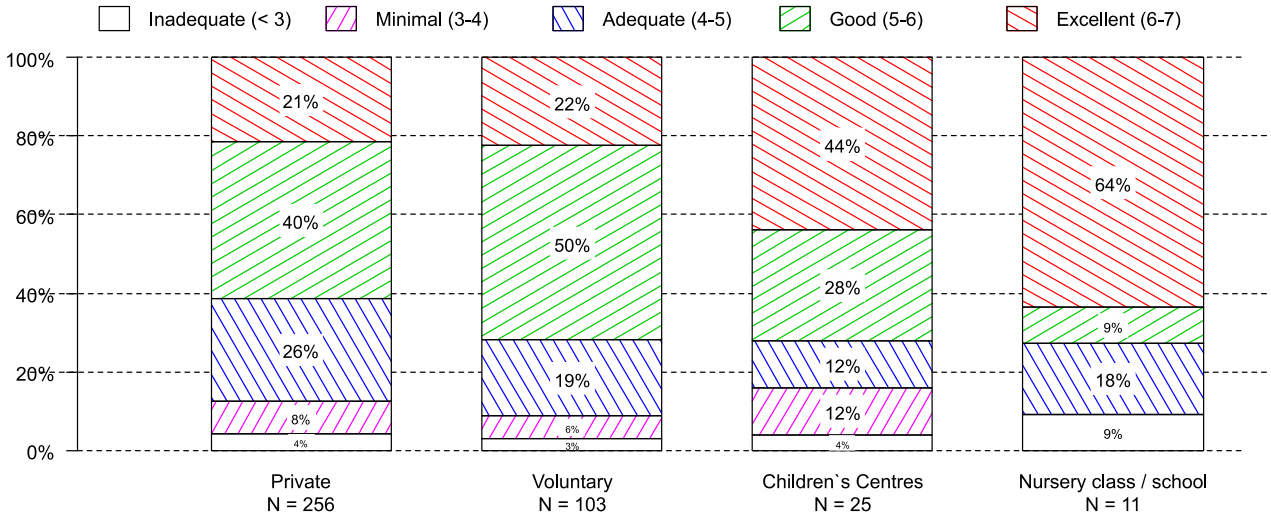
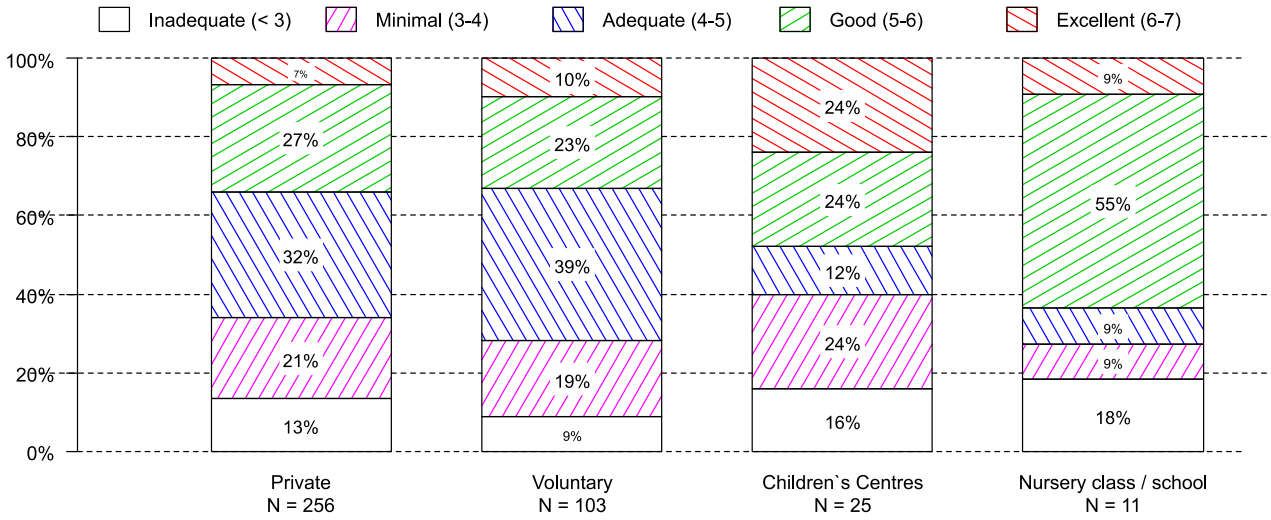


Figure 3: Breakdown by quality band of SSTEW scores for settings for two-year-olds by type.



Associations between structural characteristics and process quality for two-year-olds

Analyses examined which structural characteristics were predictive of higher quality scores using multivariate regression. Given observed structural differences between the setting types, separate analyses were performed for:

- Private settings
- Voluntary settings
- Children's centres

Associations are ordered below in reference to the strength of linear associations observed between structural characteristics and process quality.

Private Settings

The factors associated with higher quality at private settings were:

- Having a higher overall staff to child ratio (i.e. fewer children per staff member across the whole setting) was the strongest predictor of process quality. This factor was associated with higher scores on both the ITERS-R scale (overall quality) and the SSTEW scale (quality of staff / child interactions) and with achieving “good or better” scores on these scales.

- Having a minimum age of two for children accepted at the setting was associated with higher scores for both the ITERS-R (overall quality) and SSTEW (quality of staff / child interactions).

- Having a larger number of places at the setting was associated with higher scores for both ITERS-R (overall quality) and SSTEW (quality of staff / child interactions). This factor was also associated with an increased probability of achieving “good or better” ITERS-R scores and of achieving “excellent” SSTEW scores.

- Having a higher mean level of staff qualification was associated with higher scores on the SSTEW scale (quality of staff / child interactions). This factor was also associated with an increased probability of achieving “good or better” SSTEW scores and with an increased probability of achieving “excellent” ITERS-R scores (overall quality).

- Having a lower maximum age for children accepted at the setting was associated with higher ITERS-R scores (overall quality) and with an increased probability of achieving “good or better” ITERS-R scores.

- Where the childcare setting was on single site there was an increased probably of achieving “good or better” ITERS-R scores.

The results for private settings are summarized in Table 3.

Table 3: Summary of models of process quality in terms of structural characteristics (two-year-olds) for private settings.

Characteristics of ECEC settings; Private settings	Predictors of higher process quality		Predictors of excellent process quality		Predictors of good or better process quality	
	ITERS-R	SSTEW	ITERS-R	SSTEW	ITERS-R	SSTEW
Having a higher overall staff to child ratio (i.e. fewer children per staff member)	1	1			1	2
Having a higher mean level of staff qualification		3	1			1
Having a larger number of places	3	4		1	3	
Having a minimum age for children of two	2	2				
Having a lower maximum age for children	4				2	
Childcare setting is on single site					4	

For each model, statistically significant factors are ranked in order of effect size (1 = largest effect, 2 = second largest effect etc.). Different numbers of effects are seen for each model because only statistically significant effects are shown.
Higher process quality is measured as a continuous outcome measure, while excellent and good or better process quality are measured as categorical outcomes.

Voluntary Settings

The factors associated with higher quality at voluntary settings were:

- Not having specialist SEN/D provision was associated with higher scores for ITERS-R (overall quality), was the strongest predictor of higher scores for the SSTEW (quality of staff / child interactions) and was associated with an increased probability of achieving “good or better” scores on these scales.

- Having a staff training plan in place was the strongest predictor of higher scores on the ITERS-R scale (overall quality) and was associated with an increased probability of achieving “good or better” scores on this scale.

The results for voluntary settings are summarized in Table 4.

Table 4: Summary of models of process quality in terms of structural characteristics (two-year-olds) voluntary settings (predictor rank order)

Characteristics of ECEC settings; Voluntary settings	Predictors of higher process quality		Predictors of excellent process quality		Predictors of good or better process quality	
	ITERS-R	SSTEW	ITERS-R	SSTEW	ITERS-R	SSTEW
Setting does not have specialist SEN/D provision	2	1			1	1
Settings has a staff training plan in place	1				2	

For each model statistically significant factors are ranked in order of effect size (1 = largest effect, 2 = second largest effect etc.). Different numbers of effects are seen for each model because only statistically significant effects are shown. Higher process quality is measured as a continuous outcome measure, while excellent and good or better process quality are measured as categorical outcomes.

Children's Centres

The separate models for children's centres for two-year-olds found no statistically significant predictors of process quality among the structural characteristics. This may relate to the small sample size and relative homogeneity (i.e. limited range in quality scores) of these settings; a larger and more variable sample would be better able to detect any relationships that may exist.

Settings for three- to four-year-olds

The breakdown of three- to four-year-old ECEC settings by type is given in Table 5. The majority of settings for three- to four-year-olds were private or voluntary (74%), followed by nursery classes / schools (21%) and children's centres (4%). The small group of Local Authority nurseries (N = 4) were omitted from the analyses of process quality in terms of structural characteristics of settings.

Table 5: Breakdown of settings for three- to four-year-olds by type.

Type of setting	N	Percent
Private	302	51%
Voluntary	143	24%
Nursery Class / School	123	21%
Children's Centre	26	4%
Local Authority Nursery	4	0.7%
Total	598	100%

Structural characteristics of settings for three- to four-year-olds

Overview of settings

Some settings accepted children below two years of age (46%); and some only accepted children from two years upwards (54%). Sixty-three per cent of settings made specialist provision for children with special education needs and / or disabilities (SEN/D) whilst 37% did not. The mean overall staff to child ratio was 1 to 8.[10]

Staff characteristics

The most common level of Manager's qualification was Level 6, which is degree or NVQ Level 6 or equivalent. The average level of staff qualification across all settings was 3.2 (SD = 0.82) which is A-Level / NVQ Level 3 or equivalent. The percentage of staff replaced (staff turnover) had a mean of 11% (SD = 14.8), with 38% having replaced 10% or more) in the last year.

Continuing Professional Development (CPD), supervision and training

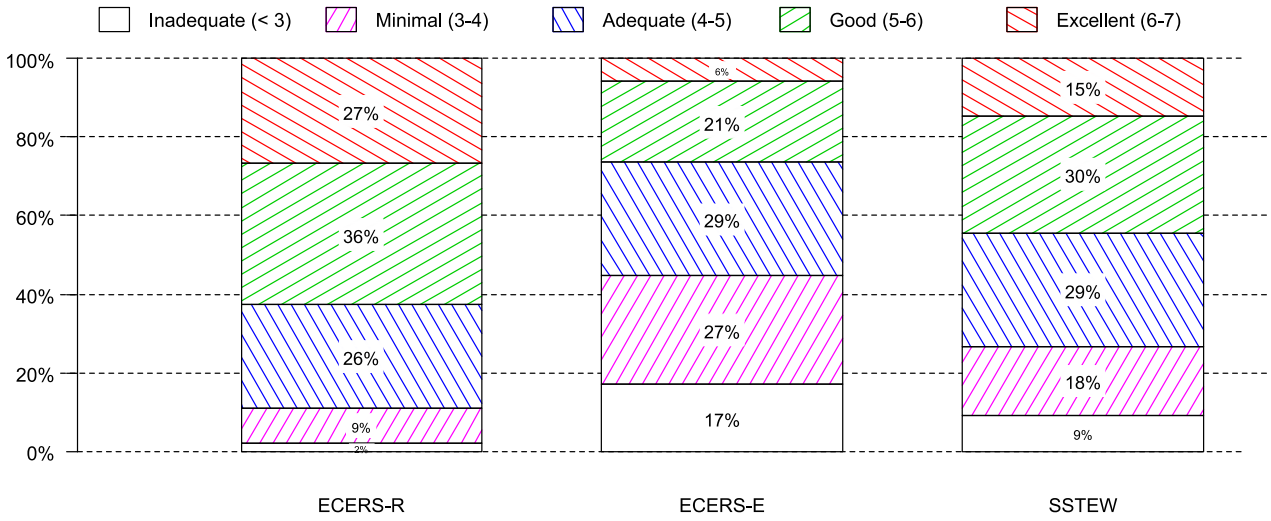
The frequency of CPD ranged from one to 24 times per year, mean 4.7 (SD = 4.0). The frequency of staff supervision ranged from weekly to annually. The mean number of supervisions per year was 8.7 (SD = 12.3). Eighty-six per cent of settings had a training plan in place, 14% did not. Fifty-six per cent of settings had a training budget, 44% did not.

Process quality of settings for three- to four-year-olds

Settings quality was usually at least adequate, with 89% of settings rated adequate or better on the Early Childhood Environment Rating Scale (ECERS-R), 56% rated adequate or better on the Early Childhood Environment Rating Scale: Extension (ECERS-E) and 74% rated adequate or better on the Sustained Shared Thinking and Emotional Well-being scale (SSTEW). See Figure 4.

[10] Details on statutory ratio requirements are available in the technical report Appendix D.

Figure 4: Breakdown of ECERS-R, ECERS-E and SSTEW scores settings for three- to four-year-olds by quality band.



On average, process quality scores tended to be higher at nursery classes / schools and at children's centres than at the private and voluntary settings. See Figures 5-7. Any differences between nursery classes and nursery schools cannot be established in this report due to small numbers of nursery schools.

Figure 5: Breakdown by quality band of ECERS-R for settings for three- to four-year-olds by type.

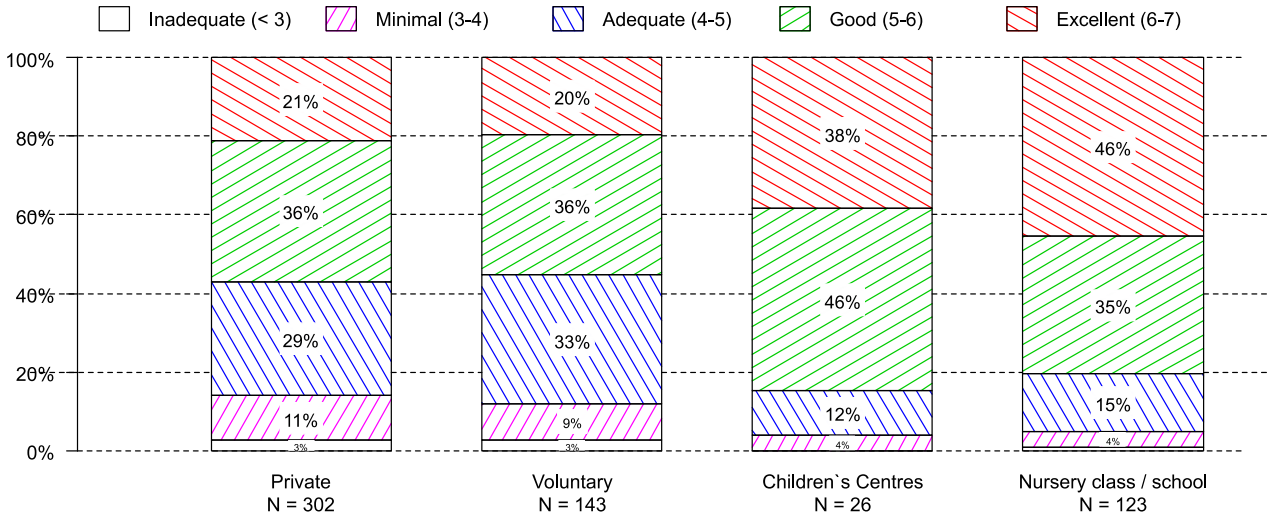


Figure 6: Breakdown by quality band of ECERS-E for settings for three- to four-year-olds by type.

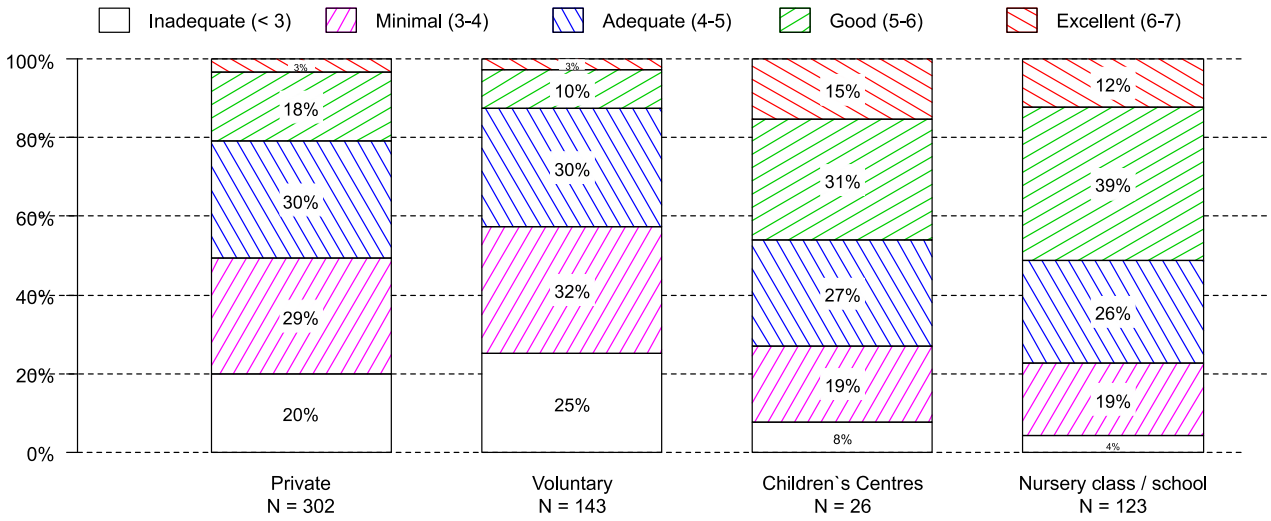
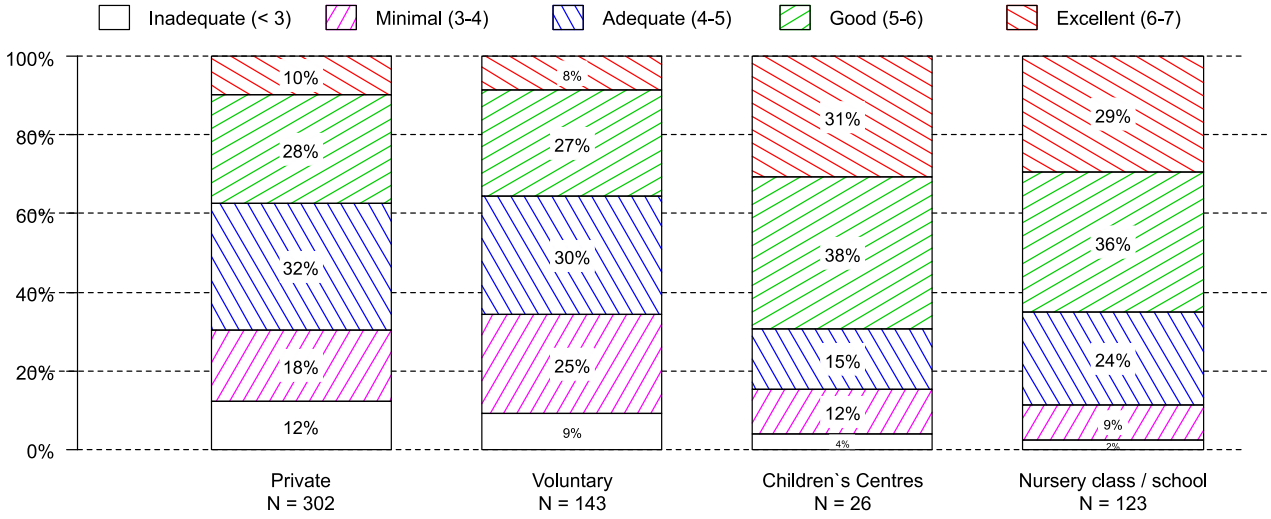


Figure 7: Breakdown by quality band of SSTEW for settings for three- to four-year-olds by type.



Associations between structural characteristics and process quality for three- to four-year-olds

Multivariate regression analyses were conducted to determine which structural characteristics were predictive of higher quality scores. Given observed structural differences between the setting type, separate analyses were performed for:

1. Private settings
2. Voluntary settings
3. Nursery classes / schools
4. Children's centres

Associations are ordered below in reference to the strength of linear associations observed between structural characteristics and process quality.

Private settings

The following factors were associated with higher quality at private settings:

- Having a higher mean level of staff qualification was the strongest predictor of higher scores for ECERS-R (overall quality), ECERS-E (educational quality) and SSTEW (quality of staff / child interaction). This factor was also associated with an increased probability of achieving "good or better" ECERS-R and SSTEW scores and of achieving "excellent" ECERS-R scores.

- Having a larger number of places at the setting was associated with higher scores for ECERS-R (overall quality), ECERS-E (educational quality) and SSTEW (quality of staff / child interaction). This factor was also associated with a higher probability of achieving "good or better" scores on these scales and with a higher probability of achieving "excellent" ECERS-E and SSTEW scores.

- Having a minimum age for children of two was associated with higher scores on the ECERS-R, ECERS-E and SSTEW scales and with an increased probability of achieving "good or better" scores on the ECERS-E and SSTEW scales.

- Having specialist SEN/D provision was associated with higher scores on the ECERS-E scale (educational quality).

- Having a higher overall staff to child ratio (i.e. fewer children per staff member across the whole setting) was associated with an increased probability of achieving "excellent" SSTEW scores (quality of staff / child interaction) and an increased chance of achieving "good or better" ECERS-R scores (overall quality).

- Having a lower frequency of staff continuing professional development (CPD) was associated with an increased probably of achieving "excellent" scores on the ECERS-R scale (overall quality).[11]

Factors associated with higher quality at private settings are summarized in Table 6.

[11] This may be an instance of "reverse causation"; i.e. those settings which are performing relatively less well may increase their frequency of staff CPD in an attempt to improve quality.

Table 6: Summary of models of process quality in terms of structural characteristics (three- to four-year-olds) private settings (predictor rank order).

Structural characteristics of ECEC settings (private settings)	Predictors of higher process quality			Predictors of excellent process quality			Predictors of good or better process quality		
	ECERS-R	ECERS-E	SSTEW	ECERS-R	ECERS-E	SSTEW	ECERS-R	ECERS-E	SSTEW
Setting has larger number of places	2	2	3		1	2	3	1	2
Setting has a higher mean level of staff qualification	1	1	1	1			1		1
Minimum age for children is two	3	3	2					2	3
Setting has a higher overall staff to child ratio (i.e. fewer children per staff member)						1	2		
Setting has a lower frequency of staff CPD				2					
Setting has specialist SEN/D provision		4							

For each model, statistically significant factors are ranked in order of effect size (1 = largest effect, 2 = second largest effect etc.). Different numbers of effects are seen for each model because only statistically significant effects are shown. Higher process quality is measured as a continuous outcome measure, while excellent and good or better process quality are measured as categorical outcomes

Voluntary settings

The factors associated with achieving higher quality at voluntary settings were:

- Having a staff training plan in place was the strongest predictor of higher scores on the ECERS-R scale (overall quality) and the SSTEW scale (quality of staff / child interaction). This factor was also associated with an increased probability of achieving “good or better” SSTEW scores.

- Having a higher staff to child ratio for three- to four-year-olds (i.e. fewer three- to four-year-olds per member of staff supervising this age group) was the strongest predictor of higher scores on the ECERS-E scale (educational quality) and was associated with an increased probability of achieving “good or better” scores on this scale.

- Having a higher overall staff to child ratio (i.e. fewer children per staff member across the whole setting) was associated with higher ECERS-R scores (overall quality).

- Not having specialist SEN/D provision was associated with an increased probability of achieving "excellent" ECERS-R scores (overall quality).

- Having a minimum age for children of zero to one accepted at the setting was associated with an increased chance of achieving "good or better" ECERS-E scores (educational quality).

The factors linked with higher quality at voluntary settings are summarized in Table 7.

Table 7: Summary of models of process quality in terms of structural characteristics (three- to four-year-olds) voluntary settings (predictor rank order).

Structural characteristics of ECEC settings (voluntary settings)	Predictors of higher process quality			Predictors of excellent process quality			Predictors of good or better process quality		
	ECERS-R	ECERS-E	SSTEW	ECERS-R	ECERS-E	SSTEW	ECERS-R	ECERS-E	SSTEW
Setting has a staff training plan in place	1		1						1
Setting has a higher staff to child ratio for three- to four-year-olds (i.e. fewer three- to four-year-olds per member of staff supervising this age group)		1						2	
Setting has a minimum age for children of zero to one								1	
Setting does not have specialist SEN/D provision				1					
Setting has a higher overall staff to child ratio (i.e. fewer children per staff member)	2								

For each model, statistically significant factors are ranked in order of effect size (1 = largest effect, 2 = second largest effect etc.). Different numbers of effects are seen for each model because only statistically significant effects are shown. Higher process quality is measured as a continuous outcome measure, while excellent and good or better process quality are measured as categorical outcomes.

Nursery classes / schools

Three factors emerged as statistically significantly associated with settings' achieving higher standards as measured by the ECERS-R, ECERS-E and / or SSTEW quality scales (see Table 6):[12]

[12] Sample size for nursery classes / school (and for children's centres) was insufficient to examine the relationship with the binary outcomes of 'good or better' or 'excellent' quality scores.

- Having a lower maximum age for children accepted at the setting was the strongest predictor of overall quality on the ECERS-R (overall quality) and was also a statistically significant predictor of scores on the ECERS-E (educational quality).

- Having a staff training budget in place was the strongest predictor of quality on the ECERS-E (educational quality) and the SSTEW (quality of staff / child interaction).

- Having a lower rate of staff turnover was also a statistically significant but less strong predictor of scores on the SSTEW (quality of staff / child interaction).

Table 8: Summary of models of process quality in terms of structural characteristics (settings for three- to four-year-olds) nursery classes / schools.

Structural characteristics of ECEC settings	Predictors of higher process quality		
	ECERS-R	ECERS-E	SSTEW
Having a lower maximum age for children	1	2	
Having a staff training budget in place		1	1
Having a lower rate of staff turnover			2

Statistically significant relationships between the process quality outcome and the structural characteristic covariate in the final multivariate regression model are numbered here in order of strength (1 = strongest relationship). Different numbers of effects are seen for each model because only statistically significant effects are shown. Higher process quality is measured as a continuous outcome measure.

Children's centres

Having a higher mean level of staff qualification was the only structural characteristic that was predictive of higher ECERS-R quality scores (overall quality). None of the structural characteristics of children's centres for three- to four-year-olds were statistically significant predictors of higher ECERS-E (educational quality) or SSTEW scores (quality of staff / child interaction). This may relate to the small sample size and relative homogeneity (i.e. limited range in quality scores) of these settings; with a larger and more variable sample it would generally be easier to detect any relationships between variables that may exist.

Comparing quality between the settings for two-year-old and for three- to four-year-old children

There was a small but statistically significant difference in mean SSTEW scores (quality of staff / child interaction) between the settings for two-year-olds and those for three- to four-year-olds. Mean SSTEW scores for settings for two-year-olds were 4.49, whereas mean SSTEW scores for settings for three- to four-year-olds were 4.70, although for both ages the mean score was within the 'adequate' range. Additional analyses suggest that this difference in quality was partly attributable to the higher levels of staff and manager qualification at the settings for three- to four-year-olds.

Comparing quality by region, settings type, area deprivation, and over time

ECEC setting quality showed considerable variation by region and by type of ECEC setting. The different distribution of types of ECEC settings by region partly explains the regional variations in quality.

There was little evidence of systematic variation in ECEC setting quality by Index of Multiple Deprivation, a measure of relative disadvantage of the areas in which settings are located.

The comparison of data from SEED and the Effective Provision of Pre-School Education (EPPE) Project[13] (data collected 1998-1999) indicated an increase in the quality of settings for three- to four-year-olds over time. An increase in the qualification level for both managers and staff in settings was also observed from when the EPPE Project interviews were carried out in 1998. It is probable that the increase of the qualification level of managers and staff is related to the rise in quality levels. There may be other factors related to the apparent rise in quality levels, such as the other structural characteristics that are linked to process quality in this report.

Conclusion

The findings indicate that process quality across all types of settings was generally sufficient, with adequate or greater ratings often seen in private and voluntary settings as well as nursery classes / schools and children's centre settings. Furthermore, quality appears to have improved in England over the past 16 years across settings. This may be associated with concurrent improvements in staff qualifications among other factors.

Although quality is generally high, some variation was observed by setting type and by age group. Nursery classes / schools, as well as children's centres, tend to score higher on process quality than private and voluntary settings which make up the majority of

[13] Sylva et.al, 1999a.

provision, although differences between nursery classes and schools cannot be established in this report due to limitations in the numbers of these settings. Furthermore, higher process quality scores on the SSTEW, a measure of quality of interactions between staff and children, were observed in three- to four-year-old settings than in two-year-old settings. These differences are partly explained by differences in the levels of staff and manager qualification. These findings indicate that, although quality is often adequate, there is scope to increase the quality of private and voluntary settings in particular. In addition, focussing on improving quality for two-year-old settings may be of particular importance.

A number of structural characteristics were identified that relate to process quality and may therefore be targets for change to improve ECEC quality. These include staff qualifications, staff training and turnover, staff to child ratios, the age range of children at settings, size of settings and whether or not settings offered specialist SEN/D provision. Variation was seen according to type of setting, i.e. whether settings were private, voluntary, nursery classes / schools or children's centres, as well as the age of children studied.

At private settings the strongest predictor of both quality measures for two-year-old settings was a higher overall staff to child ratio (i.e. fewer children per member of staff across the whole setting), while the strongest predictor of all quality measures for three- to four-year-old settings was a higher overall level of staff qualification. Other predictors of quality for both two- and three- to four-year-olds in private settings were a narrower age range (i.e. minimum age for children of two years accepted at the setting or a lower maximum age), and the setting having a larger number of places. Having specialist SEN/D provision was also associated with better educational quality at three- to four-year-old private settings.

For voluntary settings, a strong predictor of setting quality for both age groups was having a training plan in place. For the three- to four-year-old voluntary settings a higher overall staff to child ratio across the whole setting (i.e. fewer children per member of staff) was also associated with higher overall quality and a higher staff to child ratio for three- to four-year-olds (fewer three- to four-year-olds per member of staff) was associated with higher educational quality. One issue that may require further research is the association found at voluntary settings between not having specialist SEN/D provision and higher setting quality.

At nursery classes / schools a lower maximum age for children accepted at the setting was predictive of higher overall quality and educational quality, whilst having a training budget was associated with better educational quality and staff / child interactions. A lower rate of staff turnover was also significant for improved staff / child interactions for nursery class / schools.

Addressing these structural factors set out above may therefore be a route to improving the quality of early years provision.

Although regional variation in setting quality was observed, this partly relates to regional differences in the distribution of setting types since areas of lower quality appear to have more private and voluntary settings and fewer nursery classes / schools or children's centre settings. Furthermore, regional variation does not appear to relate to area deprivation, given that findings indicate that children in deprived areas are equally likely to receive good quality provision as children in less deprived areas. Given that previous studies have indicated variation in quality relating to area deprivation, this may indicate that efforts to address quality in deprived areas have been effective.

The findings from this study indicate that the quality of ECEC is generally high, and appears to have improved over time, potentially in response to a number of policy changes. Further, the findings have identified a number of potential structural characteristics of settings that might be targets for efforts to improve the quality of early years provision. In particular, the findings highlight the potential benefits of a focus on improving the quality of private and voluntary provision, as well as the quality of provision for two-year-olds. Although previous research in England has indicated a relationship between process quality and child cognitive development outcomes (Sylva et al., 2004, Melhuish et al., 2010), this report has focused on linking structural characteristics and process quality. Quality has not yet been linked with outcomes in the SEED study; this is a question that will be addressed in future SEED reports.

Chapter 1: Introduction

Background

Much is already known about the importance of early childhood education and care (ECEC). Previous studies have provided good evidence that ECEC is key to school readiness, long-term school attainment and lifelong outcomes (DfE, 2017; Sylva et al., 2008; 2012). But it is also known that just attending ECEC isn't enough to improve outcomes. The quality of the setting (e.g., nursery, pre-school, children's centre, childminder) and staff are important – children exposed to high quality ECEC have better developmental outcomes (e.g., Melhuish et al., 2015). This can be particularly important for disadvantaged children and narrowing the gap in development between them and their peers. Missing out on attending ECEC affects disadvantaged children more than advantaged children. For example, on average across OECD countries a socio-economically advantaged student who did not attend ECEC has an 8% probability of low performance in mathematics, whereas a disadvantaged student who did not attend has a 25% probability of low performance. This gap increases when other risk factors are also present (OECD, 2016).

Previous research on quality in early years provision

While people working in ECEC hold varying views on programme quality, two broad dimensions are identified consistently as facilitators of children's development and learning. They comprise: (a) process quality, which includes the quality of the curriculum, pedagogical practices and child experiences that support children's development; and (b) the structural characteristics of ECEC (e.g., adult-child ratios, staff qualifications, group size and characteristics of the physical space) (Early et al., 2007). Structural characteristics and process quality are often related. For example, the level of staff qualifications is frequently associated with measures of process quality, as in the EPPE study in England (Sylva et al., 1999a) and EPPNI study in Northern Ireland (Melhuish et al., 2006).

A number of studies have indicated the relationship between good quality ECEC and educational, cognitive, behavioural and social outcomes for children, both in the short and long term (e.g. Barnes and Melhuish, 2016; Lloyd and Potter, 2014; Melhuish, 2004; Smith et al., 2009; Sylva et al., 2004; Sylva et al., 2010). Furthermore, a number of structural characteristics of settings have been linked to the observed quality of provision as measured by direct observation of practice.

A key structural factor that has been strongly associated with quality of early years provision is staff and managers' qualifications (Karemaker et al., 2011; Mathers et al., 2007; Mathers and Smees, 2014; Roberts et al., 2010). Given these findings, there has been support to improve qualification levels in England (e.g. the Graduate Leader Fund) and some evidence has indicated the level of qualifications in the early years sector has indeed gone up (e.g. Simon et al., 2016; Brind et al., 2014). This increase in

qualifications may therefore be linked to increase in Ofsted quality ratings over time (Ofsted, 2015b).

Another characteristic that has been associated with better quality provision is higher staff-child ratios (Mathers et al., 2007; Roberts et al., 2010). For example, more children per staff member has been associated with lower quality of interactions in preschool settings (Karemaker et al., 2011). Detail on the statutory staff to child ratios for early years providers are available in the Technical Report, Appendix D.

Research has also indicated that the type of setting may be associated with the quality of provision. For example, the Millennium Cohort Study (Roberts et al., 2010) and the Effective Provision of Pre-school Education (EPPE) Project (Sylva et al., 1999b) have indicated higher quality in maintained settings.

Policy context

Based on a considerable body of research indicating the benefits of ECEC, over recent years successive policies have introduced universal provision, increased the number of hours of free entitlement and progressively reduced the age at which children become entitled to early years provision. Currently, all three- to four-year-old children in England are entitled to 570 hours of funded ECEC, available to all children from the term after their third birthday, and three- to four-year-old children of working parents[14] are entitled to an additional 570 hours.

In September 2013, children aged two and in the most disadvantaged households (those in receipt of specified benefits and looked after children) in England became eligible for 570 hours of funded ECEC per year (often taken as 15 hours per week for 38 weeks of the year). From September 2014 this funded provision was extended to include two-year-olds in moderately disadvantaged households in England (including low income families, children with Special Educational Needs or Disability (SEN/D), and children who have left care).

The requirements for early years settings and schools are set out in the *Statutory Framework for the Early Years Foundation Stage* (EYFS), which covers children from birth to age five (Department for Education, 2014) and has legal foundations in the Childcare Act 2006. One of the stated aims of the framework is ‘to provide quality and consistency in all early years settings, so that every child makes good progress and no child gets left behind’ (DfE, 2014: 5). The Government monitors the extent to which early years providers satisfy the requirements of the EYFS through inspections carried out by Ofsted using the Common Inspection Framework (since September 2015).[15]

[14] Earning or expecting to earn the equivalent to working 16 hours each week at the national minimum or living wage (and less than £100,000 a year).

[15] For more information about the Common Inspection Framework, see Ofsted (2015a).

The Study of Early Education and Development (SEED)

The Study of Early Education and Development (SEED) is a major longitudinal study that investigates the potential impact of ECEC on children's school readiness and longer-term outcomes, including the potential impact for the most disadvantaged children. It was commissioned by the Department for Education (DfE) and is being undertaken by a consortium of NatCen Social Research, the University of Oxford, Action for Children and Frontier Economics. This research will help the DfE provide more robust evidence regarding the long-term benefits of their investment in ECEC. This report addresses the relationship between structural and process aspects of quality, while future reports will address the ultimate aim of SEED to investigate whether quality of settings is related to child outcomes.

Research aims

The overall purpose of this component of SEED is to explore the relationship between the structural characteristics of settings and process quality.

The main objectives of this report are to explore:

- The distribution of quality of ECEC in different group settings for two-year-old and three- to four-year-old children in England.
- The relationship between the characteristics of a setting and the quality of care and education it offers.

Further results and supporting material can be found in the accompanying SEED technical report: "Study of Early Education and Development (SEED): Study of Quality of Early Years Provision in England: Technical Report (2017)".

Chapter 2: Methods

This chapter outlines the methods for this evaluation of quality in ECEC settings. This includes detail of the instruments used to measure process and structural quality and the procedure for data collection. Furthermore, details of the sample are outlined as well as detail on the different ECEC settings included. Finally, the analytical strategy is presented. Findings are presented in subsequent chapters.

Measures

Quality was measured in terms of two broad dimensions, process quality and structural characteristics.

Structural characteristics

Structural characteristics of ECEC include adult-child ratios, staff qualifications, group size and characteristics of the physical space.

In addition to the process quality assessment, a structured questionnaire was administered at each setting to gain additional information on structural characteristics. Prior to visiting the setting, this questionnaire was sent by email to the managers for them to fill out and return to the consultant carrying out the observation.[16]

Structured questions covered the following topics:

Setting background

- Setting on single site / multiple sites
- Number of places the setting is registered to offer
- Minimum age of children they are registered for
- Maximum age of children they are registered for
- Whether the site offers specialist SEN/D provision

Staff characteristics

- Mean level of staff qualification (relevant to working with children and young people)
- Manager's highest qualification (relevant to working with children and young people)
- Percentage of staff replaced in last year (staff turnover)

[16] The complete questionnaire is given in Appendix B of the Technical Report.

Staff to child ratios

- Staff to child ratios for under twos, two-year-olds, and three- to four-year-olds (i.e. the number of staff relative to the number of children in a given room or setting). The age specific ratios were reported by the ECEC providers. They represent the minimum staff to child ratios for each age group which the setting provides (or aims to provide). They are strongly influenced by the statutory minimum staff to child ratios for a given age group and they show relatively little variation between settings.[17]

- We also considered the overall staff to child ratio, derived from the total number of staff at the setting and the total number of places for children at the setting. This is a more empirical measure of the staff to child ratio at a setting than the provider reported age specific staff to child ratios.

Staff training or professional development activities

- Training plan in place (yes, no)
- Training budget in place (yes, no)
- How frequently staff typically attend continuing professional development (CPD), e.g., workshops or other activities (monthly, quarterly, bi-annually or less)
- Frequency of staff supervision (weekly, monthly, quarterly, annually or other)

Staff Levels of Qualification[18]

Level 1: GCSE D-G / NVQ Level 1 or equivalent

Level 2: GCSE A*-C / NVQ Level 2 or equivalent

Level 3: A-Level / NVQ Level 3 or equivalent

Level 4: Certificate of Higher Education (CertHE) / NVQ Level 4 or equivalent

Level 5: Diploma of Higher Education (DipHE) / NVQ Level 5 or equivalent

Level 6: Degree (BA / BSc) / NVQ Level 6 or equivalent

Level 7: Master's degree (MA, MSc) / NVQ Level 7 or equivalent

Level 8: Doctorate (PhD, DPhil)

[17] The minimum staff to child ratios for settings in the study are as described in the EYFS statutory framework available in Appendix D of the Technical Report.

[18] Further detail on qualification levels available in the associated Technical Report, Appendix D.

Process quality

Process quality includes the quality of the curriculum, pedagogical practices and child experiences that support children's development. Instruments were selected according to the age group. All the process quality scales in this study use a 1-7 scale, with 1 (inadequate), 3 (minimal), 5 (good), and 6+ (excellent).

Process quality was assessed for two-year-old children using two measures:

- The revised Infant-Toddler Environment Rating Scale (ITERS-R)
- The Sustained Shared Thinking and Emotional Wellbeing scale (SSTEW)

For three- to four-year-old children three measures were used:

- The revised Early Childhood Environmental Rating Scale (ECERS-R)
- The curricular extension ECERS-E
- The Sustained Shared Thinking and Emotional Wellbeing scale (SSTEW)

These measures have been selected because they are commonly used internationally and in England for quality assessments of ECEC settings and have high levels of inter-rater reliability, which indicates that different observers produce closely similar scores (Clifford et al., 2010, Whitebread et al., 2015). These methods have proved to be relatively successful in predicting later child outcomes (Sylva et al., 2004; Howard et al., 2017), and / or capturing key elements of quality (Siraj, Kingston & Melhuish, 2015; Otero & Melhuish, 2015).

An overview of these scales is given in Table 9.[19]

[19] More information can be found in Appendix A of the Technical Report.

Table 9: Overview of the process quality scales.

The ITERS-R is an overall measure of quality, and was used in the SEED study to assess settings for two-year-old children across 6 domains:

I. Space and Furnishings
II. Personal Care Routines
III. Listening and Talking
IV. Activities
V. Interaction
VI. Program Structure

The ECERS-R is an overall measure of quality, and was used in the SEED study to assess settings for three- to four-year-old children across 5 domains:

I. Personal Care Routines
II. Language Reasoning
III. Activities
IV. Interaction
V. Programme Structure

The ECERS-E focuses on the educational aspects of experience, and was used in the SEED study to assess settings for three- to four-year-old children across 3 domains:

1. Literacy
2. Mathematics
3. Diversity

The SSTEW focuses on the quality of interactions between staff and children, and was used in the SEED study to assess settings, both for two-year-old as well as three- to four-year-old, across 5 domains:

I. Building Trust, Confidence and Independence
II. Supporting and Extending Language and Communication
III. Supporting Emotional Well-being
IV. Supporting Learning and Critical Thinking
V. Assessing Learning and Language

Procedure

From May 2014 to April 2016, 1000 visits were completed: 402 room visits for settings for two-year-olds and 598 room visits for settings for three- to four-year-olds.

A group of experienced consultants conducted these observational assessments of ECEC providers. They had to be qualified teachers and / or had to have a high level qualification relevant to working with children, as well as being trained in the implementation of the SSTEW, ITERS-R, ECERS-R and ECERS-E.

More information on assessment procedures can be found in the Technical Report: Appendix C.

Sample

The sample was recruited as a subgroup of settings included in the larger SEED longitudinal study. The SEED sample of group settings for ECEC is currently the most representative sample of early years group settings in England available.[20]

Families were selected from the full range of the socio-economic spectrum. In line with the two-year-old offer of 15 hours of free ECEC for disadvantaged families, the families were sampled to provide approximately:

- A third of families in the lowest quintile by family disadvantage, as defined by receipt of specified benefits and looked after children (i.e. approximately the 20% most disadvantaged families).
- A third of families in the next to lowest quintile, including low income families, children with SEN/D, and children who have left care, (i.e. approximately the 20-40% most disadvantaged families).
- A third of families in the other more affluent quintiles (i.e. approximately the 60% least disadvantaged families).

Clustering of children in settings

The sampling approach adopted for the SEED longitudinal study of children was intended to cluster families in postcode sectors. This was intended to maximise the number of children that might use a specific setting, and therefore the number of children about whom data could be collected on the quality of the early years provision they attend.

Sampling strategy

The list of ECEC settings to be sampled was obtained from the parent interviews carried out when the child was two years old, as part of Wave 1 of the SEED longitudinal study. Parents informed the interviewer of the setting(s) that the child was attending at the time. This list contained the number of children in the SEED study attending a particular setting. Providers with more children in the SEED longitudinal study were prioritised.

The sample was stratified by provider type:

[20] A representative sample for the SEED study was selected from Child Benefit records, the most appropriate universal sample frame at the time. Families were geographically clustered. See SEED Baseline Report 2015 for further details about the sampling design for families (Speight et al., 2015).

- Nursery class
- Nursery school
- Private nursery and / or pre-school (including on school site)
- Voluntary nursery and / or pre-schools (including on school site)
- Independent nursery / nursery class
- Children's centre
- Local Authority (LA) nursery

The number of settings selected in each type was chosen to provide a similar percentage to the overall number of settings in that category as used by the longitudinal sample of families. The sample was therefore broadly in proportion with numbers of places of each type being used by children in the longitudinal study. When a provider did not wish to participate in the study it was replaced with the same type of provider in the same geographical area, wherever possible. The sample of settings in this study was designed to maximise the number of children in the SEED longitudinal survey for whom matching settings quality data would be available. Given that SEED uses a national sampling frame, the sample was distributed across England, however proportional representativeness of settings within regions was not a part of the sampling strategy.

Summary of the different types of provision

All the provision within the SEED study operates under the Statutory Framework for the Early Years Foundation Stage (Department for Education, 2014). The ECEC settings can be divided into seven types, which are distinguishable by funding source, operational characteristics and accessibility. The sample aimed to study only formal group ECEC settings. The characteristics of childminder settings are reported in more detail in a previous SEED report (Otero & Melhuish, 2015).

Nursery class – A maintained early years class within a primary school with a qualified teacher present. Children usually attend either a 3-hour morning or afternoon session and some schools offer the option to stay for lunch and attend both sessions.

Nursery school – A maintained school specifically for children in their early years with a qualified teacher present. Children usually attend either a 3-hour morning or afternoon session and some schools offer the option to stay for lunch and attend both sessions.

Private nursery and / or pre-school – Privately owned provision that includes both full day care and sessional care. It could be privately owned by an individual or by a larger organisation / chain. These settings will be incorporated and registered with Companies House. Some private provision is run on a school site, some from separate premises.

Voluntary nursery and / or pre-schools – These settings are run by a charity or voluntary management committee on a not-for-profit basis. They include both full day care and sessional care. If the organisation is incorporated it will be registered with the Charity Commission. Some smaller provision could be unincorporated and be run by a local committee. Some voluntary provision is run on a school site, some from separate premises (these have been sub-classified for the SEED study).

Independent nursery / nursery class – This operate within the independent schools sector, and this type of early years provision is run by an Independent School and delivered on site. It can be full day care or sessional, depending on the arrangement of the individual school.

Children's centre - Children's centres are governed in various different ways: by the Local Authority, by the School Governing Body (if on a school site), by a charity, or by a private provider. They offer all families with children under five a range of services, information and support in their local community. Some offer full day care and some offer sessional provision. children's centres in the SEED study have ECEC provision on site that is run by the children's centre. (Note: early years provision associated with children's centres provided by external providers was classified as either private or voluntary.)

Local Authority nursery – These nurseries were operated by Local Authorities, and full day care or sessional provision was delivered with staff members employed by the Local Authority. They have been decreasing in numbers in the last 15 years.

Response rates

Of the settings approached according to the sampling strategy described earlier, the overall participation rate was 75%. Reasons for non-participation included an OFSTED inspection being due, staff change / shortage, or because the timing of the visit was inconvenient. There is a chance that providers who volunteered to participate differed from those who declined, which may introduce some bias in the sample compared to a completely random sample of ECEC centres in England. However, given that the sample is large and broadly representative of the population and setting types in England, and because the participation rate was of an acceptable level, it is unlikely to have introduced a large amount of bias in to the findings.

Analytical Strategy

Findings are presented separately for two-year-old settings and for three- and four-year old settings as these settings differ in their characteristics and different measures of process quality were used. Analyses were carried out using IBM SPSS version 22 and R 3.2.5.

Structural and process quality across settings

- Descriptive statistics are presented for setting structural characteristics as well as process quality overall scale averages and individual sub-scales.

- Comparison of whether process quality scores were significantly different between setting types, using private settings as the reference (comparison) category, considered process quality is both a continuous score (i.e. along a continuum) using linear regression as well as a binary rating of whether scores were "excellent" (6 and above) or "good or better" (5 and above) using logistic regression.

- Comparison of whether structural characteristics were significantly different between setting types, using private settings (the largest group) as the reference category, used Wilcoxon rank sum tests for continuous variables and Chi-square tests for binary variables.[21]

Relationships between structural and process quality

Univariate Analyses

Initial univariate analyses examined the relationship between structural characteristics and process quality measures. Univariate analyses consider the relationship without controlling for any other factors.

The association between structural characteristics and mean process quality scores were examined using Kendall's tau correlation coefficient (continuous structural characteristics) and the Wilcoxon test (binary structural characteristics).

Multivariate Analyses

Subsequent multivariate analysis examined the relationship between structural characteristics and process quality measures. Multivariate analyses enable the effects of all other variables to be controlled for when calculating the effect of a variable.

Due to structural differences observed between types of settings, multivariate analyses for two-year-olds analyses were carried out separately for private settings, voluntary settings and children's centres.[22] For three- to four-year-olds analyses were carried out separately for private settings, voluntary settings, nursery classes / schools, and for children's centres.

Because it is useful to understand what factors generally improve quality overall, but also which factors are related more specifically to 'good or better' or 'excellent' quality scores, structural characteristics were considered as predictors of process quality in three ways:

[21] A continuous variable is a variable along a continuum (e.g. age), while a binary variable has two discrete categorical responses (e.g. yes or no).

[22] No analysis was carried out for two-year-old local authority nurseries or for nursery classes / schools because of their small sample size and because their distinct setting characteristics meant they could not easily be combined with other setting types,

1. Predictors of overall process quality treated as a continuous variable were examined using multiple linear regression (i.e. which characteristics are associated with higher quality scores).

2. Predictors of excellent process quality provision (scores 6 and above) were examined using binary logistic regression.

3. Predictors of good and above process quality provision (scores 5 and above) were examined using binary logistic regression.

The binary models of "excellent" and "good or better" outcomes could only be fitted where there was a reasonably large sample size. In practice this meant that these models were fitted for private and voluntary settings only.

"Number of staff at setting" was not included as a predictor in the analysis since as the relationship of this variable to "number of places at setting" and "overall staff to child ratio" would have made model interpretation difficult. It was also decided to omit "manager's highest qualification" because collinearity with "mean level of staff qualification" might make interpretation of results difficult.[23]

Comparing quality by region, setting type, area deprivation and over time

- Variation in the quality of settings by government office region, type of ECEC setting and area deprivation (Index of Multiple Deprivation; IMD) was investigated.

- Comparisons were also made with comparable structural and process quality data from the EPPE study, conducted prior to the 2004 Children Act and universal state-funded provision for three- to four-year-olds (EPPE quality data is not available for two-year-olds).

Reporting of statistically significant effects

Throughout the report, effects are reported as "statistically significant" if they are significant at the 5% level, i.e. $p < 0.05$. A statistically significant association is one where we are confident there is a true difference in the data.

A note on causation

Although this study is observational in nature, overall it appears that structural factors having a causal effect on process quality (directly or indirectly) is the most likely interpretation of any associations found, although it is possible that in some cases there may also be unobserved mediating factors, e.g., a higher staff to child ratio might

[23] Collinearity is a phenomenon in which two or more predictor variables in a multiple regression model are highly correlated which can lead to mis-estimation of results.

improve staff morale (a factor not observed), which might in turn improve process quality. Further, there may be unknown external factors influencing both structural factors and process quality. [24]

[24] Further consideration of causal processes is available in the Technical Report.

Chapter 3: Structural characteristics and process quality: two-year-olds

Key Findings for two-year-olds

- Most settings of all types achieved at least adequate levels of process quality. While children's centres and nursery classes / schools were more likely to achieve an excellent rating on at least one of the ITERS-R (overall quality) and SSTEW (quality of staff / child interaction) measures of ECEC setting process quality than were the private and voluntary ECEC settings, they were only a small percentage of the ECEC settings for two-year-old children in the study. Their higher scores were in part explained by structural differences between different types of settings, including staff qualification levels.

- The predictors of high quality at private settings were:
    - Having a higher overall staff to child ratio (i.e. fewer children per member of staff across the whole setting).
    - Having a minimum age for children of two.
    - Having a larger number of places at the setting.
    - Having a higher mean level of staff qualification.
    - Having a lower maximum age for children at the setting.
    - The childcare setting being on a single site.

- The predictors of high quality at voluntary settings were:
    - The setting not having specialist SEN/D provision.
    - Having a staff training plan in place.

Introduction

This chapter presents the findings from analysis for two-year-old ECEC settings. Structural characteristics and measures of process quality will be presented, as well as consideration of the differences in these factors across settings. Furthermore, relationships between structural characteristics and process quality are presented to consider which structural characteristics are associated with generally higher levels of process quality and which are associated with achieving good or excellent scores on process quality measures.

Structural characteristics of ECEC settings for two-year-olds

Overview of settings

Type of setting

A breakdown of the settings for two-year-olds by type is given in Table 10. Private or voluntary settings were attended by 89% of children. Only 6% attended children's centres, 3% attended nursery classes / schools and less than two per cent attended Local Authority nurseries.

Table 10: Breakdown of settings for two-year-olds by type.

Type of setting	N	Percent
Private	256	64%
Voluntary	103	26%
Children's Centre	25	6%
Local Authority Nursery	7	2%
Nursery Class	5	1%
Nursery School	6	2%
Total	402	100%

Single / multiple sites

Of the 402 settings, 271 (68%) were on a single site, 130 (32%) were distributed over multiple sites (data not given for one setting).

Number of places provided

The number of places provided ranged from 4 to 188. The mean was 55.6 (SD = 32.4).[25]

Table 11: Distribution of number of places (of all ages) at settings

Number of places	N	%
≤ 20	28	7%
21 to 40	126	31%
41 to 60	112	28%
61 to 100	93	23%
> 100	39	10%
Not given	4	1%
Total	402	100%

[25] Standard deviation (SD) is a number used to tell how measurements for a group are spread out from the average (mean), or expected value. A low standard deviation means that most of the numbers are very close to the average. A high standard deviation means that the numbers are spread out.

Minimum age of children

Most settings accepted children from under two years of age (66%), and some only accepted children from two years of age upwards (34%). The reported minimum and maximum age ranges for settings represent settings' policy. Practice differed from policy in some cases, leading to some two year olds attending settings where the minimum age was given as three.

Table 12: Minimum age from which settings accepted children.

Minimum age of children	N	Percent
0	260	65%
1	5	1%
2	132	33%
3	5	1%
Total	402	100%

SEN/D provision

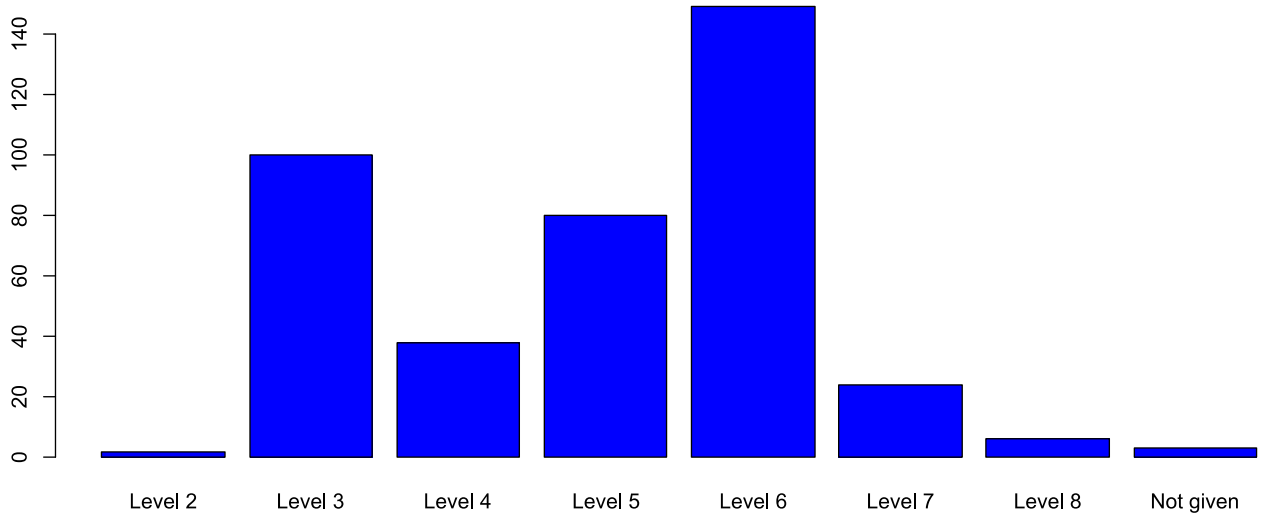
Of the 402 settings, 247 (63%) made specialist provision for children with special education needs and / or disabilities (SEN/D) whilst 150 (37%) did not, aside from the five settings for which information was unavailable.

Staff characteristics across the setting

Manager's highest relevant qualification

Manager's highest relevant qualification was between Level 2 and Level 8 (see Figure 8), mean level 4.9 (SD = 1.4). The most common level of qualification was Level 6, which is degree or NVQ Level 6 or equivalent. [26]

Figure 8: Manager's highest level qualification.



[26] A brief description of the levels of qualification is available in Chapter 2, with further detail available in the associated Technical Report, Appendix D.

Managers' additional qualifications

In 16 cases (4%) managers had additional specialist qualifications (see Table 10).

Table 13: Managers' additional qualifications.

Additional qualification	N	Percent
Early Years Professional Status	14	4%
National Professional Qualification of Integrated Children Centre	1	0.2%
Early Years Teacher	1	0.2%
No additional qualification	386	96%
Total	402	100%

Number of staff

The number of staff ranged from 2 to 63, with a mean of 14.4 (SD = 8.8).

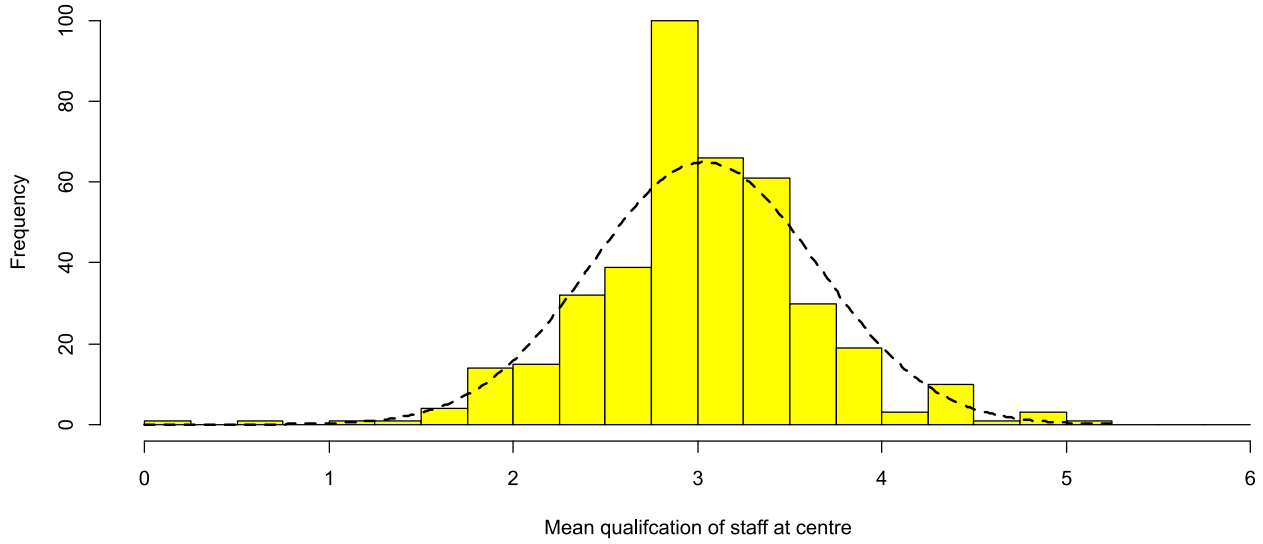
Table 14: Distribution of number of staff at settings.

Number of staff	N	Percent
1-5	47	12%
6-10	121	30%
11-15	90	22%
16-20	62	15%
21-30	53	13%
> 30	29	7%
Total	402	100%

Mean relevant qualification level of staff

The research team collected data on the number of staff qualified to Levels 1 to 8 or with no qualifications. The mean level of staff relevant qualifications for settings was 3.0 (A-Level / NVQ Level 3 or equivalent). The standard deviation was 0.62. See Figure 9.

Figure 9: Histogram showing the distribution of staff qualifications.



Percentage of staff replaced during the last year

The percentage of staff replaced during the last year is a measure of staff turnover; across all settings this had a mean of 11% (SD = 12.6), with 42% having staff turnover of 10% or greater.

Table 15: Percentages of staff replaced in previous year at settings.

% staff replaced in previous year	N	Percent
< 10%	234	58%
10% to < 25%	128	32%
25% to < 50%	34	9%
50% to 100%	5	1%
Not given	1	0.2%
Total	402	100%

Staff to child ratio

The staff to child ratio was recorded for three age groups: children under two years, children aged two years and children aged three to four years.

Staff to child ratio, children aged under two years

In 94% of cases where the ratio was recorded, the staff to child ratio for under twos was 1:3.

Table 16: Staff to child ratios: children under two years old.

Staff to child ratio	N	Percent
1:2	7	2%
1:2.5	2	0.5%
1:3	246	61%
1:4	7	2%
Not given[27]	140	35%
Total	402	100%

Staff to child ratio, children aged two years

The staff to child ratio for children aged two varied little; in 92% of cases where a ratio was recorded it was 1:4.

Table 17: Staff to child ratios: two-year-olds.

Staff to child ratio	N	Percent
1:2	5	1%
1:3	19	5%
1:4	365	91%
1:5	3	0.7%
1:6	3	0.7%
Not given	7	2%
Total	402	100%

Staff to child ratio, children aged three to four years

The number of children, aged three to four years, per member of staff varied from 2 to 13, mean 7.6 (SD = 1.4).

Table 18: Staff to child ratios: three- to four-year-olds.

Staff to child ratio	N	Percent
1:2 to 1:4	18	5%
1:5 to 1:7	55	14%
1:8	308	77%
1:9 to 1:13	15	4%
Not given	6	2%
Total	402	100%

[27] Where this ratio was not given the setting did not provide ECEC for children under 2.

Overall staff to child ratio

The overall staff to child ratio was the number of places at a setting divided by the total number of staff. The mean overall staff to child ratio was 1 to 4.5 (SD = 2.3).

Table 19: Overall staff to child ratio.

Overall staff to child ratio	N	Percent
1:<3	79	20%
1:3 to 1:<4	127	32%
1:4 to 1:<5	72	18%
1:5 to 1:<6	52	13%
1:6 or more	66	16%
Missing	6	2%
Total	402	100%

Continuing Professional Development (CPD) and supervision across the setting

Frequency of staff CPD

How frequently staff typically attend CPD (workshops or other activities) ranged from 1 to 24 times per year, mean 4.8 (SD = 4.1).

Table 20: Frequency of CPD at settings.

Frequency of CPD	N	Percent
Twice monthly	1	0.2%
Monthly	86	21%
Twice termly	5	1%
Termly	201	50%
Twice annually	74	18%
Annually	25	6%
Not given	10	3%
Total	402	100%

Frequency of staff supervision

The frequency of staff supervision ranged from annually to weekly. The mean number of supervisions per year was 8.7 (SD = 11.0).

Table 21: Frequency of staff supervision.

Frequency of staff supervision	N	Percent
Weekly	21	5%
Twice Monthly	2	0.5%
Monthly	98	24%
Twice termly	59	15%
Quarterly	132	33%
Termly	45	11%
Twice annually	5	1%
Annually	36	9%
Not given	4	1%
Total	402	100%

Staff training across the setting

Training plan in place

350 settings (87.1%) had a training plan in place, 50 settings (12.4%) did not (data not given for two settings).

Training budget

182 settings (45.3%) had a training budget, 219 settings (54.5%) did not (data not given for one setting).

Process quality of ECEC settings for two-year-olds

Process quality was measured using the Infant / Toddler Environment Ratings Scale (ITERS-R) as an overall measure of quality of ECEC settings for two-year-olds, and the Sustained Shared Thinking and Emotional Well-being scale (SSTEW), which focuses on the quality of interactions between staff and children. Further detail on these measures is available in Chapter 2. Both quality scales use a 1-7 scale, with 1 (inadequate), 3 (minimal), 5 (good), and 6+ (excellent).

Distribution of process quality scales and sub-scales

ITERS-R scale (overall quality)

The means of the six ITERS-R sub-scales are given in Table 22. The mean value of ITERS-R across all 402 settings for two-year-olds was 5.25 (good). The means for the six ITERS-R sub-scales were similar, ranging from a low of 4.75 (Activities) to a high of 5.55 (Interaction).

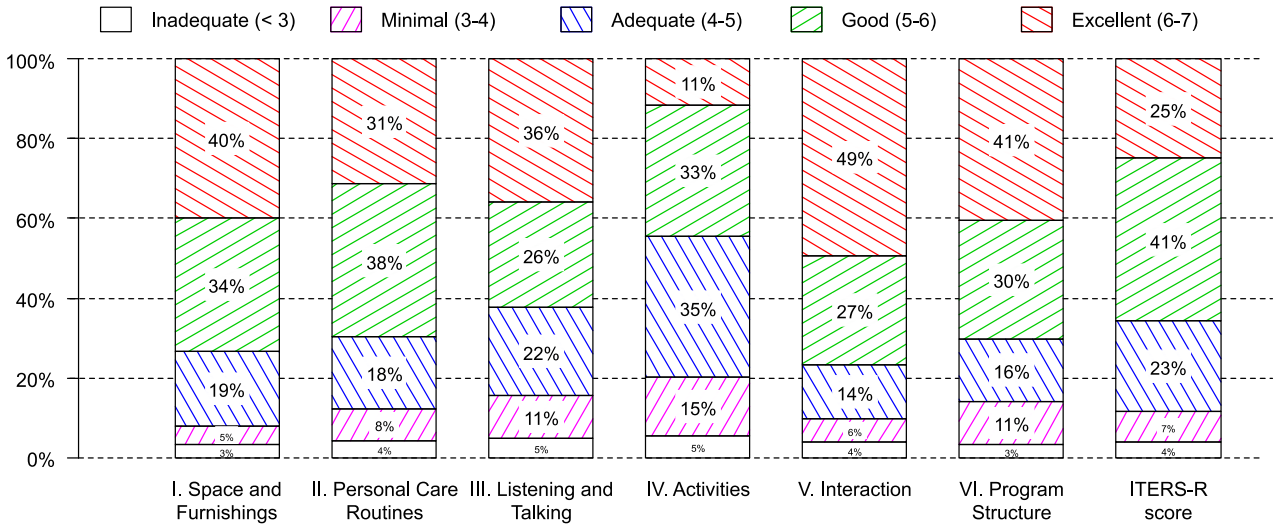
Table 22: Means and standard deviations for ITERS-R sub-scales (overall quality)

ITERS-R sub-scales	Mean	SD
I. Space and Furnishings	5.46	1.06
II. Personal Care Routines	5.26	1.15
III. Listening and Talking	5.13	1.25
IV. Activities	4.75	1.01
V. Interaction	5.55	1.14
VI. Program Structure	5.37	1.24
Overall ITERS-R score	5.25	0.99

ITERS-R is measured on a 1 to 7 scale with 1(inadequate), 3 (minimal), 5 (good) and 6+ (excellent).

Figure 10 shows the distribution of the ITERS-R scores classified into five levels of quality. These categories are: “inadequate (< 3)”, “minimal (≥ 3 and < 4)”, “adequate (≥ 4 and < 5)”, “good (≥ 5 and < 6)” and “excellent (≥ 6)”. It can be seen that a vast majority of settings (89%) were rated adequate on the ITERS-R, with almost two-thirds (66%) receiving a good or excellent score.

Figure 10: Breakdown of ITERS-R scores by quality band for sub-scales and overall score.



SSTEW scale (quality of interactions)

The means of the five SSTEW sub-scales are given in Table 23. The mean SSTEW score across the settings for two-year-olds was 4.49 (adequate). The lowest mean score was for the Supporting Learning and Critical Thinking sub-scale (mean = 3.65); the highest was for Supporting and Extending Language and Communication (mean = 4.95).

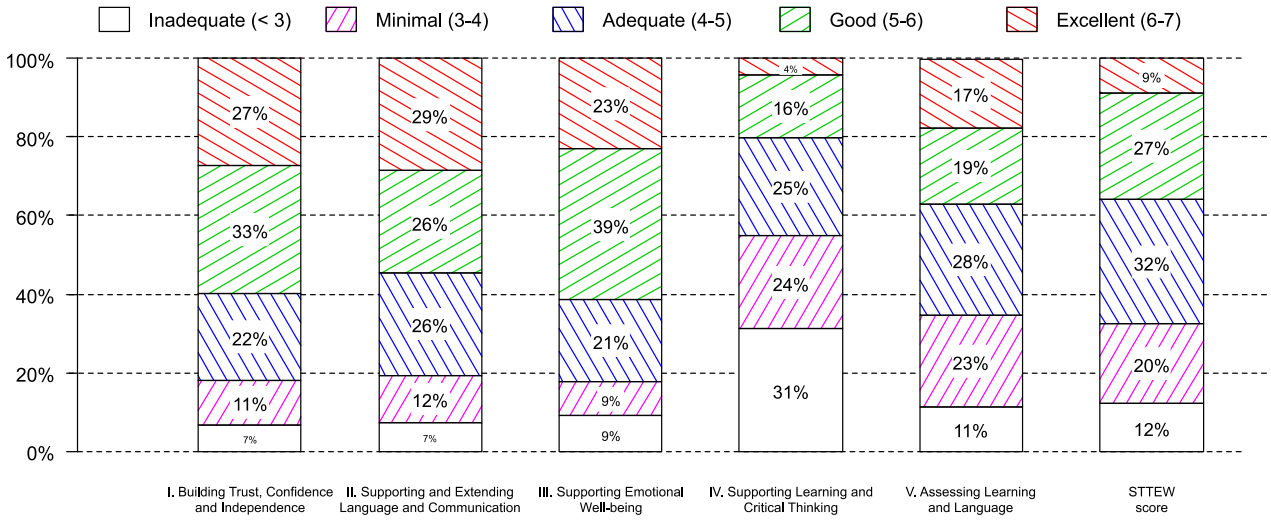
Table 23: Means and standard deviations for SSTEW sub-scales (quality of interactions)

SSTEW sub-scales	Mean	SD
I. Building Trust, Confidence and Independence	4.94	1.27
II. Supporting and Extending Language and Communication	4.95	1.30
III. Supporting Emotional Well-being	4.62	1.29
IV. Supporting Learning and Critical Thinking	3.65	1.29
V. Assessing Learning and Language	4.30	1.34
Overall SSTEW score	4.49	1.16

SSTEW is measured on a 1 to 7 scale, with 1(inadequate), 3 (minimal), 5 (good) and 6+ (excellent).

Figure 11 shows the distribution of the SSTEW scores classified into five levels of quality. These categories are: “inadequate (< 3)”, “minimal (≥ 3 and < 4)”, “adequate (≥ 4 and < 5)”, “good (≥ 5 and < 6)” and “excellent (≥ 6)”. It can be seen that over two-thirds of settings (68%) had an adequate or above score of quality of interactions between staff and children (SSTEW score), with over a third (36%) receiving a good or excellent score. The Supporting Learning and Critical Thinking sub-scale stands out, with a higher percentage of settings having minimal or inadequate performance on this sub-scale.

Figure 11: Breakdown of SSTEW scores by quality band of sub-scales and overall score.



Process and structural quality by provider type in two-year-old settings

Comparing process quality by type of setting for two-year-old settings

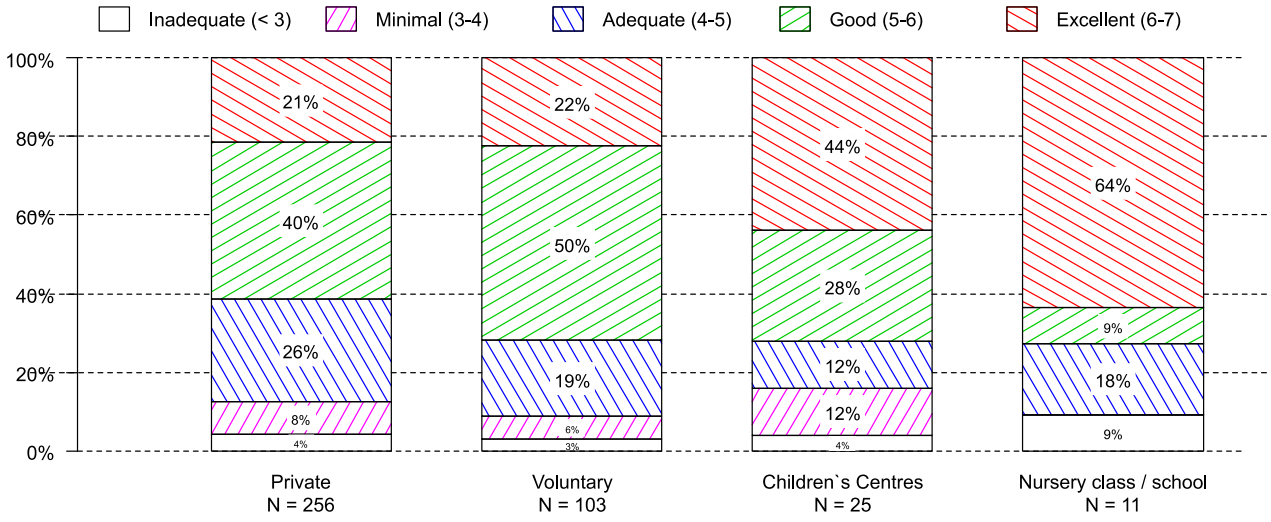
A breakdown of settings for two-year-olds by type is shown in Table 10. For the purpose of this analysis, the Local Authority nurseries were a distinct type of setting that could not

easily be combined with other settings[28] and were omitted, as the low numbers (N = 7) would make a separate analysis of these settings unreliable, and as they were distinctly different to other types of setting combining them with other settings for analysis would be inadvisable. Nursery classes and nursery schools have similarities in their staffing, regulations and relationship to the education system, and hence were combined into a single “nursery class / school” category to give adequate numbers for analysis. This report is therefore unable to establish any differences between the two. Means and standard deviations of process quality scores by settings type are given in Table 24.

Table 24: Means and standard deviations (SD) of process quality scores by type (two-year-olds).

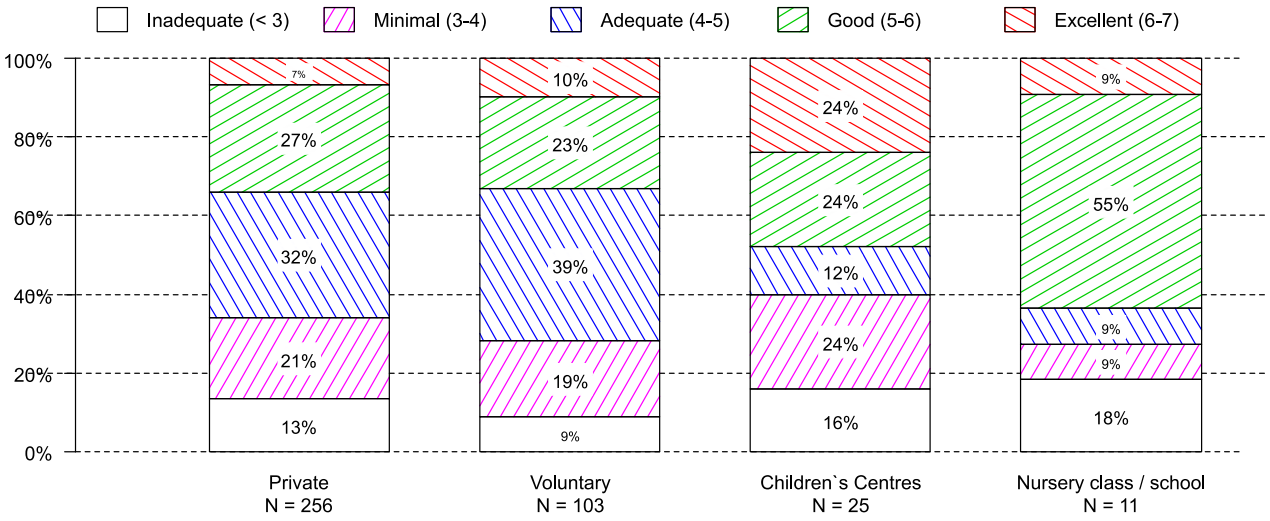
Type of setting	N	ITERS-R		SSTEW	
		Mean	SD	Mean	SD
Private	256	5.15	0.99	4.41	1.15
Voluntary	103	5.34	0.90	4.56	1.06
Children's Centre	25	5.57	1.20	4.69	1.54
Nursery class / school	11	5.73	1.20	4.90	1.41
All types	395	5.24	0.99	4.48	1.16

Figure 12: Breakdown by quality band of ITERS-R scores for settings for two-year-olds by type.



[28] LA nurseries are maintained by the Local Authority but ratios and inspection for LA nurseries are similar to private and voluntary provision rather than maintained settings.

Figure 13: Breakdown by quality band of SSTEW scores for settings for two-year-olds by type.



From Table 24 and Figures 12-13 there appear to be differences in ITERS-R and SSTEW process quality by type of ECEC settings. On average, children's centres and nursery classes / schools tend to have higher process quality scores than private and voluntary settings, which show similar quality levels. However, the relatively small numbers of nursery classes / schools and children's centres in the sample mean that observations concerning settings of this type must be regarded with caution.

Analyses tested for statistically significant differences between mean ITERS-R and SSTEW scores by type and for differences in the proportion of settings having "excellent" (≥ 6) scores and "good or better" (≥ 5) scores. As the largest group, private settings were used as the reference category.

ITERS-R scores (overall quality) were significantly higher at children's centres than at private settings, and children's centres were significantly more likely to achieve excellent ITERS-R and SSTEW scores (quality of staff / child interaction) than private settings. Nursery classes / schools were significantly more likely to achieve excellent ITERS-R scores than private settings. There were no statistically significant differences between private and voluntary settings.

Where there were differences in quality between types of settings, these were not wholly explained by differences in structural characteristics between them, i.e. there are some additional unmeasured aspects related to type of setting that affect quality.[29]

[29] The change in these relationships when controlling for structural differences are given in the Technical Report.

Comparing structural characteristics of settings by type of setting for two-year-old settings

Analyses investigated whether there were any systematic variations in the structural characteristics of ECEC settings by type of setting. The means of continuous structural characteristics are shown by type in Table 25 and the percentages of settings with a given binary characteristics are shown in Table 26.

Table 25: Mean value of structural characteristics by type of setting.

Variable	Private	Voluntary	Nursery class / school	Children's Centre
Number of places at the setting overall	61.01	***41.10***	61.91	64.46
Minimum age of children accepted	0.39	***1.34***	***2.00***	0.76
Maximum age of children accepted	6.14	***5.64***	***4.73***	***5.00***
Ratio: children aged 2 per staff member	3.96	3.91	4.22	4.00
Overall ratio: children per staff member	4.27	4.36	***9.60***	4.79
Mean level of staff qualification	2.98	3.01	***3.72***	***3.46***
Manager's highest qualification	4.95	***4.48***	***6.27***	***5.84***
Frequency of CPD	4.78	4.22	4.36	6.88
Frequency of staff supervision	8.70	8.47	9.00	8.92
% staff replaced in last year (turnover)	11.59	***8.38***	9.80	12.18
Group size	256	103	11	25

Where there is a statistically significant difference between the mean value for settings of a given type and that for the reference type (Private settings) the mean is shown in ***bold italics*** (red). A Wilcoxon test was used.

Table 26: Percentages of settings with given structural characteristics by type.

Variable	Private	Voluntary	Nursery class / school	Children's Centre
Centre on single site	57%	***89%***	***100%***	72%
Has SEN provision	61%	65%	55%	68%
Has training plan	89%	83%	91%	92%
Has training budget	39%	49%	***82%***	***72%***
Group size	256	103	11	25

Where there is a statistically significant difference between the percentage for a given type of settings and the reference type (Private settings) the percentage is shown in ***bold italics*** (red). A chi-square test for difference in proportions was used.

Voluntary settings

Voluntary settings tend to be smaller than private settings and to accept a narrower age range of children. The managers at voluntary settings tend to be less highly qualified than

those at private settings, and the rate of staff turnover tends to be lower. Voluntary settings are more likely than private settings to be on a single site.

Nursery classes / schools

Nursery classes / schools have a narrower age range of children than private settings. They tend to have a lower staff to child ratio (i.e. more children per member of staff) with more highly qualified staff and managers. Nursery classes / schools are more often on a single site than private settings; they are also more likely to have a staff training budget.

Children's centres

Children's centres tend to have a lower maximum age for children accepted at the setting than private settings. Children's centres also tend to have more highly qualified managers and staff. Finally, children's centres are more likely to have a staff training budget than private settings.

Process quality and structural characteristics for two-year-old settings

Univariate analysis of process quality by structural characteristics for two-year-old settings

Univariate analyses (analysis of the raw relationship without any controls) investigated the associations between the ITERS-R (overall quality) and SSTEW (quality of staff / child interaction) measures and the structural characteristics of ECEC settings listed in Chapter 2.

The factors associated with higher process quality on one or both of the ITERS-R and SSTEW measures were (see Table 27):

- Minimum age of children accepted at the setting is two years
- Setting has a staff training plan in place
- Lower maximum age for children accepted at the setting
- Overall staff to child ratio is higher (i.e. fewer children per member of staff across the whole setting)
- Higher mean level of staff qualification
- Manager is more highly qualified
- Lower rate of staff turnover

Table 27: Univariate associations between structural characteristics and ITERS-R and SSTEW process quality measures.

Characteristics of settings associated with higher process quality	ITERS-R	SSTEW
Minimum age of children accepted at the setting is two	+	+
Setting has training plan in place	+	
Lower maximum age for children accepted	+	
Higher overall staff to child ratio (fewer children per member of staff)	+	+
Higher mean level of staff qualification		+
Manager is more highly qualified		+
Lower rate of staff turnover		+

'+' indicates a statistically significant association ($p < 0.05$) between a structural characteristic and the ITERS-R or SSTEW measures of process quality.

Multivariate analysis of process quality by structural characteristics for two-year-old settings

Multivariate regression models examined which structural characteristics were statistically significant[30] predictors of the overall continuous process quality measures, and which structural characteristics were associated with whether or not settings achieved "excellent" process quality (scores of six or more) and "good or better" process quality (scores of five or more).

Initial analyses showed that the relationships between structural characteristics and process quality differed according to the type of setting. Separate analyses were therefore carried out for private settings, voluntary settings and children's centres. (The number of local authority nurseries and nursery classes / schools was too small to permit a separate analysis).

Cautiously, it is suggested that the statistically significant relationships between the structural characteristics and the process quality measures in these multivariate regression models may well indicate causal relationships between structural quality and process quality.[31]

[30] A statistically significant association is one where we are confident there is a true difference in the data.

[31] Causation is considered in more detail in the technical report.

Results: private settings

The results of the multivariate regression models are summarized in Table 28.

In the model of ITERS-R (overall quality) the following structural factors were statistically significantly associated with higher ITERS-R scores, in descending order of effect size:

1. Having a higher overall staff to child ratio (i.e. fewer children per member of staff across the whole setting).
2. Having a minimum age of two for children accepted at the setting.
3. Having a larger number of places at the setting.
4. Having a lower maximum age for children at the setting.

The following factors were statistically significantly associated with higher SSTEW scores (quality of staff / child interactions), in descending order of effect size:

1. Having a higher overall staff to child ratio (i.e. fewer children per member of staff across the whole setting).
2. Having a minimum age of two for children accepted at the setting.
3. Having a higher mean level of staff qualification.
4. Having a larger number of places at the setting.

Predictors of excellent process quality

1. Having a higher mean level of staff qualification was associated with achieving excellent ITERS-R scores (overall quality).
2. Having a larger number of places at the settings was associated with achieving excellent SSTEW scores (quality of staff / child interactions).

Predictors of good process quality

The following factors were associated with achieving good or better ITERS-R scores (overall quality), in descending order of effect size:

1. Having a higher overall staff to child ratio (i.e. fewer children per member of staff across the whole setting).
2. Having a lower maximum age for children at the setting.
3. Having a larger number of places at the setting.
4. The setting being on a single site.

The following factors were associated with achieving good or better SSTEW scores (quality of interactions), in descending order of effect size:

1. Having a higher mean level of staff qualification.
2. Having a higher overall staff to child ratio (i.e. fewer children per member of staff across the whole setting).

Table 28: Summary of models of process quality in terms of structural characteristics (two-year-olds) for private settings.

Characteristics of ECEC settings (private settings)	Predictors of higher process quality		Predictors of excellent process quality		Predictors of good or better process quality	
	ITERS-R	SSTEW	ITERS-R	SSTEW	ITERS-R	SSTEW
Higher overall staff to child ratio (i.e. fewer children per staff member)	1	1			1	2
Higher mean level of staff qualification		3	1			1
Larger number of places at the setting	3	4		1	3	
Minimum age of children is two	2	2				
Lower maximum age of children accepted at the setting	4				2	
Centre is on single site					4	

For each model, statistically significant factors are ranked in order of effect size (1 = largest effect, 2 = second largest effect etc.). Models are for private settings. Different numbers of effects are seen for each model because only statistically significant effects are shown.
Higher process quality is measured as a continuous outcome measure, while excellent and good or better process quality are measured as categorical outcomes. ITERS-R measures overall quality; SSTEW measures quality of interactions

Results: voluntary settings

The results of the multivariate regression models are summarized in Table 29.

In the model of ITERS-R (overall quality) the following structural factors were statistically significantly associated with higher ITERS-R scores, in descending order of effect size:

1. The setting having a training plan in place.
2. The setting not having specialist SEN/D provision.

Higher SSTEW scores (quality of interactions) were significantly associated with the setting not having SEN/D provision.

Predictors of excellent process quality

There were no statistically significant predictors of excellent process quality in the models of process quality at voluntary settings.

Predictors of good process quality

The following factors were associated with a setting achieving good or better scores on the ITERS-R scale (overall quality):

1. The setting not having SEN/D provision.
2. The setting having a training plan in place.

Good process quality on the SSTEW scale (quality of interactions) was associated with the setting not having SEN/D provision.

Table 29: Summary of models of process quality in terms of structural characteristics (two-year-olds) voluntary settings.

Characteristics of ECEC settings	Predictors of higher process quality		Predictors of excellent process quality		Predictors of good or better process quality	
	ITERS-R	SSTEW	ITERS-R	SSTEW	ITERS-R	SSTEW
Setting does not have specialist SEN/D provision	2	1			1	1
Settings has training plan in place	1				2	

For each model, statistically significant factors are ranked in order of effect size (1 = largest effect, 2 = second largest effect etc.). Models are for voluntary settings. Different numbers of effects are seen for each model because only statistically significant effects are shown.
Higher process quality is measured as a continuous outcome measure, while excellent and good or better process quality are measured as categorical outcomes. ITERS-R measures overall quality; SSTEW measures quality of interactions

Results: children's centres

In the models for children's centres there were no statistically significant associations found between the structural characteristics and the ITERS-R (overall quality) and SSTEW (quality of staff / child interactions) measures. This failure to find any associations is likely to be due to the small sample size (N = 25) and the relative homogeneity of this group.

Due to sample size limitations making modelling unreliable, the models of association with 'excellent' or 'good' process quality were not carried out for children's centres.

Structural factors not associated with quality for two-year-olds

Other structural factors, listed below, were not statistically significantly associated with quality for two-year-olds, after allowing for other structural factors:

- Staff to child ratio for two-year-olds (i.e. the number of two-year-olds per member of staff supervising this age group)

- Whether there is a staff training budget in place
- Frequency of staff supervision
- Frequency of staff continuous professional development (CPD)
- Rate of staff turnover

Summary and Conclusion

The majority of ECEC settings for two-year-olds (89.3%) were either private or voluntary settings, with smaller numbers of children's centres, nursery classes / schools, and Local Authority nurseries. The number of Local Authority nurseries was small (N = 7) and these were omitted from the analyses of process quality in terms of structural characteristics.

Settings quality was usually at least adequate, with 89% of settings being rated adequate or better on the Infant / Toddler Environment Ratings Scale (ITERS-R) measure of overall quality and 68% of settings being rated adequate or better on the Sustained Shared Thinking and Emotional Well-being scale (SSTEW) measure of quality of interactions. The supporting learning and critical thinking subscale of the SSTEW stands out as an area where there appears to be greatest room for improvement.

On average, process quality scores tended to be higher at nursery classes / schools and at children's centres than at the private and voluntary settings. This was in part explained by differences in structural characteristics between setting type, such as staff level of qualification.

A number of factors were associated with higher quality at private settings at age two, ordered below in reference to the strength of linear associations observed between structural characteristics and process quality:

- Having a higher overall staff to child ratio (i.e. fewer children per member of staff across the whole setting) was the strongest predictor of higher ITERS-R (overall quality) and SSTEW (quality of staff / child interactions), and was associated with an increased probability of achieving "good or better" scores on both these scales.

- Having a minimum age of two for children accepted at the setting was associated with higher scores on both the ITERS-R (overall quality) and SSTEW (quality of staff / child interaction) scales.

- Having a larger number of places was associated with higher scores on both the ITERS-R (overall quality) and SSTEW (quality of staff / child interaction) scales, and was associated with an increased probability ofachieving "excellent" SSTEW scores and "good or better" ITERS-R scores.

- Having a higher mean level of staff qualification was associated with higher SSTEW (quality of staff / child interaction) scores and was associated with an increased probability of achieving "excellent" ITERS-R (overall quality) scores and "good or better" SSTEW scores.

- Having a lower maximum age for children accepted at the setting was associated with higher ITERS-R (overall quality) scores and with being more likely to achieve “good or better” scores on this scale.

- Where the setting is on a single site scores are more likely to be “good or better” on the ITERS-R (overall quality scale).

At voluntary settings at age two:

- Not having specialist SEN/D provision was associated with higher ITERS-R (overall quality) scores, was the strongest predictor of SSTEW (quality of staff / child interaction) scores and was associated with increased probability of achieving “good or better” scores on these scales.

- Having a staff training a plan in place was the strongest predictor of higher ITERS-R (overall quality) scores and was associated with increased probability of achieving “good or better” scores on this scale.

These findings therefore indicate a number of structural factors that could potentially be targeted to improve overall process quality across ECEC settings.

Chapter 4: Structural characteristics and process quality: three- to four-year-olds

Key Findings for three- to four-year-olds

- Most settings of all types achieved at least adequate levels of process quality. While children's centres and nursery classes / schools were more likely to achieve excellent ratings on the ECERS-R, ECERS-E and SSTEW quality scales than were the private and voluntary settings, they made up a small minority of the settings for three- to four-year-old children in the study. Their higher scores may in part be explained by structural differences between different types of settings, particularly staff qualification levels.

- Key factors associated with higher quality at private settings for three- to four-year-olds were:

    - Settings having a higher mean level of staff qualification.
    - Settings having a larger number of places.
    - Settings accepting a minimum age for children of at least two.
    - Settings offering specialist SEN/D provision.
    - Settings having a higher overall staff to child ratio (i.e. fewer children per member of staff across the whole setting).
    - Settings with a lower frequency of CPD[32].

- Key factors associated with higher quality specifically at voluntary settings for three- to four-year-olds were:

    - Settings having a training plan in place.
    - Settings having a higher staff to child ratio for three- to four-year-olds (i.e. fewer children aged three to four per member of staff with responsibility for supervising this age group).
    - Settings having a higher overall staff to child ratio (i.e. fewer children per member of staff across the whole setting)
    - The setting not having specialist SEN/D provision
    - Settings accepting a minimum age of children of zero to one years

- At nursery classes / school for three- to four-year-olds, higher process quality as measured by the ECERS-R, ECERS-E and / or SSTEW quality scales[33] was predicted by:

[32] This could be explained by reverse causation, i.e. those settings which were performing poorly may have raised the frequency of staff CPD to address the issue

[33] Sample size for nursery classes / school (and for children's centres) was insufficient to examine the relationship with the binary outcomes of 'good or better' or 'excellent' quality scores

  - Having a lower maximum age for children was the strongest predictor of overall quality on the ECERS-R (overall quality) and was also a statistically significant predictor of scores on the ECERS-E (educational quality)
  - Having a staff training budget in place was the strongest predictor of quality on the ECERS-E (educational quality) and the SSTEW (quality of staff / child interaction).
  - Having a lower rate of staff turnover was also a statistically significant but less strong predictor of scores on the SSTEW (quality of staff / child interaction).

- At children's centres for three- to four-year-olds, higher process quality on the ECERS-R scales was predicted by having a higher mean level of staff qualification.

- SSTEW scores (quality of interaction) were statistically significantly higher at settings for three- to four-year-olds than at the settings for two-year-olds. This difference in quality is partly attributable to differences in structural characteristics including the higher levels of manager and staff qualification at the settings for three- to four-year-olds.

Introduction

This chapter presents the findings from analysis for three- to four-year-old ECEC settings. Structural characteristics and measures of process quality will be presented, as well as consideration of the differences in these factors across settings. Furthermore, relationships between structural characteristics and process quality are presented to consider which structural characteristics are associated with generally higher levels of process quality and which are associated with achieving good or excellent scores on process quality measures. Finally, differences between the quality of two-year-old and three- to four-year-old provision are considered.

Structural characteristics of ECEC settings for three- to four-year-olds

Overview of settings

Type of setting

A breakdown of settings for three- to four-year-olds by type is given in Table 30. Private and voluntary settings were attended by 74% of children and nursery classes / schools were attended by 21% of children. Only 4% attended children's centres and less than one per cent attended Local Authority nurseries.

Table 30: Breakdown of settings by type.

Type of setting	N	Percent
Private	302	51%
Voluntary	143	24%
Children's Centre	26	4%
Local Authority Nursery	4	0.7%
Nursery Class	110	18%
Nursery School	13	2%
Total	598	100%

Single / multiple sites

Of the 598 settings, 451 (75%) were on a single site, 145 (24%) were distributed over multiple sites (data not given for 2 settings).

Number of places provided

The number of places provided ranged from 4 to 318. The mean was 50.7 (SD = 29.9).

Table 31: Distribution of number of places (of all ages) at settings.

Number of places	N	%
≤ 20	34	6%
21 to 40	241	40%
41 to 60	163	27%
61 to 100	117	20%
> 100	36	6%
Not given	7	1%
Total	598	100%

Minimum age of children

Some settings accepted children from below two years of age (46%); and some only accepted children from two years upwards (54%).

Table 32: Minimum age from which children are accepted.

Minimum age of children	N	Percent
0	264	44%
1	9	2%
2	203	34%
3	122	20%
Total	598	100%

SEN/D provision

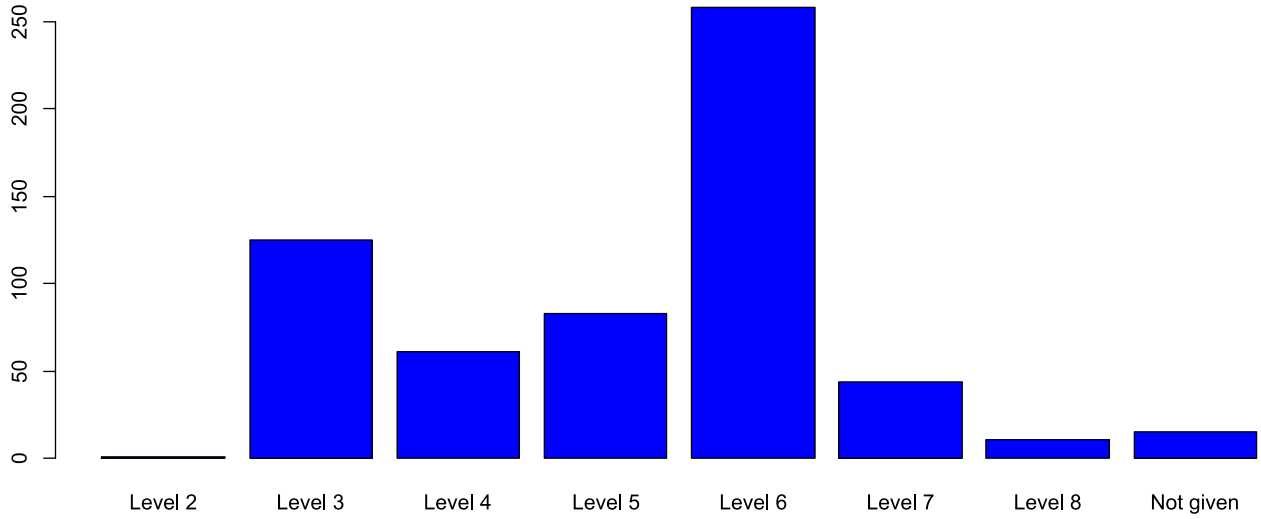
Of the 598 ECEC settings, 371 (63%) made specialist provision for children with special education needs and / or disabilities (SEN/D) whilst 216 (37%) did not aside from the 11 settings for which information was unavailable.

Staff characteristics across the setting

Manager's highest qualification

Manager's highest qualification was between Level 2 and Level 8 (see Figure 14), mean level 5.1 (SD = 1.4). The most common level of qualification was Level 6, which is degree or NVQ Level 6 or equivalent. [34]

Figure 14: Manager's highest level qualification.



Managers' additional qualifications

In some cases, managers had additional specialist qualifications.

Table 33: Managers' additional qualifications.

Additional qualification	N	Percent
Early Years Professional Status (EYPS)	8	1.3%
Degree + Qualified Teacher	3	0.5%
Qualified Teacher (QTS)	2	0.3%
Early Years Teacher	2	0.3%
Degree in education	1	0.2%
Postgraduate Certificate of Education (PGCE)	1	0.2%
PGCE + QTS	1	0.2%
Degree + QTS + EYPS	1	0.2%
Certificate in nursery teaching	1	0.2%
National Professional Qualification of Integrated Children Centre	1	0.2%
No additional qualification	577	96.5%
Total	598	100.0%

[34] A brief description of the levels of qualification is available in Chapter 2, with further detail available in the associated Technical Report, Appendix D.

Number of staff

The number of staff ranged from 2 to 47, mean 11.5 (SD = 7.9).

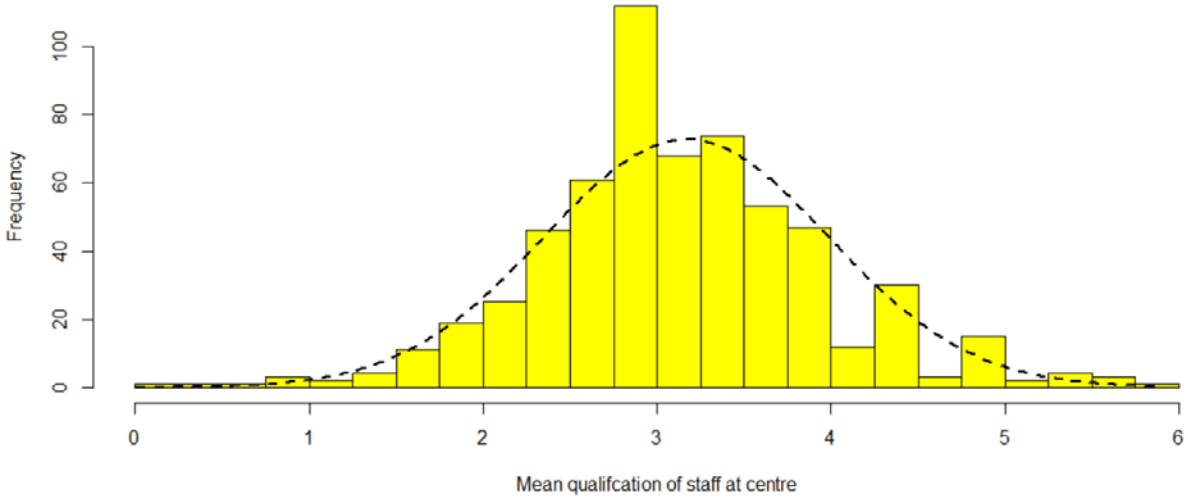
Table 34: Distribution of number of staff at settings.

Number of staff	N	Percent
1-5	140	23%
6-10	205	34%
11-15	112	19%
16-20	69	12%
21-30	51	9%
> 30	21	4%
Total	598	100%

Mean qualification level of staff

The number of staff qualified to Levels 1 to 8 and the number of staff with no qualifications were collected. The mean level of staff qualification was calculated for each setting. The average staff qualification across all settings was 3.2 (SD = 0.82) which is A-Level / NVQ Level 3 or equivalent. See Figure 15.

Figure 15: Histogram of mean level of staff qualification.



Percentage of staff replaced during the last year

The percentage of staff replaced (staff turnover) had a mean of 11% (SD = 14.8), with 38% having replaced 10% or more in the last year.

Table 35: Percentages of staff replaced in previous year at settings.

% staff replaced in previous year	N	Percent
< 10%	368	62%
10% to < 25%	160	27%
25% to < 50%	56	9%
50% to 100%	13	2%
Not given	1	0.2%
Total	598	100%

Staff to child ratio

The staff to child ratio was recorded for three age groups: children under two years, children aged two years, and children aged three or four years.

Staff to child ratio, children aged under 2

In 96% of cases where recorded, the staff to child ratio for under twos was 1:3.

Table 36: Staff to child ratios: children under two years old.

Staff to child ratio	N	Percent
1:2	5	0.8%
1:3	255	43%
1:4	4	0.7%
1:9	1	0.2%
Not given	333	56%
Total	598	100%

Staff to child ratio, children aged two years

In 91% of cases where this ratio was recorded it was 1:4.

Table 37: Staff to child ratios: two-year-olds.

Staff to child ratio	N	Percent
1:2	3	0.5%
1:3	20	3%
1:4	428	72%
1:5	6	1.0%
1:6	10	2%
1:8	3	0.5%
1:9	1	0.2%
Not given	127	21%
Total	598	100%

Staff to child ratio, children aged three and four years

The number of children aged three and four years per staff member varied from 2 to 13, mean 8.1 (SD = 2.0).

Table 38: Staff to child ratios: three- to four-year-olds.

Staff to child ratio	N	Percent
1:2 to 1:4	20	3%
1:5 to 1:7	88	15%
1:8	401	61%
1:9 to 1:13	88	15%
Not given	1	0.2%
Total	598	100%

Overall staff to child ratio

The overall staff ratio was the number of places at a setting divided by the total number of staff. The mean overall staff to child ratio was 1 to 5.5 (SD = 3.7).

Table 39: Overall staff to child ratio.

Overall staff to child ratio	N	Percent
1:<3	86	14%
1:3 to 1:<4	148	25%
1:4 to 1:<5	115	19%
1:5 to 1:<6	64	11%
1:6 to 1:<8	69	12%
1:8 to 1:<10	56	9%
1:10 or more	52	9%
Missing	8	1%
Total	598	100%

Continuing Professional Development (CPD) and supervision across the setting

Frequency of staff CPD

The frequency of CPD ranged from one to 24 times per year, mean 4.7 (SD = 4.0).

Table 40: Frequency of CPD at settings.

Frequency of CPD	N	Percent
Twice monthly	1	0.2%
Monthly	130	22%
Twice termly	5	0.8%
Termly	290	49%
Twice annually	122	20%
Annually	36	6%
Not given	14	2%
Total	598	100%

Frequency of staff supervision

The frequency of staff supervision ranged from annually to weekly. The mean number of supervisions per year was 8.7 (SD = 12.3).

Table 41: Frequency of staff supervision at settings.

Frequency of staff supervision	N	Percent
Weekly	39	7%
Twice Monthly	8	1%
Monthly	104	17%
Twice termly	78	13%
Quarterly	173	29%
Termly	96	16%
Twice annually	14	2%
Annually	75	13%
Not given	11	2%
Total	598	100%

Staff training across the setting

Training plan in place

516 settings (86%) had a training plan in place, 80 settings (13%) did not (data not given for two settings).

Training budget

336 settings (56%) had a training budget, 260 settings (44%) did not (data not given for two settings).

Process quality of settings for three- to four-year-olds

Process quality was measured using the Early Childhood Environment Rating Scale: Revised (ECERS-R) as an overall measure of quality of ECEC settings for over-threes, the Early Childhood Environment Rating Scale: Extension (ECERS-E), which focuses on the educational aspects of experience for the over-threes, and the Sustained Shared Thinking and Emotional Well-being scale (SSTEW), which focuses on the quality of interactions between staff and children. Further detail on these measures is available in Chapter 2. All three quality scales use a 1-7 scale, with 1 (inadequate), 3 (minimal), 5 (good), and 6+ (excellent).

Distribution of process quality scales and sub-scales

ECERS-R scale (overall quality)

The means of the five sub-scales are given in Table 42. The mean value of ECERS-R across all 598 ECEC settings for three- to four-year-olds was 5.28 (good). The means for the five ECERS-R sub-scales were found to be similar, ranging from a low of 4.60 (Activities) to the highest value of 5.67 (Interaction).

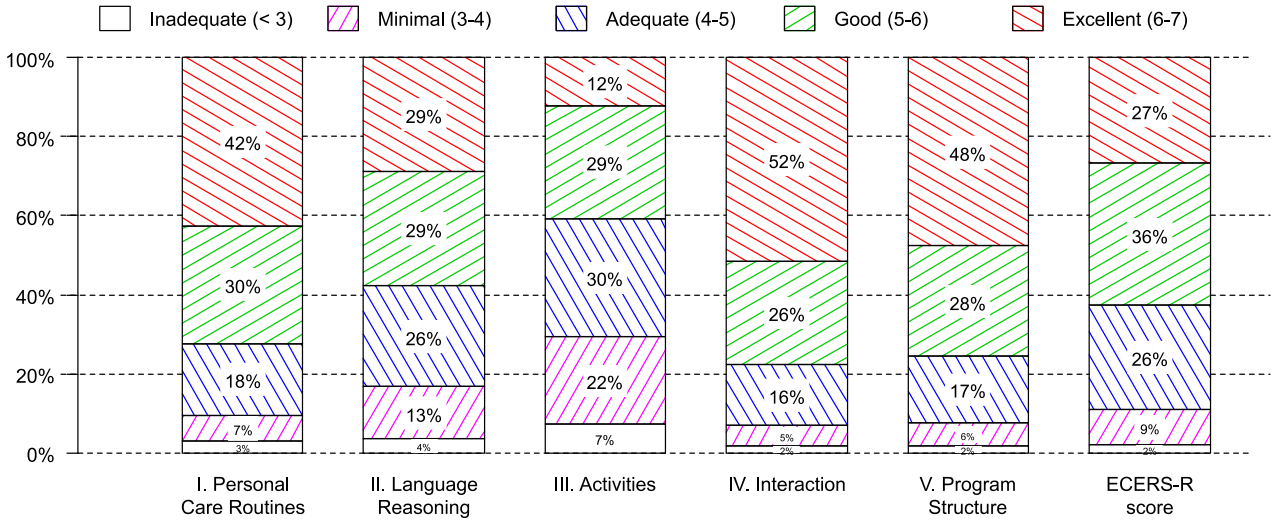
Table 42: Means and standard deviations for ECERS-R sub-scales (overall quality)

ECERS-R sub-scales	Mean	SD
I. Personal Care Routines	5.45	1.15
II. Language Reasoning	5.07	1.16
III. Activities	4.60	1.09
IV. Interaction	5.67	1.08
V. Program Structure	5.59	1.13
Overall ECERS-R score	5.28	0.99

ECERS-R is measured on a 1 to 7 scale with 1(inadequate), 3 (minimal), 5 (good) and 6+ (excellent).

Figure 16 shows the distribution of the ECERS-R scores classified into five levels of quality. These categories are: “inadequate (< 3)”, “minimal (≥ 3 and < 4)”, “adequate (≥ 4 and < 5)”, “good (≥ 5 and < 6)” and “excellent (≥ 6)”. It can be seen that a vast majority of settings (89%) were rated adequate on the ECERS-R, with almost two-thirds (63%) receiving a good or excellent score.

Figure 16: ECERS-R sub-scales and overall average scores (overall quality)



ECERS-E scale (quality of educational aspects)

The mean of the three sub-scales are given in Table 43. The mean value for the ECERS-E total score was 4.18. The means for the three ECERS-E sub-scales were similar, ranging from 3.96 (Diversity) to 4.54 (Literacy).

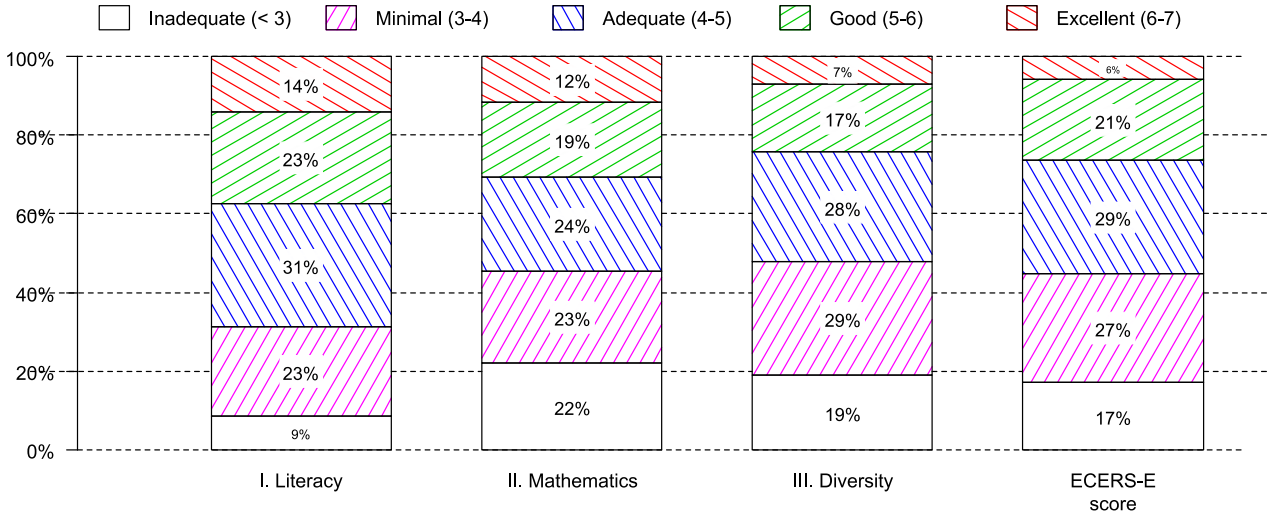
Table 43: Means and standard deviations for ECERS-E sub-scales (quality of educational aspects)

ECERS-E sub-scales	Mean	SD
I. Literacy	4.54	1.14
II. Mathematics	4.03	1.38
III. Diversity	3.96	1.19
Overall ECERS-E score	4.18	1.13

ECERS-E is measured on a 1 to 7 scale with 1(inadequate), 3 (minimal), 5 (good) and 6+ (excellent).

Figure 17 depicts the distribution of the ECERS-E scores classified into five levels of quality. These categories are: “inadequate (< 3)”, “minimal (≥ 3 and < 4)”, “adequate (≥ 4 and < 5)”, “good (≥ 5 and < 6)” and “excellent (≥ 6)”. It can be seen that over half of settings (56%) were rated adequate on the ECERS-E, although less than a third (27%) received a good or excellent score.

Figure 17: ECERS-E sub-scales and overall average scores (quality of educational aspects)



SSTEW scale (quality of interactions)

The mean for the SSTEW total score across all settings was 4.71. The means for the five SSTEW sub-scales are shown in Table 44. The lowest mean score was for the Supporting Learning and Critical Thinking sub-scale (mean = 3.98); the highest was for Supporting and Extending Language and Communication (mean = 5.16).

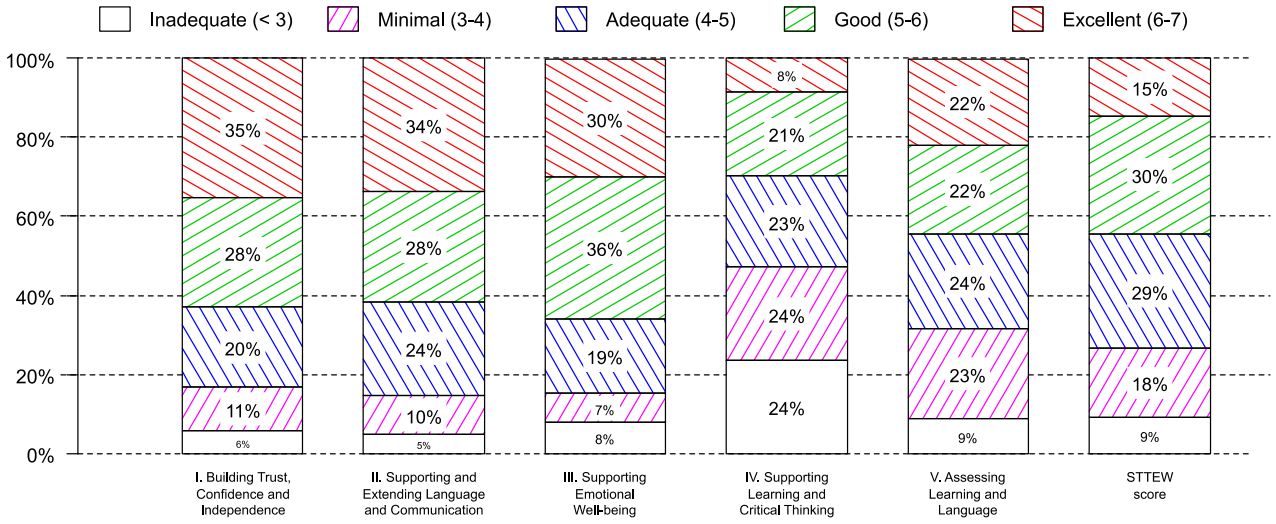
Table 44: Means and standard deviations for SSTEW sub-scales (quality of interactions)

SSTEW sub-scales	Mean	SD
I. Building Trust, Confidence and Independence	5.12	1.28
II. Supporting and Extending Language and Communication	5.16	1.23
III. Supporting Emotional Well-being	4.79	1.31
IV. Supporting Learning and Critical Thinking	3.98	1.34
V. Assessing Learning and Language	4.47	1.35
Overall SSTEW score	4.71	1.17

SSTEW is measured on a 1 to 7 scale with 1(inadequate), 3 (minimal), 5 (good) and 6+ (excellent).

Figure 18 depicts the distribution of the SSTEW scores classified into five levels of quality. These categories are: “inadequate (< 3)”, “minimal (≥ 3 and < 4)”, “adequate (≥ 4 and < 5)”, “good (≥ 5 and < 6)” and “excellent (≥ 6)”. It can be seen that almost three quarters (74%) were rated adequate on the SSTEW, with almost half (45%) receiving a good or excellent score. The Supporting Learning and Critical Thinking sub-scale stands out, with a higher percentage of settings having minimal or inadequate performance on this sub-scale.

Figure 18: SSTEW sub-scales and overall average scores (quality of interactions)



Process and structural quality by provider type in three- to four-year-old settings

Comparing process quality by type of setting for three- to four-year-old settings

A breakdown of settings for three- to four-year-olds by type is given in Table 30. As with the analysis of settings for two-year-olds, the small number of Local Authority nurseries (N = 4) were omitted from the analyses. Nursery classes and nursery schools have similarities in their staffing, regulations and relationship to the education system, and hence were combined into a single “nursery class / school” category to give adequate numbers for analysis. This report is therefore unable to establish any differences between the two in any detail. Means and standard deviations of process quality scores by settings type are given in Table 45.

Table 45: Means and standard deviations (SD) of process quality scores by type (three- to four-year-olds).

Type of setting	N	ECERS-R		ECERS-E		SSTEW	
		Mean	SD	Mean	SD	Mean	SD
Private	302	5.14	0.99	4.03	1.09	4.51	1.17
Voluntary	143	5.12	0.93	3.81	1.00	4.51	1.09
Nursery class / school	123	5.68	0.86	4.79	0.99	5.26	0.98
Children's Centre	26	5.72	0.85	4.85	1.15	5.34	1.20
All types	594	5.27	0.97	4.17	1.12	4.70	1.16

Figure 19: Breakdown by quality band of ECERS-R for settings for three- to four-year-olds by type (overall quality)

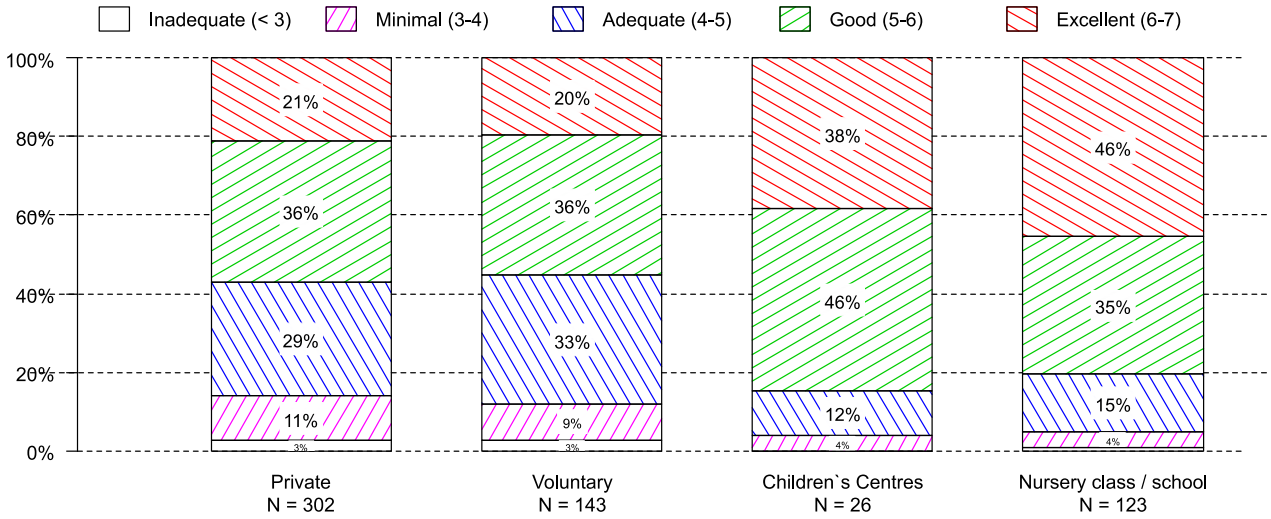


Figure 20: Breakdown by quality band of ECERS-E for settings for three- to four-year-olds by type (quality of educational aspects)

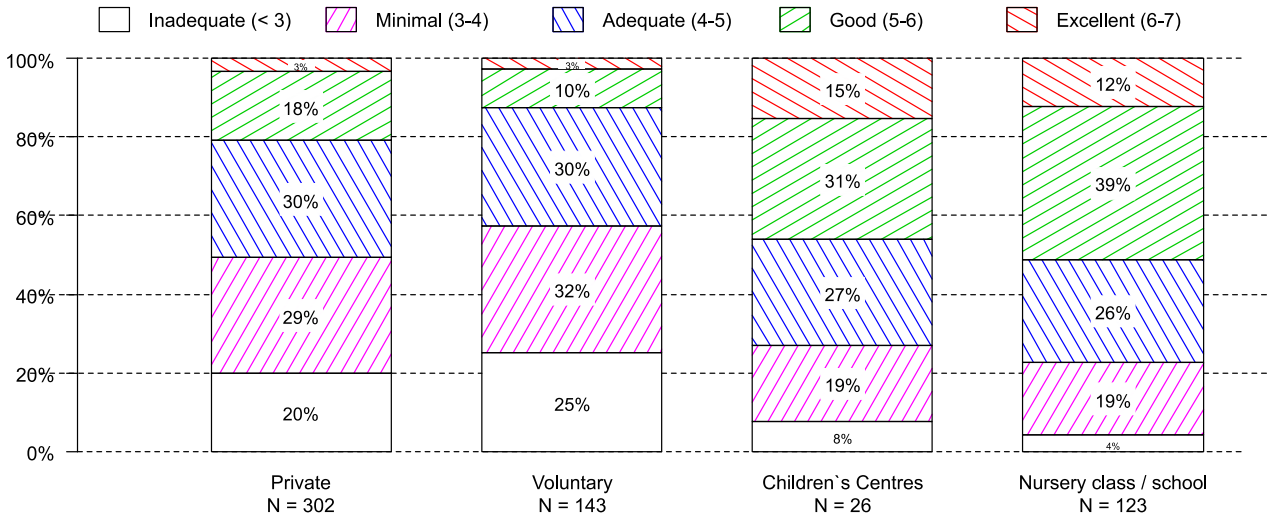
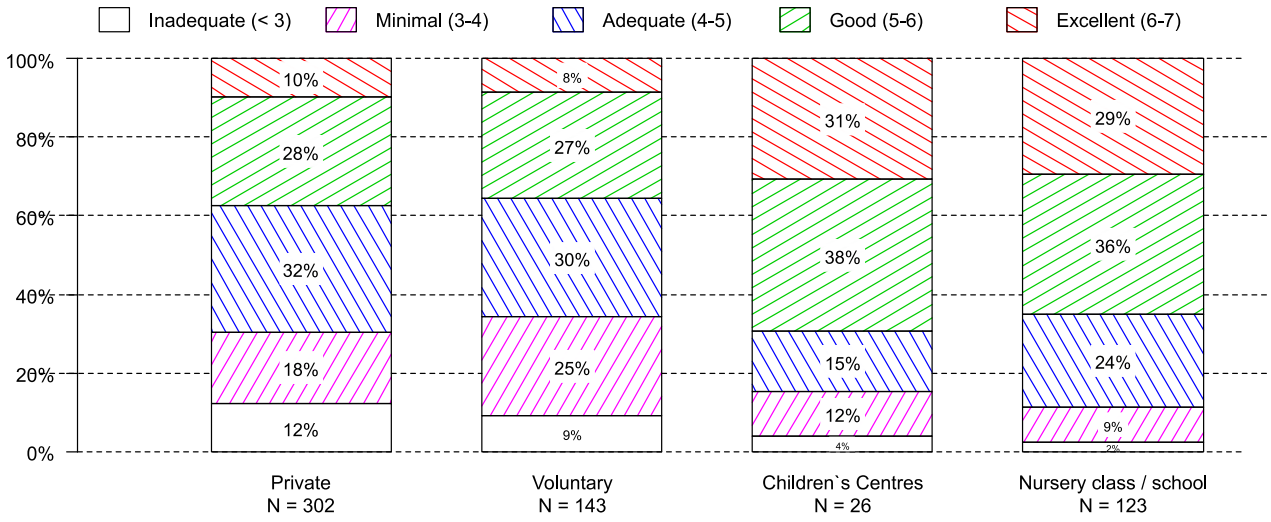


Figure 21: Breakdown by quality band of SSTEW for settings for three- to four-year-olds by type (quality of interactions)



From Table 45 and Figures 19-21 there appear to be differences in the three settings quality measures by type. The general impression is of higher process quality scores at nursery classes / schools and children's centres than at private and voluntary settings.

Analyses tested for statistically significant differences in ECERS-R, ECERS-E and SSTEW by type of setting, and for differences in the proportion of settings having "excellent" scores (six or more) and "good or better" scores (five or more). Private settings, the largest group, were used as the reference category.

Both children's centres and nursery classes / schools had statistically significantly higher process quality scores than both private and voluntary settings for all three quality scales, and were also more likely to achieve both "excellent" and "good or better" scores on all three quality scales than were private settings. Voluntary settings had statistically significantly lower ECERS-E scores and were less likely to achieve "good or better" scores on this scale than were private settings.

The differences in quality between types of settings were not wholly explained by differences in structural characteristics between the settings types, i.e. there are some additional unmeasured aspects related to type of setting that affect quality. [35]

Comparing structural characteristics of settings by type of setting for three- to four-year-old settings

This section examines whether there were systematic variations in the structural characteristics of settings by type. The means of continuous structural characteristics are shown by type in Table 46 and the percentages of settings with given binary characteristics are shown in Table 47.

Table 46: Mean value of structural characteristics of ECEC settings by type.

Variable	Private	Voluntary	Nursery class / school	Children's Centre
Number of places at the setting overall	54.95	***38.27***	***51.65***	***69.48***
Minimum age of children accepted	0.65	***1.54***	***2.76***	0.81
Maximum age of children	6.10	***5.46***	***5.55***	5.46
Ratio: children aged three to four per	7.70	***7.36***	***10.03***	***8.65***
Overall ratio: children per staff member	4.33	4.34	***10.08***	4.89
Mean level of staff qualification	3.02	2.90	***3.78***	***3.43***
Manager's highest qualification	4.91	***4.52***	***6.16***	***6.08***
Frequency of CPD	4.39	***3.63***	***6.10***	***8.50***
Frequency of staff supervision	9.02	7.13	***10.14***	7.00
% staff replaced in last year	11.62	***9.66***	***9.29***	10.18
Group size	302	143	123	26

Where there is a statistically significant difference between the mean value for settings of a given type and that for the reference type (Private settings) the mean is shown in ***bold italics*** (red). A Wilcoxon test was used.

[35] The change in these relationships when controlling for structural differences can be seen in the Technical Report.

Table 47: Percentages of settings with given structural characteristics by settings type.

Variable	Private	Voluntary	Nursery class / school	Children's Centre
Centre on single site	60%	***90%***	***97%***	77%
Has SEN provision	62%	67%	63%	65%
Has training plan	90%	***80%***	84%	92%
Has training budget	50%	43%	***83%***	***81%***
Group size	302	143	123	26

Where there is a statistically significant difference between the percentage for a given type of settings and the reference type (Private settings) the percentage is shown in ***bold italics*** (red). A chi-square test for difference in proportions was used.

There are a number of differences in settings' structural characteristics by type.

Voluntary settings

Voluntary settings tend to be smaller than private settings and to have a narrower age range for children. Voluntary settings tend to have slightly higher staff to child ratios for three- to four-year-olds than private settings (i.e. fewer children per member of staff). They tend to have slightly less qualified managers and a lower rate of staff turnover than private settings. Voluntary settings are more likely to be on a single site than private settings and they are less likely to have a training plan in place.

Nursery classes / schools

Nursery classes / schools show statistically significant differences from private settings on nearly all structural characteristics. They tend to be slightly smaller and have a narrower age range than private settings. They tend to have lower staff to child ratios than private settings (i.e. more children per member of staff) and to have more highly qualified managers and staff. Nursery classes / schools tend to have a higher frequencies of staff supervision and CPD than private settings and to have a lower rate of staff turnover. They are more likely to be on a single site than private settings and more likely to have a training budget. Due to small numbers of nursery schools, this report is unable to establish any differences between nursery classes and school.

Children's centres

Children's centres tend to be larger than private settings. They tend to have a slightly lower staff to child ratio for three- to four-year-olds (i.e. slightly more children per member of staff). Children's centres tend to have more highly qualified managers and staff than private settings and they tend to have a higher frequency of staff CPD. Children's centres are more likely to have a training budget in place than private settings.

Process quality and structural characteristics for three- to four-year-old settings

Univariate analysis of process quality by structural characteristics for three- to four-year-old settings

Univariate analyses (analysis of the raw relationship without any controls) examined the associations between the ECERS-R, ECERS-E and SSTEW measures of process quality and the structural characteristics listed in Chapter 2:

The factors associated with higher process quality on one or more of the ECERS-R, ECERS-E and SSTEW measures in three- to four-year-old settings were (see Table 48):

- Setting is on a single site
- Setting has specialist SEN/D provision
- Setting has staff training plan in place
- Setting has training budget in place
- Setting has a higher overall number of places
- Higher minimum age for children accepted at the setting
- Lower maximum age for children accepted at the setting
- Staff to child ratio for three- to four-year-olds is lower (i.e. more children per member of staff)
- Overall staff to child ratio is lower (i.e. more children per member of staff across the whole setting)
- Higher mean level of staff qualification
- Manager is more highly qualified
- Higher frequency of staff CPD
- Lower frequency of staff supervision
- Lower rate of staff turnover

Table 48: Univariate associations between structural characteristic and ECERS-R, ECERS-E and SSTEW process quality measures.

Characteristics of settings associated with higher process quality	ECERS-R	ECERS-E	SSTEW
Setting is on a single site			+
Setting has specialist SEN/D provision		+	
Setting has training plan in place	+	+	+
Setting has training budget in place	+	+	+
Setting has a higher overall number of places		+	
Higher minimum age for children accepted	+	+	+
Lower maximum age for children accepted	+	+	+
Staff to child ratio for three- to four-year-olds is lower		+	+
Overall staff to child ratio is lower		+	+
Higher mean level of staff qualification	+	+	+
Manager is more highly qualified	+	+	+
Higher frequency of staff CPD		+	+
Lower frequency of staff supervision	+		
Lower rate of staff turnover	+		+

'+' indicates a statistically significant association ($p < 0.05$) between a structural characteristic and the ECERS-R, ECERS-E or SSTEW measures of process quality.

ECERS-E (educational quality) and SSTEW (quality of staff / child interaction) scores were found to be higher when the staff to child ratio was lower, i.e. when settings had a larger number of children per member of staff. However, although univariate analysis indicates a relationship between lower ratios and quality, this may be confounded by setting type given that the previous section indicates that nursery classes / schools and children's centres have lower ratios but higher quality than private and voluntary settings. The change in the direction of the relationship between ratios and quality in the later multivariate analysis where other variables (such as qualifications) are controlled for, indicates that other factors such as staff qualifications, which enable lower ratios, and which are related to higher quality, rather than lower ratios themselves.

Multivariate analysis of process quality by structural characteristics for three- to four-year-old settings

Multivariate regression models examined which structural characteristics were predictors of the overall continuous process quality measures, and which structural characteristics were associated with whether or not settings achieved "excellent" process quality (scores of six or more) and "good" or better process quality (scores of five or more).

Cautiously, it is suggested that the statistically significant relationships between the structural characteristics and the process quality measures found in these multivariate

regression models may well indicate causal relationships between structural quality and process quality. [36]

In light of the differences found between the structural characteristics of different types of setting reported earlier, four separate sets of models were used:

1. Models for private settings
2. Models for voluntary settings
3. Models for nursery classes / schools
4. Models for children's centres

Due to small numbers of nursery schools, they have been combined with nursery classes, which have similar structural characteristics, to improve the reliability of analysis. The models for excellent and good quality were fitted for private and voluntary settings only, since the smaller sizes of the nursery class / school and children's centre groups made modelling the proportion of excellent and good settings unreliable.

Results: private settings

The results of the multivariate regression models for the private settings, which was the largest group of settings in the sample, are summarized in Table 49.

In the model of ECERS-R the following structural factors were statistically significantly associated with higher ECERS-R scores (overall quality), listed here in descending order of effect size:

1. Having a higher mean level of staff qualification
2. Having a larger number of places
   Having a minimum age for children accepted of at least two

In the model of ECERS-E the following structural factors were statistically significantly associated with higher ECERS-E scores (quality of educational aspects), listed here in descending order of effect size:

1. Having a higher mean level of staff qualification
2. Having a larger number of places
3. Having a minimum age for children accepted of at least two
4. Having specialist SEN/D provision

In the model of SSTEW the following structural factors were statistically significantly associated with higher SSTEW scores (quality of staff / child interactions), listed here in descending order of effect size:

1. Having a higher mean level of staff qualification
2. Having a minimum age for children accepted of at least two

[36] Further consideration of causal processes is available in the Technical Report.

3. Having a larger number of places

Predictors of excellent process quality

The following factors were associated with achieving excellent ECERS-R scores (overall quality), listed here in descending order of effect size:

1. Having a higher mean level of staff qualification
2. Having a lower frequency of staff CPD

The association between a lower frequency of staff CPD and a higher probability of achieving excellent ECERS-R scores could be explained by reverse causation, i.e. those settings which were performing poorly may have raised the frequency of staff CPD to address the issue.[37]

Settings with a larger number of places were more likely to achieve excellent ECERS-E scores (quality of educational aspects).

The following factors were associated with achieving excellent SSTEW scores (quality of staff / child interactions), listed here in descending order of effect size:

1. Having a higher overall staff to child ratio (i.e. fewer children per member of staff across the whole setting)
2. Having a larger number of places

Predictors of good process quality

The following factors were associated with achieving good or better ECERS-R scores (overall quality), listed here in descending order of effect size:

1. Having a higher mean level of staff qualification
2. Having a higher overall staff to child ratio (i.e. fewer children per member of staff across the whole setting)
3. Having a larger number of places

The following factors were associated with achieving good or better ECERS-E scores (overall quality), listed here in descending order of effect size:

1. Having a larger number of places
2. The minimum age for children accepted at the setting is at least two

Finally, the following factors were associated with achieving a good or better SSTEW score (quality of staff / child interactions), listed here in descending order of effect size:

1. Having a higher mean level of staff qualification

[37] Further consideration of causal processes is available in the Technical Report.

2. Having a larger number of places
3. Having a minimum age for children of at least two

Table 49: Summary of models of process quality in terms of structural characteristics (three- to four-year-olds) private settings.

Structural characteristics of ECEC settings (private settings)	Predictors of higher process quality			Predictors of excellent process quality			Predictors of good or better process quality		
	ECERS-R	ECERS-E	SSTEW	ECERS-R	ECERS-E	SSTEW	ECERS-R	ECERS-E	SSTEW
Larger number of places	2	2	3		1	2	3	1	2
Higher mean level of staff qualification	1	1	1	1			1		1
Minimum age of children accepted is two	3	3	2					2	3
Higher overall staff to child ratio (i.e. fewer children per member of staff)						1	2		
Lower frequency of CPD				2					
Has specialist SEN/D provision		4							

For each model, statistically significant factors are ranked in order of effect size (1 = largest effect, 2 = second largest effect etc.). Models are for private settings. Different numbers of effects are seen for each model because only statistically significant effects are shown.
Higher process quality is measured as a continuous outcome measure, while excellent and good or better process quality are measured as categorical outcomes. ECERS-R measures overall quality; ECERS-E measures educational quality, SSTEW measures quality of interactions

Results: voluntary settings

The results of the multivariate regression models for the voluntary settings, which was the second largest group of the settings sampled, are summarized in Table 50.

In the model of ECERS-R the following structural factors were statistically significantly associated with higher ECERS-R scores (overall quality), listed here in descending order of effect size:

1. Having a training plan in place
2. Having a higher overall staff to child ratio (i.e. fewer children per member of staff across the whole setting)

In the model of ECERS-E (quality of educational aspects) higher quality scores were associated with settings having a higher staff to child ratio for three- to four-year olds (i.e. fewer children aged three to four per member of staff supervising this age group).

In the model of SSTEW (quality of staff / child interactions) higher quality scores were associated with settings having a training plan in place.

Predictors of excellent process quality

Higher ECERS-R scores (overall quality) was associated with settings which did not have specialist SEN/D provision.

There were no significant predictors of excellent ECERS-E or SSTEW scores.

Predictors of good process quality

There were no significant predictors of achieving good or better ECERS-R scores.

The following factors were associated with achieving good or better ECERS-E scores (quality of educational aspects), listed here in descending order of effect size:

1. Having a minimum age of zero to one for children accepted at the setting.
2. Having a higher staff to child ratio for three- to four-year olds (i.e. fewer children aged three to four per member of staff supervising this age group).

Finally, achieving a good or better SSTEW score (quality of staff / child interactions) was associated with having a staff training plan in place.

Table 50: Summary of models of process quality in terms of structural characteristics (three- to four-year-olds) voluntary settings.

Structural characteristics of ECEC settings	Predictors of higher process quality			Predictors of excellent process quality			Predictors of good or better process quality		
	ECERS-R	ECERS-E	SSTEW	ECERS-R	ECERS-E	SSTEW	ECERS-R	ECERS-E	SSTEW
Staff training plan in place	1		1						1
Higher staff to child ratio for three- to four- year olds (i.e. fewer three- to four-year-olds per member of staff supervising that age group)		1						2	
Minimum age of children is zero to one								1	
Does not have specialist SEN/D provision				1					
Higher overall staff to child ratio (i.e. fewer children per member of staff)	2								

For each model, statistically significant factors are ranked in order of effect size (1 = largest effect, 2 = second largest effect etc.). Models are for voluntary settings. Different numbers of effects are seen for each model because only statistically significant effects are shown.
Higher process quality is measured as a continuous outcome measure, while excellent and good or better process quality are measured as categorical outcomes. ECERS-R measures overall quality; ECERS-E measures educational quality, SSTEW measures quality of interactions

Results: nursery classes / schools

In the model of ECERS-R, having a lower maximum age for children accepted at the setting was statistically significantly associated with having higher ECERS-R scores (overall quality).

In the model of ECERS-E the following structural factors were statistically significantly associated with higher ECERS-E scores (quality of educational aspects), listed here in descending order of effect size:

1. Having a training budget in place
2. Having a lower maximum age for children accepted at the setting

In the model of SSTEW the following structural factors were statistically significantly associated with higher SSTEW scores (quality of staff / child interactions), listed here in descending order of effect size:

1. Having a training budget in place
2. Having a lower rate of staff turnover

Table 51: Summary of models of process quality in terms of structural characteristics (settings for three- to four-year-olds) nursery classes / schools. [38]

Structural characteristics of ECEC settings (nursery classes / schools)	Predictors of higher process quality		
	ECERS-R	ECERS-E	SSTEW
Having a lower maximum age for children	1	2	
Having a staff training budget in place		1	1
Having a lower rate of staff turnover			2

For each model, statistically significant factors are ranked in order of effect size (1 = largest effect, 2 = second largest effect etc.). Different numbers of effects are seen for each model because only statistically significant effects are shown.

Results: children's centres

In the model of ECERS-R, having a higher mean level of staff qualification was associated with higher ECERS-R scores (overall quality). There were no statistically significant effects of structural characteristics of children's centres on ECERS-E (educational quality) or SSTEW scores (quality of staff / child interactions).

[38] Sample size for nursery classes / school (and for children's centres) was insufficient to examine the relationship with the binary outcomes of 'good or better' or 'excellent' quality scores.

Structural factors not significantly associated with quality for three- to four-year-olds

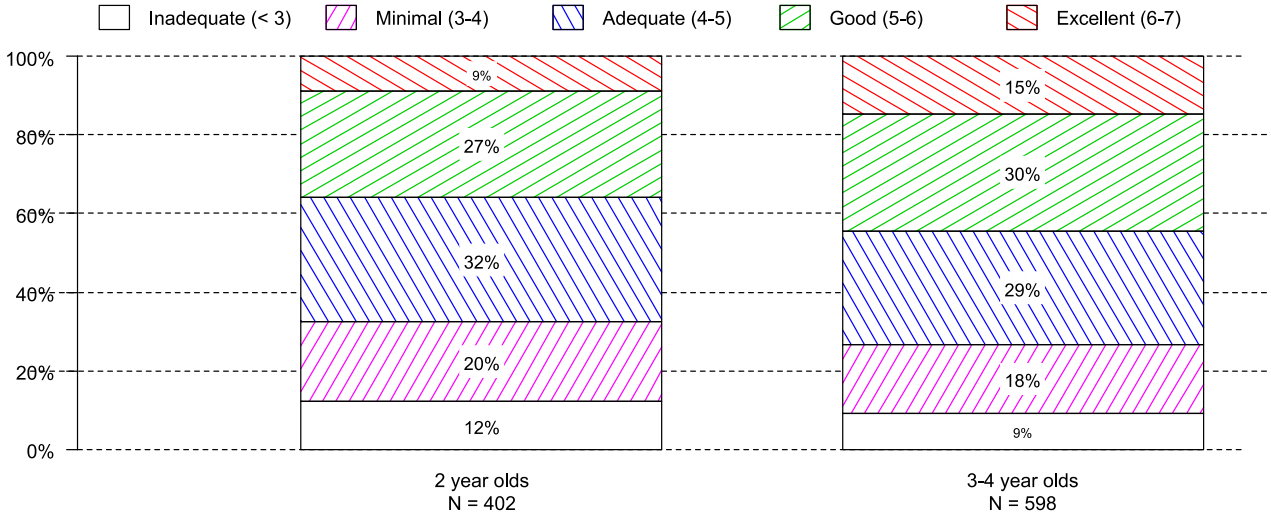
Two structural characteristics were not associated with setting quality in the final models of process quality in terms of structural characteristics of settings:

- Whether setting is on a single site / multiple sites
- The frequency of staff supervision

Differences between quality of two-year-old and three- to four-year-old provision

Analyses investigated whether the quality of settings differed between the age two and age three to four provision. These were comparisons of the SSTEW quality measure (quality of interactions) for the two age groups, which was the only quality measure used for both settings for two-year-olds and settings for three- to four-year-olds. See Figure 22.

Figure 22: SSTEW scores for settings for two-year-olds and settings for three- to four-year-olds, broken down by quality band (quality of interactions)



The mean SSTEW value for the settings for two-year-olds was 4.49; for the settings for three- to four-year-olds it was 4.70. A t-test showed that this difference was statistically significant; see Table 52.

Table 52: Comparisons of mean SSTEW, mean level of manager's qualification and mean level of staff qualification between age two and age three to four settings (quality of interactions)

Variable	Age 2 settings	Age 3-4 settings	p-value from t-test for difference in means
SSTEW	4.49	4.70	0.0045 **
Manager's highest level qualification	4.93	5.11	0.039 *
Mean level of staff qualification	3.04	3.12	0.0046 **

* = p < 0.05, ** = p < 0.01
Number of * indicates statistical significance level which relates to the certainty in the finding rather than the size of the finding

This statistically significant result suggests that settings for three- to four-year-olds are of higher quality than the settings for two-year-olds, although the difference in quality is fairly modest (β = 0.21, p = 0.005). It is suggested that at least part of the explanation for this is that both managers and staff tended to be more highly qualified at the age three to four settings than at the settings for two-year-olds (Table 52).

In a model controlling for mean level of staff qualification and manager's highest qualification there was still a significant difference in SSTEW between settings for two-year-olds and three- to four-year-olds (β = 0.16, p = 0.030). We conclude that the difference in quality between two-year-old and three- to four-year-old settings is partly but not entirely explained by differences in levels of qualification of staff and managers.

Summary and Conclusion

The largest groups of settings were private (51%), voluntary (24%) and nursery classes / schools (21%), with smaller numbers of children's centres and Local Authority nurseries. The number of Local Authority nurseries was very small (N = 4) and was omitted from the analyses of process quality in terms of structural characteristics of settings.

Settings quality was usually at least adequate, with 89% of settings rated adequate or better on the Early Childhood Environment Rating Scale (ECERS-R) measure of overall quality, 56% rated adequate or better on the Early Childhood Environment Rating Scale: Extension (ECERS-E) measure of quality of educational aspects, and 73% rated adequate or better on the Sustained Shared Thinking and Emotional Well-being scale (SSTEW) measure of quality of interactions. The ECERS-E as well as the supporting learning and critical thinking subscale of the SSTEW stand out as areas where there appears to be greatest room for improvement.

All three process quality measures were on average statistically significantly higher at children's centres and nursery classes / schools than at private and voluntary settings. This was in part explained by differences in structural characteristics, such as staff level

of qualification, although findings indicate this does not account for all differences across settings.

A number of factors were associated with higher quality at private settings at age three to four, ordered below in reference to the strength of linear associations observed between structural characteristics and process quality:

- Having a higher mean level of staff qualification was the strongest predictor of higher scores on the ECERS-R (overall quality), ECERS-E (educational quality) and SSTEW (quality of staff / child interaction) scales, and was associated with achieving “excellent” and “good or better” ECERS-R scores and “good or better” SSTEW scores.

- Having a larger number of places was associated with higher scores on the ECERS-R (overall quality), ECERS-E (educational quality) and SSTEW (quality of staff / child interaction) scales and was also associated with achieving “good or better” scores on these scales and with achieving “excellent” ECERS-E and SSTEW scores.

- Having a minimum age for children of at least two accepted at the setting was associated with higher scores on the ECERS-R (overall quality), ECERS-E (educational quality) and SSTEW (quality of staff / child interaction) scales and with achieving “good or better” scores on the ECERS-E and SSTEW scales.

- Having specialist SEN/D provision was associated with higher ECERS-E (educational quality) scores.

- Having a higher overall staff to child ratio (i.e. fewer children per member of staff across the whole setting) was associated with achieving excellent SSTEW (quality of staff / child interaction) scores and with achieving “good or better” ECERS-R (overall quality) scores.

- Having a lower frequency of staff CPD was associated with achieving “excellent” ECERS-R (overall quality scores) scores (possibly an instance of reverse causation: those settings seeking to improve may increase their frequency of staff CPD whilst those which are excellent may not feel the need to do so).

The factors associated with achieving higher quality at voluntary settings at age three to four were:

- Having a staff training plan in place was the strongest predictor of higher scores on the ECERS-R (overall quality) and SSTEW (quality of staff / child interaction) scales and was associated with increased probability of achieving “good or better” SSTEW scores.

- Having a higher staff to child ratio for three- to four-year-olds (i.e. fewer children aged three to four per member of staff with responsibility for supervising this age

group) was the strongest predictor of higher ECERS-E (educational quality) scores and was associated with increased probability of achieving “good or better” ECERS-E scores.

- Having a higher overall staff to child ratio (i.e. fewer children per member of staff across the whole setting) was associated with having higher ECERS-R (overall quality) scores.

- Not offering have specialist SEN/D provision was associated with increased probability of achieving “excellent” ECERS-R (overall quality) scores.

- A minimum age for children of zero to one was associated with increased probability of achieving “good or better” ECERS-E (educational quality) scores.

At nursery classes / schools at age three to four, three factors were statistically significantly associated with higher process quality as measured by the ECERS-R (overall quality), ECERS-E (educational quality) and / or SSTEW (quality of staff / child interaction) quality scales:

- Having a lower maximum age for children was the strongest predictor of overall quality on the ECERS-R and was also a statistically significant predictor of scores on the ECERS-E

- Having a staff training budget in place was the strongest predictor of quality on the ECERS-E and SSTEW scales.

- Having a lower rate of staff turnover was also a statistically significant but less strong predictor of scores on the SSTEW scale.

Due to small numbers of nursery schools, any differences between nursery classes and school are unable to be established in this report.

At children’s centres at age three to four, having a higher mean level of staff qualification was the only structural characteristic associated with higher process quality on the ECERS-R scale (overall quality). There were no statistically significant predictors of ECERS-E (educational quality) or SSTEW (quality of staff / child interaction).

SSTEW quality of interactions scores were statistically significantly higher at settings for three- to four-year-olds than at the settings for two-year-olds. This difference in quality was partly explained by the higher levels of manager and staff qualification at the settings for three- to four-year-olds.

These findings therefore indicate a number of structural factors that may be potential targets to improve overall process quality across ECEC settings.

Chapter 5: Comparing quality by region, setting type, area deprivation and over time

Key findings

- There were variations in setting process quality by region; these were partly explained by observed variations in the type of settings in different regions.
- There was little evidence of systematic variation in setting quality by the Index of Multiple Deprivation (a set of measures of area deprivation), indicating that quality of provision shows little variation by area deprivation.
- Comparison with the Effective Provision of Pre-School Education (EPPE study) (1998-1999), the previous DfE study of settings in England, indicates that settings' quality scores (as measured by ECERS-R and ECERS-E) have improved considerably since the EPPE study. Comparisons suggest this may at least in part be due to improvements in the qualifications of staff and managers during this time.

Introduction

The sample of settings included in this study was a subsample of the larger SEED longitudinal study and was therefore distributed across England. The sample was selected to include a representation of setting types proportionate to that seen in the larger SEED longitudinal study, although ensuring sample representativeness *within regions* was not part of the sampling strategy.

Analyses investigated whether the quality of settings varied according to:

- Government Office Region including by type of ECEC setting
- Index of Multiple Deprivation (IMD)
- Change over time in comparison with data collected 1998-1999 for the Effective Provision of Pre-School Education (EPPE) Project[39]

Procedure for region, type and IMD comparisons

The analyses used the official classification of Government Office Region as used by the Office of National Statistics as follows:

1. North East
2. North West
3. Yorkshire and the Humber
4. East Midlands

[39] Sylva et.al., 1999a.

5. West Midlands
6. East of England
7. London
8. South East
9. South West

Settings were divided into the following types:

1. Private
2. Voluntary
3. Children's centre
4. Nursery class / school

The small number of Local Authority nurseries (N=7) were omitted and the nursery classes and nursery schools were merged into a single nursery class / school category to allow for a more robust sample size for analysis.

Using the setting's postcode, the Index of Multiple Deprivation (IMD) for the area was measured. The IMD is a measure of area deprivation that uses data on people's income, employment, health and disability, education, skills and training, barriers to housing and services, living environment and crime, to produce a measure of overall deprivation for an area. The IMD was analysed by quintile.

The mean of the process quality measures was calculated for each region. A regression model was used to test for statistically significant differences between the regional means once structural characteristics of settings had been controlled for.

Results

Setting quality by region
Setting quality varied by region for both two-year-old settings and three- to four-year-old settings.

For two-year-old settings assessed in this study there were differences between regions on ITERS-R quality, a measure of overall quality (see Table 53). Scores were highest in the South West and lowest in the North East. There were no statistically significant regional differences in SSTEW, a measure of quality of interactions between staff and children.

Table 53: Analysis of ITERS-R and SSTEW scores by region; settings for two-year-olds.

Region	N	%	Mean ITERS-R	Mean SSTEW
South East	75	20	5.44	4.54
Yorkshire and the Humber	52	14	5.13	4.52
West Midlands	45	12	5.10	4.22
London	43	12	5.27	4.41
North West	42	11	5.45	4.82
East of England	38	10	5.17	4.23
South West	32	9	5.60	4.90
North East	25	7	***4.55***	4.29
East Midlands	15	4	5.34	4.75
TOTAL	367	100	5.26	4.50

Analyses tested for statistically significant differences between the regional means using a univariate regression model. Where the mean quality measure for a region was statistically significantly different from that in the South East (which, as the largest region, was used as the reference region) the mean is shown in ***bold italics*** (red).

For settings for three- to four-year-olds there were differences in quality on all three quality measures (see Table 54). In contrast to the results for two-year-old settings assessed in this study, the North East was here among the best performing regions, with the poorest quality scores found in the East of England and in Yorkshire and the Humber.

Table 54: Analysis of ECERS-R, ECERS-E and SSTEW scores by region; settings for three- to four-year-olds.

Region	N	%	Mean ECERS-R	Mean ECERS-E	Mean SSTEW
South East	109	18	5.27	3.99	4.64
Yorkshire and the	57	10	***4.93***	3.97	4.42
West Midlands	83	14	5.51	4.27	4.95
London	106	18	5.17	4.04	4.41
North West	55	9	5.27	***4.41***	4.80
East of England	40	7	***4.92***	***3.45***	***4.08***
South West	70	12	5.49	4.26	4.96
North East	56	9	5.47	***5.06***	***5.33***
East Midlands	14	2	5.33	4.32	4.84
TOTAL	590	100	5.28	4.18	4.71

Analyses tested for statistically significant differences between the regional means using a univariate regression model. Where the mean quality measure for a region was statistically significantly different from that in the South East (which, as the largest region, was used as the reference region) the mean is shown in ***bold italics*** (red).

Association between region and type of setting

In chapters 3 and 4 analyses of process quality measures by type of setting are shown in Table 24 (two-year-olds) and Table 45 (three- to four-year-olds). These analyses indicate

that process quality measures tend to be higher in nursery classes / schools and children's centres than in private and voluntary settings.

The distribution of types of setting measured in this study varies considerably by region of the country; see Figures 23 and 24.

Variations in the proportion of settings of each type between the different regions offer some explanation for the North East having the poorest mean quality of settings at age two whilst being among the best performing regions at age three to four. For settings for two-year-olds the North East has the highest proportion of private settings of any region (88%). This report has indicated that private settings tend, on average, to perform less well on process quality measures than children's centres and nursery classes / schools, which may in part relate to setting structural characteristics. However, for settings for three- to four-year-olds the North East has the lowest proportion of private settings of any region (42%) and the highest proportions of children's centres (9%) and settings in the nursery class / school cluster (38%). These latter two types of ECEC settings are among the best performing on quality measures in this study.

Figure 23: Breakdown of percentage of settings for two-year-olds by type in each region.

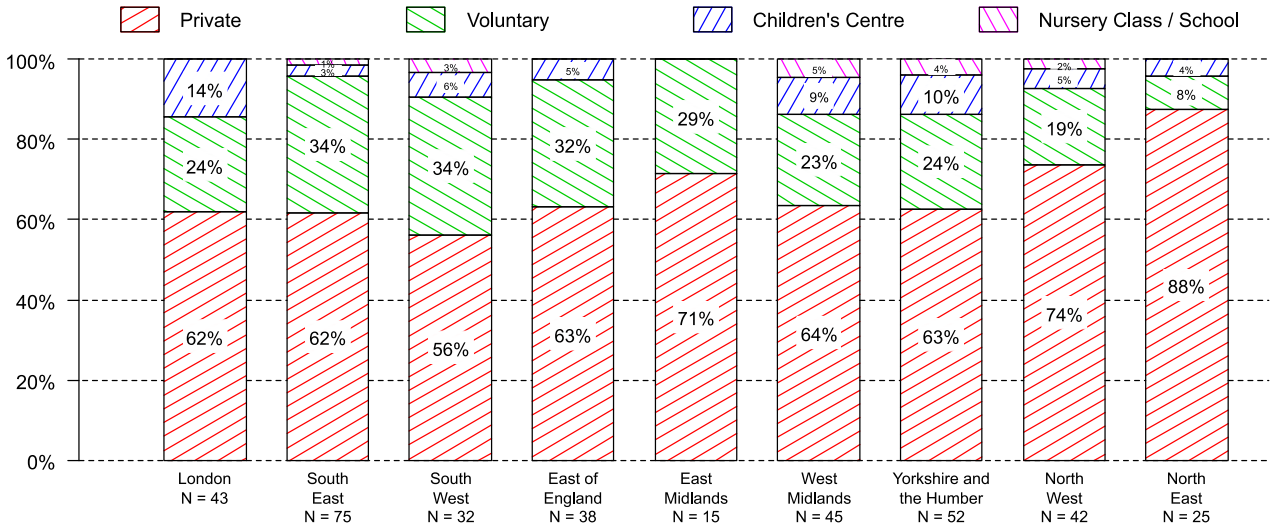
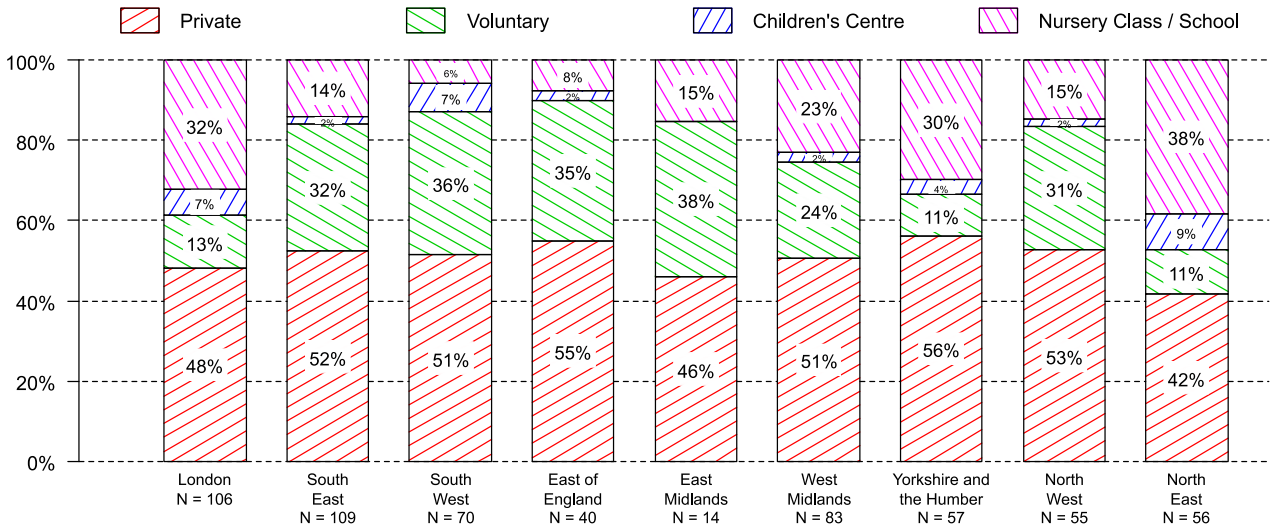


Figure 24: Breakdown of percentage of settings for three- to four-year-olds by type in each region.



It was investigated whether differences in quality by region were in fact explained by variations in the distribution of settings types between regions and by regional variations in the structural characteristic. For each type of setting, settings quality was regressed on region in models controlling for structural characteristics of settings. These models showed that, although regional variation in quality was in part attributable to type or structural characteristics of settings, there were some residual regional differences not explained by these factors. These are summarized by region in Table 55, which shows that regional variation in quality that was not attributable to measured structural factors was particularly driven by variation in quality of private settings, with some variation also seen for voluntary settings and nursery classes / schools.

Table 55: Summary of regional differences in quality of settings which are not explained by differences in the distribution of types of setting by region or by the different structural characteristic of settings by region.

Region	Details of regional difference in settings quality, not explained by settings type and structural characteristics
South East	(Reference region with which other regions are compared)
Yorkshire and the Humber	Private settings have lower than expected quality at two-years-old (ITERS-R scale) and at three- to four-years-old (ECERS-R, ECERS-E, and SSTEW scales)
West Midlands	
London	Private settings have lower than expected quality at three- to four-years-old (SSTEW scale)
North West	Voluntary settings have higher than expected quality at three- to four-years-old (ECERS-E scale)
East of England	Private settings have lower than expected quality at three- to four-years-old (ECERS-R, ECERS-E, and SSTEW scales)
South West	Voluntary settings have higher than expected quality at three- to four-years-old (SSTEW scale)
North East	Private settings have lower than expected quality at two years old (ITERS-R scale) Private settings have higher than expected quality at three- to-four-years-old (ECERS-E scale) Nursery Classes / Schools have higher than expected quality at three- to four-years-old (ECERS-E and SSTEW scales)
East Midlands	

Table shows where there were statistically significant differences between each type of setting by region. The largest region (South East) was used as the reference group. Differences are not reported if there were fewer than 10 settings of a given type in a region.

Index of Multiple Deprivation (IMD)

There was little evidence of systematic variation in setting quality by quintile of IMD (see Table 56 and Table 57). There was one statistically significant result in the models that controlled for structural characteristics of settings. At two years old, settings in the 4th quintile of IMD had statistically significantly lower SSTEW scores than those in the least deprived quintile (see Table 56).

Table 56: Analysis of ITERS-R and SSTEW scores by IMD quintile; settings for two-year-olds.

IMD	N	%	Mean ITERS-R	Mean SSTEW
1 least deprived	59	15	5.28	4.67
2	76	19	5.21	4.47
3	85	21	5.37	4.50
4	84	21	5.14	***4.29***
5 most deprived	98	24	5.27	4.56
TOTAL	402	100	5.25	4.49

Regression analysis tested for statistically significant differences between the mean process quality scores by quintile of IMD controlling for the structural characteristics of ECEC settings. Where the mean quality measure for a quintile was statistically significantly different from that in the least deprived quintile (which was used as the reference level) the mean is shown in ***bold italics*** (red).

Table 57: Analysis of ECERS-R, ECERS-E and SSTEW scores by IMD quintile; settings for three- to four-year-olds.

IMD	N	%	Mean ECERS-R	Mean ECERS-E	Mean SSTEW
1 least deprived	121	20	5.29	4.24	4.79
2	118	20	5.24	4.14	4.77
3	114	19	5.29	4.05	4.63
4	117	20	5.34	4.24	4.67
5 most deprived	128	21	5.23	4.22	4.66
TOTAL	598	100	5.28	4.18	4.70

Regression analysis tested for statistically significant differences between the mean process quality scores by quintile of IMD controlling for the structural characteristics of ECEC settings. There were no statistically significant differences by IMD.

Comparison between EPPE and SEED quality findings

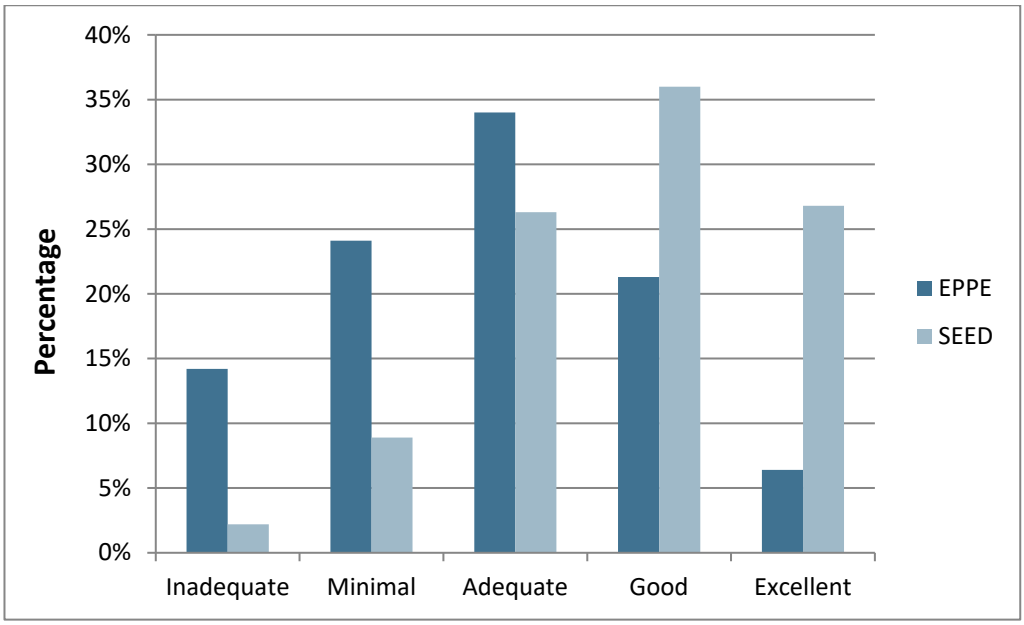
This section compares findings from this report with the Effective Provision of Pre-School Education (EPPE) Project (data collected 1998-1999), which is the previous DfE benchmark longitudinal study in England to investigate the characteristics of ECEC,

including the quality of provision.[40] In this comparison it should be borne in mind that neither SEED nor EPPE samples were strictly representative of the early years sector at the time. However, no better data exists, and the sample sizes and distribution in both studies suggest close approximation to representativeness, and hence comparison may be instructive. Both EPPE (Sylva et.al., 1999a) and SEED provide quality data using the ECERS-R and ECERS-E measures applied to group settings for three- to four-year-olds.

Both the ECERS-R (a measure of overall quality) and the ECERS-E (a measure which focuses on the educational aspects of experience) show that process quality of settings was higher on average in the SEED study than in the EPPE study.

Comparing EPPE with SEED, the average overall score for ECERS-R in EPPE was 4.29, a rating of 'adequate'. In SEED the average was 5.18, consolidating provision quality level in the 'good' range. The ECERS-E scores averaged 3.17 in EPPE and 4.12 in SEED. The differences between the ECERS-R and ECERS-E quality ratings for EPPE and SEED are shown in Figures 25 and 26.

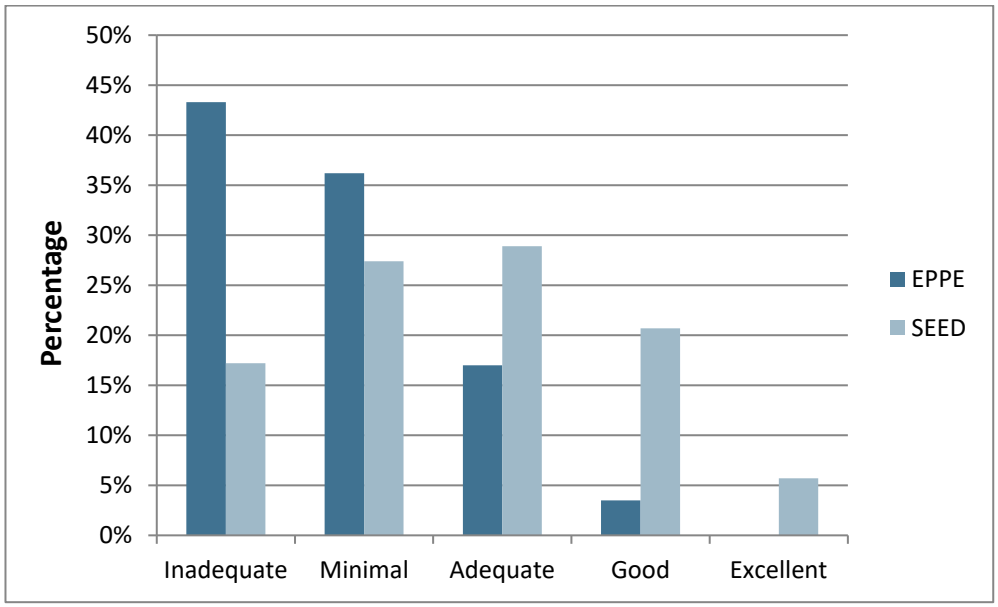
Figure 25: Percentage of ECERS-R scores in categories for EPPE and SEED .



Showing the percentages of settings that score within these categories; "inadequate (< 3)", "minimal (≥ 3 and < 4)", "adequate (≥ 4 and < 5)", "good (≥ 5 and < 6)" and "excellent (≥ 6)".

[40] More information on the Effective Provision of Pre-School Education (EPPE) study is available at: http://eppe.ioe.ac.uk/eppe/eppepdfs/RBTec1223sept0412.pdf

Figure 26: Percentage of ECERS-E scores in categories for EPPE and SEED.



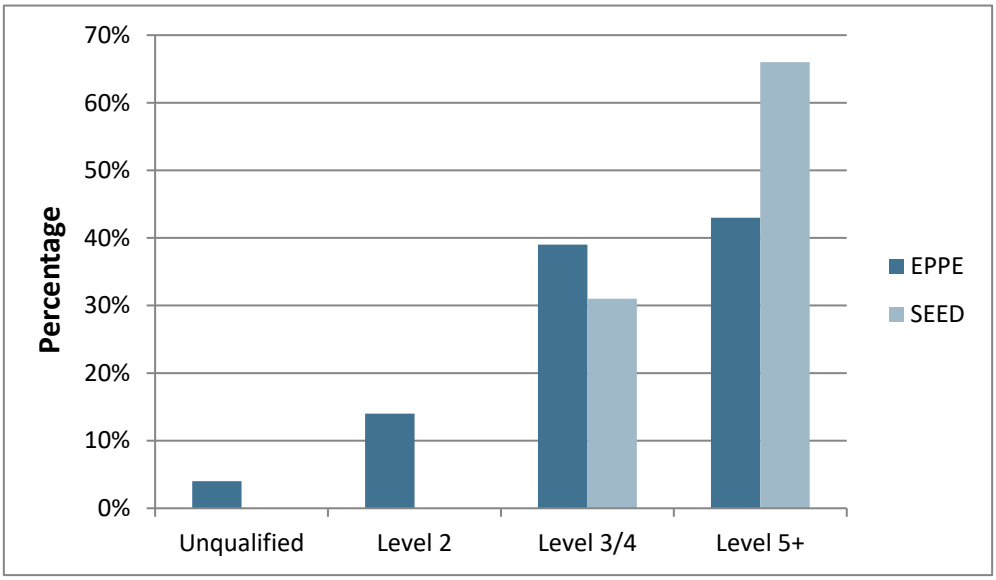
Showing the percentages of settings that score within these categories; “inadequate (< 3)”, “minimal (≥ 3 and < 4)”, “adequate (≥ 4 and < 5)”, “good (≥ 5 and < 6)” and “excellent (≥ 6)”.

There are a greater proportion of poor quality settings (i.e. inadequate, minimal, and adequate) in the EPPE study than in the SEED study. This is the case for both ECERS-R (a measure of quality) and ECERS-E (a measure which focuses on the educational aspects of experience) measures. This indicates that the overall quality in ECEC settings in England as assessed by these measures has improved from the time of EPPE to the time of SEED.

Manager and staff qualifications for EPPE and SEED

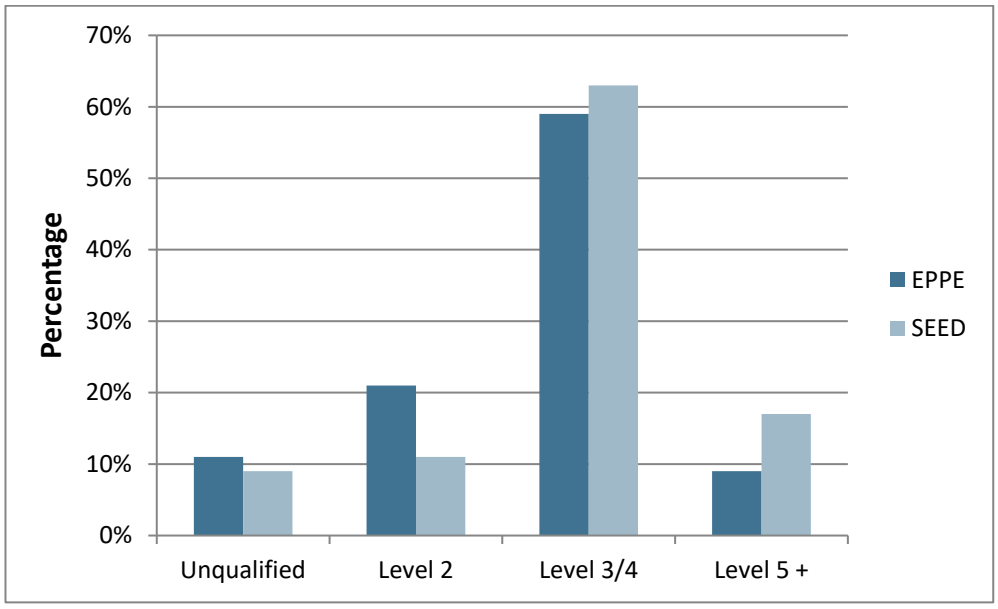
The qualification levels of both managers and staff at ECEC settings increased between the EPPE interviews in 1997-1998 (Taggart et al., 2000) and the SEED interviews in 2014-16. The percentage of managers with a degree (Level 5 or above) rose from 43% to 66%. See Figure 27.

Figure 27: Manager qualifications relevant to working with children for EPPE and SEED.



The most commonly held early years qualification level for staff was a Level 3 or 4 in both SEED and EPPE projects (see Figure 28). The second most common category for the EPPE Project was a Level 2, whilst for the SEED data the second most common level of qualification was a Level 5 or above.

Figure 28: Staff qualifications relevant to working with children for EPPE and SEED.



It is probable that the increase of the qualification level of managers and staff is related to the rise in quality levels.

Summary and Conclusion

There is considerable variation in setting quality and type of setting by region. However, ensuring sample representativeness *within regions* was not part of the sampling strategy, analysis cannot confirm with certainty to what extent samples for different regions were

representative of the provision in those regions. Regional differences in the distribution of types of settings partly explain the regional variations in quality, given that areas of lower quality appear to have somewhat more private and voluntary settings and fewer nursery classes / schools or children's centre settings. Generally lower process quality scores among private and voluntary settings therefore explain some of the regional differences in quality.

There is little evidence of systematic variation in setting quality by area deprivation. This indicates that children in more deprived areas are equally likely to receive good quality provision as children in less deprived areas.

The comparison of EPPE with SEED quality data using the ECERS-R and ECERS-E measures applied to group settings for three- to four-year-olds showed an increase in these measures from the time of EPPE to the time of SEED. The average rating for ECERS-R was 'adequate' (an average score of 4.29) in EPPE and was 'good' (an average score of 5.28) in SEED. The ECERS-E scores increased from 3.17 to 4.18, portraying provision as improving on this curricular scale developed for England.

An increase in qualification levels for both managers and staff in settings was also observed from when the EPPE project interviews were carried out in 1997-1998 (Taggart et al., 2000). It is probable that the increase of the qualification level of managers and staff is related to the rise in quality levels. Also it is the case that in the last 16 years there has been an increasing emphasis on improving the quality of early years provision that is reflected in a number of government-initiated measures.

Chapter 6: Discussion and conclusion

This report presents findings of the study of quality of provision for early years settings within the SEED project. The main objectives of this report were to explore the distribution of quality of ECEC in different group settings for two-year-old and three- to four-year-old children in England, as well as the relationship between the characteristics of a setting and the quality of care and education it offers.

In 402 two-year-old settings and 598 three-year-old settings, quality of provision was assessed through observations of process quality as well as questionnaires assessing structural characteristics.

Process and structural characteristics across ECEC settings

The majority of ECEC settings within the sample were private and voluntary settings for both two-year-olds (89%) and three- to four-year-olds (74%). Both age groups had smaller numbers of children's centres, nursery classes / schools, and Local Authority nurseries. Childminders and informal childcare were not captured in this sample. Given the rigorous sampling strategy of the SEED study (see Chapter 2), this distribution of provider types can be considered to be roughly representative of settings in England.

Setting quality for two-year-olds and for three- to four-year-olds was generally at least adequate. For two-year-olds 89% of settings were rated adequate or better on the Infant / Toddler Environment Ratings Scale (ITERS-R) measure of overall quality and 68% of settings were rated adequate or better on the Sustained Shared Thinking and Emotional Well-being scale (SSTEW) measure of the quality of staff-child interactions.

For three- to four-year-olds 89% of settings were rated adequate or better on the Early Childhood Environment Rating Scale (ECERS-R) measure of overall quality, 56% rated adequate or better on the Early Childhood Environment Rating Scale: Extension (ECERS-E) measure of educational quality and 73% rated adequate or better on the Sustained Shared Thinking and Emotional Well-being scale (SSTEW) measure of the quality of staff-child interactions.

These findings indicate that the area with the greatest room for improvement may be the ECERS-E scale among three- to four-year-olds which measures the quality of the educational provision in the setting. This finding is in line with those from previous evaluations in England such as EPPE and the National Evaluation of Sure Start (Melhuish et al., 2010; Sylva et al., 2004). Furthermore, the supporting learning and critical thinking subscale of the SSTEW also stands out as another area where there appears to be greatest room for improvement.

There was a small but statistically significant difference in mean SSTEW scores (quality of staff-child interaction) between the settings for two-year-olds and those for three- to four-year-olds, the only measure used in both age settings. This indicates higher quality of interaction scores in settings for three- to four-year-olds than in settings for two-year-

olds. This difference in quality is partly attributable to the higher levels of staff and manager qualification at the settings for three- to four-year-olds, or greater use of nursery classes / schools among three- to four-year-olds compared with two-year-olds, which tend to be of higher quality than the private and voluntary settings which make up a larger proportion of settings for two-year-olds. The finding indicates that the focus on improving quality, particularly quality of interaction, may be of particular importance within two-year-old settings. This finding makes an important contribution to knowledge given that previous studies such as EPPE have often only measured quality of ECEC from age three onwards. Although age comparison has been made using the SSTEW quality of interaction score, given that different scales are used to measure overall quality in different age settings it is not possible to compare whether any difference in overall quality is seen for different ages.

The process quality of ECEC provision also varied according to the type of setting. Although quality across all types of setting was generally high, at both two and three to four years of age, nursery classes / schools and children's centres tend to have statistically significantly better process quality than private and voluntary settings. This factor is of more relevance for three- to four-year-olds since nursery classes / schools and children's centres make up a much larger proportion of ECEC provision for this age group, although the number of nursery classes / schools and children's centres overall still made up a minority of provision for both age groups. Due to small numbers of nursery schools, any differences between nursery classes and school are unable to be established in this report.

Variation in structural characteristics between setting types, particularly seen for staff qualifications, child ratios and age ranges, do not fully explain the observed differences in process quality between types of setting. Other unmeasured factors may be more strongly related to process quality. This finding of a difference in quality across different types of settings is in line with previous research for example, the Millennium Cohort Study (Roberts et al., 2010) and the Effective Provision of Pre-school Education (EPPE) Project (Sylva et al., 1999b), which have also indicated higher quality in maintained settings. The finding indicates that there is room for further improvement for private and voluntary settings (which make up the majority of available provision) to reach the level of quality achieved in nursery classes / schools and children's centres, although further work is needed to establish the most important targets to achieve such change.

Relationships between structural characteristics and process quality measures

A number of structural characteristics were found to be associated with process quality, many of which are in line with characteristics identified in previous studies of early years provision (e.g. Cryer et al., 1999; Whitebread et al., 2015). A number of characteristics were related to quality across setting types and age groups. Consistent with previous research, while some structural characteristics may have a stronger relationship with quality than others; there are a number of influential factors rather than one single structural variable found to be related to process quality. The key factors identified

include staff qualifications, staff training and turnover, staff to child ratios, the age range of children at settings, size of settings and whether or not settings offered specialist SEN/D provision. Overall, these identified structural characteristics offer a number of potential targets for change to improve quality standards across ECEC settings. Variation was seen according to type of setting, i.e. whether settings were private, voluntary, nursery classes / schools or children's centres, as well as the age of children studied. A summary of the significant relationships for each setting type and age group can be seen in Table 58.

Table 58 Summary of the significant associations between structural characteristics and process quality for each setting type and age group

	Private Setting	Voluntary Setting	Nursery Class / School
Age two	• Higher overall staff to child ratio (fewer children per member of staff) • Minimum age for children accepted is two • A larger number of places • Higher mean level of staff qualification • Lower maximum age for children accepted • *Centre is on single site*	• Setting does not have specialist SEN/D provision • Settings has a training plan in place	
Age three to four	• Higher mean level of staff qualification • A larger number of places • Minimum age for children accepted is two • Setting has specialist SEN/D provision • *Higher overall staff to child ratio (fewer children per member of staff)* • *A lower frequency of staff CPD*	• Setting has a training plan in place • Higher staff to child ratio for three- to four-year-olds • Higher overall staff to child ratio • *Setting does not have specialist SEN/D provision* • *Minimum age for children accepted is zero to one*	• Lower maximum age for children accepted • Staff training budget in place • Lower rate of staff turnover

Statistically significant associations between setting characteristics and process quality are listed for each setting type and age group. Characteristics associated with 'good or better' or 'excellent' quality but not overall higher quality scores are in italics.

No analyses were run for nursery class / school at age two due to the small sample size. A statistically significant association was also seen for staff qualification in Children's Centres at age three to four.

For private settings the strongest predictor of both quality measures for two-year-old settings was a higher overall staff to child ratio (i.e. fewer children per member of staff across the whole setting), while the strongest predictor of all quality measures for three- to four-year-old settings was a higher overall level of staff qualification. Other predictors of quality in private settings for both age groups were a larger number of places at the setting and a narrower age range (a minimum age for children of two or a lower maximum age for children). Having specialist SEN/D provision was also associated with better educational quality at three- to four-year-old private settings.

For voluntary settings a strong predictor in both age groups was the presence of a staff training plan. For the three- to four-year-old voluntary settings a higher overall staff to child ratio across the whole setting (i.e. fewer children per member of staff) was also associated with higher overall quality and a higher staff to child ratio for three- to four-year-olds (fewer three- to four-year-olds per member of staff) was associated with higher educational quality.

For nursery classes and schools at age three to four having a lower maximum age for children, a staff training budget and a lower rate of staff turnover were the predictors of higher setting quality. A lower rate of staff turnover was specifically predictive of a better quality of staff / child interactions.

These findings imply that settings which focus on a more tightly defined age group are often associated with better quality. However, for voluntary settings at age three to four having a minimum age of zero to one for children was associated with an increased probability of achieving good or better educational quality, so the finding of quality benefits of a narrower age range for children at childcare settings is not straightforward.

At voluntary settings and nursery classes / schools there were quality benefits from having a staff training plan or budget. However, given that the presence of a training plan or budget were measured as a binary question (yes or no), there is a need to consider in more detail which specific characteristics of having and implementing a successful training plan or budget play a role in achieving quality.

Furthermore, at private settings, as well as children's centres at age three to four, having on average a higher qualified staff leads to improved quality. However, given that qualification has been considered as a continuous variable, it remains uncertain what an optimum level of qualification might be, and whether quality relates to having graduates in settings, or higher qualifications among staff in general. Staff qualification has also been linked to ECEC quality in previous research (e.g. Sylva et al., 2004).

Staff qualification was not a significant predictor of quality at voluntary settings or in nursery classes / schools where these were analysed separately for three- to four-year-olds. This may in part relate to requirements for higher qualification levels in maintained settings, which may lead qualification levels to be sufficiently high in this type of provision.

The relationship for staff ratios is complex, given that staff with graduate qualifications allow settings to have lower ratios (more children per member of staff). However, findings suggest that, when qualification level is controlled for, higher ratios (i.e. having fewer children per member of staff across the whole setting) has a strong association with quality at private settings for both age groups and at voluntary settings for three to four year olds. At voluntary settings there was also a specific association between educational quality and a higher staff to child ratio for three to four year olds (i.e. fewer three to four-year-old children per member of staff supervising this age group). However, the optimum ratios have not been established in this analysis, and may remain dependent on whether or not there is a graduate in the setting.

Previous research in England has also indicated a relationship between ratios and measures of process quality (e.g. Melhuish et al., 2010). The absence of a significant relationship for ratios among nursery classes / school settings for three- to four-year-olds in the present analysis may relate to requirements for graduate qualifications and consequently lower ratios (more children per member of staff), and also to there being less variability in ratios in these settings than in other setting types.

An additional factor identified in private settings was that having a larger number of places at the setting was related to a number of aspects of quality, suggesting larger settings are more able to deliver high quality provision.

For private settings at age three to four having specialist SEN/D provision was associated with higher quality provision. However, at voluntary settings for both age groups having specialist SEN/D provision was associated with lower quality provision. This inconsistent relationship may indicate that the role of SEN/D in quality may interact with other characteristics of the setting. This issue may require further research.

No significant relationships were identified for children's centres in both two-year-old and three- to four-year-old settings, with the exception of the relationship for qualification levels in three- to four-year-old settings. The sample size for the separate children's centre analysis was considerably smaller than that used in the other subgroup analyses, and therefore the finding of few relationships should be interpreted with caution. Previous research in children's centres has however indicated no relationship between staff training or manager qualification, with the exception of leadership qualifications, on child outcomes, although it has linked higher quality on a broad measure of leadership with improved prosocial behaviour but lower verbal development (Sammons et al., 2015).

Variation by region and IMD

Region

There were variations in setting quality by region; however, these were partly explained by the variations in the type of settings used in different regions. Areas with lower quality process ratings generally had more private and voluntary settings and fewer nursery classes / schools and children's centres. As has been indicated earlier, the variation in

measured process quality relating to setting type may relate to structural differences between setting types. This finding may indicate a need to focus on improving quality in regions that have higher proportions of private and voluntary settings in particular.

It is important to note however that the sampling strategy did not aim to ensure sample representativeness within regions so generalisability of this finding may be uncertain.

Index of Multiple Deprivation

There was little evidence of systematic variation in setting quality by Index of Multiple Deprivation. This indicates that children in more deprived areas are equally likely to receive good quality provision as children in less deprived areas.

This finding is inconsistent with some previous research, for example Ofsted statistics have indicated that the quality of provision in deprived areas is lower than affluent areas (Hillman & Williams, 2015). Differences in findings may be because the in-depth quality measures used in the present study are designed to capture a more detailed assessment of provision quality in comparison with inspection ratings by Ofsted. Other research using ECERS has also indicated that quality is lower for private and voluntary settings in disadvantaged compared with advantaged areas, although in maintained settings quality is comparable across levels of area deprivation (Mathers & Smees, 2014). Evidence of lower quality in disadvantaged areas may relate to lower levels of social mix, which has been linked to children's outcomes (Melhuish et al., 2008), and the discrepancy between advantaged and disadvantaged areas may be greater in settings without graduates (Mathers & Smees, 2014).

Comparison to the EPPE study

A comparison with the EPPE results (Sylva et al., 1999a) for process quality measures showed a noteworthy increase in the quality of settings in the SEED results. The average score for the ECERS-R (overall quality) rose from 4.34 to 5.28, consolidating provision quality level in the 'good' range. The ECERS-E scores (educational quality) increased from 3.12 to 4.18, showing that provision was improving on this curricular scale developed for England. Given that a number of structural characteristics have been shown to link to process quality, this increase in quality of ECEC over time may indicate that changes to guidelines and practice over time may be driving these improvements in quality. Although this report has highlighted potential limitations to the comparability of the EPPE and SEED samples, this trend of increasing quality over time is in line with observations by Ofsted where the proportion of ECEC providers judged to be good or outstanding increased from 74% in 2012 to 93% in 2017 (Ofsted, 2017). However, it is important to note that there are considerable differences in the criteria for the validated quality measures used in this study and an Ofsted rating, which is not intended to provide a detailed measure of quality.

An increase in the qualification level for both managers and staff in settings was also observed from when the EPPE Project interviews were carried out in 1997-1998 (Taggart

et.al. 2000) compared with the present SEED data. It is probable that the increase of the qualification level of managers and staff is related to the rise in quality levels. Increased qualification levels over time have also been indicated in other research in England over a similar period such as the Labour Force Survey (Simon et al., 2016). Increase in qualification over time may reflect investment in professionalisation of the workforce and changes in qualification guidelines in the early years statutory framework.

Conclusion

Findings indicate that process quality across all types of settings was generally sufficient, with adequate or greater ratings often seen in private and voluntary settings as well as nursery classes / schools and children's centre settings. Furthermore, quality appears to have improved in England over the past 16 years across all types of settings. This may be associated with concurrent improvements in staff qualifications among other factors.

Although quality is generally high, some variation was observed by setting type and age group. Nursery classes / schools and children's centres tend to score higher on process quality than private and voluntary settings which make up the majority of provision, although the difference between nursery classes and schools cannot be established in this report due to limitations in the numbers of nursery schools in particular. Furthermore, higher process quality scores on the SSTEW, a measure of quality of interactions between staff and children, were observed in three- to four-year-old settings than in two-year-old settings. These differences are partly explained by differences in structural characteristics such as staff qualification. This finding indicates that although quality is often adequate there is scope to increase the quality of private and voluntary settings in particular, and that focus on improving quality for two-year-old settings may be of particular importance.

A number of structural characteristics were identified that relate to process quality and may therefore be targets for change to improve ECEC quality, these include staff qualifications, staff training and turnover, staff to child ratios, the age range of children at settings, size of settings and whether or not settings offered specialist SEN/D provision. Variation was seen according to type of setting, i.e. whether settings were private, voluntary, nursery classes / schools or children's centres, as well as the age of children studied.

At private settings the strongest predictor of both quality measures for two-year-old settings was a higher overall staff to child ratio (i.e. fewer children per member of staff across the whole setting); while the strongest predictor of all quality measures for three- to four-year-old settings was a higher overall level of staff qualification. Other predictors of quality for both two- and three- to four-year-olds were a narrower age range (i.e. minimum age for children accepted at the setting of two years or a lower maximum age), and the setting having a larger number of places. Having specialist SEN/D provision was also associated with better educational quality at three- to four-year-old private settings.

For voluntary settings, a strong predictor of setting quality for both age groups was having a training plan in place. For the three- to four-year-old settings a higher overall staff to child ratio across the whole setting (i.e. fewer children per member of staff) was associated with higher overall quality and a higher staff to child ratio for three- to four-year-olds was associated with higher educational quality. One issue that may require further research is the association found at voluntary settings between not having SEN/D provision and higher setting quality.

At nursery classes / schools a lower maximum age for children accepted at the setting was predictive of higher overall quality and educational quality, whilst having a training budget was associated with better educational quality and staff / child interactions. A lower rate of staff turnover was also significant for improved staff / child interactions.

Addressing these structural factors may therefore be a route to improving the quality of early years provision. It is also worth noting that the SEED cost report concludes that higher quality settings do not necessarily lead to higher costs (Blainey & Paull, 2017). This may be in part because of the interrelated nature of many structural characteristics, for example higher qualifications enable lower staff to child ratios.

Although regional variation in setting quality was observed, this is partly explained by regional differences in the distribution of setting types, with areas of lower quality having more private and voluntary settings and fewer nursery classes / schools or children's centre settings. Furthermore, regional variation does not appear to relate to area deprivation, given that findings indicate that children in deprived areas are equally likely to receive good quality provision as children in less deprived areas. Given that previous studies have indicated variation in quality relating to area deprivation, this may indicate that efforts to address quality in deprived areas appear to have been effective.

In sum, the findings from the present study indicate that quality of ECEC is generally high, and appears to have improved over time, potentially in response to a number of statutory changes and guidelines. Further, the findings have identified a number of potential targets for improving the quality of early years provision, and particularly highlight the potential benefits of a focus on improving the quality of private and voluntary provision, as well as the quality of provision for two-year-olds. Although previous research in England has indicated a relationship between process quality and child cognitive development outcomes (Sylva et al., 2004, Melhuish et al., 2010), this report has focused on linking structural characteristics and process quality. Quality has not yet been linked with outcomes in the SEED longitudinal study, and is a question that will be addressed in future SEED reports.

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