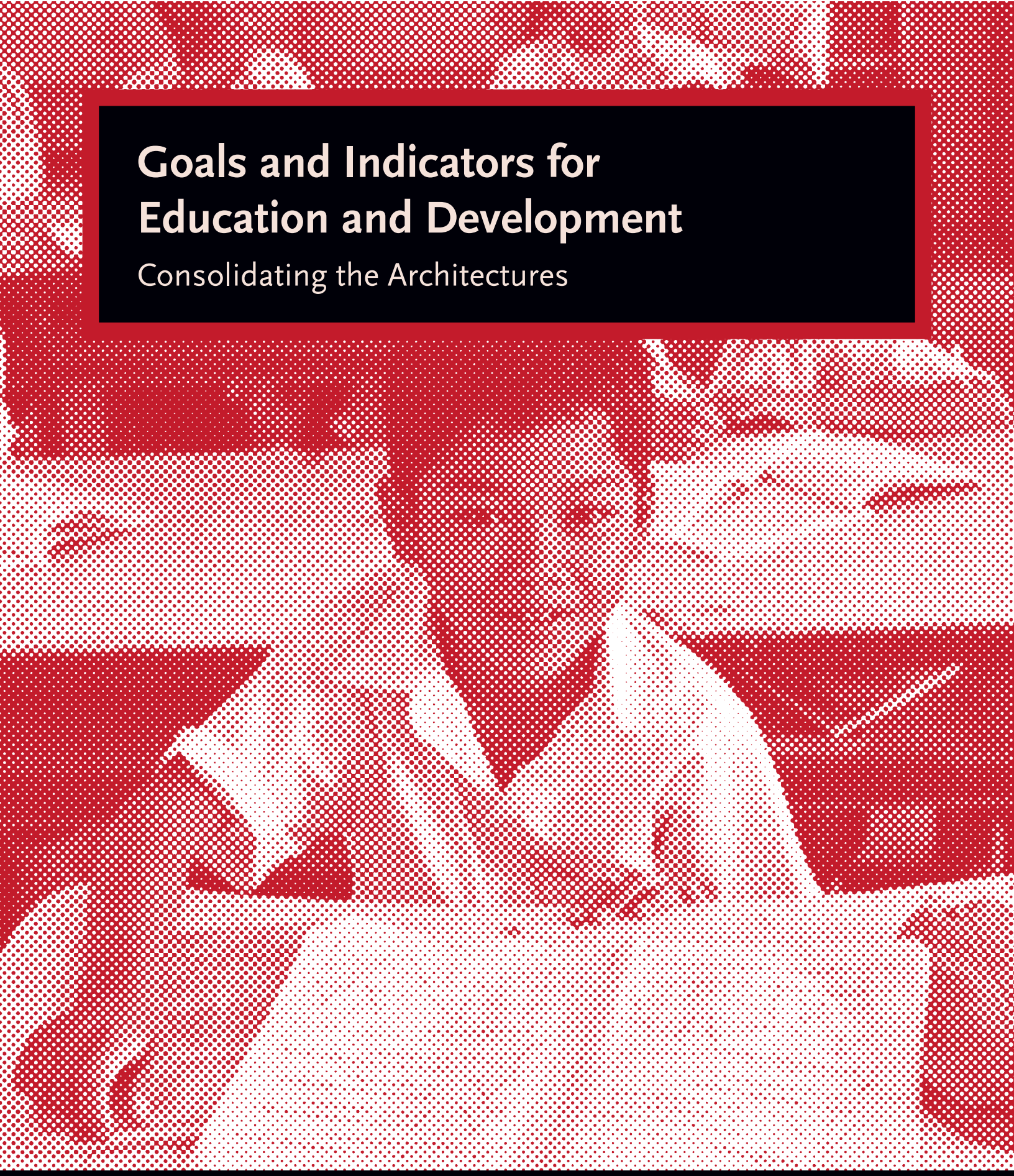
Goals and Indicators for Education and Development

Consolidating the Architectures



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Goals and Indicators for Education and Development:

Consolidating the Architectures

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Cover photo: Children in school, Siem Reap, Cambodia. © 2015 Pascal Deloche/Getty.

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INTRODUCTION

The purpose of this paper is to review recent developments related to the development of indicators of educational progress in the context of the Post 2015 deliberations to generate a new international architecture for educational investment through to 2030. There have been a plethora of suggestions and several parallel consultation processes since 2012 to revise and replace the goals for education and development agreed at the World Education Forum in Dakar (UNESCO, 2000) and enshrined in the Millennium Development Goals (United Nations, 2000).[1] This process is now converging on the two frameworks that are the subject of this analysis.

Specifically, there are now seven goals that the Education for All Steering Committee has developed which were consolidated in the May 2014 Muscat Agreement (UNESCO, 2014); and the ten goals produced by the Open Working Group on Sustainable Development of the U.N. General Assembly (UN General Assembly, 2014). These goal statements overlap and are largely consistent with each other but contain some significant differences. This paper reconciles the differences and develops sets of possible indicators building on the work of the Indicators Technical Advisory Group (TAG-EFA, 2014) and the UN Statistical Commission (UNSC, 2014).

The paper is organized in six parts. Part 1 analyses the strengths and weaknesses of the existing goals and targets for education and development to frame subsequent discussion in the context of the evolution of Education for All since 1990. Part 2 offers a necessary clarification of the relationship between goals and objectives, and targets and indicators. Part 3 reviews and discusses the process of developing indicators that are fit for purpose. Part 4 highlights characteristics of different types of indicator. Part 5 develops a list of preferred goal statements from the Muscat Agreement and OWG goals, links these to a discussion of existing and proposed indicators, and consolidates promising indicators that could be used to assess progress. The last part of the paper collects together forward looking conclusions that profile key issues that will shape how new indicators are devised to monitor the sustainable development goals for education.

[1] This paper makes use of insights from many different sources that include the UNESCO EFA consultation process, the UIS-led Technical Advisory Group on indicators, and discussions on indicators organized by Education International, UKFIET, ODI, Commonwealth Secretariat, DFID, DFAT, and many other groups.

1. STRENGTHS AND WEAKNESSES OF THE EXISTING FRAMEWORK OF GOALS AND TARGETS

Context

The Education for All goals and the Millennium Development Goals (MDGs) have provided a framework for investment in education for development endorsed by UN member states. These goals have shaped the implementation of Education for All programmes and have helped focus priorities within countries, shaped the architecture of development assistance, encouraged greater participation and gender equity, and emphasised the importance of delivering on promises of the right to education to all citizens. The framework of aspirations that they have supported has helped mobilise large amounts of external financing that might not otherwise have been made available. It is time to revisit what was promised and take the opportunity to identify new priorities.

The international goals for education have a long history. The World Conference on Education for All at Jomtien in 1990 committed countries to Education for All and developed goals that evolved to become the six educational goals agreed at Dakar in 2000. The parallel International Development Targets were developed in the 1990s through a process that culminated in agreement on the eight Millennium Development Goals in 2000. The MDGs include two explicitly educational goals and six other goals that imply needs for greater educational participation and wider freedoms from ignorance. All of this had precursors on the Regional UNESCO conferences on universalising access to primary school in Delhi, Addis Ababa, and Santiago in 1961!

Progress since 2000 has been impressive but has also left gaps between those countries likely to achieve most of the goals, and those for whom it is clear the current deadline of 2015 is too close (EFA Global Monitoring Report, 2015). In a nutshell, the rate of progress appears to have slowed since 2010, general improvement has been accompanied by stagnation in the lowest progress countries, and inequalities in access and participation within countries have worsened at least as much as they have improved.

More specifically, Early Childhood Development (ECD) and pre-school provision have expanded but tend to be provided privately and rationed by price. This contributes to gaps in performance between children from richer and poorer households at entry to primary school and also through the enduring effects of early learning on progress through higher grades. There remains much evidence of stunting, micro-nutrient deficiencies, and avoidable disease amongst pre-school children that may compromise their subsequent development irreversibly.

Enrolment in primary school has grown dramatically in all regions. However, some countries maintain low enrolment rates, especially amongst the poorest and other excluded groups (rural households, migrants, and in some cases girls, orphans, and social groups suffering discrimination). Some fragile states are far from establishing universal access. In most low enrolment countries a

majority of children fail to complete primary schooling and enter secondary grades, despite high gross enrolment rates. Many children attend irregularly, are seriously over-age, and/or fail to master basic skills by Grade 6. If an "expanded vision of access" (CREATE, 2011) is used and those below the age of 15 years are included, it is likely that more than 300 million children are excluded from a full cycle of basic education.

The learning needs of young people and adults remain far from being met. Access to secondary school remains heavily skewed against children from the poorest households, who may have one-fifth or even one-tenth of the chance of those in the richest quintile of completing secondary school successfully. University students remain largely drawn from children from the richest quintiles of household income in most low income countries. Adult education remains a poor relation to formal schooling in many countries.

Though literacy rates have been improving in most parts of the world this has sometimes not been as fast as population growth. New illiterates continue to enter adulthood when schooling fails to ensure all who complete primary school achieve sustained literacy. If all children who entered school after 2000 left literate this would be reflected in rapidly falling adult illiteracy.

Great progress has been made towards eliminating gendered disparities in access to primary and secondary schooling. Gender Parity Indices are in the range 0.96 - 1.04 at primary for about 85 percent of all countries and are at that level in over 95 percent of countries with GDP per capita over USD 5,000. However, girls remain excluded disproportionately in a minority of low income countries, often those which are fragile states. In some countries, including India and China, preferences for boy children are leading to striking imbalances by gender in populations of children. In contrast, in some other countries girls now out enrol boys at school level, and are increasingly outperforming boys on achievement tests. This is the case in many middle and high income countries; overwhelmingly so in higher education in the OECD.

Investment in improving the quality of education, most often indicated by the results of achievement tests, has been substantial but is yet to deliver gains consistent with expectations. Greatly expanded participation may have led to falling achievement levels over and above that which would be expected from expanding access to children across the full range of capabilities. Many countries do not have standardised assessments that allow comparisons of performance over time. Where they exist, they show cause for concern that many fall well below national norms for learning outcomes in low enrolment countries and there are alarming differences in performance and attainment between rich and poor children. Despite this, it is widely the case that much more learning is taking place if levels of achievement are integrated with higher participation rates.

Critiques

Alongside these observations of progress there have been a number of common criticisms of the existing framework of goals and their associated targets and indicators.

- Universal primary schooling and gender parity in enrolments have received more emphasis than other goals partly because they can be readily converted into measureable targets using Gross and Net Enrolment Rates (GERs and NERs) and Gender Parity Indices (GPI). Though apparently simple, both of these indicators are flawed, ambiguous to interpret, and have limitations if used for targeting (Lewin, 2005). Despite this, in practice the two goals have been prioritised since they have been considered more measurable than others.

- Universal access to primary schooling has been privileged over investment for development at secondary and tertiary levels. The majority of external support in the poorest countries has been directed towards expanded participation at the primary level. Where progress has been greatest this may no longer be a priority. Where progress has been compromised it may still be that balanced approaches to investment across the education sector including levels above primary are appropriate.

- Universal goals do not recognise that countries are at different stages of development and that what are appropriate goals for some have already been achieved by others. Neither do they acknowledge that there may be several pathways to the same end. A single universal set of goals and sub-goals will not reflect different strategic and practical choices.

- Though equity is included in some of the goals, this has generally not been reflected in common indicators of progress. Narrowing the gap in participation and achievement between the richest and the poorest—and between other social groups—has to accompany aggregate improvements in access and participation reflected in averages (Lewin & Sabates, 2011). Making the right to education a reality implies less rather than more inequality across key indices of inputs and outcomes.

- The existing goals do not link learning outcomes to enhanced participation, yet access without mastery of core competencies is no access at all. Expanded access has often been accompanied by falling levels of achievement that must compromise the impact on development and on poverty reduction.

- Gender equity has changed considerably since 2000 and gaps have reduced in many countries. Differences remain in pockets, at some levels rather than others, and in some fragile states, and increasingly girls out enrol and outperform boys. New strategies are likely to be needed to provide equal opportunities to both boys and girls and address the special and different needs of both.

- Currently there are no goals for investments in infrastructure. But too many schools remain in temporary structures without basic services such as clean water and sanitation, and without adequate learning materials.

Experience with the existing architecture of goals, targets, and indicators leads to at least eight points of departure around which there has been widespread consensus. These provide one basis on which to develop a new generation of indicators and can be mapped onto the goals emerging from the broader consultation processes around EFA.

Consolidated Ambitions

- Reduce and seek to eliminate early childhood under-nutrition and avoidable childhood disease, and universalise access to community based ECD and pre-school below age 6 years.
- Universalise an expanded vision of access to a full cycle of basic education (at least Grade 9) with successful achievement of national learning outcomes in cognitive, affective, and psychomotor domains by all children by the age of 15 years.
- Invest strategically in equitable access to secondary and tertiary level education and training linked to wellbeing, livelihoods, employment, and the transition to responsible adult citizenship.
- Provide adequate infrastructure for learning according to national norms for buildings, basic services, safety, learning materials, and learning infrastructure within appropriate distances of household.
- Ensure that sufficient qualified teachers are available and adequately supported.
- Eliminate illiteracy and innumeracy amongst those under 50 years old.
- Reduce wealth, gender, and social group disparities in participation in education at school level and ensure all children have equal educational opportunities.
- Encourage the development of sustainable financing of education systems from domestic revenue with external assistance directed towards this goal.

2. GOALS, OBJECTIVES, TARGETS, AND INDICATORS

The development of indicators related to a new generation of goals for education and development has to be seen as part of an iterative process. The intentions embedded in goals and judgments and the extent of their realisation depend on determinations of what it would look like if the goals were achieved. One way to understand the meanings behind goals is determine the indicators that would be appropriate to assess progress towards goals.

More generally, from an organisational theory point of view, goals will be linked to objectives that, if achieved, will be steps on a pathway to achieving an overarching goal. Targets may be developed that create milestones on time bound pathways towards achieving objectives and goals.

Indicators must therefore stand in a logical relationship with targets, objectives, and goals. The implication is that goals should not be developed without some thought for indicators with which they will be associated, and that indicators can't be developed without consideration of targets, objectives, and goals.

Goals come in different forms and these have implications for their translation into indicators. This can be illustrated by recalling the six goals identified at the Jomtien World Conference in 1990 listed in Figure 1. Each resonates with current concerns including those for equity, learning, and sustainable development—invoking a certain sense of déjà vu.

Figure 1. 1990 Jomtien World Conference on EFA Goals and Indicators

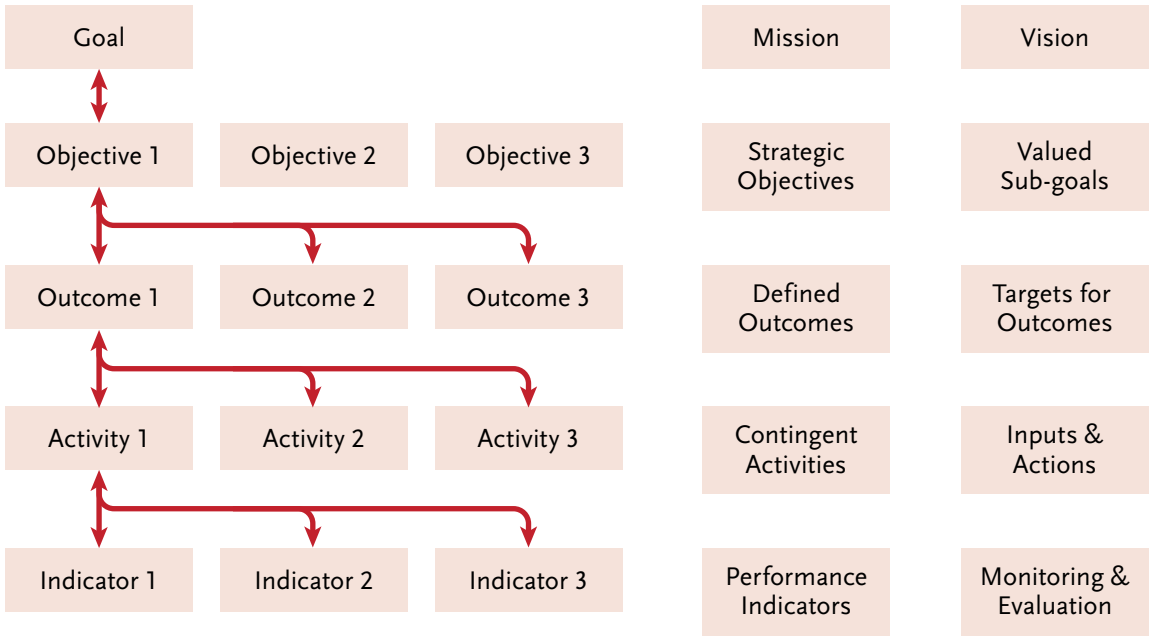
Goal	Comment and Implication
1. Expansion of early childhood care and developmental activities, including family and community interventions especially for poor, disadvantaged and disabled children;	**Expansion goal with no starting point and no limit** except universal access; no time scale; no indication of meaning of especially for poor disadvantaged and disabled children.
2. Universal access to, and completion of, primary education (or whatever higher level of education is considered as "basic") by the year 2000;	**Absolute target that is time bound** with some flexibility in terms of national determination of "basic."
3. Improvement in learning achievement such that an agreed percentage of an appropriate age cohort (e.g., 80 percent of 14-year-olds) attains or surpasses a defined level of necessary learning achievement;	**Outcome orientated goal with performance criteria;** "necessary" remains undefined.
4. Reduction of the adult illiteracy rate (the appropriate age group to be determined in each country) to, say, one-half its 1990 level by the year 2000, with sufficient emphasis on female literacy to significantly reduce the current disparity between male and female illiteracy rates;	**Relative improvement goal with proportional outcome** that is time bound; "significantly reduce" is undefined.
5. Expansion of provisions of basic education and training in other essential skills required by youth and adults, with programme effectiveness assessed in terms of behavioural changes and impacts on health, employment and productivity;	**Expansion goal with no starting point and no limit** except universal access; no time scale; no indication of meaning of "behavioural changes" or "impacts on health, employment and productivity," which could take many forms—some of which might not be developmental.
6. Increased acquisition by individuals and families of the knowledge, skills and values required for better living and sound and sustainable development, made available through all education channels including the mass media, other forms of modern and traditional communication, and social action, with effectiveness assessed in terms of behavioural change.	**Expanded capability goal for "individuals and families"** (but not work organisations?); sustainable development goal linked to "third way" promotion through communications media etc; "behavioural change not defined."

Source: Author

The essential point is that goals should map onto indicators and that both must relate to each other within a logical framework. Figure 2 shows this very simply. The reality will not be so mechanistic. The model is a reminder that in the world of planning and the development of interventions and resource allocation that reflect policy goals several steps are likely to be necessary that link goals to objectives to targets and indicators. All this will be familiar to those used to LogFrames and project programming, but perhaps less so for other stakeholders engaged in goal setting and indicator development.

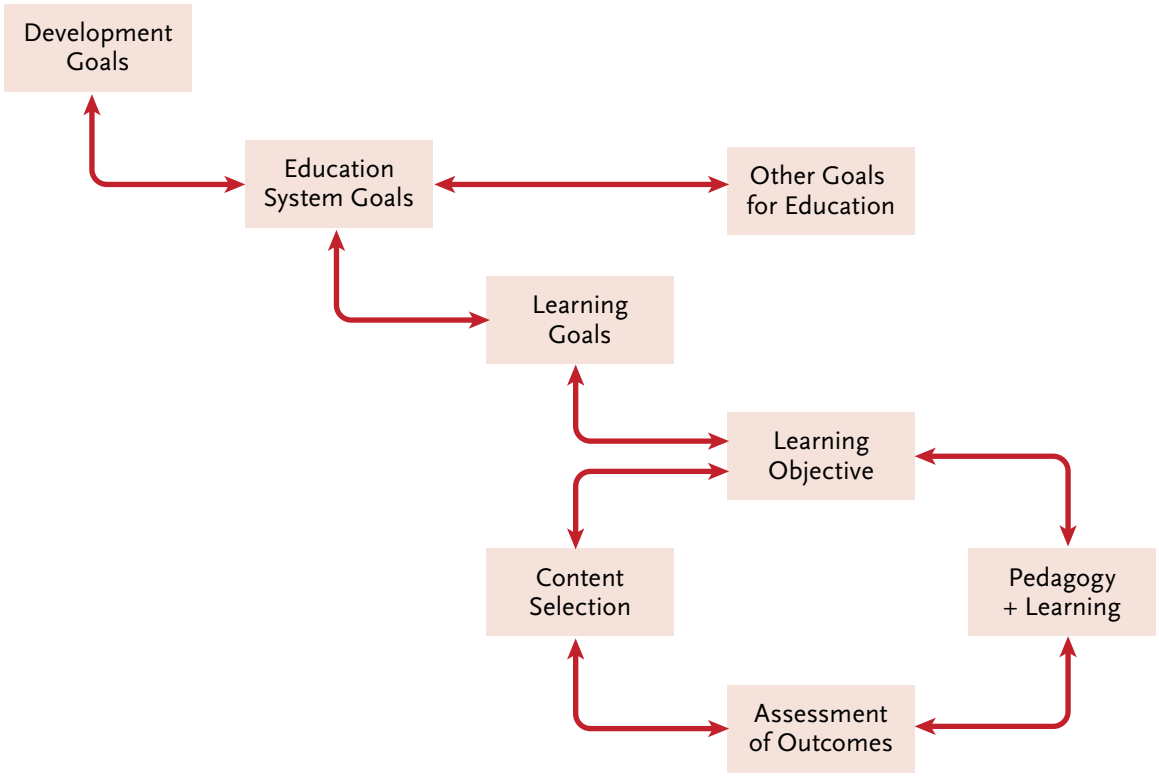
Learning goals, which define the knowledge, skills and attitudes that are valued, can also be linked iteratively to indicators. Understanding and sharing learning goals is greatly facilitated if the goals can be translated into learning objectives linked to measurable and observable behaviours that can be assessed. This enables curricula to be developed that link together the necessary basic elements of learning objectives, content selection, pedagogic and learner strategies, and assessment of outcomes. All valued knowledge and skill may not be like this, but much can be approached in this way. Figure 3 shows this.

Figure 2. Goals, Objectives, Targets, and Indicators



Source: Author

Figure 3. Mapping Learning Goals



Source: Author

Objectives for learning only make sense if there is some method to determine if they have been achieved. Indicators provide the architecture to assess progress towards learning outcomes defined by learning objectives. Moreover, educational objectives need to specify the conditions under which learning outcomes will be achieved and by implication the resources needed. Thus, content selection, pedagogic choices, the learning styles of learners, and the assessment of outcomes all need to consider the behaviours, conditions, and standards that are embedded in statements of educational objectives.

It must be remembered that education systems are not only about learning, they often have many social, economic, and political purposes that extend well beyond curriculum based learning within the confines of national curricula. The challenge for education and development is to balance core concerns for curriculum issues and learning with broader social, economic, and political aspirations that may not be directly linked to learning within conventional domains of cognition.

3. DEVELOPING INDICATORS OF PROGRESS THAT ARE FIT FOR PURPOSE

Indicators can have many different purposes and characteristics that determine how useful they are for different purposes. They must stand in a logical relationship with goals, objectives, and targets if they are to be useful in planning and monitoring progress. The indicators that are chosen help define goals and objectives since they determine what it would look like if the goals and objectives were achieved. Indicators can be used to assess inputs, processes, and outputs and will have different qualities depending on where the emphasis lies. Those engaged in developing indicators for the new international educational development goals (IEDGs) need to consider a range of issues and will decide the fitness for purpose of indicators chosen.

Ownership and Origins

The IEDGs arise from an extensive process of international consultation and an evolution of the priorities established at Jomtien in 1990 and refined in Dakar in 2000. The goals and the indicators that relate to them have the legitimacy provided by the conferences that generated them and by their repeated affirmation in subsequent meetings of international development partners at the global and regional levels.

These processes do not often have analogues at national level and this can lead to gaps between international aspirations and national strategies. At the global level the goals are blind to the differences between countries and education systems. This may not matter too much at the highest level of generality (universal access to basic education) but may be problematic as goals lead to objectives and targets that vary from system to system for good reason. It is not clear, for example, whether there are universal indicators that can capture what is important in the growth of post basic education systems when national priorities vary, structural characteristics are enormously varied, and more participation is not always necessarily developmental. Constructs like "global citizenship" and "early childhood development" do not have universal meanings across cultures.

The Ministers who sign up for the IEDGs are unlikely to be the Ministers charged with meeting performance targets related to key indicators of implementation two years later, never mind in 2030. The capacity of domestic civil services to act on stated governmental priorities, and their commitment to transparency in the collection, collation, and analysis of data that populates indicators and gives them meaning varies widely and affects the viability of different indicators. The IEDGs have to be mediated by the realities of power, resource availability, and national politics.

Types of Indicator

Indicators come in many different forms. The possibilities include indicators that have an absolute scale with an upper limit (e.g., all girls and boys should complete nine years of school) and those that assess relative improvement (e.g., adult illiteracy rates will be halved over the next decade). Some

indicators are linked to external benchmarks (e.g., levels of average achievement in mathematics will exceed the PISA level for OECD countries) and others are linked to best practice levels of input (e.g., countries that have universalised primary have pupil teacher ratios of x, therefore x is an important indicator and progress should be measured against best practice). The UNDP Human Development Index in part compares life expectancy in a country with the highest level achieved by any country, which sets the scale boundary of the indicator.

There are many different methods of indicating equality and equity. Participation of children from the top and bottom 20 percent of household expenditure can be compared—a kind of vertical equity. Girls' participation at an educational level can be compared to boys' participation—a kind of horizontal equity. Compensatory approaches can be defined (e.g., marginalized group x has spending per child of y compared to an average of z, spending per child for group x should be increased to 10 percent more than the average to compensate for marginalization). Which types of targets are identified, on which basis, clearly have implications for the extent to which they may be understood, accepted, and acted on. The types of targets identified may also shape which interest groups may be threatened or supported when decisions are made about resource allocation.

The data that is used to populate indicators and give them meaning will have different forms. Typically, the data is quantitative and types include nominal, ordinal, interval, and ratio. Nominal data classifies things into categories that cannot be ordered and are simply different (e.g., boys and girls). Ordinal data allows ordering of a variable (first, second, third, etc.). Interval data places observations on a scale that not only orders data but also indicates the degree of difference between points on the scale (e.g., norm referenced examination scores). Ratio data has a non-arbitrary zero point that allows judgements to be made of the magnitude of a continuous quantity (e.g., school enrolment). The type of data collected determines the analysis that can be undertaken and the significance of changes in values over time.

Indicators have to be associated with a defined level of analysis. Education systems are often thought of in terms of national, regional, district, and local, with school, class, and individual pupils as units of analysis. Data collected at one level of analysis may not be suitable for interpretation to reach conclusions at another level of analysis. Thus, comparisons of average pupil:teacher ratios across school systems between countries may enable us to say something about the relative costs of schooling but it would be dangerous to conclude anything about the quality of learning or the amount of time on task. We would need data at the level of classrooms and learners.

There are many different ways of aggregating data, which may lead to different results. This is not widely appreciated. Average levels of achievement based on lists of all pupils' examination results will not create the same average as averages using the school or the district as the unit of analysis. Indicators that have several components that use different types of data distributed over different ranges in different ways may weight the component parts very differently in terms of their impact on variations in the composite indicator. Regional indicators may not use the same collection of

countries in different years, and averages may or may not be weighted. If weighting is used there are many choices (e.g., by population, by chid population, by in-school population).

Indicators and Standards

Indicators are often used to measure progress towards targets. This can create dilemmas in setting standards and measuring progress. A simple illustration is setting minimum criteria for learning outcomes. If set too high, achievement will be beyond the capability of the majority of pupils and the indicator will likely show that most fail to reach the criterion level—without the ability to diagnose the causes. If the criterion level is set too low, all will pass over the criterion level and targeting will fail to encourage improved performance. Indicators must be designed to capture differences in performance in ranges of interest to policy and related to education system goals.

Paradoxically, raising performance may mean lowering standards in the sense of adjusting expectations to be challenging but not out of reach. In some areas it may not be possible to develop single indicators that can capture the range of performance and behaviour that is of interest; thus, more than one indicator may be needed (e.g., the range of mathematics capability at the age of 15 is often thought to be difficult to capture with a single test).

Indicators need to capture the intentions behind goals since these can be ambiguous. The goal that "all children should complete basic education" needs to be carefully specified if relevant indicators are to be deployed. Does this goal mean that it will be achieved when all children of any age succeed in completing primary school even if they are 20 years old? Does it mean that all children should complete primary schooling of at least six years and lower secondary of three years by age 15? Does it mean the goal has been achieved when all children do complete the cycle but significant numbers remain illiterate? If age is important the indicators must capture age and grade relationships.

Accountabilities and Indicators

Indicators need to be identified and populated independently of those who may benefit from assessments of particular levels of performance. Paradoxically, indicators and what they indicate also need to be owned by those who have responsibilities to act to improve performance. Careful thought is therefore needed in terms of establishing data collection and analysis systems if consequent resource allocation decisions are made and policy is adjusted as a result. Target setters need to understand indicators that are used to determine progress and they must communicate effectively with target getters responsible for implementing policy. If target setters have not had experience target getting, they may set unrealistic targets with inappropriate indicators.

If achieving targets brings substantial benefits, there is the risk of "moral hazard" and a possible incentive to choose the most achievable outcomes using indicators that favour impressions of progress. If flows of resources and external assistance depend on meeting targets, such targets may well appear to be met when the reality is different. Conversely, achievement in terms of particular

indicators may penalise the successful and reward the laggards. If the price of success is the withdrawal of subsidy and additional support to achieve the target, it may be attractive to fail by a modest margin. If the price of success is another more demanding target, the same is true. Falling short of the target—especially if the causes are lost in a fog of confused accountability—may be more attractive than succeeding. There may be an element of moral hazard if reaching targets is linked to indicators that have high stakes. All indicators risk being gamed if what they signify is valued.

Prioritisation and Trade-offs

Indicators have different qualities. The data needed to populate them may or may not already exist. They may have high or low costs in terms of data acquisition. They may be more or less sensitive to the time and frequency with which data is collected. Most obviously, some indicators require household survey data that realistically is only likely to be available on a sample basis periodically, not annually. Though it is desirable that such data is collected longitudinally it is rarely practical to do this on any scale. Judgments about changing patterns depend on cross-sectional data that almost invariably have issues of comparable sampling when comparisons over time are made.

Other indicators can be populated with administrative data from school census exercises that are often conducted annually. This can indicate characteristics of schools and flows of students and provide a useful time series of system evolution. It may contain over or under reporting if there are incentives that link indicators to resource allocation.

A third source of data for some indicators relates to national systems of assessment and qualification in cases where examination boards collect and collate large quantities of data on candidate performance. Sometimes assessment data arises from the use of standardized international tests, but these are often low stakes and the results may be at variance with those of high-stakes selection exams within the same system. Qualitative data often exists in documentary form, not least in the reports of school inspections. Judgments have to be made about the use of particular indicators in terms of their demands on data collection and data processing systems and the value they add to decision making at different levels.

Education systems have the characteristics of systems; as a result, component parts often interact. This is a consideration in identifying appropriate indicators and in determining the meaning of the data they produce. Secondary participation rates are limited by, and interact with, the number of children successfully graduating from primary schools. In all but the short-term, participation rates are likely to be influenced by demographic transitions that may not be included in the indicators that focus on education policy goals alone.

Financial parameters interact. The percentage allocation of GDP to education and the percent of the government budget spent on education only acquire meaning if government expenditure as a proportion of GDP is known. Some indicators are mechanically linked. The number of children in

school within an age group is the complement of the number of children in school. The proportion of the budget allocated to primary schools stands in a predictable relationship with the proportion allocated to secondary schools if the total allocation is known.

Lastly, indicators linked to targets generated from desirable wish lists may not be cumulatively feasible. This may be self-evident when resource needs and timelines are linked to indicators of progress. Prioritisation is necessary and trade-offs inevitable. The problem is to decide on what basis this can be achieved and how projection of indicators of system development can be modeled to sharpen perceptions of the choices available.

4. CHARACTERISTICS OF INDICATORS

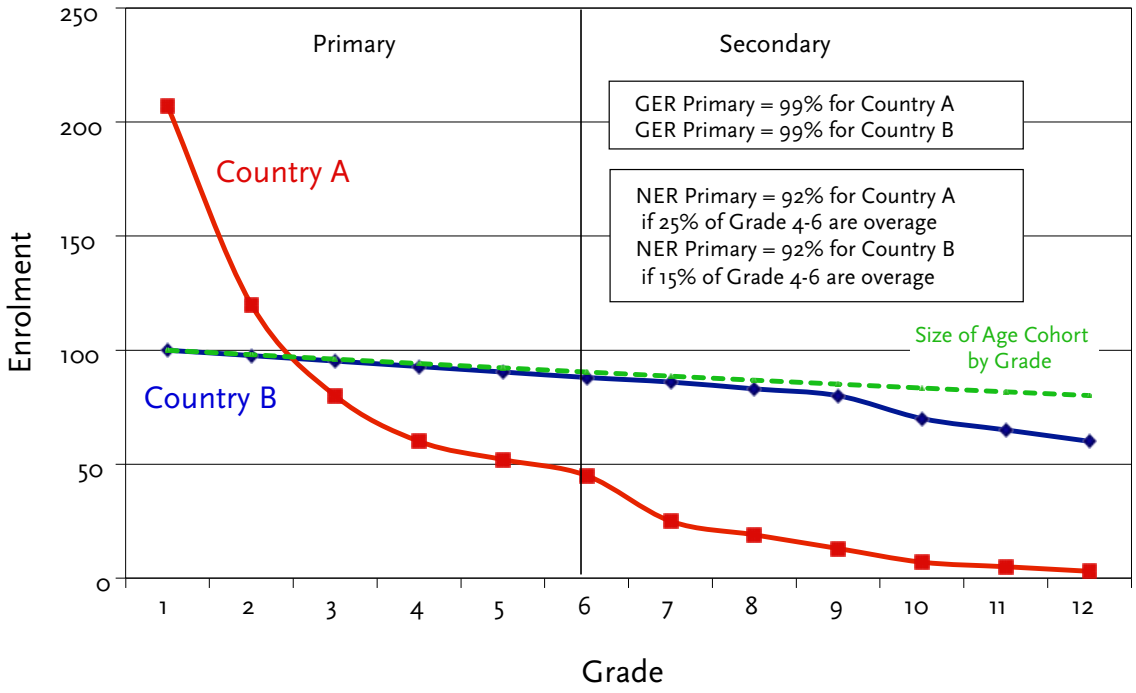
There are number of characteristics of indicators that should be evaluated in the process of identifying those are the most useful. Eight characteristics for consideration are noted below.

Ambiguous Interpretation

Useful indicators usually only have one direction of travel that represents improvement. Ambiguity arises when it is not clear whether increases or decreases in value represent progress towards the desired goal. Gross Enrolment Rates (GERs) have this characteristic. They often overshoot to as high as 150 percent or more during periods of rapid enrolment growth, before dropping back to the values found in high enrolment countries of around 100 percent. This is largely because of varying numbers of over-age children and repeaters within the total number enrolled across an educational cycle. A brief illustration makes the point.

The GER of the primary school cycle is the total enrolment of all ages in primary divided by age group for primary grades. Figure 4 shows enrolment by Grade for two countries. The first (country A) is similar to many low income countries that have had high levels of investment in EFA programmes designed to universalise access (e.g., Uganda, Tanzania, Malawi, Nepal, and Cambodia). In these countries enrolment in Grade 1 is much greater than the number of children of Grade 1 age. Many enter over age and some under age. Dropout is rapid and only half or less of those in the age group succeed in completing the end of the primary cycle. The second case (country B) has high enrolment rates in every grade and little dropout and is typical of OECD countries with almost full enrolment at primary level.

Figure 4. Gross and Net Enrolment Rates

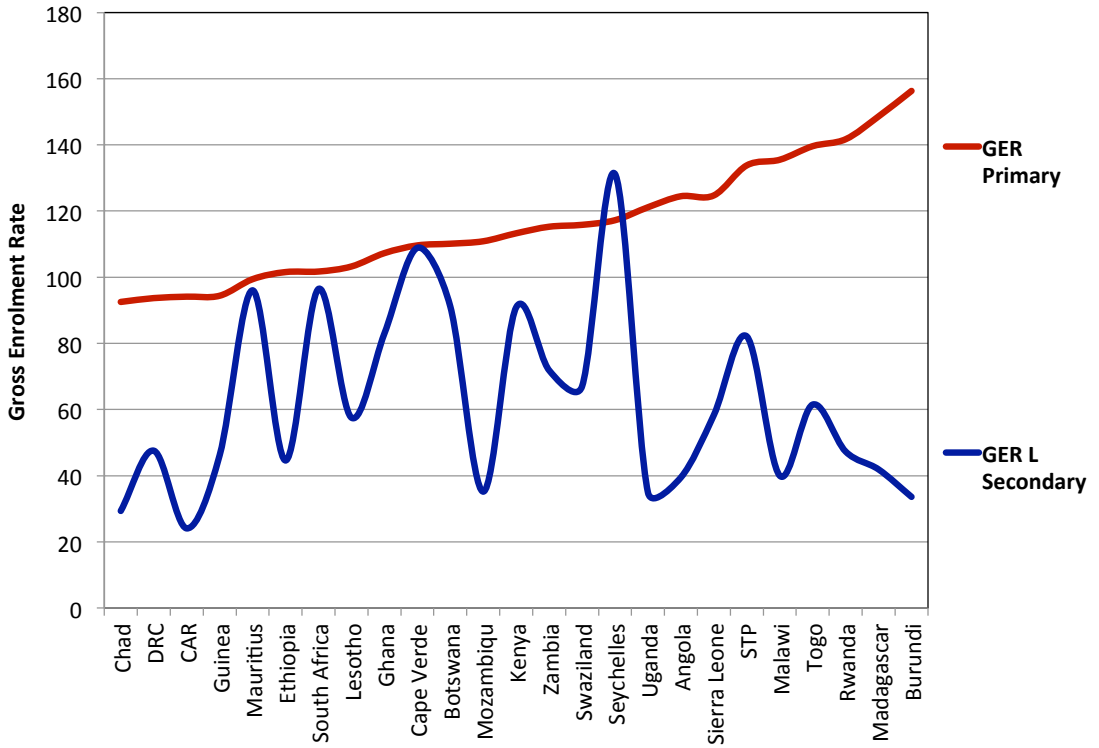


Source: Author

In this example country A has a GER of 99 percent since total enrolments are only a little less than the total number of children of primary school age. Interestingly, in country B the GER is also about 99 percent because the total of the enrolments for Grades 1 to 6 is the same. However, the pattern of enrolments is very different, with high attrition and few of those enrolling in Grade 1 succeeding in reaching Grade 6 in country A. GER as conventionally calculated is not a good indicator of participation and does not draw attention to key policy issues (e.g., over age enrolment and dropout patterns). The Net Enrolment Rate (NER) has problems that are similar but less misleading because of over age enrolment within the cycle. Figure 4 shows how Increases in values may conceal diminishing efficiency.

Figure 5 highlights the many countries in sub-Saharan Africa that exceed 100 percent GER at the primary level. Those with the highest levels will see GERs decline as the number of over age and repeating children diminishes. GERs for secondary schooling are generally much lower but may follow the same trajectory of over shoot at some point in the future. Grade specific enrolment rates provide a much more illuminating indicator of enrolment and participation than composite enrolment rates.

Figure 5. GER Primary and Secondary sub-Saharan Africa



Source: Author

The Significance of Significance

Differences in the value of indicators can be significant in the statistical sense of being unlikely to occur by chance less than 5 percent or 1 percent of the time, but they may have limited practical significance if their magnitude is small. For example, a Gender Parity Index (GPI) of 0.96 or of 1.04 means that out of 100 boys and girls only 2 children have an enrolment status different to the other group. GPI 0.96 means that out of 100 boys and girls 46 girls are in school and 48 boys. Conversely, GPI 1.04 means that out of 100 boys and girls there are 48 girls in school and 46 boys in school. On large samples these differences are likely to be statistically significant. However, whether and how they are significant for policy is another matter. If it is possible to target the small numbers responsible for the differences between groups this is attractive. Approaching the problem as if the whole group is disadvantaged may mislead. Whatever the general picture, pockets are likely where the forms of exclusion differ from those suggested by aggregate data.

Significant differences can sometimes be invisible. The GPI compares the Gross Enrolment Rate for girls with the Gross Enrolment Rate for boys. If there are significantly different numbers of girls in the population as a result of selective abortion and infanticide, this will not be evident from the GPI. It is quite possible to have a higher GPI for girls than for boys and to have many fewer girls in the population. Though the difference in enrolment rates between boys and girls is likely to be significant, it can mislead. Without knowing the ratio of boys and girls in the population, what may be really significant in terms of gender discrimination may be missed.

Differences Between and Within Groups and Aggregation

Differences between groups are generally much smaller than differences within groups. For example, whatever the differences in enrolments or measured achievement between boys and girls, it would be very unusual if the differences within the group of boys and within the group of girls related to household income were not much bigger than the differences between boys and girls. Thus, a kind of horizontal equity issue (differences between groups of boys and girls) may be much less important than a vertical equity issue (differences in performance between rich and poor boys, and between rich and poor girls). Diminishing one kind of difference may require exacerbating another kind. In judging the implications of performance differences between groups, the inter-relationships have to be appreciated.

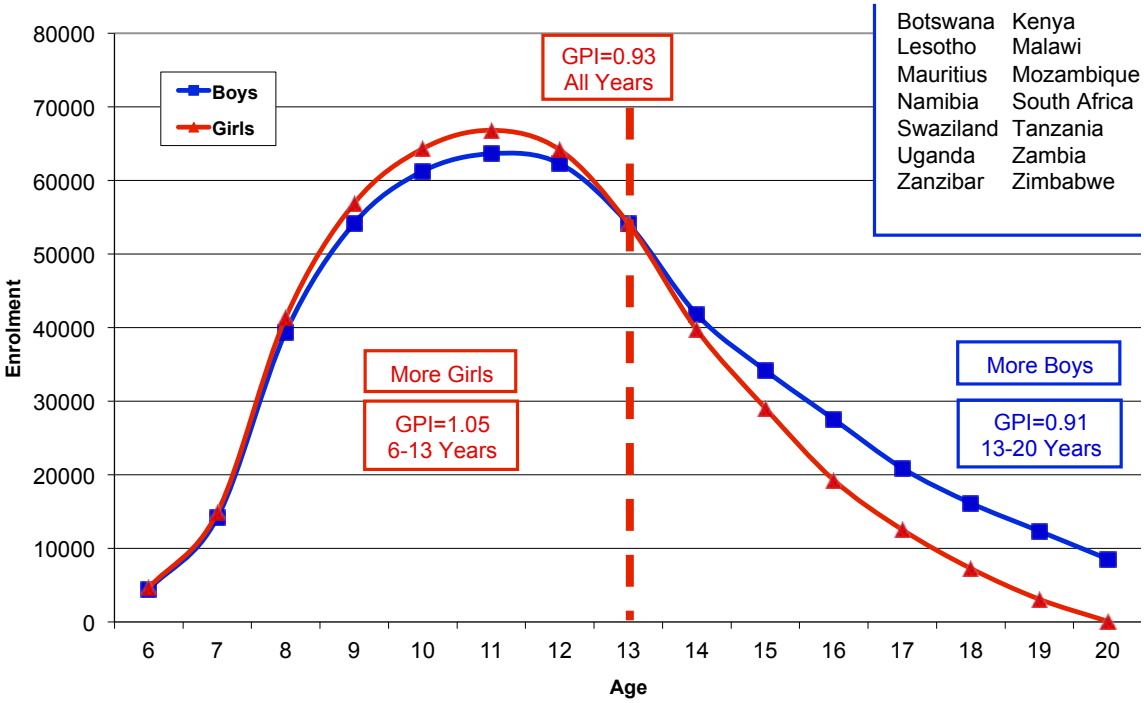
Comparisons between groups usually involve aggregation. Most obviously, averages can be calculated in different ways across datasets. As an example, regional averages for enrolment rates may be calculated by simply averaging the rate for each country arithmetically using the country as the unit of analysis. An alternative is to weight each average by size of the child population in each country, thus giving some sense of the proportion of children as a whole that may or may not be in school. These two methods of aggregation produce different results. Very large countries in the dataset (e.g., India in South Asia, Ethiopia in Africa, and Brazil in South America) will contribute most of the variation to the enrolment rates in the overall average.

Correlation is Not Causality

The reasons the value of indicators change can be complex. If rural children have higher dropout rates than urban children it does not mean that rurality causes dropout. Rural households may be poorer, the distances to school greater, the costs higher as a proportion of household income, and the quality of schools lower. All these things are not necessarily a function of rurality, but they could all be correlated.

Another example of the problems that can arise relates to countries where there are more boys enrolled than girls in primary school. An increasing amount of data shows that it is common in some of these countries (especially in Sub-Saharan Africa) for boys to enrol later and remain in school longer with more repetition and over-age progression and persistence to greater ages. Overall there may be more boys than girls in primary school and this can lead to the misleading conclusion that the problem will be solved if more girls enter school in grade 1. However, if the cause of the imbalance in boys and girls is early enrolment and failure to graduate on schedule six years later leading to dropout around puberty, the conclusions have to be revisited. In all the countries shown in Figure 6 there is a pattern of girls enrolling younger and leaving earlier. The solution to raising enrolment rates of girls may be to make sure girls remain on track to graduate by the age of 12 years, rather than further universal incentives to enrol girls when almost all enter school. Analytic studies are needed to establish causality. Child tracking data may be especially useful, but is rarely used.

Figure 6. Age and Enrolment Patterns in Primary School by Sex



Source: Author

The attribution of changes in the values of indicators to a single cause must exclude the possibility that the changes have arisen through several causal relationships and/or would have happened anyway. Simply put, education systems will develop in one way or another without interventions and that is the baseline against which policy can be measured. If may be that all gains in enrolment rates, gender parity, reading achievement, etc. can be attributed to interventions, but it is also possible some of the gains would have happened anyway. Making reasonable attributions of impact thus requires disinterested analysis of data over time, which can be used to demonstrate directionality and causality controlling for other factors. Understanding why performance on one indicator has changed is likely to require consideration of other indicators; which are most relevant depends on the development of causal models that can be tested with the data available.

Composite Indicators are Almost Always Difficult to Interpret

Composite indicators, which have several component parts, generally suffer from ambiguity. When they change it is not clear which element is responsible for the change. For example, the Education Development Index (EDI) of the GMR is a composite index using four of the six EFA goals, selected on the basis of data availability (UNESCO, 2009). The four components are:

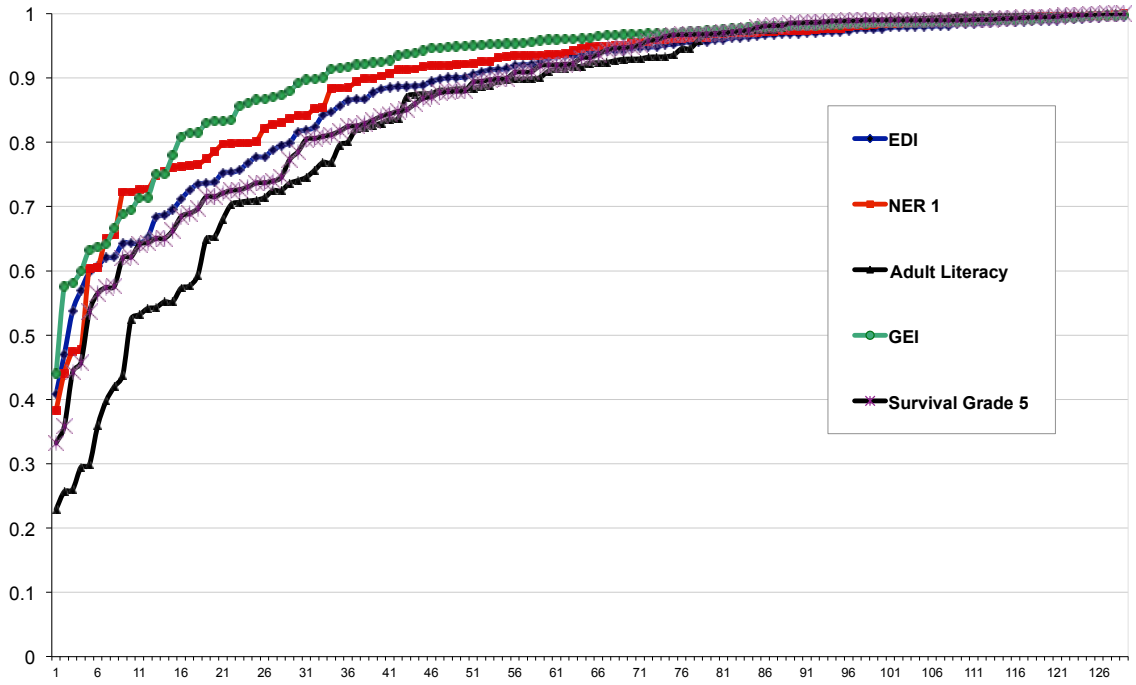
i. for universal primary education: the primary adjusted net enrolment ratio;

ii. for adult literacy: the adult literacy rate for those aged 15 and above;

iii. for quality of education: the survival rate to Grade 5; and

iv. for gender: the gender-specific EFA index, the GEI, which is itself a simple average of the three gender parity indexes (GPI) for primary education, secondary education, and adult literacy.

Figure 7. Education Development Index Components



Source: UIS Data, 2012

Figure 7 shows the values of the component parts of the Index for each country with countries on the x axis and values on the y axis. The GEI has more impact on the Index than the Adult Literacy score for low EDI countries. For high EDI countries the component parts of the Index converge and there is little variation in value. The dynamic behaviour of the index is not very useful in charting progress across a wide range of countries. More detailed analysis shows that the majority of countries do not change their position by more than 5 percent over 5 years. This is likely to be within the margins of measurement error. When the EDI changes in value it could be for many different reasons. As the number of component parts of a composite index increase, it becomes more and more difficult to interpret changes and explain them to a general audience.

Error of Measurement

Nothing can be measured without error. A particular value of an indicator always has a margin of "+ or -" within which its "true" value lies with a certain range of probability. The statistics of this are beyond a general audience, though the idea is familiar. If changes in the value of a key indicator are close to the + or - band of uncertainty, it would be unsafe to believe that anything has changed that is worth reward or sanction. It would simply be unknown and the safe conclusion would be that nothing

has changed. Enrolments, age groups of school age children, and pass rates in examinations are rarely measured within "+1% or –1%." Even 5 percent margins are not uncommon in the real world, and may be larger in fragile states.

Whatever indicators are identified, they have to be assessed against the precision with which they can be measured and the cost of increasing the precision relative to the need for information to inform decisions. It is important to remember that there are at least two kinds of precision of interest. The first is of an absolute measure (e.g., to determine the number of children in school). The second, which is most relevant for assessing progress, is to determine with a known degree of accuracy how much a particular indicator has changed over time (e.g., the increase in enrolments over a five-year period). Even if the first measure is inaccurate as a result of under reporting or over reporting by schools, the second measure may be more accurate, especially if like-for-like sampling is used. Random errors and systematic errors have different qualities.

Proxies

Proxies are indirect measures that sometimes have to be used. For example, the number of non-repeating candidates taking a primary school leaving examination compared to those in an age group is a proxy for the primary completion rate if the size of the age group is known. Examination pass rates are a proxy for learning achievement but may not have consistent standards or curriculum coverage year on year. Pupil:teacher ratio is a poor proxy of teacher productivity since it says nothing about how much teaching occurs. Proxies need to be chosen that are better than alternative methods of collecting data on aspects of performance and outcomes.

Time Scale and Sensitivity and Costs

Some things are unlikely to change rapidly. If the performance of school candidates in mathematics improved by more than 10 percent in one year on equivalent tests, it is unlikely to be a real increase. Year on year gains in enrolment of 10 percent across an educational cycle are also unlikely, not least because they would imply very large increases in entry rates assuming children do not enter higher grades directly.

Slowly changing parameters make poor short term indicators of progress towards targets because they do no change very much. Thus, the significance of changes in the value of GER and NER diminishes as they approach 100 percent from above or below. Like other indicators that approach desired values asymptotically, the significance of changes in the indicator reduces as a limit is approached. Possible gains in the value of the NER if it is already 97 percent are very different than where the NER is 60 percent. Also, gains on the margin for most indicators that have limits will be more difficult and expensive to realise than gains around the mid values. Thus, a 5 percent gain in NER from 94 percent to 99 percent may be more challenging than a 5 percent gain from 60 percent to 65 percent. Clearly, a 10 percent gain is not available from 94 percent, but is possible from 60 percent. These difficulties are compounded by measurement error margins.

Some indicators are too expensive or too inconvenient and intrusive to measure. It is very important to separate that which requires data on every child, that which can be usefully assessed on a stratified sample, and that which may best be approached through sample and targeted reference groups of special interest. Those who develop indicators have to be aware of the feasibility (or otherwise) of collecting the necessary data.

5. PREFERRED GOALS AND POSSIBLE INDICATORS

The goals that have been developed by the EFA Steering Committee and the Open Working Group have been taken as a framework for the development of indicators designed to assess progress. The goals and indicators identified by the Technical Advisory Group (TAG) of the EFA steering committee in November of 2014 were cross-referenced as the most recent source of development work on new EFA indicators.

Indicators cannot be developed without clear goals statements. After consolidation of the seven goals identified in the Muscat Agreement and the ten goals enumerated by the OWG, the goal statement from one or the other that best captures the sentiments behind the goal statements were chosen and identified in Table 1. The next step in the process was to re-examine the goals that emerged and revisit their wording to eliminate repetition, reduce ambiguity, enhance the identification of viable indicators, and consolidate a development agenda.

The temptation to add new goals and delete others has been resisted since the two sets of goals derive legitimacy from the global processes that resulted in their specification. This does not, however, preclude refinement designed to make the goals more useful and give them greater traction when converted to national and international level programme objectives, targets, and indicators. The result is a list of 10 consolidated goals that can be linked to the indicators currently suggested by the TAG. The strengths and weaknesses of these indicators are assessed in the subsequent tables; this complements the analysis already undertaken by the TAG.

The final step in this analysis was to identify, for each of the ten consolidated goals, indicators that should be considered for a consolidated list at a global level. Where possible, each field identified by a goal is linked to a limited number of indicators to avoid a proliferation of indicators that will not be used in practice. To the extent possible in the short time available the development of these indicators has been informed by consideration of likely data availability, attributes of different types of indicators that make them suited to different purposes, costs and frequencies of measurement, and issues related to construct validity and portability across different systems.

Some aspects of educational development can only be meaningfully monitored at national system level since the specificities of different systems vary in terms of curricula, high stakes selection examinations, teacher qualifications, modes of financing, etc. Goals of use at the international level have limitations when projected downwards onto specific systems.

Many things that can be measured are not worth measuring, and many things that are important for the development of education systems cannot be measured but can only be judged. The matrix below focuses on indicators that can be associated with the goals identified and data that already exists or could realistically be collected. Where it may be more appropriate to judge rather than measure progress, this is noted.

Reconciling the EFA Steering Committee and OWG Goals

Table 1 shows the existing goals proposed by the EFA working committee and by the OWG. These are rationalised into a single list in the third column based on what appears to be the most useful statement of the goal. Column 4 shows comments related to each goal and identifies issues that will arise in trying to convert the goal statement into indicators. Several things are important to note and the commentary below highlights points related to each of the Preferred Existing Goals in Table 1:

First, several of the proposed goals are expressed in terms of x% as a target without any indication of how x% will be determined or by whom. If this format is used, the value of x% will change over time as progress occurs. In practice, the x% is not likely to be populated in a consistent way that gains consensus from different stakeholders. It should therefore be avoided or numerically specified and linked to a time frame.

Second, it is assumed that assessment can be made of pre-school children and those in Grade 2. This may be easier to specify than to enact. Testing very young children, especially those who are pre-literate, requires the presence of an unfamiliar adult and a process more like a clinical interview than a written test. To undertake it on any scale with a reliable protocol may be difficult

Third, school readiness is not a well-defined construct and may well vary considerably cross-culturally. It will be much easier to assess whether children who arrive in Grade 1 are ready for it than to establish ways of systematically assessing capabilities of pre-school children in what is often a disorganised sector without centralised records and with much unregulated private ownership.

Fourth, some goals are expressed in terms of the most marginalised but this begs the question of what the marginalisation is from and how it affects need. Just as it is possible to overlook the marginalised by concentrating on the middle, it may also be possible to overlook the needs of the middle by focusing on the most marginalised. Poverty is generally a more important source of exclusion than gender, location, and social group—and this reality is also sometimes over looked when single issue lobbying is very purposeful.

Fifth, the existing specifications in both the OWG and MA goals group several goals into a single goals statement (e.g., OWG 4.1 specifies universal completion of basic education, appropriate levels of achievement by the time of completion, and equitable access and progression all in one goal; OWG 4.7 on sustainable development and global citizenship specifies at least seven different goals to be achieved within one statement). This may overburden a single goal statement. If access is important, it should have a separate goal. If learning is to be grounded, it should have a separate goal. If equity is an overarching and crosscutting concern, it should also have a separate goal.

Sixth, goals for youth and adults need to be considered in relation to opportunities to design programs and devise indicators appropriate for learners with a wide range of ages. This may mean different goals are needed for different groups.

Seventh, affordable learning has no meaning. Affordable may depend on household income, household size and location, gender, and many other non-educational factors. It may also been defined to include unsustainable debt. Free should mean fee-free. It should also mean free to any household below the poverty line.

Eighth, TVET is a complex sector that cannot easily be reduced to the subject of a simple goal. It may be unrealistic to capture the diversity of need and demand in a simple goal related to participation in programmes with different lengths, costs, locations, and patterns of demand.

Ninth, goals related to global citizenship should logically build from national citizenship programmes. It is unlikely to be sustainable to focus on global citizenship without a secure base in national citizenship. This will need a consensus of values and attitudes that have yet to be demonstrated.

Tenth, sustainable development goals for education, first muted at the Jomtien conference in 1990, remain undefined. If there is to be a separate goal it must clarify the valued attributes of sustainability.

Eleventh, teachers are at the heart of effective education systems and warrant a separate goal, which should be retained. Some argue that this is a "means to an end goal" but this is not so. Having trained and competent teachers in well-founded schools with appropriate learning space is central to the definition of quality education, not simply an input to achieve it.

Twelfth, there is no overarching goal for aid and investment by development partners. Perhaps there should be, or at least some adumbration of intent to support the resource and other demands that result from adopting the goals in countries that qualify for external assistance.

Goals for EFA Steering Committee and OWG

Table 1. EFA Steering Committee and OWG Goals

Goal Cluster	Muscat Agreement (May 14)	Open Working Group, Focus Area 4 (July 14)	Preferred Existing Goal	Comment
	MA Ensure equitable and inclusive quality education and lifelong learning for all by 2030	OWG Ensure inclusive and equitable quality education and promote life-long learning opportunities for all	MA Ensure equitable and inclusive quality education and lifelong learning for all by 2030	It is access to education that should be equitable though the education itself should be delivered in an equitable way. If education is for all it is by some definitions necessarily inclusive and would not have quality if it was exclusive. This Supergoal is in fact several goals.
1.	By 2030, at least x% of girls and boys are ready for primary school through participation in quality early childhood care and education, including at least one year of free and compulsory pre-primary education, with particular attention to gender equality and the most marginalized.	By 2030 ensure that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education.	By 2030 ensure that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education.	X% cannot readily be defined and will change according to rate of progress. Readiness has not been defined. It could be a minimum level of measured capabilities at age 5 (?). But how do you assess all 4 year olds reliably? Who is competent to make the assessment? What is assessed? What are the consequences for those below some arbitrary threshold of readiness? The phrase "so that they are ready for primary education" is redundant. Pre-primary education would have no purpose if it did not prepare children for primary education! It is also restrictive if it implies this is the only purpose of early childhood development and care.

Goal Cluster	Muscat Agreement (May 14)	Open Working Group, Focus Area 4 (July 14)	Preferred Existing Goal	Comment
2.	By 2030, all girls and boys complete free and compulsory quality basic education of at least 9 years and achieve relevant learning outcomes, with particular attention to gender equality and the most marginalized.	By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes.	By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes.	All girls and boys means universal access to all including the most marginalised. Free means fee free. It can be extended to mean free of all charges. It does not exclude those who can pay contributing to costs. Nine years completed by the age of 15 years is becoming an international norm. It also means children will complete basic education before reaching the minimum age of work. It discourages acceptance of over-age progression and significant repetition. A separate goal for learning (rather than access coupled with learning in MA 2 and OWG4.1) is justified to give learning outcomes prominence. Minimum learning goals must be set nationally if they are to relate to national curricula. In some cases these goals may converge towards common learning goals ("international learning goals?") in subjects which have universalistic characteristics (e.g., in mathematics and science and technology). Relevance has to be established within national economies and labour markets. Opportunities to learn and educational outcomes should be equitably distributed and not strongly associated with social group, gender, disability, location, and civil status. Average years of schooling and levels of achievement in core subjects should be equitably distributed. The importance of this justifies a separate goal statement.

Goal Cluster	Muscat Agreement (May 14)	Open Working Group, Focus Area 4 (July 14)	Preferred Existing Goal	Comment
3.	By 2030, all youth and at least x% of adults reach a proficiency level in literacy and numeracy sufficient to fully participate in society, with particular attention to girls and women and the most marginalized	By 2030, ensure that all youth and at least x% of adults, both men and women, achieve literacy and numeracy.	By 2030, ensure that all youth and at least x% of adults, both men and women, achieve literacy and numeracy.	X% cannot readily be defined and will change according to rate of progress. Youth under 25 years should be separated from the adult population since most young people will achieve literacy and numeracy from schooling, and illiterate adults from adult education. Plausible relative improvement rates from the existing baseline of illiteracy are the most appropriate goals for adult illiteracy reduction. 4% a year would half rates over a 15-year period.
4.	By 2030, at least x% of youth and y% of adults have the knowledge and skills for decent work and life through technical and vocational, upper secondary and tertiary education and training, with particular attention to gender equality and the most marginalized.	By 2030 ensure equal access for all women and men to affordable quality technical, vocational and tertiary education, including university.	By 2030, ensure equal access for all women and men to affordable quality technical, vocational and tertiary education, including university.	Affordable has no meaning that can be defined across countries. Affordable education could be financed by (unsustainable) household debt. It may be associated with privatisation of services.
		By 2030, increase by x% the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship.		Cannot be readily translated into indicators. X% is unknown, varies between countries, changes over time, and will be different for different employment sectors. Unless there a definition of "decent jobs" so there can be no indicator. Determining improved access (OWG4.3) will provide an indication of increased rates of qualification in the labour force if it is linked to completion rates and qualification.

Goal Cluster	Muscat Agreement (May 14)	Open Working Group, Focus Area 4 (July 14)	Preferred Existing Goal	Comment
5.	By 2030, all learners acquire knowledge, skills, values and attitudes to establish sustainable and peaceful societies, including through global citizenship education and education for sustainable development.	By 2030 ensure all learners acquire knowledge and skills needed to promote sustainable development, including among others through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship, and appreciation of cultural diversity and of culture's contribution to sustainable development.	By 2030, all learners acquire knowledge, skills, values and attitudes to establish sustainable and peaceful societies, including through global citizenship education and education for sustainable development.	There is no agreed definition of learning outcomes for necessary and sufficient sustainable and peaceful societies. Most countries already have national curricula that include citizenship/civics/life shills/social studies. Understanding citizenship is a necessary pre requisite to understanding global citizenship which is part of citizenship education. Sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship, and appreciation of cultural diversity and of culture's contribution to sustainable development are all part of citizenship education which will reflect national curricula priorities.
6.	By 2030, all governments ensure that all learners are taught by qualified, professionally-trained, motivated and well-supported teachers.	By 2030 increase by x% the supply of qualified teachers, including through international cooperation for teacher training in developing countries, especially LDCs and SIDS.	By 2030, all governments ensure that all learners are taught by qualified, professionally-trained, motivated and well-supported teachers.	Nationally defined levels of qualification and training can be defined. It is not necessary that these should be universalised. Motivation can be indicated indirectly by job application and vacancy rates and teacher turnover.

Goal Cluster	Muscat Agreement (May 14)	Open Working Group, Focus Area 4 (July 14)	Preferred Existing Goal	Comment
7.	By 2030, all countries allocate at least 4-6% of their Gross Domestic Product (GDP) or at least 15-20% of their public expenditure to education, prioritizing groups most in need; and strengthen financial cooperation for education, prioritizing countries most in need.	NO EQUIVALENT	By 2030, all countries allocate at least 4-6% of their Gross Domestic Product (GDP) or at least 15-20% of their public expenditure to education, prioritizing groups most in need; and strengthen financial cooperation for education, prioritizing countries most in need.	There is no OWG goal for financing. There is no goal for development partners' commitment to finance post 2015 educational development. The % of GDP allocated and the % of government budget allocated are not alternatives so the use of "or" is inappropriate. % of GDP and % of government budget for education must both be known to determine the value of the allocation. The proportion of school age children and the cost per child must also be known to translate allocations into participation rates.
8.		Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all.	Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all.	Jomtien and Dakar had no explicit commitment to build adequate infrastructure. This should be a measurable goal to include adequate sanitation, clean water, electricity, accessible location, and access to internet facilities
9.		By 2020 expand by x% globally the number of scholarships for developing countries in particular LDCs, SIDS and African countries to enrol in higher education, including vocational training, ICT, technical, engineering and scientific programmes in developed countries and other developing countries.	By 2020 expand by x% globally the number of scholarships for developing countries in particular LDCs, SIDS and African countries to enrol in higher education, including vocational training, ICT, technical, engineering and scientific programmes in developed countries and other developing countries.	X% cannot be defined, it is not clear who would define it, who the goal is for, and it would be a shifting target that changed over time in relation to need and opportunity. Allocating more investment to scholarships would have to be balanced against the opportunity costs and the likelihood of brain drain to rich countries. Without a clear development strategy, which would vary by country, there cannot be a measurable goal or an assumption that more foreign rather than in country study is necessarily a signifier of progress.

The goal statements generated by consolidating the two existing lists are a step on the pathway to identifying relevant indicators that are fit for purpose. From the comments included in Table 1 it is clear that problems will still remain. The goals have been integrated into a column of "preferred existing goals" to help generate goal statements that are more likely to be translatable into appropriate indicators. As far as possible the sentiments behind the original goal statements have been retained. The various issues and criteria that relate to the identification of appropriate indicators discussed earlier in this paper have been recognised in this process.

Table 2 presents ten main "improved goals" from the list of "preferred goals." An 11th goal, relating to the numbers of scholarships awarded for study internationally, appears to be more a means to an end than an end in itself and could be a candidate for omission.

Table 3 builds on the list of Table 2 to associate each of the 10 "improved goals" with the indicators suggested by the TAG. This then systematically presents a catalogue of suggestions that take further those identified by the TAG and add some new ones. Each indicator listed is associated with comments identifying strengths and weaknesses.

Table 4 consolidates the indicators developed in relation to each improved goal into a single simple list without further comment.

Improved Goals

Table 2. Improved Goals

Preferred Existing Goal	Improved Goal
MA Ensure equitable and inclusive quality education and lifelong learning for all by 2030	Equal Opportunities for Quality Education and Lifelong Learning for All by 2030
By 2030, ensure that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education	By 2030, all girls and boys have access to quality early childhood development, care and pre-primary education free to households by 2030
By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes	By 2030, all girls and boys have access to a full cycle of nine years of quality primary and secondary education which is free and completed by the age of 15 years.
	By 2030, all girls and boys achieve nationally defined minimum learning outcomes that are relevant to employment, livelihoods and wellbeing by the age of 15 years in maths, science and language.
	By 2030, differences in attainment and achievement in 2015 at end of primary and end of secondary between boys and girls and children from the top and bottom 20% of household income will be reduced to half their level by 2030
By 2030, ensure that all youth and at least x% of adults, both men and women, achieve literacy and numeracy	By 2030, all young people below the age of 25 years achieve nationally defined levels of literacy and numeracy; literacy rates for adults between 25 and 65 years improve by 4% per year
By 2030, ensure equal access for all women and men to affordable quality technical, vocational and tertiary education, including university	By 2030, equal access for all women and men to quality technical, vocational and tertiary education, including university that is free to those unable to pay the direct and indirect costs.
By 2030, all learners acquire knowledge, skills, values and attitudes to establish sustainable and peaceful societies, including through global citizenship education and education for sustainable development.	By 2030, all learners acquire knowledge, skills, values and attitudes consistent with nationally defined curriculum outcomes for citizenship education including global citizenship and awareness of environment science

Preferred Existing Goal	Improved Goal
By 2030, all governments ensure that all learners are taught by qualified, professionally-trained, motivated and well-supported teachers.	By 2030, all governments ensure that all learners are taught by qualified, professionally-trained, motivated and well-supported teachers.
By 2030, all countries allocate at least 4-6% of their Gross Domestic Product (GDP) or at least 15-20% of their public expenditure to education, prioritizing groups most in need; and strengthen financial cooperation for education, prioritizing countries most in need.	By 2030, all countries collect at least 25% of GDP in domestic revenue to finance government, and allocate at least 4% of GDP and 15% of government expenditure to education to ensure universal access to free basic education and support for pro-poor financing of pubic post-basic education
Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all	By 2030, build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all children and adults
By 2020 expand by x% globally the number of scholarships for developing countries in particular LDCs, SIDS and African countries to enrol in higher education, including vocational training, ICT, technical, engineering and scientific programmes in developed countries and other developing countries	By 2030, classify and monitor the number of higher education scholarships awarded for study internationally

Improved Goals and Suggested Indicators

Table 3. Improved Goals and Suggested Indicators

Goal Cluster	BY 2030 ENSURE:	Existing Indicators (TAG)	Comment	Preferred Indicators
1.	All girls and boys have access to quality early childhood development, care and pre-primary education free to households by 2030.	Early Childhood Development Index	Composite index of MICs items is difficult to interpret; changes in its value could come from any component; Index made up of self-reporting items by care givers on children in 4 fields - physical, learning, literacy and numeracy, social and emotional - with simple dichotomous items with unknown reliability and cross cultural consensus on child rearing.	Unlikely to provide a robust measure that is comparable cross culturally
		Under-five mortality rate (%)	Widely available; proxy for early childhood care and development; implications for educational investment are indirect.	Under five mortality rate (%)
		Under-five stunting rate (%)	Widely available; proxy for early childhood care and development; implications for education investment in direct.	Under five stunting rate (%)
		Percentage of children under 5 years experiencing responsive, stimulating parenting in safe environments	MICs data for a minority of countries; self-reporting of responsive parenting and household environment of unknown reliability; real changes difficult to assess without trained observers, repeat observations and carefully structured samples with high levels of cooperation.	Preschool attendance rates from household survey data
		Participation rate in organized learning (3- to 4-year-olds)	Most low and middle income countries have no systematic methods of reporting participation and large unorganised non-state provision.	Preschool enrolment rates in recognised preschools from administrative data
		Gross pre-primary enrolment ratio (%)	Composite indicator with uncertain numerator (enrolment in disorganised sector including unknown proportions of over and under age children) and denominator (one year or two years of age specific population?).	
		Child-educator ratio/Pupil-teacher ratio	Unlikely to be known with precision unless there are formal requirements for qualification and employment and enrolment registration. Average figures will conceal wide variance.	

Goal Cluster	BY 2030 ENSURE:	Existing Indicators (TAG)	Comment	Preferred Indicators
		Percentage of children receiving at least one year of a quality pre-primary education programme	No data on quality pre-primary education or agreed criteria. HH surveys can establish what proportion of an age cohort experience pre-school. School readiness best indicated by diagnostic entry assessment in grade 1 which should be undertaken for every child as a matter of good practice. This cannot be a written test.	
		Countries with one year of free and compulsory pre-primary education in legal/ institutional frameworks	Easy to establish status legally; no indication of extent of implementation.	Legislation and financial provision for one or more years of preschool
2.	All girls and boys have access to a full cycle of nine years of quality primary and secondary education which is free and completed by the age of 15 years.	Gross intake ratio to the first grade of primary education (primary completion rate)	Widely available; may be well over 100% in low enrolment countries with uncertainties about age composition; direction of change needs careful interpretation.	Gross and Net Intake Rate to first grade of primary school
		Gross intake ratio to the last grade of primary education (primary completion rate)	Widely available; age specific enrolment rate for first entry to last grade requires accurate knowledge of last grade repeaters.	Gross Intake Rate to last grade of primary education
				On-schedule graduation rate from primary school or Age Specific Graduation Rate
		Primary education attainment rate (% of cohort aged 3-7 years above official primary school age)	Widely available; if obtained from HH survey data will be periodic; possible to link attainment to socio economic status and social group for equity.	Primary education attainment rate for 15-year-old population
		Lower secondary education attainment rate (% of cohort aged 3-7 years above official lower secondary school age)	As for primary attainment ratio.	Lower secondary attainment rate for 18-year-old population
		Gross intake ratio to the last grade of upper secondary education (secondary completion rate)	As for primary GIR. Note that most systems are differentiated at this level. Enrolments in non-public and post basic education institutions may not be included. Gross intake rates may include many older students above secondary school age. A single indicator may not be appropriate across systems except for attainment of 12 years or more of education from HH survey data.	Upper secondary attainment rate for 20-year-olds

Upper secondary education attainment rate (% of cohort aged 3-7 years above official upper secondary school age)	Attainment rate difficult to calculate if differentiated provision post basic education level. Exam entry and pass rates may be a better indicator of participation, especially if these are high stakes selection examinations (see Goal 3).	
Children who were never in school (% of cohort aged 3- 6 years above official primary school age)	This establishes the proportion of 9 to 12-year-olds who have never been to school. Self-reporting from HH survey with uncertain reliability. Some 9 to 12-year-olds may enrol. If HH survey based periodic not annual.	Number and rate of Never Enrolled children of primary and lower secondary school age from HH survey data
Number of out-of-schoolchildren and adolescents	Age range (primary and lower secondary) varies between countries (5-6 to 14-18). Self-reporting from HH survey with uncertain reliability. Number is not very meaningful without comparison with the age group.	Number and rate of Out of School Children and adolescents
Primary adjusted net enrolment rate	This replicates the out of school children calculation but is based on administrative data not HH survey.	Grade by grade Gross (and Net) enrolment rates for all grades
Lower secondary total net enrolment rate	Needs data on age and enrolment in lower secondary; will underestimate participation where many are over-age.	As above
Gross enrolment ratio in secondary education	Confounded by differentiated secondary school systems that include post basic provision through a range of providers (e.g., India) and by varied age ranges for "secondary."	As above
Pupil-teacher ratio (by level of education)	Widely available; useful indicator if linked to distribution and range indicators and qualified teacher ratio in main subjects.	Qualified teacher ratio in main subjects (duplicated in Goal 8)
Countries with nine years of free and compulsory basic education in legal/ institutional frameworks	Easy to establish status legally; no indication of extent of implementation.	Legislation and financing to guarantee access to nine years of free education for all

Goal Cluster	BY 2030 ENSURE:	Existing Indicators (TAG)	Comment	Preferred Indicators
3.	All girls and boys achieve nationally defined minimum learning outcomes that are relevant to employment, livelihoods and wellbeing by the age of 15 years.	Percentage of children who achieve minimum proficiency standards relevant to their age group/ grade in reading and mathematics at the end of: grade 2; primary school; lower secondary school; secondary school	Assessment of early grade reading and numeracy needs to be formative and linked to interventions. Monitoring assessment at higher levels should be linked to performance on national examination systems. These may or may not be benchmarked against international standardised tests. Proficiency has to be determined in relation to national curricula expectations first; international comparison may or may not be relevant. There are significant transaction costs to parallel assessment systems that are not linked to national assessment systems.	Performance on national examinations; primary leaving, lower secondary, upper secondary, identifying thresholds of performance at different levels
			National monitoring assessments are widespread. If they are sample based they are cheaper and quicker than population based examinations.	Performance on sample based national monitoring assessments
			Sample based application of standardised tests as appropriate.	Performance on international standardised tests as appropriate.
		Grade 2	Grade 2 assessment problematic especially with pre-literate children and where testing requires a familiar adult with assessment skills; tests need to reflect different languages and orthographies.	Classroom based formative assessment and sample based monitoring assessments at grade 2 level
			School readiness could be established by child assessment in first three months of Grade 1.	School entry diagnostic assessments to establish % of entering cohort that are “ready”.
		Primary School	Primary school leaving tests are high stakes; standardised external tests may be low stakes. National curricula and learning goals determine valid knowledge within each system.	Learning Yield Coefficient - % of age group reaching minimum competency level in major learning domains - maths, science language 1, language 2 at key stages e.g. end of primary, end of lower secondary

	Lower Secondary School	As for primary school.	
	Secondary School	Monitoring problematic in differentiated education systems at upper secondary	
4. Differences in attainment and achievement in 2015 at end of primary and end of secondary between boys and girls and children from the top and bottom 20% of household income will be reduced to half their level by 2030.	Female attainment rate / male attainment rate	Depends on age-related data from HH survey and is thus periodic measurement.	Attainment of richest and poorest girls and boys at age 12, 15, and 20 years or ages at which data is available
	Difference between male and female attainment rate		
	Poorest 20% attainment rate/richest 20% attainment rate		
	Difference between attainment rate of poorest and richest 20%		
	Percentage of females achieving minimum learning outcomes/percentage of males achieving minimum learning outcomes	Criterion rather than norm reference tests needed; gender bias in test items requires consideration and elimination as a source of differences in performance.	Achievement of richest 20% and poorest 20% girls and boys at end of primary, lower secondary and upper secondary if data available
	Difference between males and females achieving minimum learning outcomes		
	Percentage of poorest 20% achieving minimum learning outcomes / percentage of richest 20% achieving minimum learning outcomes		

		Difference between poorest and richest 20% achieving minimum learning outcomes		
			Nationally determined signifiers of relevant inequalities have to be identified.	Achievement differences between significant social groups (language, ethnicity, disability, location defined nationally)
Goal Cluster	**BY 2030 ENSURE:**	**Existing Indicators (TAG)**	**Comment**	**Preferred Indicators**
5.	All young people below the age of 25 years achieve nationally defined levels of literacy and numeracy; literacy rates for adults between 25 and 65 years improve by 4% per year.	Percentage of youth and adults proficient in literacy skills	Widely available but often based on self-reporting. Literacy should be assessed at different levels of competence and comprehension since that is what is developmentally significant.	Age-specific literacy for those between 15 and 25 years based on HH based assessment.
		Percentage of youth and adults proficient in numeracy skills		Age-specific numeracy for those between 15 and 25 years based on HH based assessment.
		Youth/adult literacy rate	The percentage of youth 15-25 years old who are judged literate will not change over a short period since the cohort covers 10 years and will be very large; adults 25 to 65 years old are an even larger group. If the goal is to shift average levels of literacy and numeracy then a focus on younger groups is likely to be more efficient.	Literacy rates for adults aged 30, 40, and 50 years
		Participation rate in literacy programmes over the past 12 months (as % of illiterate 25- to 64-year-olds)	Difficult to measure unless enumeration restricted to registered literacy programmes of known length and quality. Rate will depend on some method of equivalencies between different types of programmes with different commitments of time, retention, and success rates	Numeracy rates for adults aged 30, 40, and 50 years

Goal Cluster	BY 2030 ENSURE:	Existing Indicators (TAG)	Comment	Preferred Indicators
6.	Equal access for all women and men to quality technical, vocational and tertiary education, including university that is free to those unable to pay the direct and indirect costs.	Participation rate in technical and vocational programmes (15 to 24-year-olds)	This is complex. Better to track TVET awards which will be on public record. 15-24 year olds is a wide spread. This would have to be collected through HH survey and could not be very specific.	Examination entry for award bearing courses for technical and vocational qualifications by level
		Percentage of youth not in education, employment or training (18 to 24-year-olds)	This could be assessed periodically but not annually through household survey data. It will be the complement of those in education, employment and training. It will be difficult to assess those in employment in lower and middle income countries which have large informal sectors. What counts as employment?	Unlikely to be a reliable indicator. Dependent on periodic HH survey
		Participation rate in education and training over the past 12 months (25 to 64-year-olds)	This would be an unusual indicator. There is unlikely to be a single source of data on the subject except household surveys undertaken periodically. Much participation of adults will be part-time. Does this count? In rich economies participation will fall when there is full employment and increase when there is unemployment. So what represents progress?	Unlikely to be a reliable indicator. Dependent on periodic HH survey
		Upper secondary attainment rate (25 to 64-year-olds)	This is only useful if deciles of age are used to determine how fast it has been changing. Comparisons across countries will be confounded by different definitions of the cycle and age range. It is only the rate in the youngest cohort that will change significantly so why not focus on the changing attainment rates of 25 to 30-year-olds?	Duplication. Adds little information
		Upper secondary education gross enrolment ratio	This is unlikely to be a reliable indicator for planning unless upper secondary is a single national system with no differentiation. It will include many over age students.	% of 18-20 year olds in full time education by level and field of study.
		Tertiary education gross enrolment ratio	As for upper secondary above: Age specific participation rate better.	% of 18-20 year olds in full time higher education by level and field of study.

Percentage of youth/adults with problem-solving skills	Problem solving skills have no standard definition. PIAAC and PISA both attempt to measure skills but are limited range and may be culture and context specific as well as modern sector biased. Higher levels of achievement in mathematics, science, and technology curricula, and language teaching are proxies for problem solving skills and are likely to be identified in educational objectives for these subjects.	Higher levels of cognitive achievement in mathematics, science and technology curricula, and language assessments
	Soft skills remain to be defined in a robust way and be associated with reliable assessment instruments. Many such skills are context specific and co-constructed and cross culturally varied.	Performance on assessment items with high cognitive demand and on problem solving tests where available
Percentage of youth/adults who are computer and information literate	No standard test available to indicate levels of computer literacy. No great virtue in measuring computer literacy since this can be acquired by those with secure literacy. Information literacy is part of being literate. Online traffic analysis can indicate take up and use of devices and profile users.	The % of young people and adults making use of the internet daily
Upper secondary attainment rate (25- to 64 year-olds)	This is only useful if deciles of age are used to determine how fast it has been changing. Comparisons across countries will be confounded by different definitions of the cycle and age range. It is only the rate in the youngest cohort that will change significantly so why not focus on the changing attainment rates of 25 to 30-year-olds?	Duplication. Adds little information

Goal Cluster	BY 2030 ENSURE:	Existing Indicators (TAG)	Comment	Preferred Indicators
7.	All learners acquire knowledge, skills, values and attitudes consistent with nationally defined curriculum outcomes for citizenship education including global citizenship and awareness of environment science.	Percentage of 15-year-old students showing proficiency in knowledge of global issues including knowledge of environmental science and geoscience	National citizenship assessments of performance logically have precedence over global citizenship measures. If environmental science issues are to be assessed these should be included in science assessments. In many low income countries at least half the children will have left school at the age of 15 years. A further 25% are likely to be in grades below the norm for their age as a result of over-age progression. For both these reasons they may not have experienced citizenship education at 15 year old level. If they are not in school they will have to be assessed in the household which will be problematic.	Examination entry (% age group) and performance for citizenship and related subjects in national curriculum Examination performance in environment science and related subjects
		Percentage of 13-year-old students endorsing values and attitudes promoting equality, trust and participation in governance	There is no agreed list of these values and attitudes cross nationally. Assessment of values and attitudes is influenced by context and experience, may be unstable over short periods of time, and is no guarantee of behaviour. This goal is unlikely to provide a robust indicator within or across countries.	Unlikely to be reliable cross national indicator; values and attitudes remain unspecified
		Percentage of adults who respond positively to the statement: "Protecting the environment should be given priority even if it causes slower economic growth and some loss of jobs"	This example illustrates several problems. There is no easy means of determining construct validity (my concept of environment or protection is not the same as yours); "given priority" fails to specify priority over what. The second part of the question implies a trade-off of environmental protection against economic growth and "job loss." This is two separate questions that are independent of the other. This is not likely to be a reliable indicator of anything.	Unlikely to be reliable cross national indicator
		Percentage of 13-year-old students participating in citizenship education	This is likely to be determined by the national curriculum, whether it includes a subject of citizenship, whether other subjects include aspects of citizenship, and how much time is allocated to it. It is trivial to measure something that is administratively determined.	Time allocation to citizenship or related subjects in the national curriculum Time allocation to environment science or related subjects in the national curriculum

Goal Cluster	BY 2030 ENSURE:	Existing Indicators (TAG)	Comment	Preferred Indicators
8.	All governments ensure that all learners are taught by qualified, professionally-trained, motivated and well-supported teachers.	Percentage of teachers qualified according to national standards (by level)	National definitions of qualified have to be used. These may be mapped onto international comparability frameworks.	% of qualified teachers. % of schools without qualified teachers in core subjects (maths, science, language 1 and language 2)
		Percentage of teachers trained according to national standards (by level)	National definitions of trained have to be used. These may be mapped onto international comparability frameworks.	% of trained teachers. % of schools without trained teachers in core subjects (maths, science, language 1 and language2)
		Pupil teacher ratio	Preferable to have an indicator of dispersion as well.	Pupil teacher ratio at different levels (average, range, ratio of top 10% of schools to bottom 10%)
		Pupil-trained teacher ratio	This can be computed as an aggregate or better for core subject areas such as maths, science, Language 1 Language 2.	Pupil trained/qualified teacher ratio in core subjects
		Average teacher salary relative to other professionals	If comparisons across countries are made, the professions have to be identified. Since salaries depend on other financial parameters this indicator may be better considered along with indicators associated with education budgets	Teachers salary at different levels as % of GDP per capita; teachers' salaries as % of median HH expenditure (see Goal below 9)
		Status of school climate and other learning environment factors associated with teacher motivation	Aggregate measures of school climate will conceal large intra system differences? How will they be aggregated?	Teacher turnover and attrition rates; Teacher attendance; Teacher sickness; Entry grades of ITE entrants
		Incidence of in-service training	Type (full time/part time/ day release, etc.), and purpose would need to be specified if comparison of the incidence over time was attempted. Continuous Professional Development (CPD) has replaced single short in-service training in many systems.	Indicators system specific

9. All countries collect at least 25% of GDP in domestic revenue to finance government, and allocate at least 4% of GDP and 15% of government expenditure to education to ensure universal access to free basic education and support for pro-poor financing of pubic post-basic education	Public expenditure on education as percentage of GDP	This only has meaning when linked to government budget as % of GDP and % allocations to different educational levels.	Public expenditure on education as percentage of GDP by level
	Public expenditure on education as percentage of total public expenditure	As above.	Public expenditure on education as percentage of total public expenditure by level
			Government total expenditure as % of GDP
			Expenditure per child per year by level as % of GDP (= expenditure / number enrolled)
			Teachers salary at different levels as % of GDP per capita; teachers' salaries as % of median HH expenditure; teachers' salaries as % of recurrent budget
	Share of public expenditure on education received by poorest quintile	This should be compared with the share of the richest quintile.	Share of public expenditure on education received by poorest and by richest quintile
	Total aid to education	This would have to be estimated if there is substantial general budget support. How is debt release treated? Are scholarships aid?	Aid to education by country (volume and % of budget)
	Total aid to basic education	Estimates are likely to be necessary unless there is separate accounting. Does this include teacher education and other services to basic education?	Aid to basic education (volume and % of budget)

		Percentage of total aid to education in low-income countries	Does this mean % of aid to education as a % of all aid to government? If so it can only be judged as a performance indicator against intentions at country level and needs which will vary over time. Note that a majority of the poorest households with children may now not be in the poorest countries.	
		Percentage of total aid to basic education in low-income countries	As above. And this indicator would be expected to fall over time as costs were more evenly distributed across developing education systems.	
Goal Cluster	**BY 2030 ENSURE:**	**Existing Indicators (TAG)**	**Comment**	**Preferred Indicators**
10.	Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all children and adults.	Average size of single grade classes in primary schools	Terminology varies across countries. This is the size of a normal whole class teaching group.	Teacher / Teaching group size ratio (average teaching class size)
				Pupil per classroom ratio
		Access to basic services (electricity, potable water and toilets)	Administrative data widely available on public school systems	Connection to utilities, ratio of toilets, taps, desks and chairs, blackboards to boys and girls, etc.
			Key facilities for learning	Desk and chairs per student, text books per student, library, internet access, science equipment
		Percentage of students with a sense of belonging and inclusion at school	Data widely unavailable and unreliable. How would this be measured, by whom, are the attributes stable, do they depend on schools or individual teachers, and what are the independent signifiers?	Unlikely to be reliable data at national level
		Percentage of students experiencing of bullying	Issues of construct validity, self-reporting, contextual influences on response patterns, aggregation at and above school level, etc.	Unlikely to be reliable data at national level

		Percentage of schools that meet child-friendly school standards: 1) inclusive of all children; 2) academically effective and relevant; 3) healthy, safe and protective; 4) gender-responsive; and 5) involved with students, families and communities	CFC systems attempt to monitor these dimensions. None CFC may or may not have systems in place but will not assess comparable attributes. If the aggregation of the judgements were to be used as an indicator then historic data should be used to determine whether changes in the value of the indicator can be connected to any causal pathways. This would be a multi-dimensional indicator with several components measured on scales with different characteristics and changing samples of schools.	Unlikely to provide reliable data across all schools. Review inspection reports to generate judgements
11.	Classify and monitor the number of higher education scholarships awarded for study internationally.	Volume of ODA flows for scholarships	Countries that issue exit visas may be able to track students and scholarships. Receiving countries may have data on in bound student visas and scholarships awarded and other sources of finance. Any inventory is unlikely to be complete. This goal is a means to an end and may not need separate indicators. It will be difficult to define and measure since more scholarships overseas rather than at home are not necessarily better.	Volume of official and foundation scholarships. Sample survey of arriving students. Indicators are unlikely to be reliable or cross nationally comparable

Education Indicators for Post 2015

The improved goals and suggested indicators developed in Table 3 are consolidated below in Table 4. This includes some additional indicators not in the TAG documents where these seem needed, and omits some indicators in the TAG that are unlikely to be useful and/or difficult to measure robustly at realistic costs.

These improved goals have the legitimacy of the consultation process behind them and improved specification. They improve the wording with a view to developing viable indicators. This is legitimate since the existing goals cannot be "frozen in stone" from now all the way until 2030. They must continue to evolve to reflect progress and to address ambiguities and inconsistencies, as well as new dimensions that may need to be measured.

The proposed indicators are a first iteration related to the improved goals. It is easy to imagine additional indicators for specific purposes, and better ways of assessing progress as more data becomes available. The challenge is therefore use those indicators that can already be populated with data and work towards developing and refining those which have most value in informing decision making and empowering different groups of stakeholders.

Table 4. Education Indicators for Post 2015

Improved Goal		Preferred Indicators
Equal Opportunities for Quality Education and Lifelong Learning for All by 2030		
BY 2030 ENSURE: All girls and boys have access to quality early childhood development, care and pre-primary education free to households by 2030		
	Health	Under five mortality rate (%)
		Under five stunting rate (%)
	Preschool	Preschool attendance rates from household survey data
		Preschool enrolment rates in recognised preschools from administrative data
		Legislation and financial provision for one or more years of preschool
All girls and boys have access to a full cycle of nine years of quality primary and secondary education that is free and completed by the age of 15 years.		
	Primary	Gross and Net Intake Rate to first grade of primary school
		Gross Intake Rate to last grade of primary education
		On-schedule graduation rate from primary school
		Primary education attainment rate for 15 year old population
	Lower Secondary	Lower secondary attainment rate for 18 year old population
	Upper Secondary	Upper secondary attainment rate for 20 year olds
	Never Enrolled	Number and rate of Never Enrolled children of primary and lower secondary school age from HH survey data
	Out of School	Number and rate of Out of School Children and adolescents
	Flow	Grade by grade Gross (and Net) enrolment rates for all grades
	Free Education	Legislation and financing to guarantee access to nine years of free education for all
All girls and boys achieve nationally defined minimum learning outcomes that are relevant to employment, livelihoods, and wellbeing by the age of 15 years.		
	Learning Outcomes	Performance on national examinations; primary leaving, lower secondary, upper secondary, identifying thresholds of performance at different levels
		Performance on international standardised tests as appropriate.

Improved Goal	Preferred Indicators
Early Grade Assessment	Classroom based formative assessment and sample based monitoring assessments at grade 2 level
School Readiness	School entry diagnostic assessments
Learning Index	Learning Yield Coefficient - % of age group reaching minimum competency level in major learning domains (maths, science, language 1, language 2) at key stages (e.g., end of primary)
Differences in attainment and achievement in 2015 at end of primary and end of secondary between boys and girls and children from the top and bottom 20% of household income will be reduced to half their level by 2030.	
Gender equity	Attainment of richest and poorest girls and boys at age 12, 15, and 20 years, or ages at which data is available
HH Wealth Equity	Achievement of richest 20% and poorest 20% girls and boys at end of primary, lower secondary, and upper secondary if data is available
Social Equities	Achievement differences between significant social groups (language, ethnicity, disability, location) defined nationally
All young people below the age of 25 years achieve nationally defined levels of literacy and numeracy; literacy rates for adults between 25 and 65 years improve by 4% per year.	
Youth Literacy	Age-specific literacy for those between 15 and 25 years based on HH-based assessment
Youth Literacy	Age-specific numeracy for those between 15 and 25 years based on HH-based assessment
Adult Literacy	Literacy rates for adults aged 30, 40, and 50 years
Adult Numeracy	Numeracy rates for adults aged 30, 40, and 50 years
Equal access for all women and men to quality technical, vocational, and tertiary education, including university that is free to those unable to pay the direct and indirect costs.	
Participation in TVET	Examination entry for award bearing courses for technical and vocational qualifications by level
	% of 18-20 year olds in full-time education by level and field of study
	% of 18-20 year olds in full-time higher education by level and field of study
Problem Solving Skills	Higher levels of cognitive achievement in mathematics, science and technology curricula, and language on assessment items with high cognitive demand
Internet Facility	% of young people and adults with daily access to the internet

Improved Goal	Preferred Indicators
All learners acquire knowledge, skills, values, and attitudes consistent with nationally defined curriculum outcomes for citizenship education, including global citizenship and awareness of environmental science.	
Knowledge of Citizenship	Examination performance for citizenship and related subjects in national curriculum
Knowledge of Environment Science	Examination performance in environment science and related subjects
Participation in Citizenship	Time allocation to citizenship or related subjects in the national curriculum
Participation in Environment Science	Time allocation to environment science or related subjects in the national curriculum
All governments ensure that all learners are taught by qualified, professionally-trained, motivated, and well-supported teachers.	
	% of qualified teachers. % of schools without qualified teachers in core subjects (maths, science, language 1, and language 2)
	% of trained teachers. % of schools without trained teachers in core subjects (maths, science, language 1, and language2)
	Pupil:teacher ratio at different levels (average, range, ratio of top 10% of schools to bottom 10%)
	Pupil trained:qualified teacher ratio in core subjects
	Teachers' salary at different levels as % of GDP per capita; teachers' salaries as % of median HH expenditure (see Goal below 9)
	Teacher turnover and attrition rates; teacher attendance; teacher sickness; entry grades of ITE entrants
All countries collect at least 25% of GDP in domestic revenue to finance government, and allocate at least 4% of GDP and 15% of government expenditure to education to ensure universal access to free basic education and support for pro-poor financing of public post-basic education	
Budget Allocations	Public expenditure on education as percentage of GDP by level
	Public expenditure on education as percentage of total public expenditure by level
	Government total expenditure as % of GDP
	Expenditure per child per year by level as % of GDP (= expenditure / number enrolled)
Teachers' Salaries	Teachers' salary at different levels as % of GDP per capita; teachers' salaries as % of median HH expenditure; teachers' salaries as % of recurrent budget
Equity	Share of public expenditure on education received by poorest and by richest quintile

Improved Goal	Preferred Indicators
Aid	Aid to education by country (volume and % of budget)
	Aid to basic education (volume and % of budget)
Build and upgrade education facilities that are child, disability, and gender sensitive and provide safe, non-violent, inclusive, and effective learning environments for all children and adults	
Teaching Groups	Teacher:teaching goup size ratio (average teaching class size)
Classrooms	Pupil per classroom ratio
Utilities	Connection to utilities, ratio of toilets, taps, desks and chairs, blackboards to boys and girls, etc.
Learning Environment	Desk and chairs per student, text books per student, library, internet access, science equipment
Classify and monitor the number of higher education scholarships awarded for study internationally.	
Scholarships	Volume of official and foundation scholarships. Sample survey of arriving students. Indicators are unlikely to be reliable or cross nationally comparable.

6. CONCLUDING REMARKS

The purpose of this paper was to review the goals for education and development that have been produced by the Education for All Steering Committee and the Open Working Group on Sustainable Development. The paper has analysed the strengths and weaknesses of the existing goals and targets for education; clarified the relationship between goals and objectives, and targets and indicators; discussed the characteristics of indicators that can be used to measure educational progress; identified indicators that can be linked to specific goals; and consolidated these into a single matrix of goals and indicators.

This paper contains many observations and insights into the goals and indicators associated with educational development. It draws attention to the opportunities and the pitfalls involved in translating the existing list of goals into indicators that can be used to monitor progress between now and 2030.

There are no simple conclusions. The main output is a working matrix of re-specified goals that retains the sentiments behind the original formulations. These are linked to proposed indicators that provide a basis for further development. Many issues of detail have been addressed but not all can be covered in a short document; some that stand out and require further reflection and development include:

- Developing indicators for preschool is a very challenging prospect. Young children's capabilities are assessed most effectively by a familiar and knowledgeable adult. Pre-literate children cannot be given written tests. Many of their characteristics may be influenced by local context and may not be very stable over time. School readiness measures have been developed but may not be especially useful. The most efficient way to ascertain school readiness will be to develop diagnostic assessment of children entering Grade 1 to determine what capabilities they bring with them to school. If the object of assessing school readiness is to intervene in preschool programs then the assessment needs to be formative rather than summative, and linked to interventions related to individual children. The preschool sector in most countries is not organised within a single system and has many providers who operate largely independently; any efforts to assess children systematically on scale are likely very expensive. Children who are entering Grade 1 need an assessment of their capabilities, and this should indicate problems and issues that may arise from preschool for those who experience it.

- Grade specific enrolment rates that show patterns of enrolment in each grade level education system are much more informative than aggregate indicators like gross enrolment rate and net enrolment rate, which can have the same values but be associated with very different patterns of admission, progression, dropout, and completion. Entry and completion rates are helpful, especially if they can be linked to age, since low enrolment systems often have very high proportions of overage children. High enrolment rates may conceal considerable slippage in age in grade participation that is a powerful predictor of dropout.

- Early grade reading and numeracy needs to be assessed formatively so that information on performance from structured assessments can be fed back into learning and teaching. This needs to take place at the school level through teacher administered assessments. If system

level monitoring is deemed necessary in the early grades then it makes sense to undertake this through light sampling rather than systems test every child.

- Assessments of learning exist in every education system. It makes great sense to build on what exists before introducing new systems that create new demands where there is weak infrastructure and a lack of capacity. High-stakes assessment instruments are what matters to most children and their parents, and these instruments define what is important in national curricula. The pattern of performance on these tests in core subject areas creates indicators of performance that should be part of any monitoring and assessment system. It may or may not be necessary to map national assessments onto international standardised tests. This depends on who needs what information for what decision making. International tests have the virtue of comparability but the disadvantage that they are generally low stakes and thus may not reflect levels of capability very accurately.

- The ambition to promote learning for all again means it would be useful to have an index of how many children learn how much. This can be called a Learning Yield Index or simply a Learning Index. In its simplest form it would combine information from learning achievement at the end of primary and secondary school with the proportion of children who were at each different level of competency. This would give a better picture of how much learning was taking place than assessment scores that are not linked to levels of participation. Where many may have dropped out or have been pushed out before assessments are conducted, selection effects may give misleading results.

- It is important that in the next phase of investment in education for development greater stress is placed on programs that generate levels of achievement on higher cognitive capability. This is sometimes referred to as "thinking skills" and/or "problem-solving." All learning requires cognition, and logical problem-solving depends on it. These capabilities can be found in many existing subject curricula and associated learning objectives. They have been aspirational goals for learning in many subject areas for generations. Since the mid-20th century most countries have had curriculum development centres or their equivalent, at least for core subjects, and there have been a sequence of global initiatives (e.g., in mathematics, science, and technology) at school level. Other subjects have also been influenced by metropolitan country concerns for meaning and method, and more structured learning goals and objectives linked to formative assessment.

- In some areas of the school curriculum definitions of learning objectives are more difficult and assessment more ambiguous regarding what constitutes a problem and what constitutes a solution. A lot more work is needed to develop indicators that do justice to critical areas for educational development in terms of domains of knowing that are unlikely to be universal. Curriculum history has not been kind to radical rather than evolutionary approaches to new maps of learning, indicating that the possible is not the probable and that evolution is more likely than radical reform.

- It will always be extremely difficult to assess participation and learning in technical and vocational education. This is partly because the boundary between TVET and other parts of education systems is very blurred. Many of the learning outcomes associated with TVET programs are similar to those of other subjects in national curricula. Generic skills are central to much learning. Job specific skills may often be best acquired in the work place. TVET also comes in many different forms that cannot easily be aggregated into composite measures of levels of performance across many different sub-sectors, levels, locations, and time scales. It is likely to be the case that the best indicators will be system specific.

- There are similar issues in assessing the development of higher education. As systems develop and become more and more differentiated it is difficult to collapse monitoring into aggregated indicators. Thus, more participation is not necessarily a developmental advantage if there is a substantial mismatch with labour market demand. Simple participation rates of the higher education age-group have some virtue. More complex indicators are likely to be system specific.

- Some of the goals proposed for education development stress the importance of values and attitudes in shaping kinds of education that may be needed. Global citizenship is a case in point. Many countries already have citizenship curriculum. This may or may not be sufficient to include knowledge, content, values, and attitudes that may be associated with global citizenship. If these really are global, mapping existing curricula will show this. But if they are in substantial part culturally, economically, and politically specific then no global curriculum is feasible. The same will be true of values and attitudes that are associated with sustainable development. This is an old concept that itself needs to be tested in terms of what kind of consensus exists about the values and attitudes necessary for it to be realised as well as the scientific, social, and economic propositions on which it is based.

- Problems of definition apart, the difficulties of any assessment that relates to values and attitudes are well known to psychometricians. Values and attitudes can be inferred from what individuals say, or implied by what they do. What people say is highly likely to be influenced by context, recent experience, status relations, and anticipated events if there are thought to be high or low stakes consequences of answering in different ways. What people do depends in part on circumstance and who is observing them, and may be conditioned by the way in which observation takes place. If this wasn't difficult enough, it is not self-evident that values and attitudes are stable over time or characteristics of individuals. They are often co-constructions of individuals in social situations. Given these complexities, attempts to measure values and attitudes by simple questions on written questionnaires would seem unlikely to produce reliable results that could be used as a basis for intervention.

- Discussions around the new goals for education and development consistently highlight equity as an essential issue with the need to evaluate changing patterns critical to attempts to reduce education exclusion. It is widely understood that quality and equity are not the same thing and that, at least when using a formal definition, equity implies that those who suffer disadvantage should be compensated with greater opportunity and support. If equity is to be transformed there has to be some consensus about what needs to be "equitized." Some common dimensions of exclusion include household income, gender, location, civil status, and disability. There may be others that are significant in different education systems but not all. Indicators of equity can be statistically complex. The simplest ones may be best. These draw attention to differences between the top 10 percent or 20 percent and the bottom 10 percent or 20 percent on a performance indicator of interest. It will be very important to raise awareness of differences between horizontal and vertical equities and the probability that differences within groups are often greater than differences between groups.

- The new goal statements retain commitments to free education. Costs of attending school are a major excluder and source of inequality. In some countries various kinds of privatisation have resulted in increased direct and indirect costs to households. There is evidence that households at or below the poverty line are having to pay direct and indirect costs and that they contract high interest debt to finance fees and other charges. This may deepen poverty traps. This makes those households poorer. Indicators of household expenditure in each quintile of household income can be analysed to highlight how much educational costs

burden poor households and are a major cause of educational inequality.

- Motivating capable teachers is at the heart of educational development. That is why it's important to retain a development goal that relates to investment in teachers. This has many different dimensions that vary between countries. It will be important to include qualified teacher ratios for core subjects as well as aggregate pupil:teacher ratios and data on teaching group sizes, which determine the quality of learning experiences. It will also be essential to have indicators of teacher distribution since one of the major sources of inequality is the uneven distribution of teachers between schools, which means that teaching group sizes may vary across a very wide range.

- Physical infrastructure remains widely inadequate. Arguably, the existing EFA goals should have included a specific commitment to provide appropriate learning space for every child. Since this has so many ramifications for health, waterborne disease, physical wellbeing, safety, access to learning materials, teacher morale, etc., the new goal statements must retain indicators that can highlight gaps in provision that persist.

- Indicators of educational financing are often complex, especially in heavily aided countries and fragile states where accounting conventions may be arbitrary, transparency low, and public record keeping of poor quality. Judgements about whether or not states are investing adequately based on a proportion of the government budget and the percentage of GDP allocated depend on knowing the size of the government budget—which itself depends on the extent to which domestic revenue is being raised. This is not widely understood. Nor is understood that on issues like teacher salaries it is not possible to pick figures out of the air to determine an appropriate level. What is affordable will depend on the numbers of school-age children, the cost of school places per child relative to GDP per capita, and the level of participation at any given level. This provides an indication of the maximum amount in terms of GDP per capita that can be allocated to teachers' salaries before a government will run out of money.

- All education systems should be developed to be financially sustainable from domestic revenue. This may take much more time in some cases than others, but it should be an end in view. External assistance that does not have this end in view may be less assistance and more an invitation to indefinite dependence. The indicators that are used to assess the financing of education must therefore link to those that relate more generally to governance and fiscal policy. Post-2015 goals need to recognise the importance of this in relation to educational financing.

Goals ultimately do not determine educational progress but signpost aspirations. Educational objectives at system level and for learning are essential for the translation of aspiration into educational access and curricular experience. Targets help manage progress against timelines and resource constraints. Indicators refine aspirations and monitor progress in ways that should improve policy and practice. Effective frameworks for learning and development depend on constructive interplay between these elements of the planning process and the purposeful and flexible adaptation of frameworks of goals, objectives, targets, and indicators to system specificities. The lessons from the last two decades of education and development should be applied to the new post-2015 goals and a new generation of indicators that can be used both to evaluate progress and to refine the shared meanings that generate sustained political will.

REFERENCES

Consortium for Research on Educational Access, Transitions and Equity. (2011). *Making rights realities: Researching educational access, transitions and equity.* Retrieved from www.create-rpc.org

EFA Global Monitoring Report. (2015). *Education for All 2000-2105: Achievements and challenges.* Paris: UNESCO.

Lewin, K. M., & Sabates, R. (2012, March 23). Who gets what? Has improved access to basic education been pro-poor in sub-Saharan Africa? *International Journal of Educational Development,* 32(4), 517-528.

Lewin, K. M. (2005, July). Taking targets to task: Planning post primary education. *International Journal of Educational Development,* 25(4), 408-422.

Technical Advisory Group of the Education For All Steering Committee. (2014). *Towards indicators for a post-2015 education framework.* Montreal, Canada: UNESCO Institute for Statistics.

United Nations Educational, Scientific and Cultural Organization. (2000). *Dakar framework for action: Education for All; meeting our collective commitments.* Paris: UNESCO.

United Nations Educational, Scientific and Cultural Organization. (2009). *The Education for All index in overcoming inequality: Why governance matters: The EFA global monitoring report.* Oxford: UNESCO/Oxford University Press.

United Nations Educational, Scientific and Cultural Organization. (2014). *Global Education for All meeting (GEM) final statement, the Muscat Agreement.* Muscat, Oman: UNESCO.

United Nations General Assembly. (2000). *United Nations millennium declaration.* Retrieved from http://www.un.org/millennium/declaration/ares552e.pdf

United Nations General Assembly. (2014, August 12). *Full report of the Open Working Group of the General Assembly on Sustainable Development Goals* (Document A/68/970). Retrieved from http://www.un.org/ga/search/view_doc.asp?symbol=A/68/970

United Nations Statistical Commission. (2014). *Technical report by the Bureau of the United Nations Statistical Commission (UNSC) on the process of the development of an indicator framework for the goals and targets of the post-2015 development agenda* [Working draft]. Retrieved from https://sustainabledevelopment.un.org/content/documents/6754Technical%20report%20of%20the%20UNSC%20Bureau%20(final).pdf