

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 six Education for All goals but, due to data constraints, the standard index 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 (ECCE) and meeting learning needs of youth and adults are still excluded mainly because of data limitations and conceptual reasons in particular for the latter goal. However, the development of an ECCE index since last year (see Table EDI.1) is particularly promising, allowing the EDI to be broadened to five goals in the future if the data coverage is improved. The goal on learning needs of youth and adults remains difficult to grasp and progress towards it is still not easy to measure and monitor.

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.

Adult literacy

The adult literacy rate is used as a proxy to measure progress towards the first part of goal 4.¹ 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

¹ 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 halving the adult illiteracy rate.

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.² New methodologies, based on tests and on the definition of literacy as a continuum of skills, are being developed and applied in an increasing number of countries in both the developed and developing worlds, to improve the quality of literacy data. Providing a new data series of good quality for most countries will take many years, 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. 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.³ Despite these drawbacks, learning outcomes would likely be the most appropriate single proxy for the average quality of education, but as comparable data are not yet available for a large number of countries, it is not yet possible to use them in the EDI.

Among the 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.⁴ Figures A.1, A.2 and A.3 show that there is a clear positive link between such survival rates and learning achievement across various international assessments. The coefficient of correlation (R^2) between survival rates 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 mathematics and science (with a coefficient of about 33% in both **Figure A.2** and **Figure A.3**), as shown by the TIMSS 2011 results for fourth-grade students. This correlation is even stronger for eighth-grade students, with a coefficient of correlation of 44% and 54% for mathematics and science, respectively.

Another possible proxy indicator for quality often mentioned is the pupil/teacher ratio. Among countries participating on one hand in PIRLS 2011 and on the other hand in

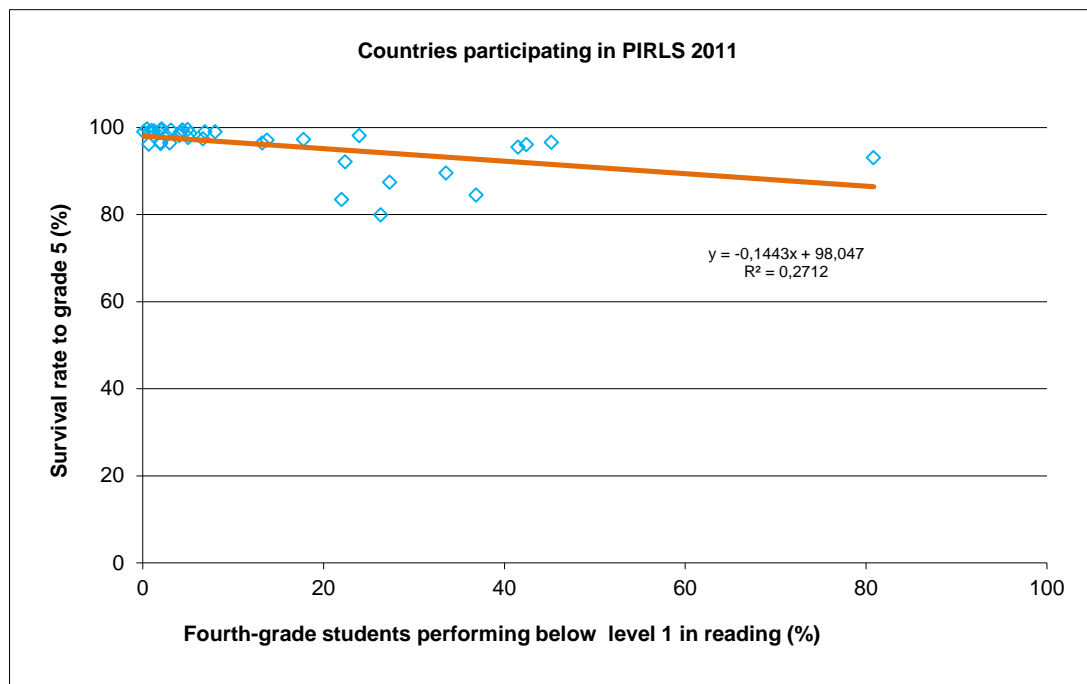
² In most countries, particularly developing countries, current literacy data are derived from methods of self-declaration or third-party reporting (e.g. a household head responding on behalf of other household members) used in censuses or household surveys. In other cases, particularly as regards developed 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. Therefore, such data should be interpreted with caution.

³ 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 (UNESCO, 2004: 43-4).

⁴ See *EFA Global Monitoring Report 2003/4*, Appendix 2, for background. For countries where primary education lasts fewer than five years, the survival rate to the last grade of primary is used.

TIMSS 2011, the association between this indicator and learning outcomes is also positive, but is much lower than for the survival rate to grade 5, with a coefficient of correlation of around 20% only for reading as measured in the first survey and for both mathematics and science based on TIMSS as well. 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. 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.⁵

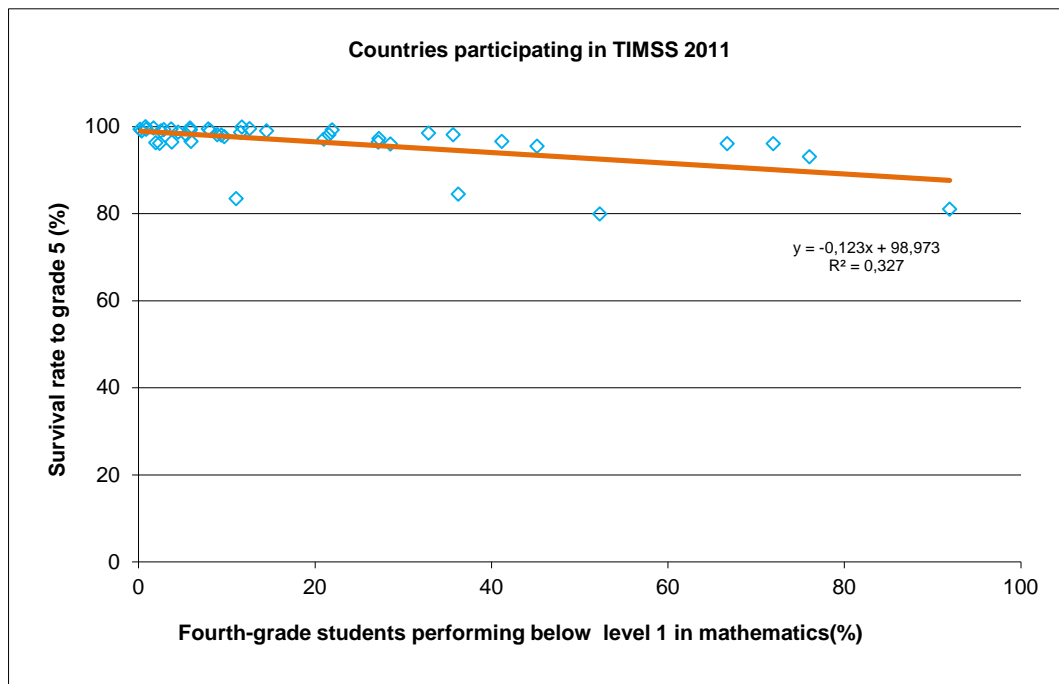
Figure A.1: Survival rates to grade 5 and learning outcomes in reading of fourth-grade primary school pupils, 2011



Sources: 2013/14 EFA Global Monitoring Report, Annex, Statistical Table 7 (website); UNESCO Institute for Statistics database (2013); Altinok, N. (2013c).

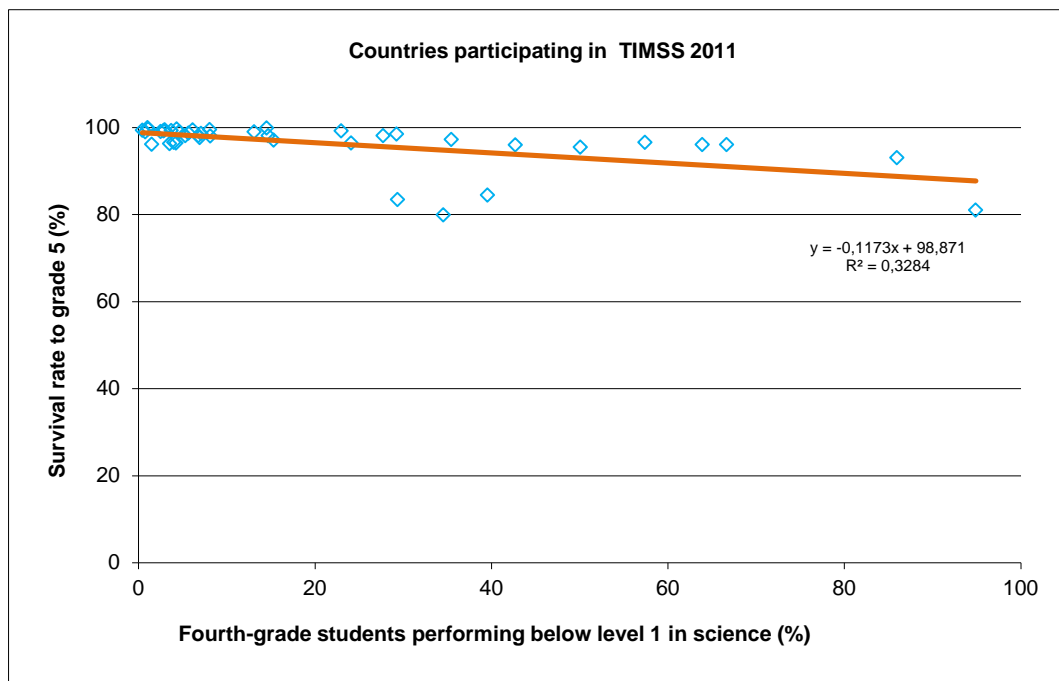
⁵ Another reason is that survival rates, like the other EDI components, but unlike pupil/teacher ratios, range from 0 to 100%. Therefore, the use of the survival rate to grade 5 in the EDI avoids a need to rescale the data. For countries where primary education lasts fewer than five years, the survival rate to the last grade of primary is used.

Figure A.2: Survival rates to grade 5 and learning outcomes in mathematics of fourth-grade primary school pupils, 2011



Sources: 2013/14 EFA Global Monitoring Report, Annex, Statistical Table 7 (website); UNESCO Institute for Statistics database (2013); Altinok, N. (2013c).

Figure A.3: Survival rates to grade 5 and learning outcomes in science of fourth-grade primary school pupils, 2011



Sources: 2013/14 EFA Global Monitoring Report, Annex, Statistical Table 7 (website); UNESCO Institute for Statistics database (2013); Altinok, N. (2013c).

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 outcomes, 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 ‘transformed’ GPIs are arrived at to highlight gender disparities that disadvantage males. Once all three GPI values have been calculated, and converted into ‘transformed’ GPIs (from 0 to 1) where needed, the composite GEI is obtained by calculating a simple average of the three GPIs, with each being weighted equally.

Figure A.4 illustrates the calculation for Senegal, using data for the school year ending in 2012. The GPIs in primary education, secondary education and adult literacy were 1.08, 0.912 and 0.609, respectively, resulting in a GEI of 0.816.

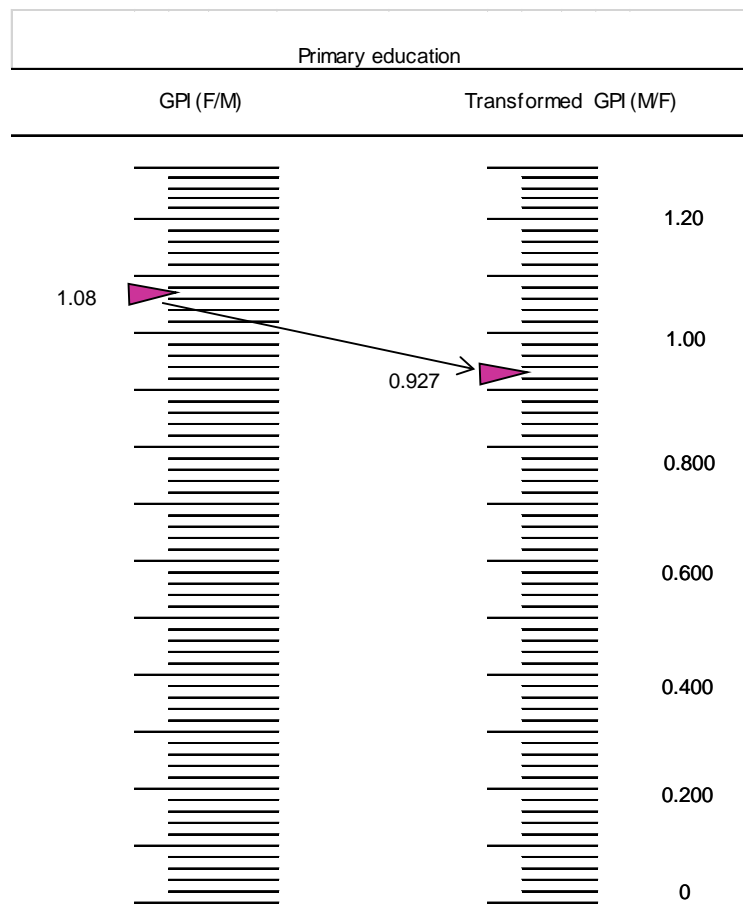
GEI = 1/3 (transformed primary GPI)

+ 1/3 (secondary GPI)

+ 1/3 (adult literacy GPI)

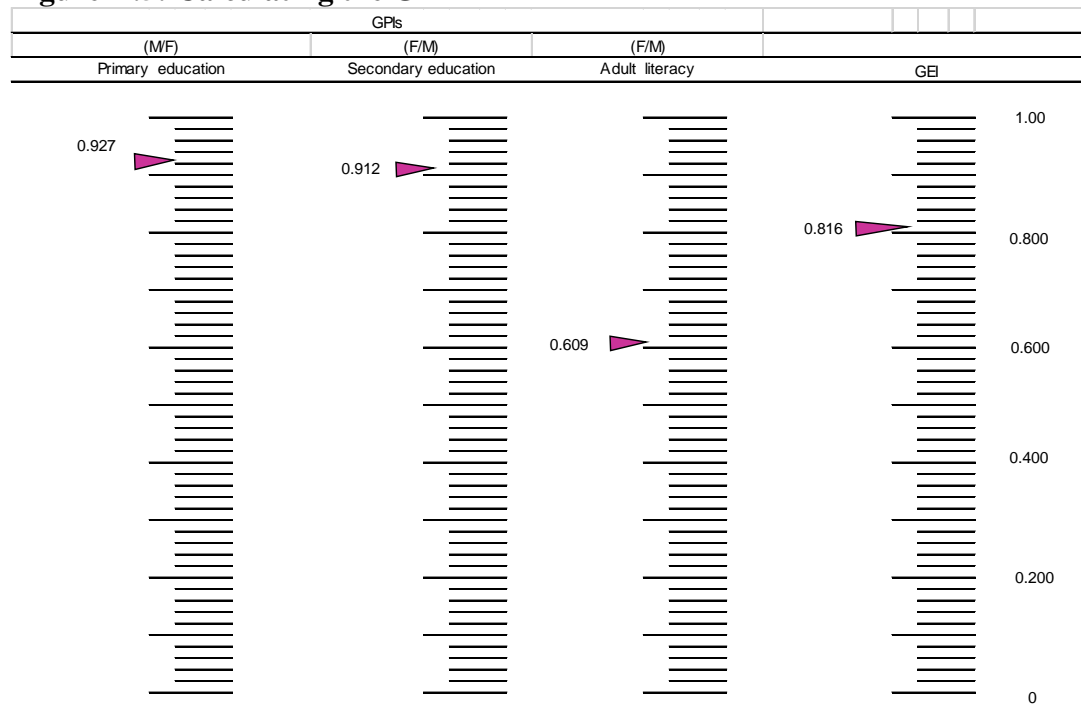
GEI = 1/3 (0.927) + 1/3 (0.912) + 1/3 (0.609) = 0.816

Figure A.4: Calculating the ‘transformed’ primary education GPI



Example used: Senegal

Figure A.5: Calculating the GEI



Example used: Senegal

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,⁶ and each of these is assigned equal weight in the overall index. The EDI value for a given 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.6 illustrates the calculation of the EDI, again using Senegal as an example. The values of primary adjusted NER, adult literacy rate, GEI and survival rate to grade 5 are 0.794, 0.521, 0.816 and 0.733, respectively, resulting in an EDI of 0.716.

EDI = 1/4 (primary adjusted NER)

+ 1/4 (adult literacy rate)

+ 1/4 (GEI)

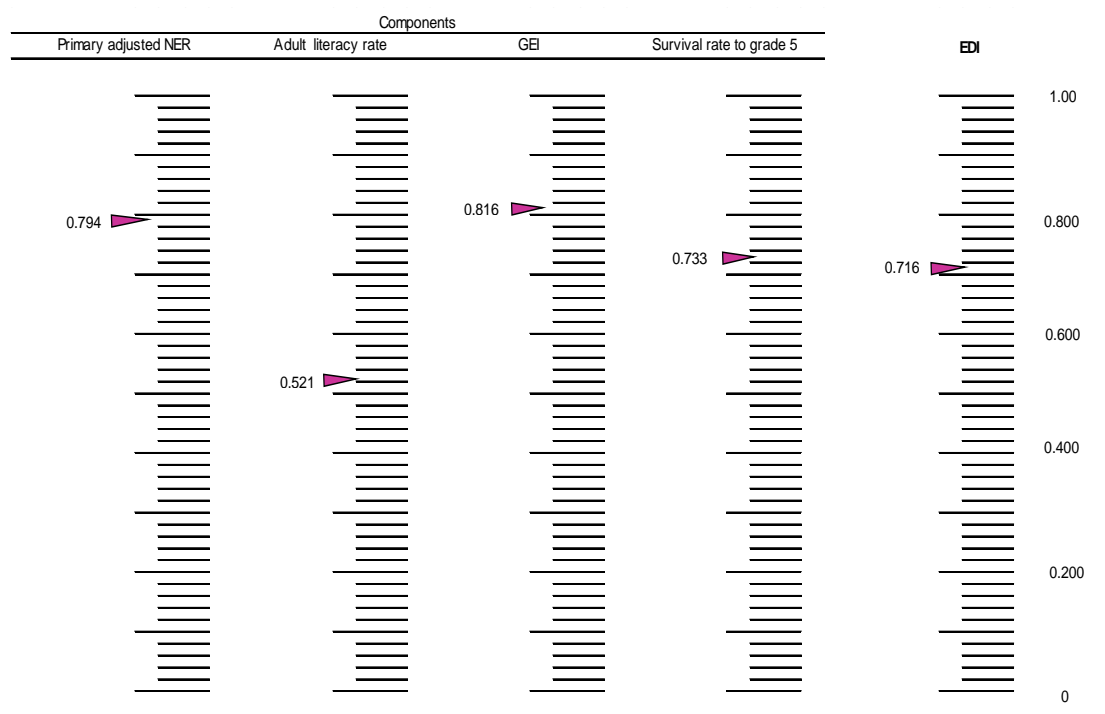
+ 1/4 (survival rate to grade 5)

EDI = 1/4 (0.794) + 1/4 (0.521) + 1/4 (0.816) + 1/4 (0.733)

= 0.776

Figure A.6: Calculating the EDI

⁶ The EDI's gender component is itself a composite index as seen above.



Example used: Senegal

Data sources and country coverage

All data used to calculate the EDI for 2012 are from the statistical tables in annex of the 2015 *EFA Global Monitoring Report* and the UNESCO Institute for Statistics (UIS) database.

Only the 113 countries with the data required to calculate the EDI are included in this analysis. Many countries are still excluded, among them a number of countries in conflict or post-conflict situations 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.