



**COUNTRY REPORTS – FRAME OF REFERENCE**

# **APPENDIX A**

**FACTORS INFLUENCING EMERGENT  
LITERACY AND THEIR INDICATORS**

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# Introduction

In contrast to other age groups, we are not able to describe the literacy status in the 0-5 age group. What we can do for this age group is to describe, based on the available information, the **factors influencing emergent literacy** and the **policies** which may positively influence them. By identifying these factors and by understanding the mechanisms through which they influence first the family environment, then the child's emergent literacy and ultimately literacy, we can provide a solid basis for policies and interventions aimed at promoting literacy from the first years of life.

For each main group of factors, we propose a list of indicators most of which can be calculated based on current statistics or data provided by national institutions.

## Early factors influencing emergent literacy and their causal pathways

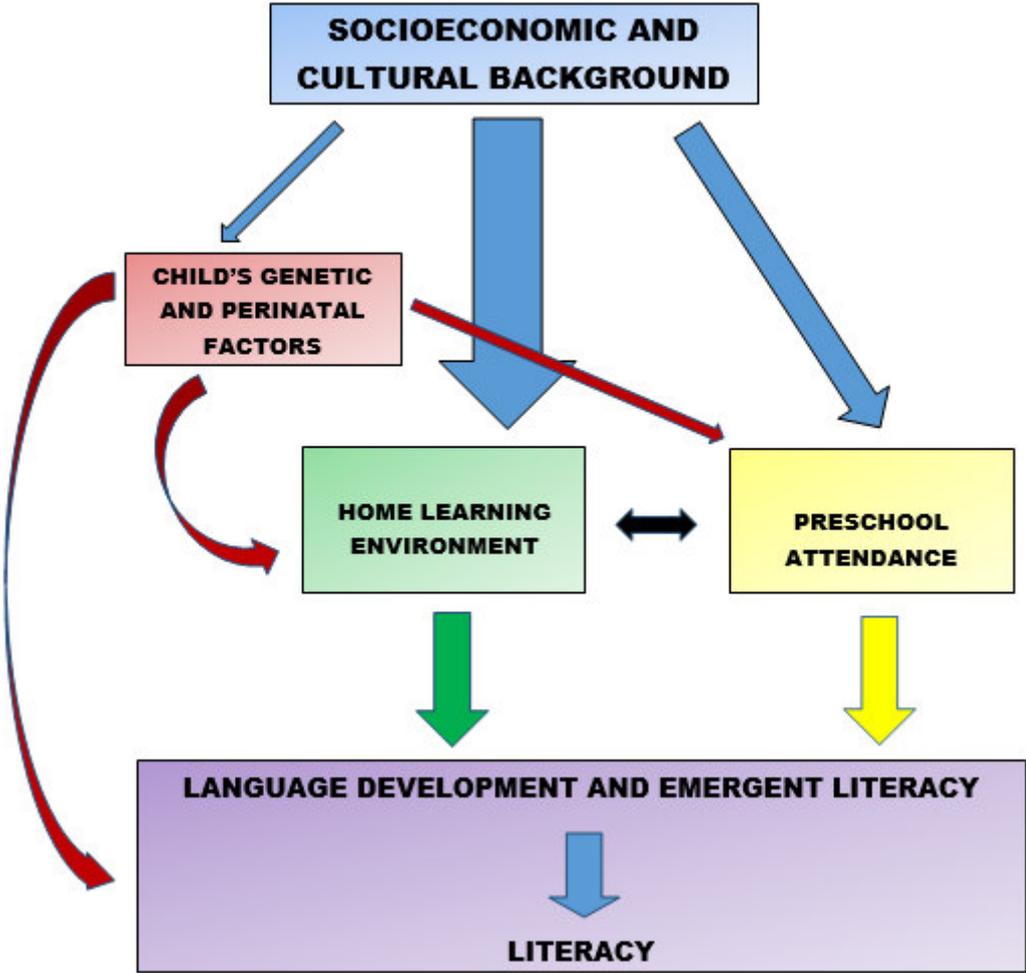
The proposed **framework** (fig. 1) is an attempt to identify the main factors influencing emergent literacy and their causal pathways. The framework is based on an ecological and bio-psycho-social approach and identifies four main groups of factors:

1. **The socioeconomic and cultural background** is a strong determinant of literacy. Material poverty and educational level, particularly of the mother, are well recognised main determinants of literacy (World Bank, 2005 and 2011). The socio-economic background also influences the biological risk, by determining early exposure to risk factors and increased susceptibility (Jednoróg 2012, Jefferis 2002). This is why SES is the main distal determinant in the proposed framework. Primary languages spoken at home also influence literacy development (Sylva 2004).
2. **Genetic and perinatal factors affecting the child.** Inherited genetic factors, such as those determining intellectual or language impairment or acquired brain damage consequent to adverse pregnancy and perinatal conditions, may lead to impaired functioning in key areas such as hearing, language and interpersonal communication. These conditions altogether may affect as many as 5%-6% of children, including developmental disabilities among very low birth weight/very premature babies and cognitive impairment due to genetic syndromes or acquired diseases (Cattaneo et al. European Child Health Report 2012). The combined effect of genetics and prenatal and postnatal events determines the child's neurobiological features and thus vision, hearing, executive functions and consequently language (articulation, vocabulary, grammar), as well as verbal intelligence and general cognitive development (concepts).
3. **The home learning environment**, particularly in the first three years, is extremely important (Blatchford et al. 2009, Brooks 2008 and 2012, Swain 2009, David 2003, Springate 2008, Evangelou 2009). It determines the quantity and quality of interactions between the infant and the primary caregivers, which are the most powerful determinants of language development, both receptive and expressive, in the first three years when experience-dependent creation of synapses is maximal. We know that the more words the child is exposed to, the more he/she learns. Caregiver-child relations in their turn strongly influence the ability to learn, by influencing self-esteem, general knowledge and motivation.
4. **Preschool attendance** is also associated with the development of emergent literacy and literacy (Nadeau 2011, Maas 2013). The earlier and the longer the exposure, the greater the effect, as shown by many studies and by the PIRLS results (Mullis 2007 and 2011, Heckman 2010). Of course, it is not only a matter of quantity but also of quality of day care, and quality standards, starting from teachers' qualifications and children to educator ratios, make a big difference, although they are certainly more difficult to measure and compare.

All four groups of factors influencing emergent literacy interact with each other in ways that may differ from one population group to another, and even from one individual to another. Factors may play a bigger or smaller role depending on the influence of other factors. Favourable conditions in one main domain may represent a protection against adverse situations in other.

It is also well recognised that early investment in human capital produces great and sustainable benefits for social and economic development (Carneiro 2003, World Bank 2005) and is crucial for fighting inequity (Irwin 2007, Springate 2008, Walker 2011).

Fig. 1: Child literacy: causal framework of main determinants



### The role of public policies in determining children’s emergent literacy

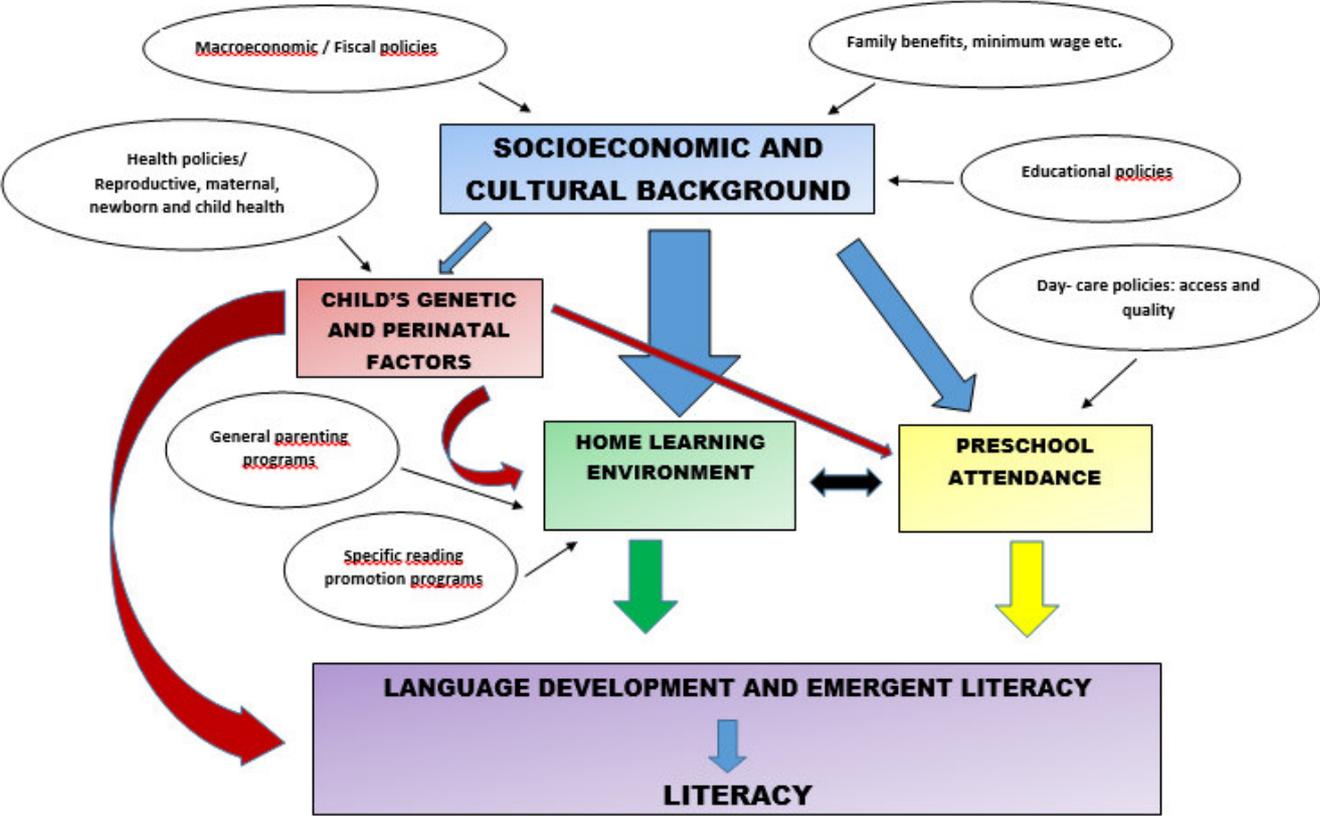
The ultimate aim of the ELINET project is to improve literacy, particularly among population groups and individuals that for social, economic and cultural reasons are lagging behind. Thus, from a policy perspective, we are interested in identifying indicators that can describe not only the main **early factors** influencing literacy, but also the **policies** that may influence them and consequently the development of literacy. In this way, we will be able to provide an analytical description of the situation in each country and possibly for specific population groups.

Fig. 2 shows how policies in a variety of domains can influence these factors. The aim of this expanded causal framework is to identify policies that create an enabling environment for the development of

family literacy, emergent literacy and ultimately child literacy. Policies may require different time spans to produce effects. For example, policies in the upper part of the schema, most of which are typically adopted by the whole government, usually require a longer time frame to produce results, but their effects are more sustained. Policies in the lower part, by improving literacy-relevant family practices (such as parenting programmes) or improving access and quality of day care, may produce more immediate although less sustained effects.

In the ELINET project, **best practices** regarding policies and interventions should be assessed by their adherence to a plausible causality framework, the size of the effect produced and classified according to the mechanisms through which they are supposed to produce their effects. The proposed scheme may therefore be helpful in classifying the policies aimed at improving family literacy and the child’s emergent literacy.

Fig. 2: Child literacy: causal framework of main determinants and policies influencing them



## **Proposed indicators for emergent literacy (factors and policies)**

The proposed indicators are useful for describing the situation in each country not only in terms of current status, but also of **current policies** (e.g. policies to increase access to early day care, or to support generic parenting skills or specific ones, such as reading aloud), **and for ascertaining whether they have been adopted** (yes or no) and **implemented** (partially or completely).

### **Criteria for the choice of the proposed indicators**

- 1) The indicator should adequately describe a factor influencing emergent literacy or an aspect closely linked to one of the main factors.
- 2) The relationship of the factor described by the indicator and the literacy development process should be clear and unequivocal, with an evidence basis.
- 3) The relevant information should be retrievable from current statistics available in all countries, or the majority of them, ideally through a homogeneous, Europe-wide data base.

Due to either intrinsic limitations of the indicators or to incomplete availability of data, only a few of the proposed indicators meet all the above requisites. Certain valid indicators are not currently included as variables in PIRLS, such as:

- Cognitive or sensory disabilities
- Child's age at which parents start to read to their child
- Parental attitudes to reading to their children

Therefore they should be considered for future PIRLS versions.

Due to the lack of an adequate, Europe-wide information basis to calculate indicators for several key factors (e.g. relevant family practices) there is the need to develop a European-wide survey for the preschool age (3 or 4 years). This should be agreed upon with the main International Agencies, starting with the EU DG Education and DG Public Health.

# 1 Socioeconomic and cultural background

## Child poverty

**Evidence:** A major determinant of child development, which consequently influences child literacy (World Bank 2005 and 2011, Jednoróg 2012, Jefferis 2002, Marmot 2008, Bennet 2012, Del Boca 2010).

**Indicator:** Percentage of children living in a household in which disposable income, when adjusted for family size and composition, is less than 50% of the national median income (UNICEF Innocenti Research Centre 2012).

**Limitations:** The indicator is dependent on each country's average income, and therefore comparisons across countries are only partially valid.

**Source:** Unicef (2012). Measuring Child Poverty. Report card 10, Innocenti Research Centre, fig. 1b, p.3.

## Primary language spoken at home different from language used at school

**Evidence:** Children learning two languages may be at an initial disadvantage in acquiring emergent literacy skills. The primary risk is that language may not develop enough in either language to facilitate advanced reading development (McBride 2004, Juel 1986, Bennet 2012, Mullis 2007 and 2012, Kennedy 2012).

**Indicator:** Proportion of children speaking a different language at home from the one used at school.

**Limitations:** There are significant differences in the impact that "primary language spoken at home different from language used at school" may have on early literacy, depending on the extent to which the language is structurally and phonologically similar to the language used at school. Furthermore, most minority languages spoken within a country are not associated with worse school achievement, except where linguistic minority status is correlated with lower SES (e.g. in England).

**Source:** PIRLS 2011. Exhibit 4.3, Students Spoke the Language of the Test Before Starting School.

## Mother's education level

**Evidence:** Maternal education level is strongly associated with child literacy, while father's education is not or is weakly associated with early learning (World Bank 2005 and 2011, Sylva 2003, McClland 2003).

**Indicator:** Proportion of women with primary, secondary or tertiary education.

**Limitations:** No limitations.

**Source:** PIRLS 2011 database.

## Gini index

**Evidence:** It is associated with inequality in literacy outcomes.

**Indicator:** The Gini index measures the income distribution (0= maximum equality, 100= maximum inequality).

**Limitations:** It is a purely economic indicator.

**Source:** Eurostat (2012). European Union Statistics on Income and Living Conditions (EU-SILC)<sup>1</sup>

## Gender

**Evidence:** Female gender is weakly associated with higher reading and writing achievements (OECD, 2012), most likely due to postnatal socially determined factors. Most importantly, the women's position and status are positively associated with countries' adult literacy performance.

**Indicators:** Eurostat provides 5 groups of gender indicators (education, labour market, earnings, childcare and health).

**Limitations:** None of the above is currently included in PIRLS.

**Source:** Eurostat<sup>2</sup>

## Teenage mothers

**Evidence:** Children of teenage mothers are at risk of being exposed to a disadvantaged Home Literacy Environment and are at greater risk of school failure (Sylva 2003, Burgess 2005, Jewell 2000).

**Indicator:** Proportion of children born to teenage mothers (under 20 years).

**Limitations:** The social significance and therefore the effects of being a child of a mother younger than 20 years are quite different across countries. In countries and population groups where early marriage is still common, for example, there is no particular risk attached, at least for children born to women older than eighteen years old.

**Source:** Unicef (2001). Teenage Birth in Rich Nations. Innocenti Report, fig. 1, p.4.

## Single-parent family

**Evidence:** Children who have divorced parents are at increased risk of special educational need (Sylva 2003). Having a single parent puts limits on literacy resources at home (Wasik, 2008) and on parental involvement (Carpentieri, 2011).

**Indicator:** Percentage of children living mainly with a single parent.

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<sup>1</sup> See: <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&language=en&pcode=tessi190>.

<sup>2</sup> See: [http://epp.eurostat.ec.europa.eu/portal/page/portal/employment\\_social\\_policy\\_equality/equality/indicators\\_gender](http://epp.eurostat.ec.europa.eu/portal/page/portal/employment_social_policy_equality/equality/indicators_gender)

**Limitations:** The association is rather weak. Due to rapid changes in society, single parenthood is becoming very common and the range of family situations may be quite wide.

**Source:** Eurostat (2012). Eurostat Report. Figure A7, Percentage of two-parent, single-parent and other type of household with children aged 0-5, 2012, p. 31.

## **Migrant parents**

**Evidence:** Migrant status has strong impacts on reading literacy (Carpentieri 2011, Kennedy 2012). This factor is strongly associated with the primary language indicator, although it includes many other aspects than just language. The child confronts language and cultural differences between home and school, and this may affect or influence motivation (Jouel 1986, Evangelou 2009, Mc Celland 2003, West 2010).

**Indicators:** Proportion of children with one parent or both parents born outside the country.

**Limitations:** No limitations.

**Source:** PIRLS 2006. Exhibit 3.12, Students' Parents Born in Country with Trends.

## 2 Child's genetic and perinatal factors

### Very low birth weight/Severe prematurity

**Evidence:** VLBW and severe prematurity are associated with developmental disabilities including reading and writing disabilities (Hack 2002, Schendel 1997).

**Indicator:** Percentage of children with birth weight below 1500g/gestational age below 32 weeks.

**Limitations:** No limitations, this information is usually available from current statistics.

**Source:** PERISTAT : European Perinatal Health Report, 2010<sup>3</sup>: Figure 7.11 - Percentage of live births with a birth weight under 2500 grams in 2010 (p.149); Figure 7.14 - Percentage of live births with a gestational age <32 weeks and between 32-36 weeks in 2010 (p.155)

### Cognitive and sensory disabilities

**Evidence:** Cognitive and sensory disabilities (not managed at an early stage) affect reading and writing performance in different ways and require special learning and communication aids (Cattaneo et. al. 2012).

**Indicator:** Hearing and vision problems not adequately managed at an early stage; specific language impairment.

**Limitations:** Precise information on incidence and prevalence of the different disabilities, which include hundreds of different conditions, may not be available.

**Source:** There is no Europe-wide source available, most countries would have their own statistics based on different definitions.

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<sup>3</sup> See: <http://www.europeristat.com/images/doc/Peristat%202013%20V2.pdf>.

# 3 Home learning environment

## ELA Scale (Early Literacy Activity Scale)

**Evidence:** Engaging in early literacy activities is strongly associated with school achievement (Mullis 2012, Strickland 2006, Fan and Chen 2001, Melhuish et al. 2001).

Research has shown that children socialised in reading retain or even increase their advantage in language performance compared to their classmates when entering primary school (Kloostermann 2011).

Throughout a child's development, the time devoted to literacy-related activities remains essential to the acquisition of reading literacy skills and the effects can be long lasting (Levy et al. 2006, Melhuish et al. 2008).

**Indicator:** Percentage of parents who (often, never or almost never) do literacy-relevant activities with their child. Nine activities are considered: reading books, telling stories, singing songs, playing with alphabet toys, talking about things done, talking about things read, playing word games, writing letters or words, reading signs and labels aloud.

**Limitations:** Requires interviews with parents.

**Source:** PIRLS 2011. Exhibit 4.6, Early Literacy Activities Before Beginning Primary School.

## Parental attitudes to reading

**Evidence:** Children who live in a supportive home environment where parents like reading books read more (Mullis 2007, Bonci 2008).

**Indicator:** Percentage of parents who "like reading" as reported by PIRLS.

**Limitations:** Requires an interview, is based on self-report (with social desirability) and is not precise.

**Source:** PIRLS 2011. Exhibit 4.4, Parents Like Reading.

## Number of children's books in the home

**Evidence:** Children living in homes with more children's books performed better in PIRLS 2006 (Mullis 2007, Dunst 2012).

**Indicators:** Number of children's books in the home (0-10, 11-25, 26-50, 51-100, >100) (PIRLS 2006); number of children living in homes with more than 25 children's books (PIRLS 2011)

**Limitations:** The PIRLS 2011 indicator describes the distribution less adequately. PIRLS is not available for all countries.

**Source:** Number of children's books in the home (0-10, 11-25, 26-50, 51-100, >100), PIRLS 2011 Database.

## **Child's age at which parents start to read to the child**

**Evidence:** Children to whom parents started to read earlier show better literacy and language skills (Dunst 2012), and they tend to display greater interest in reading at a later age (Arnold and Whitehurst 1994).

**Indicator:** Proportion of parents who start to read to their children before they are 1 year old.

**Limitations:** Reading to a child includes a wide range of behaviours (e.g. frequency and quality of reading).

**Source:** This information is not available Europe-wide but may be retrievable from national surveys.

## **Parental attitudes to reading to their children**

**Evidence:** Reading aloud to children raises their interest in reading and learning. It develops children's language and reading skills (Zuckerman 2009, Sénéchal 2002). Shared book reading experiences have a special role in fostering early literacy development by building background knowledge about the world and concepts about books and print (Bonci 2008).

**Indicator:** Percentage of parents who like, somewhat like or do not like reading books.

**Limitations:** Requires an interview; data are not available for all countries. It has been used so far in the US and in Italy.

**Source:** PIRLS 2011 Database.

## **Parents tell stories**

**Evidence:** Storytelling has the same literacy-related benefits as reading aloud to children. It influences early acquisition of language and literacy (Bus 1995), and its benefits range from improved general language facility to improved listening and reading comprehension. They also include elevated critical and creative thinking, as well as more active learning (Mottley 1997).

**Indicator:** Proportion of parents telling stories at child's first birthday.

**Limitations:** Requires an interview; data are not available for all countries.

**Source:** PIRLS 2011 database.

## **Parents sing songs/lullabies**

**Evidence:** The capacity to memorise speech sounds is crucial for language acquisition (Bernavides Varela 2011, Volkova 2006). Listening to music, or singing can lead to enhanced performance on a variety of tests of cognitive ability (Shellenberg 2005).

**Indicator:** Proportion of parents taking care of the child with positive score at his/her first birthday.

**Limitations:** Requires an interview; data are not available for all countries.

**Source:** PIRLS 2011 database.

## **Mother or father plays with child regularly**

**Evidence:** Playing games with parents is the first, natural and simple way of learning (Evangelou 2009). It allows children to use their creativity while developing their imagination, dexterity, and physical, cognitive, and emotional strength. Play is important to healthy brain development (Ginsburg 2007). It provides a vehicle for children to both develop and demonstrate knowledge, skills, concepts and dispositions (Isenberg & Quisenberry, 2002). Play provides a non-threatening context for children to learn about their world and develop the skills necessary for adult life (Bruner 1972).

**Indicator:** Percentage of parents playing with their children every day.

**Limitations:** Requires an interview, data are not available for all countries.

**Source:** PIRLS 2011 database.

## 4 Preschool attendance

### Children attending preschool

**Evidence:** Children who start attending daycare early have less difficulty when entering primary school (World Bank 2005, Heckman 2008, Young 1995, Sylva 2003, Mullis 2007 and 2012, OECD 2012, Love et al. 2003). Children who attend centre-based programmes in the years preceding kindergarten are more likely to succeed when entering kindergarten than those who do not (Espinosa, 2002).

**Indicator:** Proportion of children between 0-3 or 3-5 attending preschool.

**Limitations:** Data may not be available with the same age breakdown in all countries.

Source: OECD Family Database (2014), Paris: OECD<sup>4</sup>.

### Average duration of preschool attendance

**Evidence:** The duration of attendance was associated with greater academic improvement (Tucker-Drob 2012, Sammons et al. 2002, Sylva 2003, Love et al. 2003, Mullis 2007).

**Indicator:** Years of preschool attendance.

**Limitations:** Data may not be available for all countries.

**Source:** PIRLS 2011. Exhibit 4.7, Students Attended Preprimary Education.

### Annual expenditure in pre-primary education

**Evidence:** More investment in pre-primary education may offer better quality in teaching (Del Boca 2010).

**Indicator:** Expenditure per child on pre-primary education (prior to entry into the formal education system, which is usually at age six but in a few countries is earlier or later).

**Limitations:** No limitations.

**Source:** Eurostat (2014). Eurostat Report. Figure D3, Trends in Total Public Expenditure on Pre-primary education as a percentage of GDP, p. 80.

### Ratio of children to teachers in pre-primary school

**Evidence:** Small preschool class size can increase educational effectiveness (Del Boca 2010, Mullis 2007). When groups are smaller and staff-child ratios are higher, teachers provide more stimulating, responsive, warm, and supportive interactions (Barnett 2004, Vandell 2002). Children in smaller classes had greater gains in receptive language, general knowledge, cooperative behaviour, and verbal initiative, and showed less hostility and conflict in their interactions with others (Ruopp 1979, Espinosa 2002). The effects of class size have been found to be larger for younger children (Barnett 2004).

**Indicator:** Ratio of children to teachers in preprimary school.

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<sup>4</sup> Retrieved from [www.oecd.org/social/family/database](http://www.oecd.org/social/family/database), see table PF3.2.A (accessed August, 22, 2014).

**Limitations:** No limitations.

**Source:** OECD (2013). Education at a Glance 2013. Table D2.2, Ratio of students to teaching staff in educational institutions.

### **Preschool teachers' qualification**

**Evidence:** A high-quality teacher education is essential for the quality and relevance of education at all levels (ETUCE 2008).

There is growing evidence that teacher preparation is a powerful predictor of children's achievement, perhaps even overcoming socioeconomic and language background factors (Hammond 2000, Sylva 2003, Mullis 2007 and 2012).

Quality teaching is vital for improving children learning (Hammond 2000).

**Indicator:** Level and minimum length of initial teacher education of pre-primary teachers, and the minimum proportion of time spent on professional training.

**Limitations:** Data on teachers' education level are not available for all countries.

**Source:** Figure A2a p. 28, Key data on Teachers and School Leaders in Europe, Eurydice 2013, p.28.

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