The Education for All Development Index

The Education for All goals represent more than the sum of their individual parts. While each is important by its own, it is also useful to have a means of indicating achievement of Education for All as a whole. The EFA Development Index (EDI), a composite measure of progress across the whole EFA agenda, provides one way of doing so. Ideally, it should reflect all the six education for all goals but, due to data constraints, it currently focuses only on the four most easily quantifiable goals: universal primary education, adult literacy, the quality of education and gender parity and equality. The remaining two goals, early childhood care and education and learning needs of youth and adult have been excluded so far mainly because of data limitations and constrains. While the latter goal remains difficult to grasp for conceptual and definition reasons and progress towards it is still not easy to measure and monitor, the development of an ECCE index this year (see 2012 EFA Global Monitoring Report, Panel 1.2, p.45) is an important step towards broadening the scope of the EDI in order to make it more comprehensive. However, the inclusion of the ECCE index in the EDI as a fifth component remains difficult because of data availability limitations for many countries, including developed countries.

Choice of indicators as proxy measures of EDI components

Constructing the EDI and selecting the measurement tools involves judgements about the merits of the range of proxy indicators available and their relevance for capturing overall progress. This section explains the choice of indicators and methodology.

Universal primary education

Universal primary education (goal 2) implies both universal access to and universal completion of primary education. However, while both access and participation at this level are relatively easy to measure, there is a lack of consensus on the definition of primary school completion. Therefore, only the universal enrolment aspect of the goal is taken into consideration in the EDI. The indicator selected to measure universal primary enrolment achievement is the primary adjusted net enrolment ratio (ANER), which reflects the percentage of primary school age children who are enrolled in either primary or secondary school. Its value varies from 0 to 100%. An ANER of 100% means all eligible children are enrolled in school in a given school year, even though some of them may not complete it. However, if the ANER is at 100% for many consecutive years, it may imply that all children enrolled do complete at least primary school.

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1 The international community is still a long way from defining what constitutes progress in ‘equitable access to appropriate learning and life skills programmes’ (the core of goal 3). There is also not yet an agreement on a coherent set of internationally comparable indicators and accessing whether progress is being made. The situation may be changing though, but recent developments while promising will not produce sufficient data in time to measure and monitor EFA goal 3 adequately before the 2015 deadline (see 2012 EFA Global Monitoring Report, Panel 1.6, p.82).
Adult literacy
The adult literacy rate is used as a proxy to measure progress towards the first part of goal 4. This has its limitations. First, the adult literacy indicator, being a statement about the stock of human capital, is slow to change, and thus it could be argued that it is not a good ‘leading indicator’ of year-by-year progress. Second, the existing data on literacy are not entirely satisfactory. Most of them are based on ‘conventional’ non-tested methods that usually overestimate the level of literacy among individuals. New methodologies, based on tests and on the definition of literacy as a continuum of skills, are being developed and applied in some countries, including developed countries, to improve the quality of literacy data. Providing a new data series of good quality for most countries will take time, however. The literacy rates now used are the best currently available internationally.

Quality of education
There is considerable debate about the concept of quality and how it should be measured. Several proxy indicators are generally used to measure quality of education, among them measures of students’ learning outcomes, which are widely used for this purpose, particularly among countries at similar levels of development. However, measures of learning achievement are incomplete, as they are often limited to basic skills (reading, numeracy, science) and do not include values, capacities and other non-cognitive and transferable skills that are also important aims of education (UNESCO, 2004 , pp. 43–4) and for preparing students to the world of work. They also tell nothing about the cognitive value added by schooling (as opposed to home background) or the distribution of ability among children enrolled in school. Despite these drawbacks, learning outcomes would likely be the most appropriate single proxy for the average quality of education. However, despite increased numbers of countries conducting national assessments and or participating in regional and or international learning assessments, comparable data on learning outcomes remain limited in terms of countries coverage. Therefore, it is not yet possible to use these data in the EDI.

Among feasible proxy indicators available for a large number of countries, the survival rate to grade 5 seems to be the best available for the quality of education component of the EDI. It is commonly assumed that four to five years of school are required to become literate (UNESCO, 2005). While this obviously depends on the quality of education children are provided with, Figures A.1, A.2 and A.3 show a

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2 The first part of goal 4 is: ‘Achieving a 50 per cent improvement in levels of adult literacy by 2015, especially for women’. To enable progress towards this target to be monitored for all countries, whatever their current adult literacy level, it was decided as of the 2006 Global Monitoring Report to interpret it in terms of a reduction in the adult illiteracy rate.

3 In most countries, particularly developing countries, current literacy data are derived from methods of self-declaration or third-party reporting (e.g. a household head responding on behalf of other household members) used in censuses or household surveys. In other cases, particularly as regards developed countries, they are based on education attainment proxies as measured in labour force surveys. Neither method is based on any test, and both are subject to bias (overestimation of literacy), which affects the quality and accuracy of literacy data.

4 Transferable skills include for example problem-solving, teamwork or motivation. While they are not taught from a textbook they can be acquired through good quality education (see 2012 EFA Global Monitoring Report, Chapter 3: p.187).

5 Strictly speaking, it would be necessary to compare average levels of cognitive achievement for pupils completing a given school grade across countries with similar levels and distributions of income, and with similar NER levels, so as to account for home background and ability cohort effects.
clear positive link between survival rates and learning outcomes across countries
having participated in the most recent OECD learning achievement survey, PISA
2009. The coefficient of correlation ($R^2$) between survival rates to grade 5 and
learning outcomes in reading is 27% (Figure A.1). Education systems capable of
retaining a larger proportion of their pupils to grade 5 tend to perform better, on
average, in student assessment tests. The survival rate to grade 5 is associated even
more strongly with learning outcomes in science and mathematics, with coefficients
of correlation of about 35% and 41%, respectively, as shown in both Figure A.2 and
Figure A.3.

Another possible proxy indicator for quality often mentioned is the pupil/teacher ratio
which association with learning outcomes from PISA 2009 is much lower than for the
survival rate to grade 5, with a coefficient of correlation ranging from 6% students’
performance in reading to 9% in science and to 11% in mathematics. Many other
studies produce ambiguous evidence of the relationship between pupil/teacher ratios
and learning outcomes (UNESCO, 2004). In a multivariate context, low pupil/teacher
ratios are associated with higher learning outcomes in some studies, but not in many
others. In addition, the relationship seems to vary by the level of mean test scores. For
low levels of test scores, a decrease in the number of pupils per teacher has a positive
impact on learning outcomes, but for higher levels of test scores, additional teachers,
which lead to lower ratios, have only limited impact. More generally, while low levels
of pupil/teacher ratios are an important condition for quality learning to take place,
this is not sufficient. Making sure that teachers are qualified and well trained matters
even more, yet this is not reflected by standard pupil/teacher ratios. For all these
reasons, the survival rate is used as a safer proxy for learning outcomes and hence for
the education quality component of the EDI.6

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Figure A.1: Survival rates to grade 5 and learning outcomes in reading of 15-
year-old students, 2009

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6 Another reason is that survival rates, like the other EDI components, but unlike pupil/teacher ratios,
range from 0 to 100%. Therefore, the use of the survival rate to grade 5 in the EDI avoids a need to
rescale the data. For countries where primary education lasts fewer than five years, the survival rate to
the last grade of primary is used.
Figure A.2: Survival rates to grade 5 and learning outcomes in science of 15-year-old students, 2009


Figure A.3: Survival rates to grade 5 and learning outcomes in mathematics of 15-year-old students, 2009

Gender

The fourth EDI component is measured by a composite index, the gender-specific EFA index (GEI). Ideally, the GEI should reflect the whole gender-related Education for All goal, which calls for ‘eliminating gender disparities in primary and secondary education by 2005, and achieving gender equality in education by 2015, with a focus on ensuring girls’ full and equal access to and achievement in basic education of good quality’. There are thus two subgoals: gender parity (achieving equal participation of girls and boys in primary and secondary education) and gender equality (ensuring that educational equality exists between boys and girls).

The first subgoal is measured by the gender parity indexes (GPIs) of the gross enrolment ratios (GERs) at primary and secondary levels. Defining, measuring and monitoring gender equality in education is difficult, as it includes both quantitative and qualitative aspects (see Chapter 2 and UNESCO, 2003). Essentially, measures of educational outcomes in and beyond education, which are also part of gender equality, are needed for a range of education levels, disaggregated by sex. No such measures are widely available on an internationally comparable basis. As a step in that direction, however, the GEI includes the gender parity measure for adult literacy. Thus, the GEI is calculated as a simple average of three GPIs: for the GER in primary education, for the GER in secondary education and for the adult literacy rate. This means the GEI does not fully reflect the equality aspect of the Education for All gender goal.

The GPI, when expressed as the ratio of female to male enrolment ratios or literacy rates, can exceed unity when more girls/women than boys/men are enrolled or literate. For the purposes of the GEI, the standard F/M formula is inverted to M/F in cases where the GPI is higher than 1. This solves mathematically the problem of including the GEI in the EDI (where all components have a theoretical limit of 1, or 100%)

while maintaining the GEI’s ability to show gender disparity. Figure A.4 shows how the ‘transformed’ GPI for secondary education gross enrolment ratio (GER) in Qatar is arrived at to highlight gender disparities that disadvantage males. Once necessary transformations of this kind are made, the composite GEI is obtained by calculating a simple average of the three GPIs, with each being weighted equally.

In Qatar, the GPIs of primary and secondary education GERs and in adult literacy were 0.996, 1.209 (transformed in 0.827) and 0.989, respectively in 2010, resulting in a GEI of 0.937.

\[
\text{GEI} = \frac{1}{3} (\text{primary GPI}) + \frac{1}{3} (\text{transformed secondary GPI}) + \frac{1}{3} (\text{transformed adult literacy GPI})
\]

\[
\text{GEI} = \frac{1}{3} (0.996) + \frac{1}{3} (0.827) + \frac{1}{3} (0.989) = 0.937
\]

Figure A.4: Calculating the ‘transformed’ GPI

<table>
<thead>
<tr>
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<th>Secondary education</th>
</tr>
</thead>
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<tr>
<td>GPI (F/M)</td>
<td>Transformed GPI (M/F)</td>
</tr>
<tr>
<td>1.209</td>
<td>0.827</td>
</tr>
</tbody>
</table>

Example used: Qatar, 2010.

Calculating the EDI

In accordance with the principle of considering each goal to be equally important, one indicator is used as a proxy measure for each of the four EDI components, and each of these is assigned equal weight in the overall index. The EDI value for a given

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The EDI’s gender component is itself a composite index as seen above.
country is thus the arithmetic mean of indicators measuring each of its components. It falls between 0 and 1, with 1 representing full EFA achievement across the four goals. As a simple average, the EDI may mask important variations among its components: for example, results for goals on which a country has made less progress can offset its advances on others. Since all the goals are equally important for education for all to be achieved as a whole, a synthetic indicator such as the EDI is thus very useful to inform the policy debate on the prominence of all the Education for All goals and to highlight the synergy among them.

**Figure A.5** illustrates the calculation of the EDI, again using Qatar as an example. The primary adjusted NER, adult literacy rate and GEI are for 2010 while the survival rate to grade 5 is for 2007, the most recent year for which it is available. Their values were 0.962, 0.963, 0.937 and 0.955, respectively, resulting in an EDI of 0.954.

\[
\text{EDI} = \frac{1}{4} \text{ (primary adjusted NER)} + \frac{1}{4} \text{ (adult literacy rate)} + \frac{1}{4} \text{ (GEI)} + \frac{1}{4} \text{ (survival rate to grade 5)}
\]

\[
= 0.954
\]

**Figure A.5: Calculating the EDI**

<table>
<thead>
<tr>
<th>Components</th>
<th>Primary adjusted NER</th>
<th>Adult literacy rate</th>
<th>GEI</th>
<th>Survival rate to grade 5</th>
<th>EDI</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>0.962</td>
<td>0.963</td>
<td>0.937</td>
<td>0.955</td>
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</tr>
</tbody>
</table>

Example used: Qatar.
Data sources and country coverage

All data used to calculate the EDI for the school year ending in 2010 are from the statistical tables in the annex of the 2012 EFA Global Monitoring Report, and the UNESCO Institute for Statistics (UIS) database.

Only 120 countries had the data required to calculate the EDI. Many countries are still excluded, among them a number of conflict-affected countries and countries with weak education statistical systems. This fact, coupled with the exclusion of goals 1 and 3, means the EDI does not yet provide a fully comprehensive and global overview of Education for All achievement.

All the EDI tables can be found in Excel format on the website.