Impact of nursery school quality and pedagogy on children’s learning: Findings from project EPPE

Prof. Iram Siraj
Institute of Education, University of London
Effective Provision of Pre-School Education

E P P E

A Longitudinal Study Funded by the DFES

1997-2003

Kathy Sylva University of Oxford
Edward Melhuish Birkbeck, University of London
Pam Sammons University of Nottingham
Iram Siraj Institute of Education, University of London
Brenda Taggart Institute of Education, University of London

An ESRC TLRP (Associate) project
Aims of the EPPE research

• To establish the impact of pre-school on young children’s intellectual and social/behavioural development.

• To identify those pre-schools that are more effective than others in promoting children’s development.

• To describe the background characteristics of effective pre-school settings.

• To establish the impact of the home (before age 3) on children’s intellectual and behavioural development.

• To explore whether pre-school experience can reduce social inequalities.
Sample

• Six local authorities

• 141 Pre-school centres randomly selected within the authorities to include:
  ▪ nursery classes
  ▪ playgroups
  ▪ private day nurseries
  ▪ day care centres run by local authority
  ▪ nursery schools
  ▪ fully integrated centres

• Approx 2,800 children from 141 centres and 300+ ‘home’ children
Plan of Study

Pre-school Provision (3+yrs)
- 25 nursery classes: 590 children
- 34 playgroups: 610 children
- 31 private day nurseries: 520 children
- 20 nursery schools: 520 children
- 24 local authority day care nurseries: 430 children
- 7 integrated centres: 190 children
- Home: 310 children

Reception (5 yrs)
Exit Assessments N=1500

Year 1 (6 yrs)
Age 6 Assessments N=3,000+

Year 2 (7 yrs)
Age 7 Assessments N=3,000+
Sources of data

• Child assessments over time
• Family background information
• Interviews with staff
• ‘Quality’ rating scales
• Case studies of effective centres
## Multiple disadvantage indicators: familiar to Nursery Schools and Children’s Centres!!

<table>
<thead>
<tr>
<th>Child Characteristics</th>
<th>Disadvantage Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>First language</td>
<td>English not first language</td>
</tr>
<tr>
<td>Large family</td>
<td>3 or more siblings</td>
</tr>
<tr>
<td>Pre-maturity/LBW</td>
<td>Premature or below 2500 grams</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parent Characteristics</th>
<th>Disadvantage Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother’s highest qualification</td>
<td>No qualifications</td>
</tr>
<tr>
<td>Social class of father’s occupation</td>
<td>Semi-skilled, unskilled, never worked, absent father</td>
</tr>
<tr>
<td>Father’s employment status</td>
<td>Not employed</td>
</tr>
<tr>
<td>Young mother</td>
<td>Age 13-17 at birth of EPPE child</td>
</tr>
<tr>
<td>Lone parent</td>
<td>Single parent</td>
</tr>
<tr>
<td>Mother’s employment status</td>
<td>Unemployed</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Home environment Characteristics</th>
<th>Bottom quartile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home environment scale</td>
<td></td>
</tr>
</tbody>
</table>
Home learning before 3 years – nursery schools and integrated centres had the highest levels of parent engagement

What parents and carers do is most important and makes a real difference to development. Activities for parents which help children’s development include:

- reading to children;
- teaching children songs and nursery rhymes;
- playing with letters and numbers;
- painting and drawing;
- taking children to libraries;
- (for social outcomes) creating regular opportunities for play with friends.
Most Effective Settings (1)

Children from integrated settings and nursery schools tend to do better on cognitive outcomes even after taking account of children’s backgrounds. Children from nursery schools, integrated settings (which have fully integrated education with care) and nursery classes are better at fostering children’s social development.
Most Effective Settings (2)

Settings with higher quality provision had children who showed a decrease in anti-social/ worried behaviours. Ofsted shows nursery schools are twice as likely to get outstanding rating compared to other providers.
Most Effective Settings (3)

There were more cognitive gains for children in centres that encouraged high levels of parental involvement, for example giving parents information on their children’s learning, and encouraging education for parents.
The measurement and impact of quality

How EPPE measures quality

- Early Childhood Environment Rating Scale (ECERS-R total + subscales)
- ECERS-E (total + subscales)
- Caregiver Interaction Scale (4 subscales, e.g., punitiveness, detachment, responsiveness)
## Two Early Childhood Environment Rating Scales

### ECERS-R

- Based on observation – 7 sub-scales
  - Space and furnishings
  - Personal care routines
  - Language reasoning
  - Activities
  - Interaction
  - Programme structure
  - Parents and staff

**Harms, Clifford & Cryer (1998)**

**Rating scale:**

<table>
<thead>
<tr>
<th>Inadequate</th>
<th>Minimal</th>
<th>Good</th>
<th>Excellent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

### ECERS-E

- Based on observation – 4 sub-scales
  - Literacy
  - Mathematics
  - Science and environment
  - Diversity

**Sylva, Siraj-Blatchford & Taggart (2003)**

<table>
<thead>
<tr>
<th>Inadequate 1</th>
<th>Minimal 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 No preparation of food or drink is undertaken in front of children</td>
<td>3.1 Food preparation is undertaken by adults in front of the children</td>
</tr>
<tr>
<td>3.2 Some children can choose to participate in food preparation</td>
<td>3.3 Staff discuss with the children routine food that has been prepared by adults, where appropriate, e.g. burnt toast or new biscuits or food brought in by children because of special events.</td>
</tr>
</tbody>
</table>

Sylva, Siraj-Blatchford & Taggart (2003)
An Example of ECERS-E Item Medium scores


<table>
<thead>
<tr>
<th>Good</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1</td>
<td>Food preparation/ cooking activities are provided regularly</td>
</tr>
<tr>
<td>5.2</td>
<td>Most of the children have the opportunity to participate in food preparation</td>
</tr>
<tr>
<td>5.3</td>
<td>The staff lead the discussion about the food involved and use appropriate terminology (EX. Melt, dissolve).</td>
</tr>
<tr>
<td>5.4</td>
<td>Children are encouraged to use more than one sense (feel, smell, taste) to explore raw ingredients.</td>
</tr>
</tbody>
</table>

Sylva, Siraj-Blatchford & Taggart (2003)
### An Example of ECERS-E Item High scores


<table>
<thead>
<tr>
<th>Excellent</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1 A variety of cooking activities in which all children have the opportunity to take part are provided regularly.</td>
<td>-YES/NO</td>
</tr>
<tr>
<td>7.2 The ingredients are attractive and the end result is reasonable and appreciated (Ex. Eaten by children, taken home).</td>
<td>-YES/NO</td>
</tr>
<tr>
<td>7.3 The staff lead and encourage discussion on the process of food preparation such as what needs to be done to cause ingredients to set or melt.</td>
<td>-YES/NO</td>
</tr>
<tr>
<td>7.4 Staff draw attention to changes in food and question children about it (Ex. What did it look like before, what does it look like now, what has happened to it).</td>
<td>-YES/NO</td>
</tr>
</tbody>
</table>

Sylva, Siraj-Blatchford & Taggart (2003)
### An Example of ECERS-E Item Low scores

#### 4. Sounds in words

**Inadequate 1**

1.1 Few or no nursery rhymes or poems are spoken or sung - YES/NO

**Minimal 3**

3.1 Rhymes are often spoken or sung by adults to children - YES/NO

3.2 Children are encouraged to speak and/or sing rhymes - YES/NO

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Sylva, Siraj-Blatchford & Taggart (2003)
4. Sounds in words

<table>
<thead>
<tr>
<th>Good</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1</td>
<td>The rhyming component of songs and nursery rhymes are brought to the attention of children.</td>
</tr>
<tr>
<td>5.2</td>
<td>Initial sounds of alliterative in words and/or alliterative sentences are brought to the attention of children (e.g. Peter Piper picked a peck of pickled peppers).</td>
</tr>
</tbody>
</table>

Sylva, Siraj-Blatchford & Taggart (2003)
4. Sounds in words

Exellent  7

7.1 Attention is paid to syllabification of words through clapping games, jumping etc.  YES/NO

7.2 Some attention is given to linking sounds to letters.  YES/NO

Sylva, Siraj-Blatchford & Taggart (2003)
Box plot of mean ECERS-R score by ECEC type

- Nursery class: 25
- Private day nursery: 31
- Playgroup: 31
- Local authority nursery school: 24
- Combined centre: 20
- Nursery school: 7
Box plot of mean ECERS-E score by ECEC type

- Nursery class: N = 25
- Private day nursery: N = 34
- Local authority nursery: N = 31
- Playgroup: N = 24
- Private day nursery: N = 20
- Combined centre: N = 7
Main findings From ECERS-E

- Total scores on the ECERS-E were significantly related to progress in children’s
  Language
  Non-verbal reasoning
  Number skills

- The ECERS-E sub-scale ‘Literacy’ was significantly related to children’s progress in pre-reading skills.
Complex value-added model: the effect of pre-school’s quality on children’s cognitive progress

<table>
<thead>
<tr>
<th></th>
<th>Pre-reading</th>
<th>Early number concepts</th>
<th>Language</th>
<th>Non-verbal reasoning</th>
<th>Spatial awareness</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ECERS-E</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average total</td>
<td>positive*</td>
<td>positive</td>
<td></td>
<td>positive</td>
<td></td>
</tr>
<tr>
<td>Literacy</td>
<td>positive*</td>
<td>positive</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maths</td>
<td></td>
<td></td>
<td></td>
<td>positive</td>
<td></td>
</tr>
<tr>
<td>Science/Environment</td>
<td></td>
<td></td>
<td></td>
<td>positive#</td>
<td></td>
</tr>
<tr>
<td>Diversity</td>
<td>positive#</td>
<td>positive</td>
<td></td>
<td>positive</td>
<td></td>
</tr>
<tr>
<td><strong>ECERS-R</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Space and furnishings</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Personal care</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Language and reasoning</td>
<td></td>
<td></td>
<td></td>
<td>positive#</td>
<td></td>
</tr>
<tr>
<td>Activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interaction</td>
<td></td>
<td></td>
<td></td>
<td>positive</td>
<td></td>
</tr>
<tr>
<td>Programme structure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parents and staff</td>
<td>positive#</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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</table>

* When change of centre is not in model  
# verging on statistical significance
Complex value-added model: the effect of pre-school’s quality on children’s social-behavioural development

<table>
<thead>
<tr>
<th></th>
<th>Independence and concentration</th>
<th>Cooperation and Conformity</th>
<th>Peer Sociability</th>
<th>Anti-social/Worried</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ECERS-E</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average total</td>
<td>positive#</td>
<td>positive#</td>
<td></td>
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<tr>
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<td></td>
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<td>positive#</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Diversity</td>
<td>positive#</td>
<td>positive#</td>
<td></td>
<td></td>
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</table>
### Caregiver Interaction Scale (Arnett)

- **Positive relationships** is a subscale made up of 10 items indicating warmth and enthusiasm interaction with children by the caregiver.

- **Punitiveness** is a subscale made up of 8 items indicating harsh or over-controlling behaviour in interaction with children by the caregiver.

- **Permissiveness** is a subscale made up of 4 items indicating avoidance of discipline and control of children by the caregiver.

- **Detachment** is a subscale made up of 4 items indicating lack of involvement in interaction with children by the caregiver.
**Impact of quality as measured by the Caregivers Interaction Scale on cognitive and social behaviour outcomes**

<table>
<thead>
<tr>
<th></th>
<th>Pre-reading</th>
<th>Early number concepts</th>
<th>Independence &amp; Concentration</th>
<th>Co-operation &amp; Conformity</th>
<th>Peer Sociability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive relationships</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Punitiveness</td>
<td>-</td>
<td>-</td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Permissive</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Detachment</td>
<td>-</td>
<td>-</td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
Effective Pedagogy in the Early Years: intensive case studies

Pedagogical Interventions
- Face to face interactions
- Development of behaviour routines for collaborative play
- Arrangement of space
- Assessment
- Planning
- Resources

Pedagogical Framing
- Community relations
- Parents
- Management Structure
- Staff Development
- Liaison with outside professionals
Data entered into QSR NUD*IST – vivo

107 parent interviews and 14 centre plans
14 files of documentary and case study analysis
42 staff and manager interviews
204 transcribed naturalistic observations of 28 staff (2 staff/setting, 400+hrs taken over 56 whole days)

254 systematic target child observations
20-40 mins. each
Pedagogy: condensed model

Involvement
  adult and child

Co-construction
  of knowledge

Instruction
  modes of teaching
    demonstration
    explanation
    questioning
    modelling
Pedagogy- the key findings are in the following areas:

• Management and staff
• Ethos and climate of the settings
• Adult-child verbal Interactions
• Differentiation and formative assessment
• Discipline and adult support in talking through conflicts
• Parental partnership with settings and the home education environment
• Pedagogy
• Knowledge of the curriculum and child development
Sustained Shared Thinking

Episodes in which two or more individuals “work together" in an intellectual way to solve a problem, clarify a concept, evaluate activities, extend a narrative etc., where both participants must contribute to the thinking and it must develop and extend.

Higher levels in nursery schools

(Source Siraj-Blatchford et al., 2002)
Staff qualifications – more level 5 staff in nursery schools, followed by nursery classes and integrated centres

• % staff time at different levels (unqualified, level 2, level 3 & 4 and level 5) was tested in models.

• For cognitive progress, % staff contact time at level 5 was positive significant for outcome (pre-reading).

• For social behavioural development: % staff contact time at level 5 was positive significant for ‘Co-operation & Conformity’ and also significantly associated with reductions in ‘Anti-social / Worried’ behaviour
Percentage of pedagogical interactions (cognitive and monitoring) in settings varying in effectiveness.
Percentage of high cognitive challenge activities within each initiation category in each setting type
ECERS-E subscales by manager qualification

- Literacy
- Mathematics
- Science and environment
- Diversity

ECERS-E score: Level 2, Level 3 / 4, Level 5
Pedagogic interactions of practitioners’ with different qualifications.

- Level 5 practitioner
- NVQ level 2-4 practitioner in level 5 setting
- NVQ level 2-4 practitioner (only)

Graph showing percentages of sustained shared thinking, instruction, and monitoring for different qualifications.