Early years workforce qualifications and children's outcomes
An analysis using administrative data

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Outline

- Introduction and rationale for the study

- Methodology

- Child, workforce and setting characteristics

- Key results

- Discussion and policy recommendations

Introduction and rationale

- Purpose of the research programme: to improve our understanding of the EY workforce and the link between workforce characteristics and children's outcomes

- Strand 1: landscape view of EY workforce in England

- Strand 2: analysis of the impact of key policies of last decade

- Strand 3: study of incentives and barriers to the recruitment, retention and development of qualified early years staff (NatCen)

- Strand 4: To explore the relationship between EY workforce qualifications and children's outcomes

Background

- Starting point: Blanden et al. (2017)
    - Impact of EY workforce qualifications and Ofsted ratings on children's outcomes (EYFSP)
    - Data for children in preschool between 2008 and 2010
- This study:
    - 8 additional years of data (children in preschool between 2007/2008 and 2017/2018)
    - 3 key improvements:
        1. Analysis update with the extra years of data;
        2. Wider pool of qualifications: QTS, EYPS, EYTS (from 2015/2016) and qualifications below graduate level (for 2017/2018);
        3. Impact of workforce qualifications on children's outcomes up to KS2 (first four cohorts)

Data and methodology

- NPD data linked to EYCensus for children in preschool between 2007/2008 and 2017/2018 – more than 6m children

- Establishment-level data in EYC:
  - type of setting
  - staff qualifications: QTS, EYPS (from 2008/2009), EYTS (from 2015/2016), L2 and L3 (for 2017/2018)
  - No usable staff qualification data for 2016/2017

- Child-level data in EYC:
  - month and year of birth
  - gender
  - special educational needs status
  - hours attended at the setting

Data and methodology

Linking EYC with School Census we can

1. Identify children who appear in both, and keep the observation for the setting where he/she attends for most hours (necessary for less than 1% of observations)

2. Match preschool children with their school records. We gain more detailed information on children and family background, e.g.:
   - children's ethnicity;
   - whether they speak English as an additional language (EAL);
   - eligibility for free school meals (FSM);
   - level of deprivation of area where they live

Outcome measures

- Standardised (within cohort) EYFSP, KS1 and KS2 scores

- EYFSP problems and solutions:

  1. EYFSP carried out at the end of YR, possibly confounding the measure of nursery teaching with reception teaching – school fixed effects

  2. the robustness and sensitiveness of the EYFSP is challenged as this measure is not standardised or externally assessed – school fixed effects

  3. changes to the EYFSP in 2012/2013 – break in the timeline of analysis and focus on total scores and subscores rather than GLD.

Child, workforce and setting characteristics

Full sample of 3 and 4 year olds (2007/2008-2017/2018)

Variable	Proportion with these characteristics in matched preschool sample	Observations
Living in least deprived 20% neighbourhoods	20.3%	6,476,131
Living in middle deprived 60% neighbourhoods	60.0%	6,476,131
Living in most deprived 20% neighbourhoods	19.7%	6,476,131
Autumn born*	34.0%	6,493,530
Spring born*	24.3%	6,493,530
Summer born*	41.7%	6,493,530
Male	51.2%	6,493,530
Free school meals	16.0%	6,493,530
English as an additional language	16.4%	6,493,530
Ethnicity		
Bangladeshi	1.3%	6,932,170
Indian	2.5%	6,932,170
Other Asian	1.6%	6,932,170
Pakistani	3.5%	6,932,170
Black African	3.0%	6,932,170
Black Caribbean	0.9%	6,932,170
Black other	0.6%	6,932,170
Chinese	0.4%	6,932,170
Mixed other	1.9%	6,932,170
Mixed white/Asian	1.2%	6,932,170
Mixed white/black African	0.7%	6,932,170
Mixed white/Caribbean	1.3%	6,932,170
N/A	11.5%	6,932,170
Not obtained	0.5%	6,932,170
Other	1.4%	6,932,170
Refused	0.4%	6,932,170
White British	62.1%	6,932,170
White Irish	0.2%	6,932,170
White Irish traveller	0.1%	6,932,170
White other	4.8%	6,932,170
Gipsy/Roma	0.2%	6,932,170
Special education needs (preschool)	4.8%	6,932,126
Special education needs (reception)	9.8%	6,493,530

Children

- Average number of 3- and 4-year olds at each setting increased from 34.5 in 2007/2008 to 39.3 in 2017/2018 – increase driven by increase in average number of 3-year olds.

- Attendance:
  - the proportion of children attending for more than 15 hours per week increased from around 50% in 2008 to 59% in 2018
  - Increase driven by 30 hour funded childcare policy and by non-FSM children (from 45% in 2017 to 63% in 2018); the proportion for FSM children remained stable (from 22% to 24%)

Staff characteristics

- Distinction between staff at setting and staff working with children
- Changes in data collection in 2016/2017 impact our variables*
- Average total staff increased from 11.1 in 2007/2008 to 13.6 in 2017/2018

Proportion of children with access to a graduate

Year of preschool	QTS	EYPS	EYTS	EYPS or EYTS
2007/2008	28.9%	NA	NA	NA
2008/2009	26.2%	13.0%	NA	NA
2009/2010	24.6%	16.9%	NA	NA
2010/2011	25.2%	20.8%	NA	NA
2011/2012	24.6%	26.6%	NA	NA
2012/2013	24.6%	30.2%	NA	NA
2013/2014	26.1%	34.7%	NA	NA
2014/2015	26.7%	35.6%	NA	NA
2015/2016	26.2%	32.1%	10.8%	37.2%
2016/2017*	NA	NA	NA	NA
2017/2018	26.5%	30.1%	14.9%	38.7%

Setting characteristics

	All children	FSM	Least deprived 20% of neighbourhoods	Middle deprived 60% of neighbourhoods	Most deprived 20% of neighbourhoods	EAL	SEND
All settings							
Graduate at the setting	72.0%	81.5%	61.2%	70.4%	87.2%	86.3%	85.1%
Graduate teaching	68.8%	79.0%	58.0%	67.3%	84.6%	83.6%	82.9%
Average hours of attendance	18.0	16.4	18.1	17.5	17.8	17.6	17.1
(st. dev.)	(8.2)	(5.37)	(8.92)	(7.86)	(7.14)	(7.11)	(6.47)
PVI settings only							
Graduate at the setting	43.8%	39.4%	43.7%	40.0%	43.7%	45.5%	46.3%
Graduate teaching	40.9%	36.5%	41.0%	37.4%	39.6%	41.9%	43.5%
Share of graduates out of total staff	8.4%	6.9%	7.8%	6.9%	7.0%	7.6%	7.7%
Share of graduates out of teaching staff	31.6%	29.3%	29.8%	29.3%	34.6%	35.8%	30.9%
At least a QTS at setting	28.2%	22.5%	28.4%	23.7%	24.8%	26.4%	28.9%
At least a EYPS at setting	30.1%	28.5%	29.7%	28.7%	32.7%	32.8%	32.7%
At least a EYTS at setting	11.8%	10.6%	11.9%	11.2%	11.3%	11.7%	11.8%
QTS and EYPS teaching	10.3%	8.1%	10.5%	8.6%	9.2%	10.0%	11.0%
QTS and EYPS at setting	9.3%	7.7%	9.4%	7.8%	8.6%	8.9%	10.0%
Average hours of attendance (st. dev.)	19.17 (9.88)	16.57 (6.91)	18.78 (9.84)	18.68 (9.55)	19.94 (10.46)	19.69 (10.33)	17.98 (8.9)
EY provider attached to school	19.2%	23.7%	19.0%	21.0%	18.0%	17.5%	21.8%
Sessional provision	29.3%	31.1%	33.9%	30.6%	21.8%	26.5%	32.4%
Average number of children at setting (st. dev.)	38.5 (22.58)	37.7 (21.51)	37.3 (20.01)	38.0 (21.87)	38.4 (23.72)	41.0 (24.15)	38.3 (21.05)
Child to total staff ratio (st. dev.)	3.9 (3.73)	4.2 (4.2)	3.9 (3.44)	4.0 (3.78)	3.9 (4.49)	4.1 (4.81)	3.8 (3.66)
Child to teaching staff ratio (st. dev.)	5.8 (5.62)	6.0 (6.06)	5.7 (5.51)	5.8 (5.59)	6.2 (6.57)	6.2 (6.84)	5.3 (5.28)

Regression models

- Outcome measures: standardised scores within each cohort at ages 5 (EYFSP), 7 (KS1) and 11 (KS2 - when available).
- Focus on three- and four-year-old children who took up the free universal entitlement in PVI settings

- 5 models:
  1. We control only for the cohort (year dummies)
  2. We add primary school fixed effects (school fixed effects)
  3. We add controls for child characteristics (child characteristics)
  4. We add controls for setting characteristics (setting composition)
  5. We add further controls for other setting inputs (setting inputs)

1. Impact on EYFSP scores (2007/2008 – 2015/2016)

Notes on variables

- Data for children in preschool between 2007/2008 and 2015/2016

- New EYFSP fully introduced in 2012/2013 – break in our timeline

- Average EYFSP scores:
  - Old profile: 87.44 (st. dev. 16.92)
  - New profile: 32.35 (st. dev. 10.4)

  - FSM children: Old profile 80.4 (17.69) New profile 30.6 (8.02)
  - Non-FSM children: Old profile 88.9 (16.26) New profile 34.3 (7.98)

Key findings

Qualification variable	2007/2008-2010/2011	2011/2012-2015/2016
Graduate at setting	0.022**	0.025**
(Std. Error)	(0.003)	(0.002)
Observations	1,095,562	1,659,978
R-sq	0.21	0.133
Graduate teaching	0.021**	0.021**
(Std. Error)	(0.003)	(0.002)
Observations	1,095,586	1,659,978
R-sq	0.21	0.133
QTS	0.024**	0.030**
(Std. Error)	(0.003)	(0.002)
Observations	1,095,555	1,659,978
R-sq	0.21	0.133
EYPS	0.013**	0.015**
(Std. Error)	(0.004)	(0.002)
Observations	839,225	1,659,978
R-sq	0.222	0.132
Both QTS and EYPS present	0.028**	0.033**
(Std. Error)	(0.005)	(0.003)
Observations	1,031,249	1,659,978
R-sq	0.21	0.133

- Positive but small association between qualification measures and EYFSP scores
- Effect size of having a graduate at setting is 0.3 of an EYFSP score with new Profile
- Presence of graduate at setting and in the classroom have similar effect sizes
- The positive association is driven by having a QTS rather than a EYPS (0.3 and 0.15 of an EYFSP point)

Results by child characteristics (2011/2012-2015/2016)

Qualification variable	All children	Girls	FSM	EAL	Living in least deprived quintile	Leaving in most deprived quintile
Graduate at setting	0.025**	0.026**	–0.001	0.018**	0.025**	0.011*
(Std. Error)	(0.002)	(0.002)	(0.004)	(0.005)	(0.003)	(0.005)
Observations	1,659,978	805,183	180,119	169,196	460,020	174,316
R-sq	0.133	0.147	0.180	0.170	0.124	0.167
Graduate teaching	0.021**	0.022**	–0.002	0.015**	0.021**	0.009+
(Std. Error)	(0.002)	(0.002)	(0.004)	(0.005)	(0.003)	(0.005)
Observations	1,659,978	805,183	180,119	169,196	460,020	174,316
R-sq	0.133	0.147	0.180	0.170	0.124	0.167
QTS	0.030**	0.029**	0.012*	0.020**	0.027**	0.016**
(Std. Error)	(0.002)	(0.002)	(0.005)	(0.006)	(0.003)	(0.006)
Observations	1,659,978	805,183	180,119	169,196	460,020	174,316
R-sq	0.133	0.147	0.180	0.170	0.124	0.167
EYPS	0.015**	0.015**	–0.005	0.016**	0.016**	0.006
(Std. Error)	(0.002)	(0.002)	(0.005)	(0.005)	(0.003)	(0.005)
Observations	1,659,978	805,183	180,119	169,196	460,020	174,316
R-sq	0.132	0.147	0.180	0.170	0.124	0.167
Both QTS and EYPS present	0.033**	0.030**	0.016*	0.033**	0.032**	0.018*
(Std. Error)	(0.003)	(0.003)	(0.007)	(0.008)	(0.004)	(0.008)
Observations	1,659,978	805,183	180,119	169,196	460,020	174,316
R-sq	0.133	0.147	0.180	0.170	0.124	0.167

Key points

- No stronger association between graduate-level qualifications and EYFSP outcomes for subgroups compared to whole sample

- Effects that are statistically significant (e.g. for girls and children living in the most deprived quintile) only slightly bigger than the average effect size for the whole sample

- The effect for children eligible for FSM and for EAL pupils are either slightly negative or not statistically significant

- Positive impact mainly driven by QTS rather EYPS

Results by subscores (2011/2012-2015/2016)

Qualification variable	Personal, social and emotional development scores	Communication, language and literacy development scores	Mathematical development scores
Graduate teaching	0.012**	0.027**	0.025**
(Std. Error)	(0.002)	(0.002)	(0.002)
Observations	1,659,978	1,659,978	1,659,978
R-sq	0.116	0.097	0.095
QTS	0.018**	0.038**	0.036**
(Std. Error)	(0.002)	(0.002)	(0.002)
Observations	1,659,978	1,659,978	1,659,978
R-sq	0.116	0.097	0.095
EYPS	0.008**	0.019**	0.018**
(Std. Error)	(0.002)	(0.002)	(0.002)
Observations	1,659,978	1,659,978	1,659,978
R-sq	0.116	0.097	0.095

2. Impact on EYFSP scores (2015/2016 – 2017/2018)

Notes on variables

- Some changes in variables

- Total staff variable no longer collected – changes in our derived variables e.g. proportion of graduates and ratios

- No usable data on qualifications for 2016/2017

- EYTS data available since 2015/2016

- L2 and L3 staff data on EYC since 2017/2018 (1 year of data)

- Average EYFSP score is 32.78 (st. dev. 10.85):
  - FSM children: 31.11 (8.25)
  - Non-FSM children: 34.72 (8.27)

Key findings

Qualification variable	All children	Girls	FSM	EAL	Living in least deprived quintile	Leaving in most deprived quintile
Graduate teaching	0.027**	0.027**	0.010	0.029**	0.023**	0.024**
(Std. Error)	(0.002)	(0.003)	(0.007)	(0.007)	(0.004)	(0.006)
Observations	697,663	337,803	70,219	80,166	185,326	83,536
R-sq	0.149	0.175	0.238	0.207	0.158	0.191
QTS	0.036**	0.033**	0.018*	0.035**	0.027**	0.042**
(Std. Error)	(0.003)	(0.003)	(0.008)	(0.008)	(0.004)	(0.008)
Observations	697,663	337,803	70,219	80,166	185,326	83,536
R-sq	0.150	0.175	0.238	0.207	0.158	0.191
EYPS	0.020**	0.021**	0.006	0.030**	0.019**	0.012
(Std. Error)	(0.002)	(0.003)	(0.007)	(0.007)	(0.004)	(0.007)
Observations	697,663	337,803	70,219	80,166	185,326	83,536
R-sq	0.149	0.175	0.238	0.207	0.158	0.191
EYTS	0.029**	0.026**	-0.010	0.024*	0.022**	0.046**
(Std. Error)	(0.003)	(0.004)	(0.011)	(0.010)	(0.005)	(0.009)
Observations	692,738	335,425	69,756	79,204	184,225	82,840
R-sq	0.150	0.175	0.239	0.208	0.158	0.191

Key points

- Small but positive associations: 0.3 of an EYFSP point for a graduate in the classroom, 0.4 for QTS and 0.3 for EYTS.

- More results that are positive and statistically significant compared to 2008-2016 analysis
  - Positive association found for all qualification variables in the case of girls and EAL pupils
  - No clear association between the presence of a graduate in the classroom and EYFSP scores for FSM children
  - Positive association between the presence of a QTS and EYTS and EYFSP scores for children living in the most deprived quintile: 0.45 and 0.5 of an EYFSP point respectively

Results by subscores

Qualification variable	Personal, social and emotional scores	Communication, language and literacy development	Mathematical development
Graduate teaching	0.017**	0.033**	0.031**
(Std. Error)	(0.002)	(0.003)	(0.003)
Observations	697663	697663	697663
R-sq	0.137	0.112	0.107
QTS	0.024**	0.043**	0.041**
(Std. Error)	(0.003)	(0.003)	(0.003)
Observations	697663	697663	697663
R-sq	0.137	0.112	0.107
EYPS	0.013**	0.024**	0.023**
(Std. Error)	(0.002)	(0.003)	(0.003)
Observations	697663	697663	697663
R-sq	0.136	0.111	0.107
EYTS	0.019**	0.034**	0.031**
(Std. Error)	(0.003)	(0.004)	(0.004)
Observations	692738	692738	692738
R-sq	0.137	0.112	0.107

Level 2 and level 3 staff (2017/2018)

- Staffing structure: average total staff at setting is 13.6
- We can account for qualification levels of 85% of total staff:
  - 11.5% full and relevant level 2 qualification
  - 48.4% level 3 qualification and worked directly with children
  - 16.1% level 3 qualification and worked in a management position
  - 9% holds a graduate qualification (QTS/EYPS/EYTS)

- When including L2 and L3 in analysis, the presence of a graduate shows no significant association with children's outcomes while an increase in the proportions of L2 and L3 staff has a negative association with EYFSP scores
- Caution needed in interpreting results

Level 2 and level 3 qualifications

Interaction between graduates and L3 in non management role

Qualification variable	2017/2018
Graduate teaching share	-0.031
(Std. Error)	(0.019)
L3 in non management role share	-0.030**
(Std. Error)	(0.009)
Interaction between graduates and L3 non management role	0.133**
(Std. Error)	(0.050)
L2 share	-0.056**
(Std. Error)	(0.012)
L3 in management role share	-0.108**
(Std. Error)	(0.010)
Observations	345,714
R-sq	0.187

Interaction between graduates and L3 in management role

Qualification variable	2017/2018
Graduate teaching share	0.006
(Std. Error)	(0.017)
L3 in management role share	-0.108**
(Std. Error)	(0.011)
Interaction between graduates and L3 management role	-0.037
(Std. Error)	(0.087)
L2 share	-0.057**
(Std. Error)	(0.012)
L3 in non management role share	-0.024**
(Std. Error)	(0.008)
Observations	345,714
R-sq	0.187

- Mixed results when accounting for the interaction between the proportion of graduates and the proportion of level 3 staff

- Having a graduate present leads to the level 3 staff working in the classroom to be more effective

Hours of attendance

- Difference between children enrolled at an early years setting for more or less than the 15 hours of the free universal entitlement.

Qualification variable	2017/2018
Graduate teaching	0.013**
(Std. Error)	(0.003)
Child registered for more than 15h/w	0.151**
(Std. Error)	(0.003)
Setting has a graduate and child is registered for more than 15h/w	0.015**
(Std. Error)	(0.004)
Observations	697,663
R-sq	0.159

- Attendance beyond 15 hours per week (the universal entitlement) doubles the effect size associated with the presence of a graduate in the classroom with EYFSP scores

Hours of attendance and FSM children

Qualification variable	2017/2018
Graduate teaching	0.001
(Std. Error)	(0.007)
FSM child registered for more than 15h/w	0.102**
(Std. Error)	(0.010)
Setting has a graduate and FSM child registered more than 15h/w	0.030*
(Std. Error)	(0.015)
Observations	70,219
R-sq	0.241

- There does not appear to be any association between the presence of a graduate in the classroom and EYFSP scores for children that later on are eligible for free school meals
- However, this relationship becomes positive when the child also attends for more than 15 hours.

3. Impact on EYFSP, KS1 and KS2 scores (2007/2008 – 2010/2011)

Impact on KS1 & KS2 controlling for previous achievement

Qualification variable	KS1	KS2
Graduate teaching	0.010**	0.009**
(Std. Error)	(0.002)	(0.002)
EYFSP scores	0.804**	0.706**
(Std. Error)	(0.001)	(0.001)
QTS	0.009**	0.009**
(Std. Error)	(0.002)	(0.002)
EYFSP scores	0.804**	0.706**
(Std. Error)	(0.001)	(0.001)
EYPS	0.007**	0.007**
(Std. Error)	(0.003)	(0.003)
EYFSP scores	0.817**	0.719**
(Std. Error)	(0.001)	(0.002)
Graduate at setting	0.011**	0.011**
(Std. Error)	(0.002)	(0.002)
EYFSP scores	0.804**	0.706**
(Std. Error)	(0.001)	(0.001)

- Small but positive association between degree-level qualifications and KS1 and KS2 outcomes

Summary of findings

- Small but positive association between the presence of degree-qualified staff and EYFSP scores

- Effect size consistently larger for QTS and EYTS than for EYPS

- The positive association is sustained over time through KS1 and KS2

- Positive association between attending early years settings with a graduate for more than 15 hours per week and EYFSP scores for children who later on claim free school meals

Policy Recommendations

- Pilot studies to investigate the impact of different formulations of staffing composition within a setting, and the possible differential impact of higher qualification levels between staff in leadership position and frontline workers.

- A review of early years degrees to assess the differences among types of degree-level qualification, the quality of their theoretical content and the role of the induction system in preparing graduates for work in early years settings.

- Cost and benefit analysis of making the 30 hours entitlement universal, and assessment of the extent to which the current design affects quality and access for disadvantaged children, with the goal of redesigning the system and making it more equitable.

Final considerations

- Need to contextualise findings with other studies showing fragmentation of the sector and difficulties of PVIs

- Early education alone is not a panacea

- Small effect sizes:
  - children's outcomes are a function of their experiences in early years, school and at home
  - part-time and/or erratic attendance of early years settings, even when of high quality, cannot be expected to offset all of the disadvantages faced by children growing up in poverty
  - we cannot expect a small proportion of highly qualified staff to create systemic change when the majority of the workforce has low qualification levels, poor pay and working conditions, and insufficient access to continuing professional development
  - clear variability among early years degrees….see next presentation

Thank you

Get in touch

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