

Teachers and Development: Supply, Quality, Distribution and Financing

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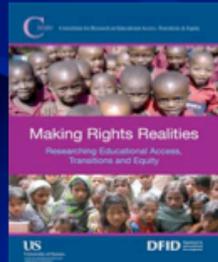




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Introduction

This paper explores key issues in teacher education internationally, which are related to development in Indonesia¹. The paper explores five sets of concerns that will shape policy. First, the paper explores opportunities and challenges in developing methods for balancing supply and demand. Second, the paper explores mechanisms to monitor and enhance the quality of teachers and to translate such initiatives into activities that have an impact on learning. Third, the paper explores insights into the distributional issues that determine where teachers teach, how much access is provided to different populations and how resources are distributed in relation to criteria that relate to equity. Fourth, the paper discusses the financial issues that determine how many teachers can be provided in ways that are efficient and financially sustainable. The final section synthesises some ways forward and draws attention to the need for re-examining the assumptions that underpin programs for initial training and continuing professional development and which will shape policy implementation in the future.

This paper is accompanied by a set of presentation slides that have been designed around this brief narrative.

Context

The most recent efforts to address global agendas for educational development have resulted in a set of goals to help shape investment over the next decade and a half until 2030. These goals seek to universalise access to basic education and increase participation at higher levels. The objective will be to ensure all children and young people complete 12 years of formal education. The ambition is captured in the latest draft of the U.N. sustainable development goals, two of which are reprinted below.

- 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 governments ensure that all learners are taught by qualified, professionally-trained, motivated and well-supported teachers.

¹ This paper was written for the Analytical and Capacity Development Partnership (ACDP) and supported by the Ministry of Education, Jakarta, the Asian Development Bank and other development partners. August 3rd/4th 2015.

This is the first inclusion of a new goal that specifies that all students have to have a qualified teacher who is professionally trained and motivated and working in an environment where their teaching is well supported. The inclusion of such goal is an important step forward in recognising the centrality of teachers to education development policy and to improved learning outcomes. The rest of this paper identifies some of the key issues that will need to be addressed if this goal for teachers is to be realised.

Key questions that will inform the debate on teachers and development fall into four areas. In summary, they are:

Supply and demand

How many teachers are needed? How can teachers be attracted and retained in teaching?
How will demographic transition and migration affect demand?

Teacher Quality

How are teachers selected, trained and motivated? How can the competencies of teachers be improved through teacher education?

Teacher Distribution

How unevenly are teachers distributed? How does this affect class size and workloads?
How can teachers be located more efficiently?

Financing Teachers

How much needs to be spent on education to universalise access with qualified teachers?
What are the constraints on financing?

Setting the Scene

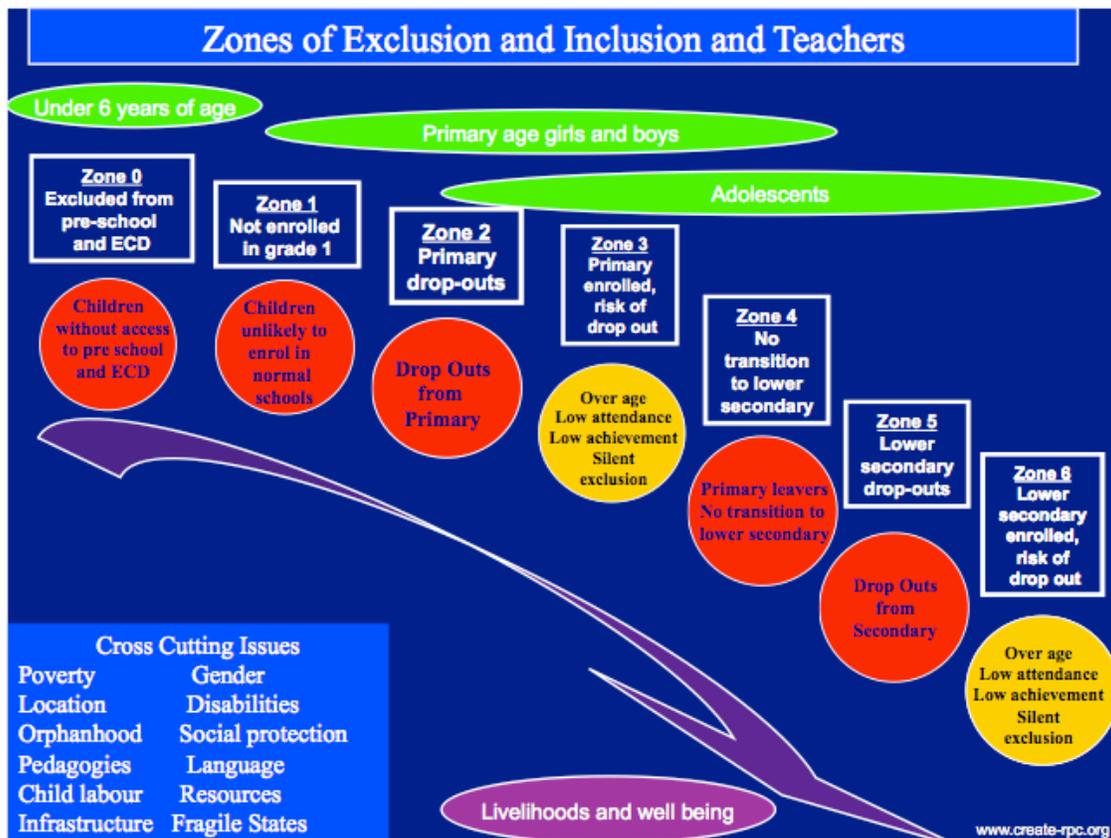
Most countries have ambitions to develop education systems that provide universal access to educational opportunity in ways that are effective, efficient, equitable and that result in levels of learning comparable with those in high-income countries. Some characteristics of education systems which are widely regarded as desirable and which are reflected in various statements of national policy include aspirations to ensure:

- All day attendance on all school days;
- Entry, progression and completion at appropriate ages;
- Meaningful learning and adequate achievement;

- Normal health and nutrition of learners;
- Appropriate learning environment including relevant pedagogy and curriculum and adequate facilities; and
- Equitable provision with less variation in the quantity and quality of inputs.

All these aspirations depend on teachers to translate expectations into realities. A model of the educational process helps lend understanding to the different roles teachers may play. Education systems can be explored with focus placed on different elements, which generate zones of inclusion and exclusion in access and learning. The CREATE programme of research (www.create-rpc.org) has done this and one of its models is presented below. This model identifies different arenas in which the four key sets of questions listed above can be asked to develop policy that is fit for the required purpose.

Figure 1: Zones of Exclusion and Inclusion



In this model:

Zone Zero identifies children who are excluded from preschool and early childhood development programmes. More often than not, education systems at this level are

privatised and exclude children by price. Teachers at this level are often untrained and there may not be any national training qualification framework or national curriculum guidelines for what should happen in preschool institutions.

Zone One identifies children who have never attended school and who will, therefore, be unlikely to have access to a qualified teacher. For some communities, e.g., nomads and displaced people, it may be attractive to develop systems to deploy qualified teachers to work with children who would otherwise be unable to attend an orthodox school. An important issue to consider is whether qualified teachers have any role in ensuring that children who currently have never attended school have the opportunity to do so. Where does the responsibility lie for children who have never attended, and what role should teachers play in reaching out to the un-enrolled?

Zone Two children are those who dropped out before completing the first cycle of education, which may range from being 5 to 8 or 9 years long. There may be many causes for the dropout of these children. Some of these causes relate to teachers and their effectiveness and their behavior. Some causes relate to the extent to which teachers' responsibilities extend to discouraging children at risk of dropout from crossing the threshold from being enrolled to being out of school. Teachers may also have responsibilities for managing the transition back into school of drop-outs who return to school.

Zone Three children are in school but at risk of dropping out. In this case, the responsibilities of qualified teachers are clear. Children whose learning is managed successfully are less likely to drop out than those who fall behind the pace set by the curriculum and who may then fail achievement tests and may repeat grades. If there is a possibility of drop out, especially if this possibility results from low learning levels or other aspects of children's school experience, the responsibility for acting in advance of premature school leaving must lie with the school and by implication its teachers.

Zone Four children fail to cross the threshold from primary to secondary school. It is secondary schools that increasingly determine how social roles are allocated and how employment is distributed amongst young people as a result of the increasing use of educational qualifications in the labour market. Access to secondary schooling can be very inequitable and favour those from richer rather poorer households. Teachers are in a unique position to maximise the chances for social mobility and improve opportunities to enhance equity through their contribution to processes that allocate opportunities to continue education into high levels.

Zone Five mirrors Zone Two and includes those who drop out during the secondary grades. The reasons for these drop outs may be different than the reasons that younger children drop out and will include opportunity costs of forgoing income related to opportunities to work and may also include early marriage and pregnancy. If the value of schooling is not appreciated by drop outs, and if the relevance of learning is valued less than immediate experiences outside the school, then teachers have a responsibility to ensure that learning and teaching are relevant and have utility.

Zone Six mirrors Zone Three and includes those enrolled at the secondary level who are not learning and who are likely to be at risk of drop out. Teachers are in the best position to monitor and intervene before dropout occurs and to make sure that everything possible is done to discourage premature school leaving.

This typology of zones helps focus discussion about teacher development into different arenas and levels where different starting points and diagnoses of policy issues apply. For example, problems related to preschool teacher supply are unlike those related to specialist teachers at upper secondary level; the skills teachers need to manage learning may be different for those teaching in urban rather than rural areas; and patterns of deployment of teachers may be very different at different levels. Patterns of participation and completion across each zone may vary greatly for different groups, e.g., boys and girls, those with disability, children from different social groups and migrants. Thus, separate conversations are required in order to address the role of teachers in educational development at different levels. Teachers are likely to be central both to providing equitable opportunities to learn and to ensuring that the school system accepts its wider responsibilities to universalise access and promote learning for all. Schools may need to be both child friendly and child seeking, and this will depend on the actions of teachers.

The charts below use enrolments by grade to profile education systems in Bangladesh, India and Indonesia and to show how the number of boys and girls varies by level. Zones of inclusion or exclusion are identified up to the end of junior secondary school level. In Bangladesh, there are more children enrolled than there are children in the age group up to grade 4, suggesting there are many overage children. This is also true in India, and to an even greater extent in Indonesia, where it appears that up to grade 6, there are more children enrolled than there are children in the relevant age group. In Bangladesh and Indonesia, equal numbers of girls and boys are enrolled in most grades with the exception of grade 6 in Indonesia. This may have to do with the transition between primary and secondary school and boys repeating more than girls. In India, there are substantially more boys enrolled than girls, and the reason for this lies partly in the fact that in several of the northern states there is a substantial imbalance in the population, with more boys surviving to school-age.

The aforementioned patterns of zones of exclusion are very different in rich countries that have experienced demographic transition. In both Australia and Japan, there are more children in higher grades as a result of a declining child population. Demographic transition will affect most countries and is already a reality in the southern states in India and in parts of Indonesia. Demographic transition is important in planning teacher supply because it means that in the medium to long term, fewer teachers are likely to be needed. Both Australia and Japan will have zones of exclusion that resonate with those mapped for Bangladesh, India and Indonesia.

Figure 2: Zones of Exclusion Bangladesh

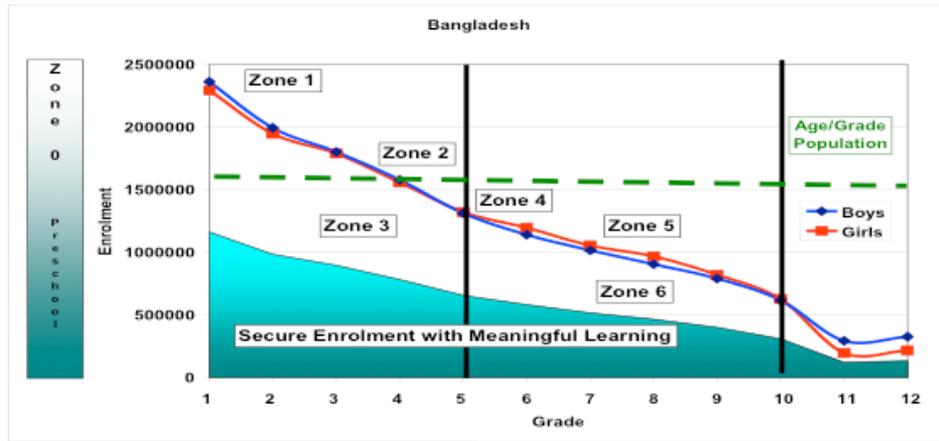


Figure 3: Zones of Exclusion India

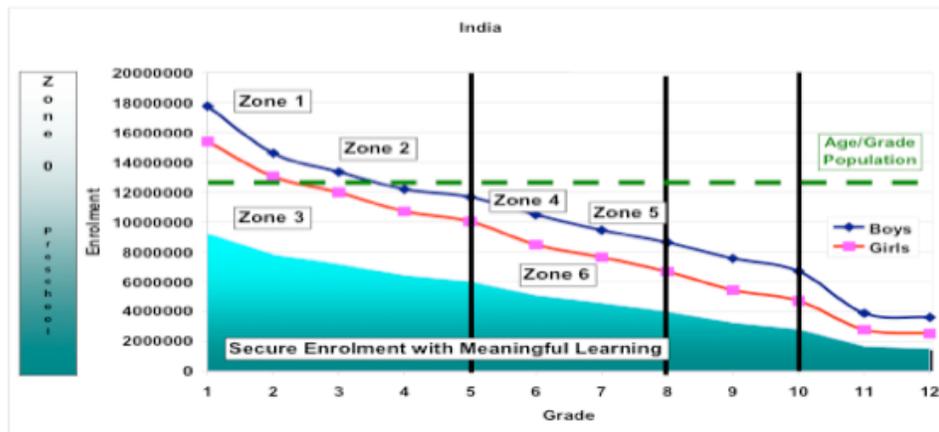


Figure 4: Zones of Exclusion Indonesia

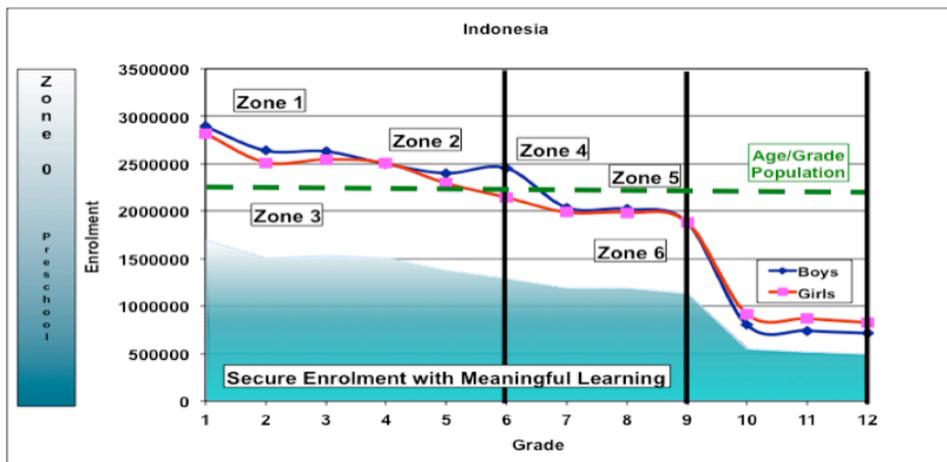
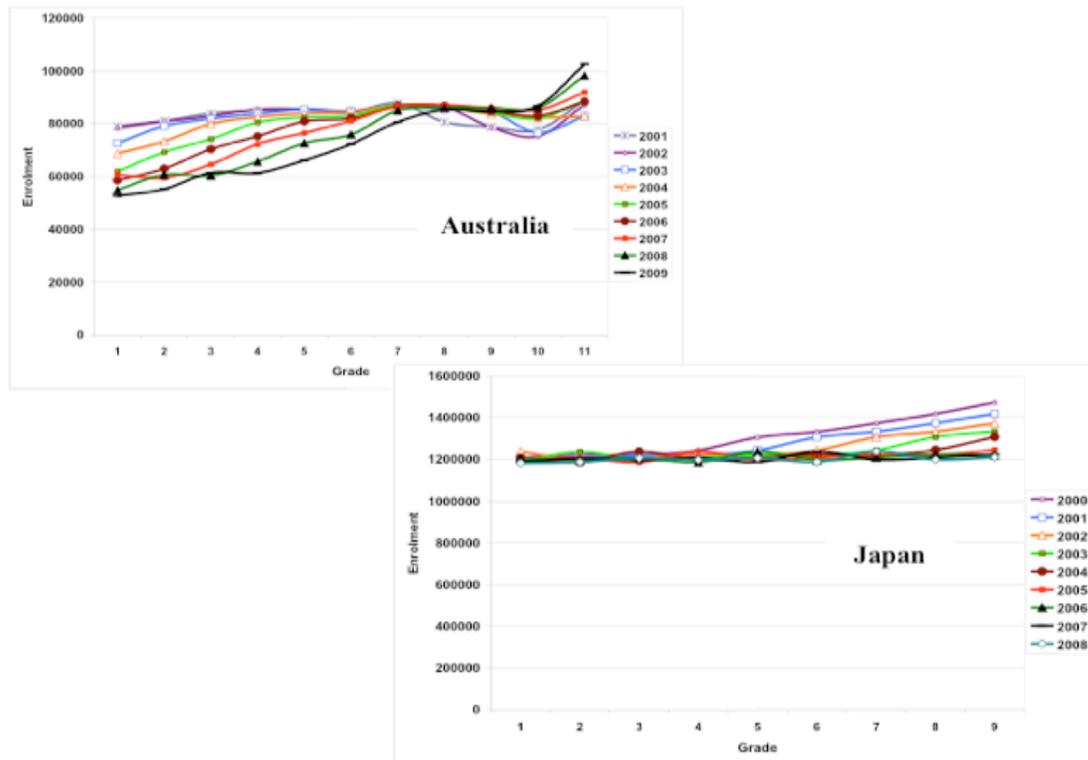


Figure 5: Enrolment Patterns in Australia and Japan



The patterns of participation by age in Indonesia are similar to those in many other middle-income countries (see below). A significant number of children do not enter school at the age of six (around 18%) and will, therefore, be overage throughout their school careers, especially if they subsequently repeat. Being overage is likely to be a disadvantage, reflected in much higher rates of dropout and lower levels of achievement. The great majority of children between the ages of six and eleven years are normally enrolled, though they may or may not be attending regularly. At about this age level, dropout accelerates and there are increasing numbers of over age children. The percentage of overage children reaches at least 23% by the age of 15, and this is likely to be an underestimate. Schools may over report enrolments and include those who have dropped out to maintain their capitation income.

A substantial proportion of those who are enrolled in school are likely to be **silently excluded**. This means they fall into a zone in which they are nominally registered and attending and should be keeping pace with the national curriculum learning goals but are failing to do so. TIMMS and PISA data for schools in Indonesia make it clear that of those who survived to 15 years old in school, levels of achievement are at least a standard deviation below the international norm. Many children are so far away from OECD learning levels that they will find it difficult to comprehend the questions being asked in standardised tests. Silent exclusion, therefore, is likely to be quite pervasive, if the criteria used are international cognitive achievement standards.

The issues this raises regarding teachers are considerable. If large proportions of children in typical classes are failing to consistently work at the level of the national curriculum, then many will struggle to complete work successfully and get promoted to the following grade. Teachers' morale will suffer, if only a few children are capable of achieving levels of performance set by international benchmarks. If children are silently excluded, the relevance of the pedagogy and content of the curriculum may need to be called into question.

There are striking differences in participation between countries related to inequalities. The most obvious inequalities are those associated with household income. Participation rates in India are heavily skewed to favour those from the richest quintile of household income. Almost all members of this quintile are enrolled up to grade 9. Those in the lowest quintile are likely to have less than a fifth of the chance of the richest of being enrolled. Indonesia's participation by wealth in grade 9 is less extreme, but, nevertheless, displays large differences in children's chances of entering and completing secondary school. In addition, the aggregate difference conceals the fact that in some provinces and districts the range will be much greater. In contrast, China is a generation or more ahead in reducing differences in participation related to household income. So, too, is Thailand. These facts can be seen when analysing data on participation in lower secondary school by household income across countries in the South and South East Asia regions.

Figure 6 Enrolment by Age

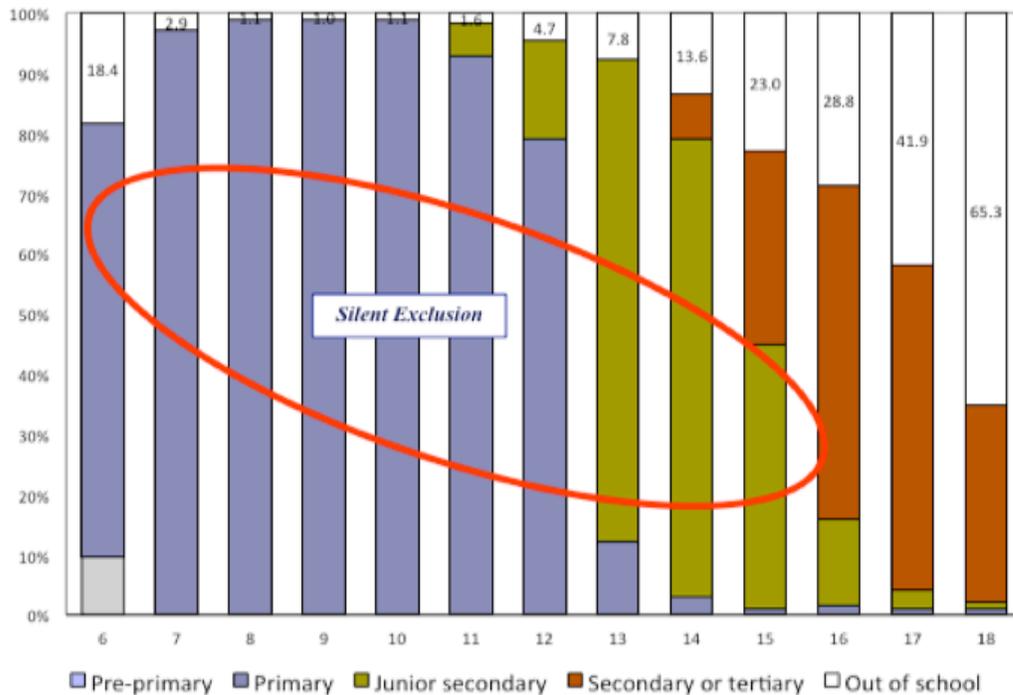


Figure 7: Participation by Household Income India, Indonesia

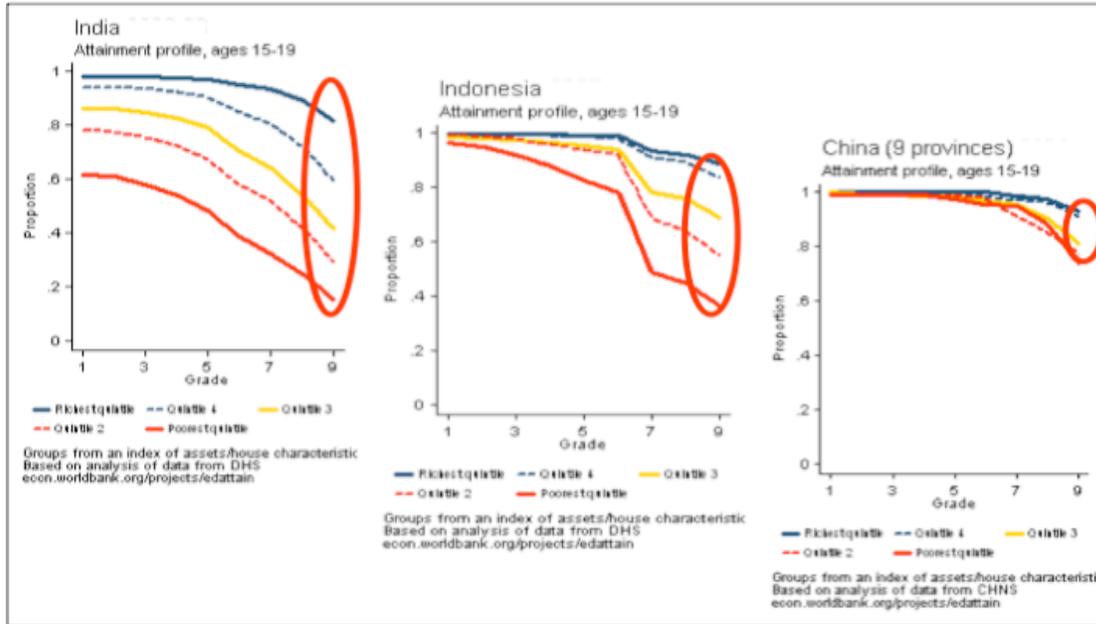
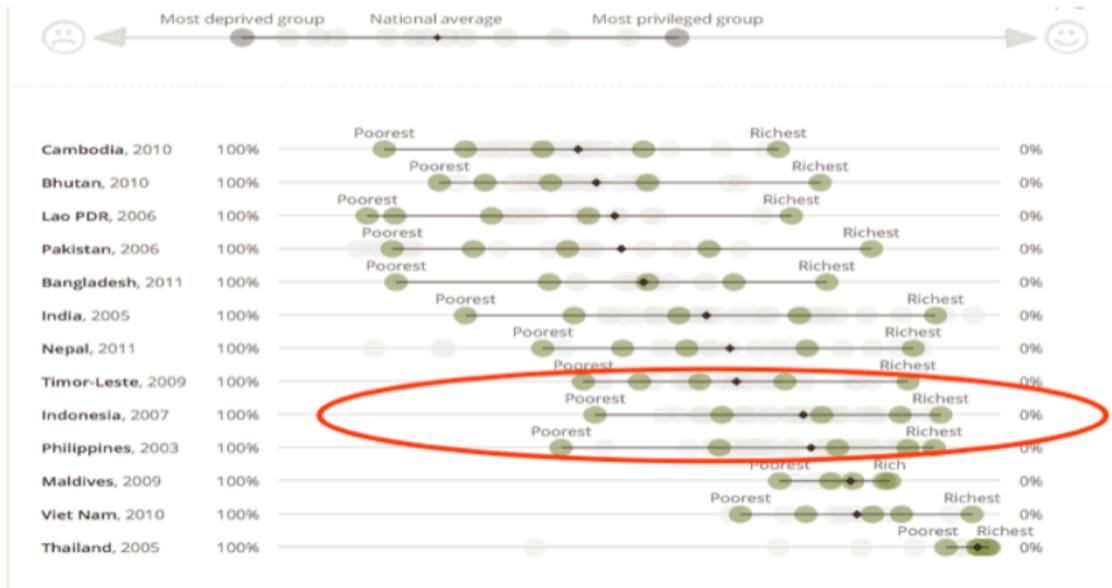


Figure 8: Participation in Lower Secondary School by income Quintile



These wide differences in participation arise from factors outside schools. However, they are likely to be reinforced depending on the extent to which teachers are aware of inequality and committed to enhancing the chances of social mobility of those from low income quintile households.

PISA mathematics data shows that patterns of achievement vary greatly between countries. The highest performing countries have a distribution of achievement that is negatively skewed to the right in relation to a normal bell curve distribution. The mean pattern for OECD countries is a bell curve. This could be interpreted as indicating that the test is too easy for the majority of students in high performing countries and it may be the result of deliberate convergence and practice effects between national curricula and the kinds of things that PISA measures. It is an indication that most students in most schools are learning and mastering a high proportion of the things that PISA tests.

Low performing countries have a very different profile. In these countries, performance is skewed positively and strongly to the left, indicating the PISA tests are too difficult for the majority of children to perform well. This distribution is quite different to the bell curve for OECD countries and the distance to travel from one to the other is very considerable. This must raise questions about whether the differences arise because of how well schools do or do not function, or because of teachers' pedagogic practices. It is also appropriate to question whether the difference partly results from a lack of convergence between national curricula and the things that PISA tests.

Figure 9: High Scoring Countries PISA Maths

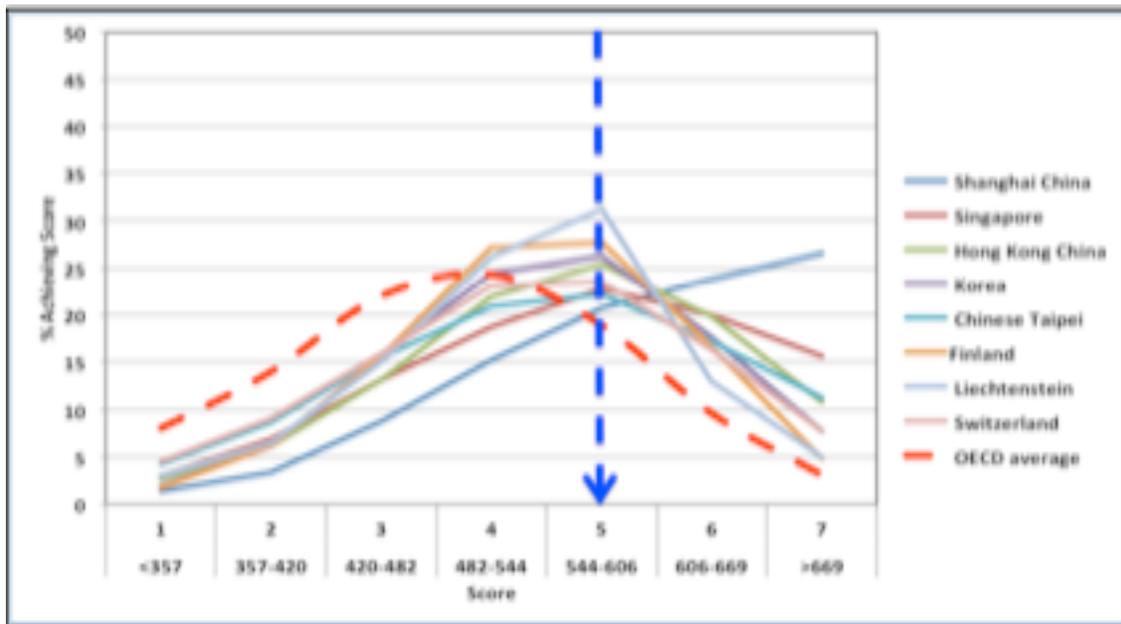


Figure 10: Low Scoring Countries PISA Maths

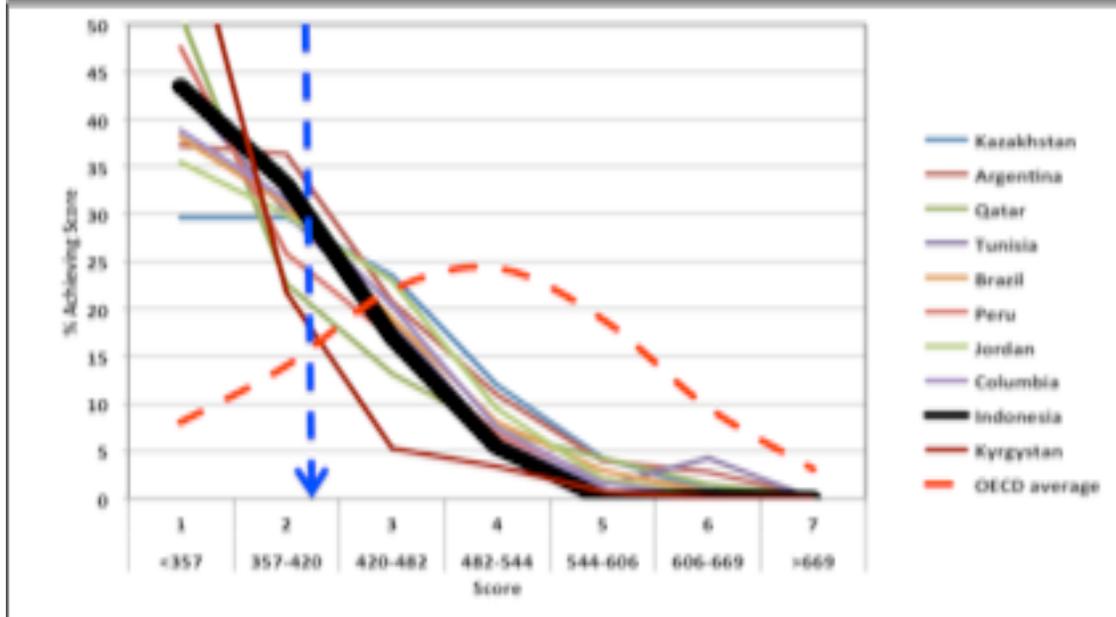
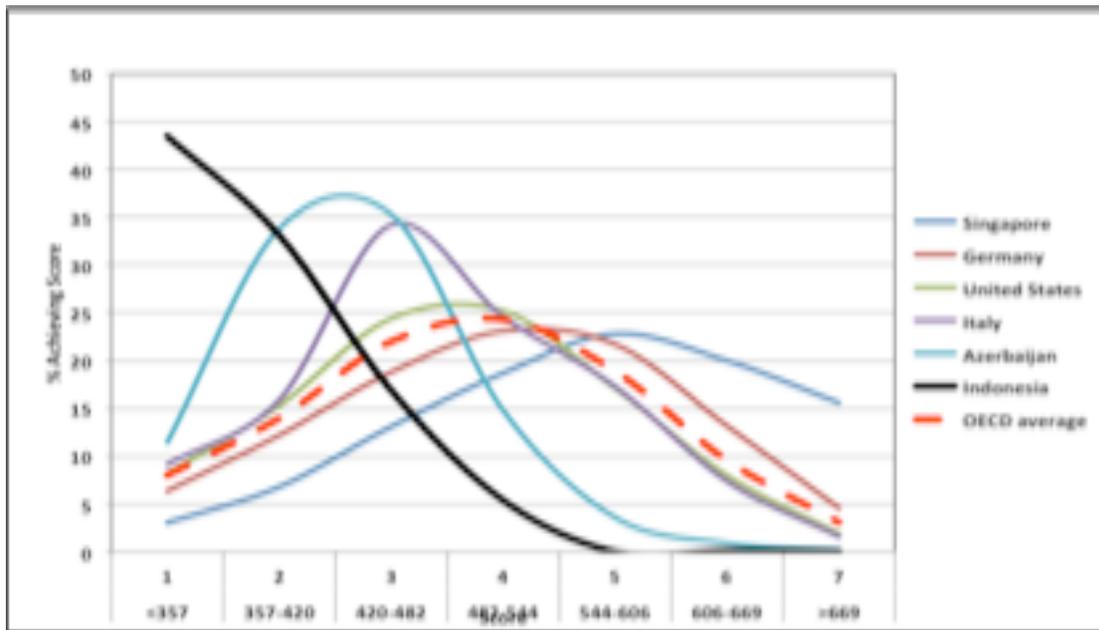


Figure 11: Five Patterns of Performance on PISA Math



The performance curves from PISA tests are a reminder to reflect on what it is teachers may be trying to achieve when they organise learning over the course of a year. There are several possibilities, which are shown in the charts below. First, a straightforward goal might be to increase the level of achievement of all students by approximately the same amount. This would result in moving the curve of achievement to the right with no change in its shape, and therefore no change in the range of scores between the best and

the worst. If teaching is conducted in a fairly homogenous way with similar effects on different children, then this might be the expected result.

Another possibility is that associated with the mastery of learning approaches to curriculum. In this approach, the idea is to deliberately try and skew the curve negatively to the right. This seeks to maximise the number of children who cross some threshold of mastery and to place more emphasis on achieving some minimum levels of competence than on the performance of the best. Outcomes-based curricula that have minimum learning achievement goals might be expected to result in negative skews of achievement.

A third possibility is to focus on accelerating the gains in the achievement of the best students with little or no attention to those who have the least capabilities. This could result in a positive skew in the achievement curve with an increase in the number of children who perform at a relatively low level at the same time as an increase in the number of children performing at the highest levels. This would increase differences between best and worst and would reflect acceptance of the consequences of increasing differences in achievement.

A fourth possibility is to achieve learning games, which increase average levels of performance, and, at the same time, reduce the standard deviation and hence the range of achievement between the best and the worst performing students. This would reflect some kind of commitment to greater equity in performance and might well require relatively greater investment in improving the achievement of the less capable as a reflection of this commitment to greater equity. This goal may be the most attractive, if equity and achievement are valued.

All these intentions and outcomes are potentially available. Which ones are realised will depend on which curriculum is adopted and which pedagogic practice is emphasised in relation to the distribution of learning achievement.

Figure 12: What are teachers trying to achieve (1)?

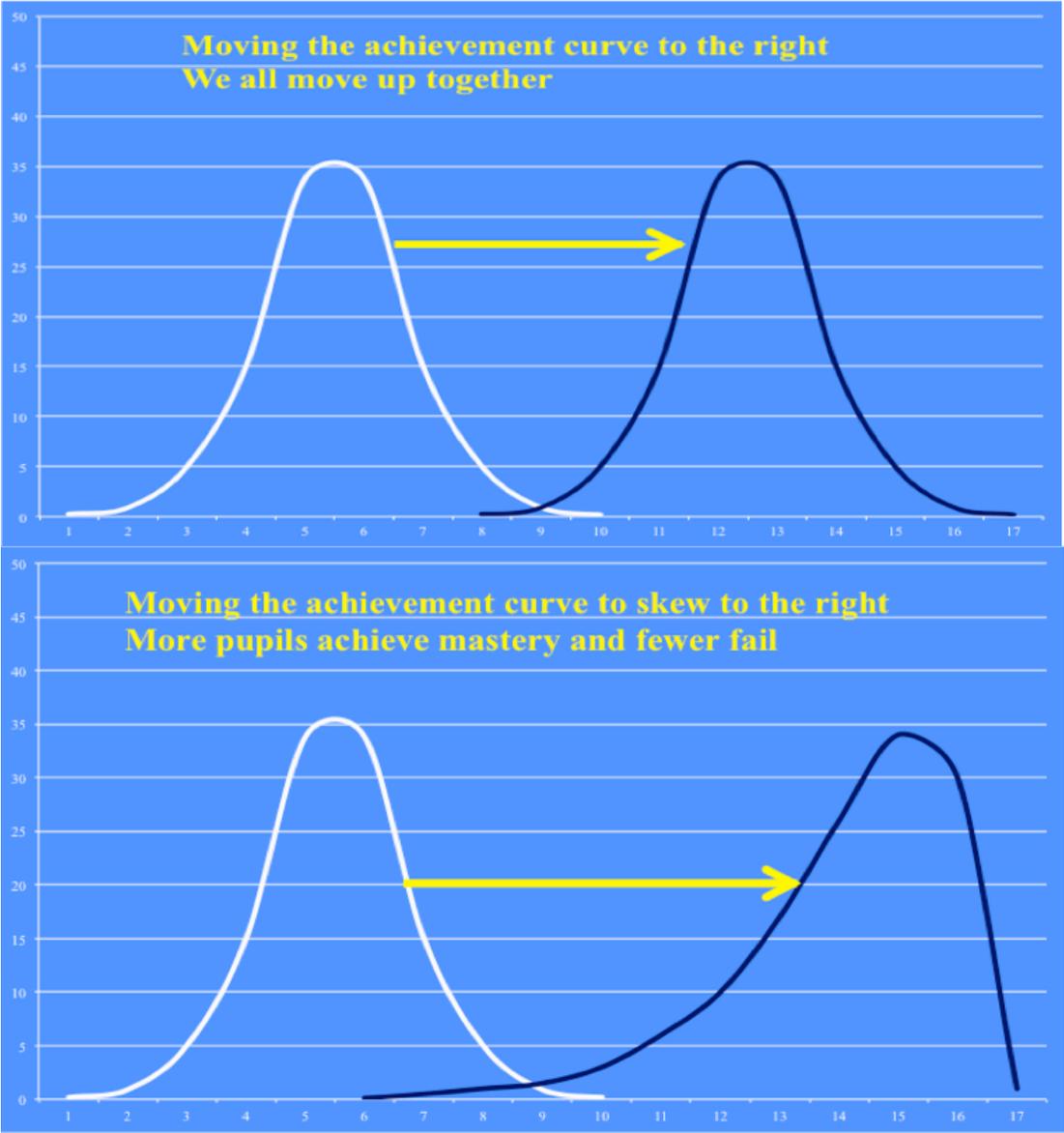
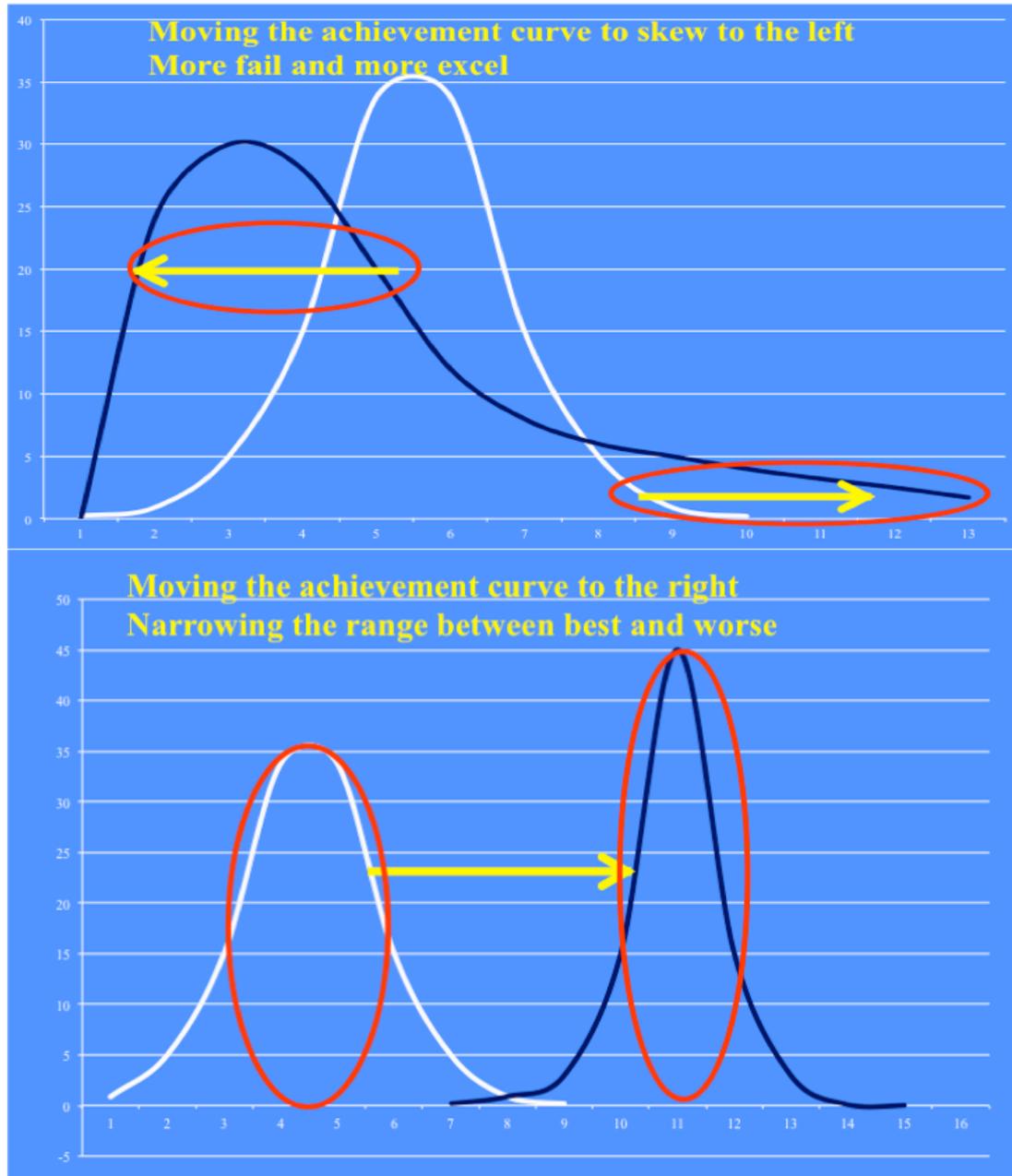


Figure 13: What are teachers trying to achieve (2)?



Supply and Demand

The main factors that influence the supply teachers include:

- The number of direct and indirect entrants to teacher education;
- The proportion who successfully complete certification;
- The attractiveness of teacher's pay and conditions of service; and
- The extent of recruitment of newly qualified teachers to schools.

The numbers of entrants to teacher education programmes may be regulated by the state through the number of places provided in publicly funded teacher education colleges. Alternatively, they may be the result of the market decisions of students and their parents operating in a private marketplace for seats on training programmes in private teacher colleges. Mixed systems also exist. Public systems will only balance supply and demand if they are managed with achieving balance as an objective. Private college systems have no necessary reason to balance their recruitment to meet likely job opportunities and may, therefore, produce an over supply of graduates relative to teaching jobs, as appears to be the case in India and Indonesia. This may be exacerbated if virtually all candidates qualify successfully for one reason or another.

Teachers' working conditions and relative positions in the labour market are likely to be influential in shaping demand for places in training programs. The exact nature of the relationship between teacher salaries and other benefits and the changes that may provide incentives to increase either numbers or the quality of applicants will be system specific.

Where large changes are made in a single step to radically change the relative position of teachers in the labour market, there are risks. Indonesia has nearly doubled the salary levels of qualified teachers with the intention of improving the quality of recruitment and the motivation of those already employed. The evidence available does not suggest that this initiative has yet been successful. This lack of success may be in part because the award has been made available to a large number of existing teachers. These teachers may be satisfied with their new levels of pay and see no benefit in further efforts to improve their performance. There is some evidence that teachers may have lowered their propensity to take second jobs, which is a benefit.

The supply of teachers into schools depends on the numbers of teachers actually recruited. Teacher education systems can be distinguished between those that have a high replacement ratio and those that have a low ratio. In Indonesia, there are more than 3 million teachers. If 30,000 are appointed each year, there is a replacement ratio of only 1% of the total; if 90,000 are appointed, the replacement ratio is 3% of the total. At 1% a year, it will take over 40 years to replace half the teachers, and at 3%, it will take at least 15 years. This means that most short term change in schools will have to be achieved through in service training and continuing professional development, not initial training.

The main factors influencing the demand for teachers are:

- Changes in enrolment rates;
- Pupil Teacher Ratios and Qualified Teacher Ratios;
- Curriculum demand;
- Changes in the school age population and migration; and
- Teacher attrition rates.

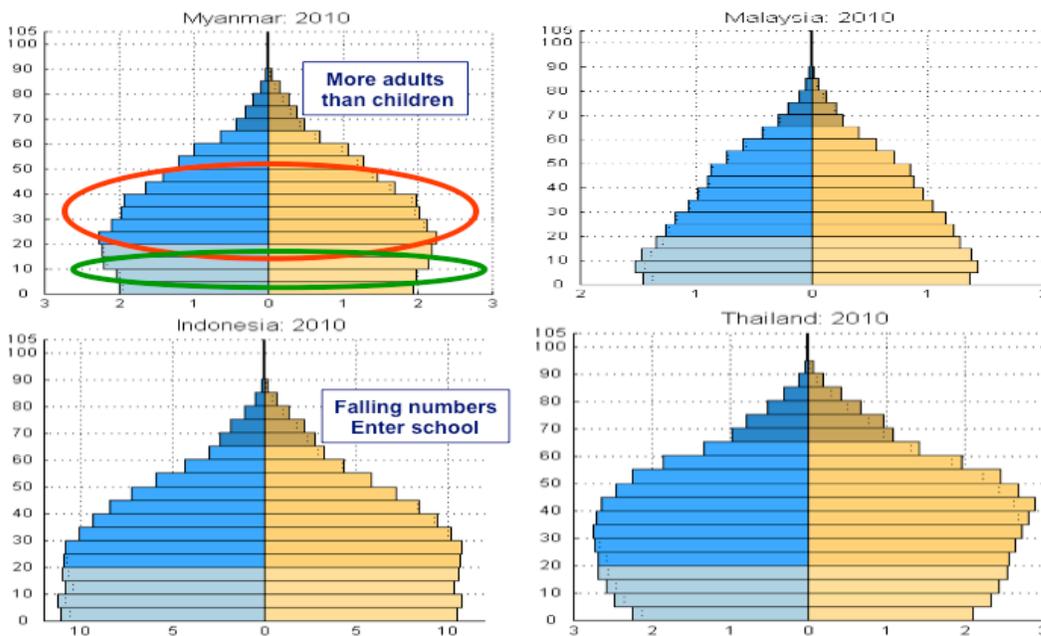
Changes in enrolment rates and the value of the pupil teacher ratio are considerations taken in generating the number of teachers needed to staff the school system. The number of new teachers needed will be related to the changes in both these parameters. If formula

used to calculate needs for teachers are based on subject teacher ratios and the curriculum specifications for numbers of periods with different specialised teachers, the result will be different than if the system is planned using overall pupil teacher ratios.

Curriculum led teacher deployment often generates very inefficient staffing ratios in small schools. In India, every school must have at least six teachers even if the enrolments are below 50. In Indonesia, every school must have at least nine teachers independent of the enrolment level. Staffing small schools this way will always be inefficient.

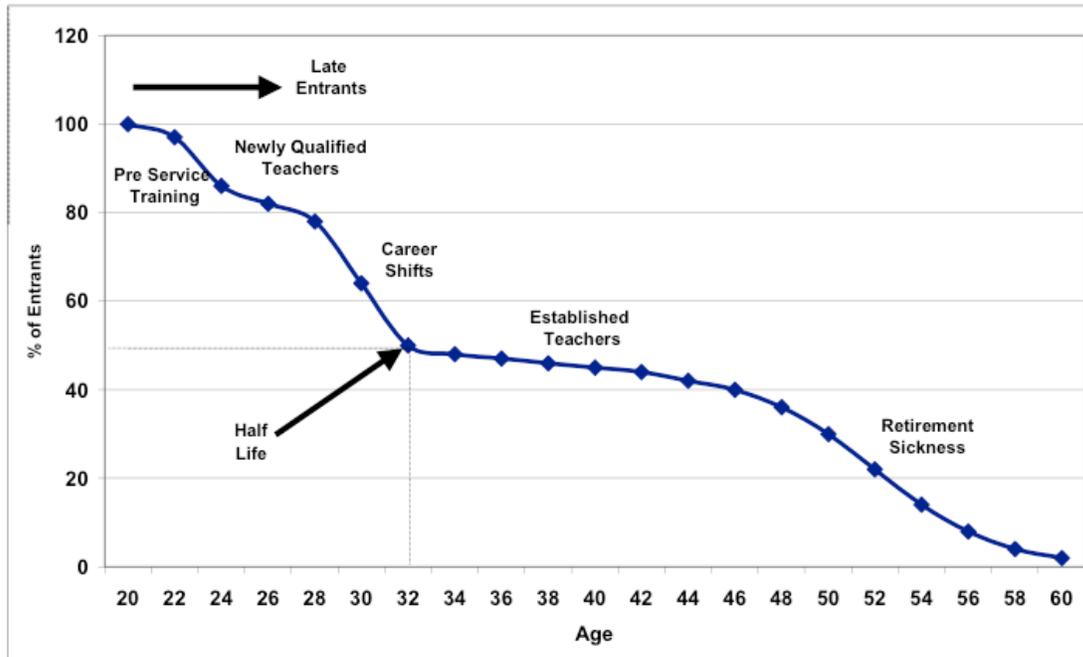
Over time, the most important drivers of the demand for teachers will be the number of children in the school age group and the rate of attrition of the stock of existing teachers including those who are newly trained. Demographic transition is a reality in many countries, and in the South-East Asian region, most countries will have fewer children in the next generation than in the last. Indonesia is one of these countries. The vast size and other variations between provinces means the incidence of demographic transition will be uneven. The graphic below illustrates how the school age group is changing in different countries.

Figure 14: Population by Age



Teachers' career trajectories vary between countries and change over time. One indication of this is the half-life of a trained teacher. "Half-life" refers to the length of time it takes for half those recruited as new entrants into teaching to leave the profession for one reason or another. In some systems, more than half those trained have left teaching after five years whereas in other systems most of those who were trained remain in teaching a career for a lifetime. The chart shows one possible profile.

Figure 15 Teacher's Career Trajectory



Quality of Teachers

Some of the factors that affect teacher quality are that:

- Teacher quality depends in part on school quality;
- Initial training may have little effect on teacher quality after five years;
- Higher cognitive knowledge and skills are central to effective pedagogies, but which knowledge and skills are best acquired where and when?
 - Subject Matter Knowledge (SCK),
 - Pedagogic content knowledge (PCK),
 - Professional Knowledge (PK);
- What modes of initial teacher education work best and are cost effective?

Teacher quality is determined by a mixture of characteristics including both those which are stable and enduring, and those which are susceptible to change through training and the influence of the organisations in which teachers work. Individual teachers bring a variety of attributes to the job; however, the way in which these attributes affect performance on the job will be a co- construction of teachers in relation to the organisations within which they work.

There are several significant points related to teacher quality. First, improving teacher quality in terms of improving teacher performance in the classroom must depend on the kind of schools and classrooms in which teachers work and the extent to which they are motivated, rewarded and recognised. The performance of teachers who are effective independent of the schools and classrooms in which they work is strongly influenced by

whether they work in effective schools or in failing schools. Part of improving teacher quality is, therefore, about creating effective schools that can draw the best from and raise the performance of less capable teachers as well as retain and inspire the most effective teachers.

Second, concern with problems of teacher quality only has a purpose if it is linked closely with support and interventions designed to overcome whatever problems are identified. The cost of diagnosis should always be a small proportion of the cost of support, intervention and professional development programs.

Third, teacher quality relates to judgments of performance in the learning environment of classrooms and students. It is learning that matters and which is a result of teacher quality. This relationship is poorly captured through self-reported pencil and paper tests and retrospective accounts of practice. It is better captured through observation and exploration of patterns of learning of students, coupled with a range of judgments on the effectiveness of teaching using different data sources.

It is important to remember that Subject Matter Knowledge (SCK), Pedagogic Content Knowledge (PCK) and Professional Knowledge (PK) can be acquired in different ways. Decisions about teacher education curriculum and modes of delivery need to determine the options, methods and location of professional development designed to address quality issues in relation to SCK, PCK and PK. Two possibilities are shown below.

Figure 16: Where are Teaching Competencies Acquired (1)?

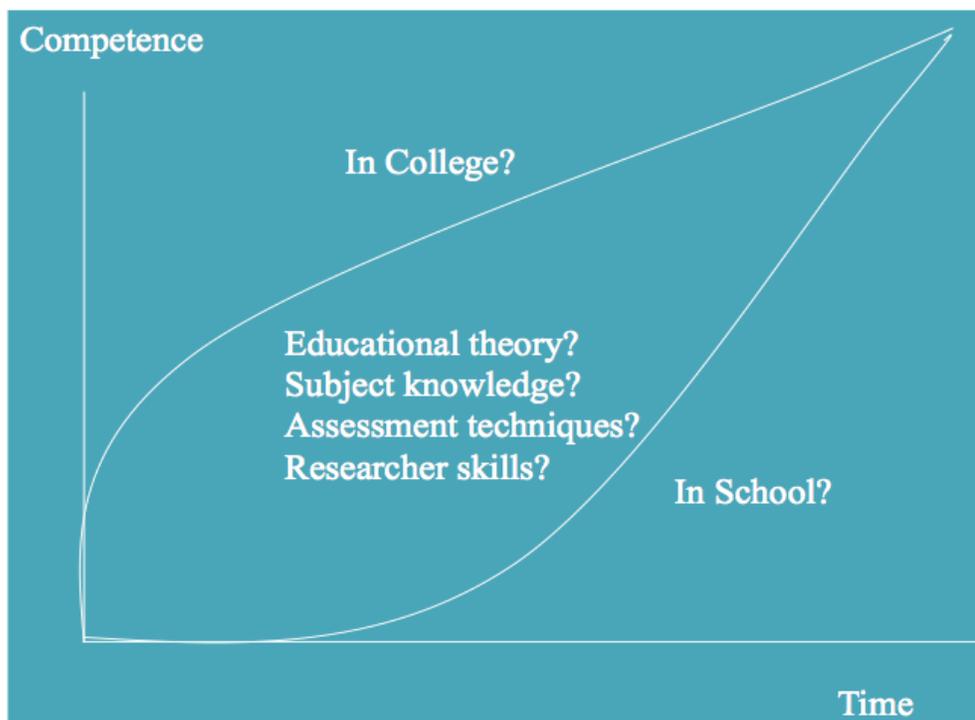
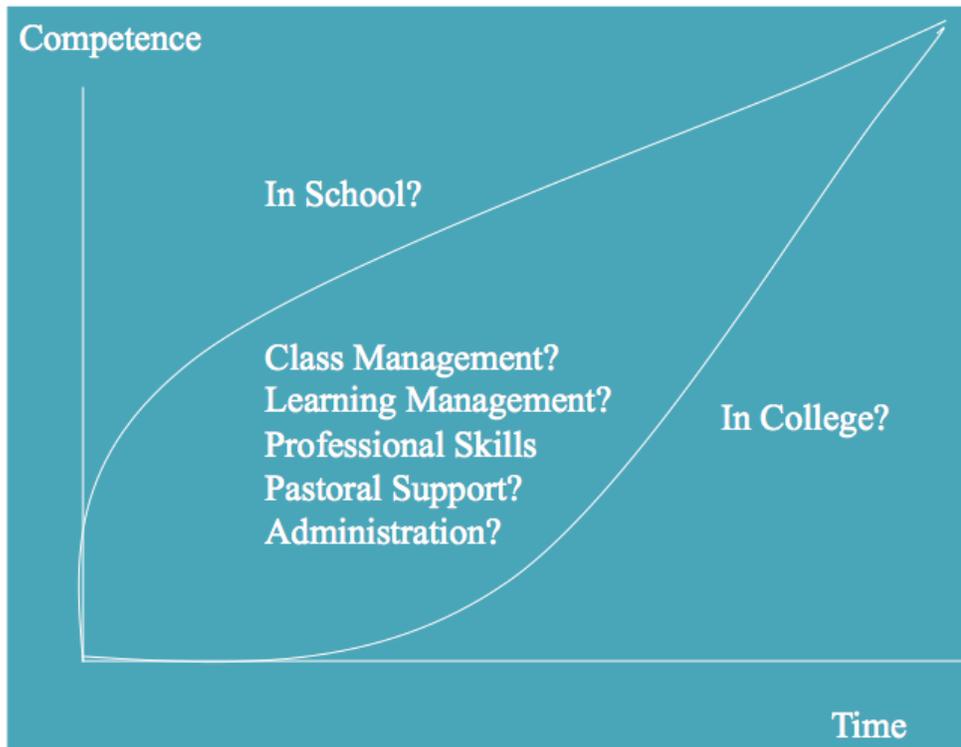


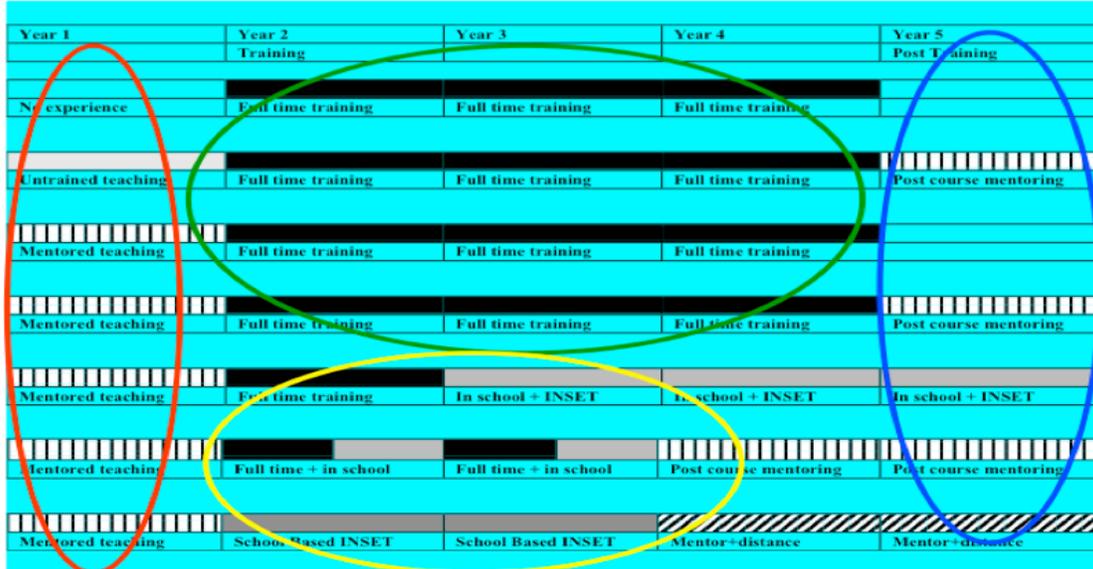
Figure 17: Where are Teaching Competencies Acquired (2)?



Teacher education can be delivered in many different ways. The chart below illustrates seven different patterns with different modalities. Each can be considered in terms of what happens before training, what happens during training and what happens after training. The range of options is wide. Initial training can be offered to those with no experience or those who have structured introduction through teaching assistantships or other kinds of attachment to schools. Formal training periods can be full-time residential and may last a period of time spanning anywhere from a year to four years. They may or may not be interspersed with periods in which trainee teachers work in schools, allowing them to become temporary staff members of schools and either provide assistance and/or acquire capabilities on the job. Training may or may not be supported by distance education methods and information and communication technology.

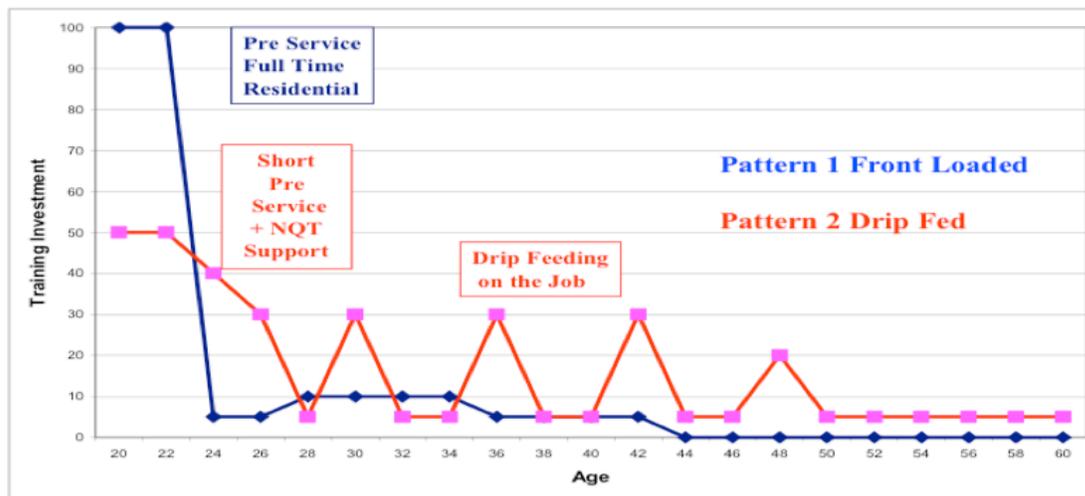
The period immediately after the completion of training and certification is probably the most neglected area of teacher education. A teacher's first teaching appointment may determine whether the competencies s/he acquired during training are reinforced and consolidated or whether they are lost and displaced by practices gained in the first appointment school. Managing a teacher's entry into the teaching profession after training may significantly determine the subsequent quality of that teacher's practice.

Figure 18: Modes of Delivery



Most teacher training is front loaded with much of the investment concentrated in the training period before teachers take up their first appointment. This is a high-risk strategy especially in systems where the half-life of trained teachers is short. Even in cases where most teachers who are appointed become career teachers and remain for 30 years or more, locating much, if not all, of the professional development input at the beginning of a career clearly risks the input becoming irrelevant and obsolescent over time. The chart below shows two different approaches to investing resources for the professional development of teachers. Less frontloading and more distribution of investment throughout a teacher's career would seem to offer the prospect of providing more support to those who continue a career in teaching and more opportunities to respond to needs as and when they arise.

Figure 19: Investment in Teacher Education and Professional Development



Distributional Issues

The distribution of teachers directly effects access, effectiveness, efficiency and equity. Distributional issues include:

- Gender imbalances in the ratio of male and female teachers;
- Under-representation of social groups;
- Uneven distribution of teachers by age and career stage;
- Wide variation in Pupil Teacher Ratios + Qualified Teacher Ratios.

Countries vary in the distribution teachers by gender. In terms of general trends, the poorest countries tend to have a greater preponderance of male teachers at all levels. As countries develop in most parts of the world, the proportion of female teachers increases. In many lower middle-income countries and most middle-income and high-income countries, the majority of primary teachers are women. This is also becoming increasingly common in junior secondary schools, but trends do vary from region to region. Similarly, the composition of the teacher force may not reflect the distribution of national minorities from different social and linguistic groups within each country. Less obvious may be the mal-distribution of teachers by age. TALIS shows that different education systems have very different proportions of older and younger teachers. Some of the highest performing countries, e.g., Singapore, have much younger teacher cadres than some lower performing countries, e.g., India. In Indonesia, it is estimated that 30% of teachers will reach retirement age in the next 10 years. Countries also differ in the distribution of teachers across career grades. Some systems have much flatter structures than others and offer less opportunity for progression and incremental salary awards.

The most striking variations with implications for equity and effectiveness relate to the variations in teacher pupil ratios and qualified teacher ratios. A typical distribution of pupil teacher ratios across a large number of schools in a lower middle-income country is represented by the chart below, which is based on real data from India. In this case, there are many small schools with low pupil teacher ratios, below 20, and these account for about two thirds of all schools. At the other end of the distribution, about 10% of schools have pupil teacher ratios over 40 to 1 and will, therefore, have very large class sizes. These may be small schools, which are understaffed, or they may be high demand large schools, which have surplus of students in relation to their staffing. Most systems target teacher ratios between 20:1 and 30:1 at primary and secondary schools, though some are content with ratios as high as 40 to 1. Indonesia now has low pupil teacher ratios by international standards, and the most recent data suggest that these ratios may have fallen to 14:1 or less.

Qualified teacher ratios may be much higher than this and depend on the number of subjects in the curriculum each week and the extent to which teachers are qualified in more than one subject. Depending on how these variables relate to each other, this can result in large numbers of schools having high-qualified teacher ratios if there are shortages of e.g. mathematics and science teachers.

Class sizes are not directly related to pupil teacher ratios since the extent to which teachers teach also makes a difference. Teaching group sizes are usually determined at the school level, and there may be no incentives to reduce class size and organise parallel teaching streams since this increases teacher workloads. Class teacher ratios in primary schools are generally around 1:1 to 1.5:1 and in secondary schools 1.5:1 to 2:1. If they are higher than this, then the cost of teaching per child will begin to become excessive and efficiency may be low. In secondary schools in Indonesia, class teacher ratios exceed 3 to 1.

Figure 20: Pupil Teacher Ratios by School

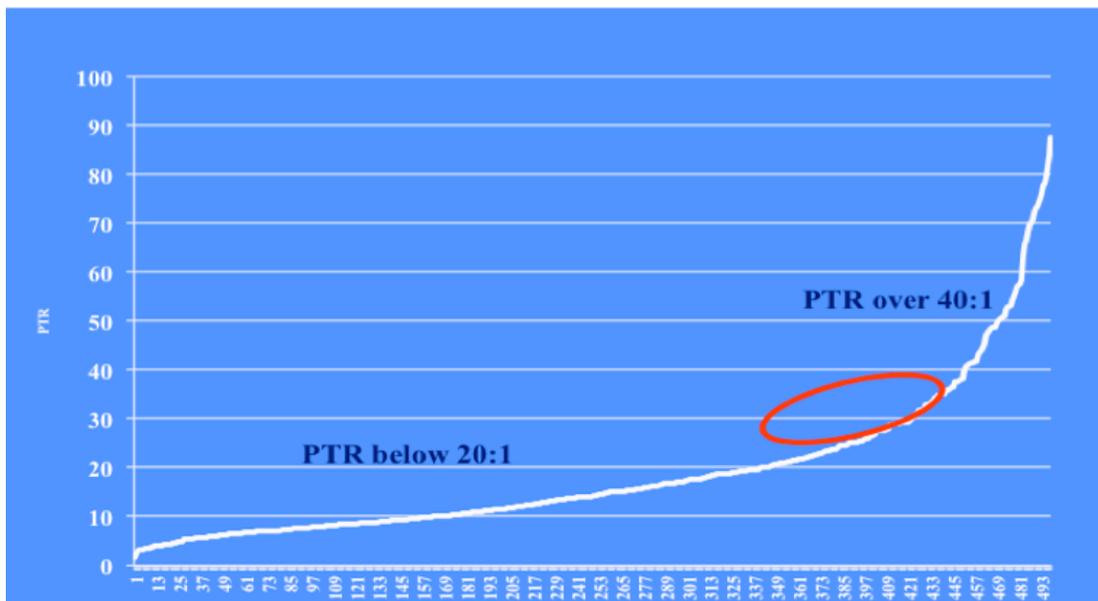


Figure 21: Pupil Teacher Ratios by Country

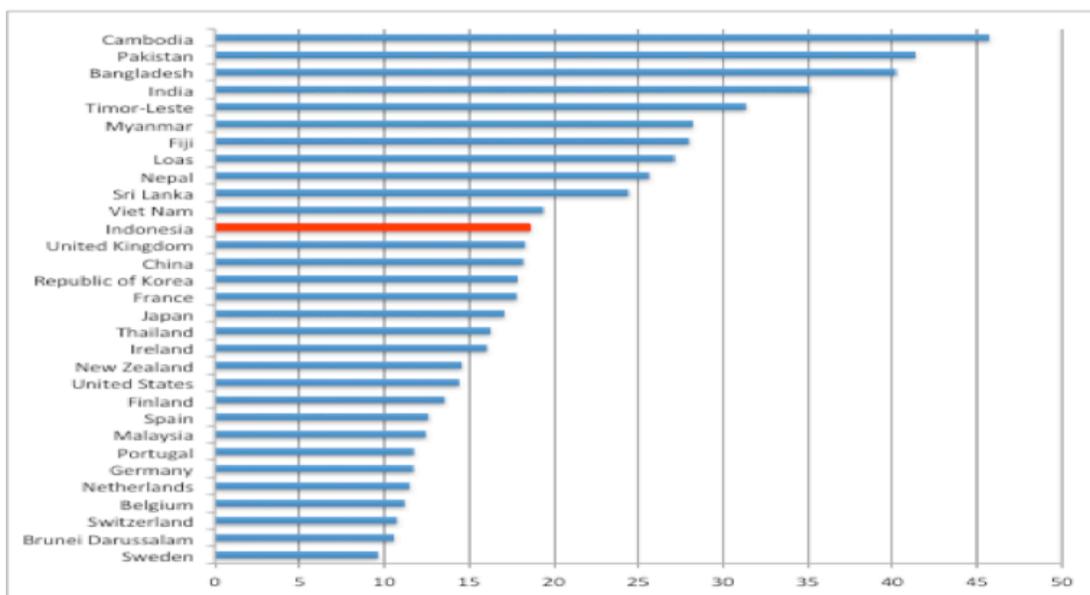
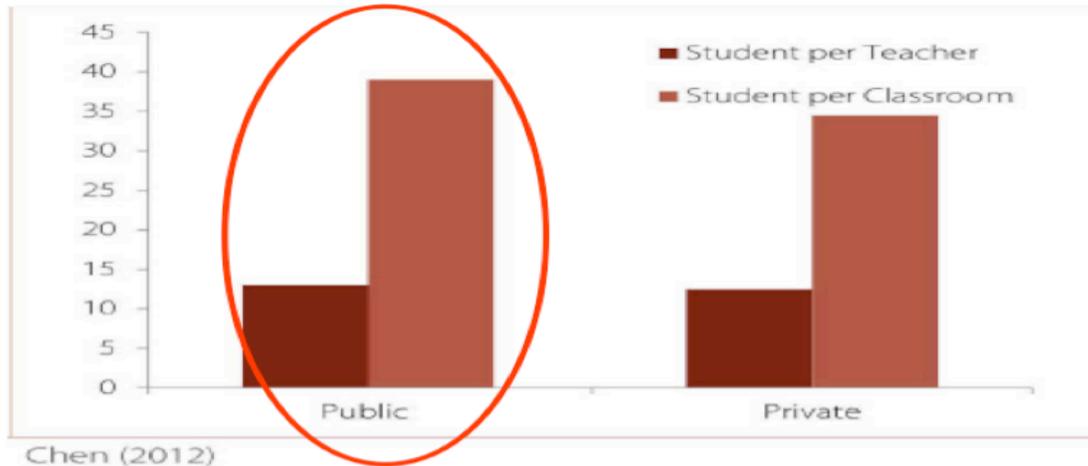


Figure 22: Class Teacher Ratios Indonesia



Finance and Resources

Teachers are the most expensive part of an education system in terms of their recurrent costs. Often, the salary bill accounts for 70% to 80% of the total budget. The basic parameters that determine the resources available to support teachers are determined by:

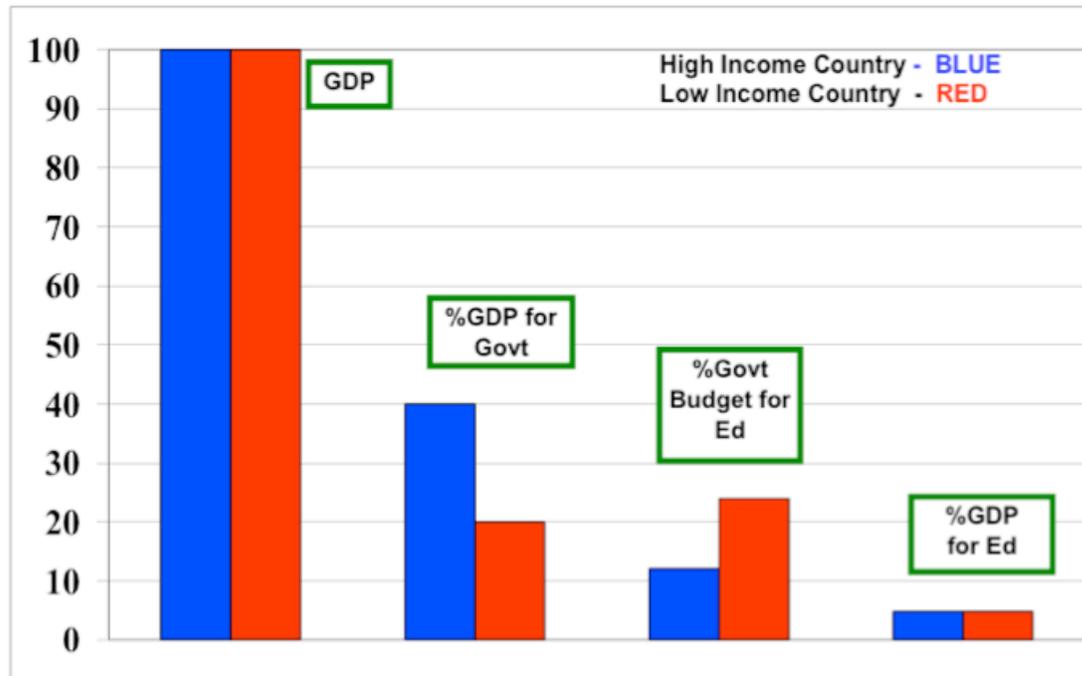
- the amount of revenue collected by government;
- the proportion of government spending allocated to education; and
- the private spending on education and contributions to salaries.

What can be delivered in a sustainable way depends on:

- the proportion of children of school age;
- the cost per child of a place which depends on pupil teacher ratios; and
- the costs of providing adequate infrastructure.

It is easier for rich countries to finance lower pupil teacher ratios and smaller class sizes because they have fewer children per working adult and collect more taxes as a proportion of GDP to finance government services. This is shown in the chart below. It is clear that to allocate the same proportion of GDP to the education budget, a greater share of public expenditure must be allocated since government is funded from a smaller proportion of GDP.

Figure 23: National Educational Financing



A simple equation can be used to determine the proportion of GDP needed to finance a given level of participation in primary and secondary schooling. The equation is as follows:

$X = GER * A * C$ Where

- X = Public expenditure as a % of GNP
- GER = Gross Enrolment Rate
- A = The % of the population of school age
- C = Expenditure per student as a %/GDP/Capita

An example makes the point. In the short term, the only thing that varies will be the cost per pupil as a percentage of GDP/capita. The number of children is relatively fixed and there will be only slow change over time with demographic transition. The cost per pupil will be determined by teachers' salaries and the non-salary costs of the school budget.

Percentage of GDP Needed for Education

	% GDP Needed X	Gross Enr Rate GER	School Age Pop a	Cost per Pupil % GDP per Cap c	Cost per Pupil USD
Primary	1.20%	100%	12%	10%	350
Secondary	1.80%	100%	10%	18%	630
Total % GDP Needed	3.00%				
Primary	1.80%	100%	12%	15%	525
Secondary	3.00%	100%	10%	30%	1050
Total % GDP Needed	4.80%				

As a rule of thumb high levels of participation have to be achieved within the parameters listed below. In aggregate these will determine the highest rates of pay for teachers that are sustainable and the opportunities there may be for increasing efficiency without undermining incentives and the motive to work.

Rules of Thumb for Sustainable Financing

- Costs per student as % GDP/capita <15% (primary), <20% (LSec), <30% (Usec) GDP/capita;
- Cost per secondary school student less than twice primary;
- Teacher salaries Primary <2x GDP/Capita; Secondary <3xGDP/Capita;
- Pupil Teacher Ratios 20:1-30:1;
- Class sizes <40;
- Teacher/class ratios < 2:1;
- Cost recovery targeted with pro-poor subsidies to promote equity.

Ways Forward

Analysis arising from the data in this paper and from other sources suggests that there are at least eight key objectives related to supply and demand, teacher quality, the distribution of teachers and the sustainable financing of teachers. New policy on teachers and development needs to address these. These objectives can be summarised as follows:

1. Matching supply and demand for qualified teachers with 10 year projections and strategic deployment plans linked to demography and migration;
2. Identifying cost effective initial training and professional development methods;
3. Enhancing terms and conditions of service to attract and retain higher quality entrants and reduce numbers of contract teachers;
4. Improving school leadership to enhance equity, effectiveness and efficiency;
5. Reforming curricula to raise achievement and focus on higher level cognitive skills;

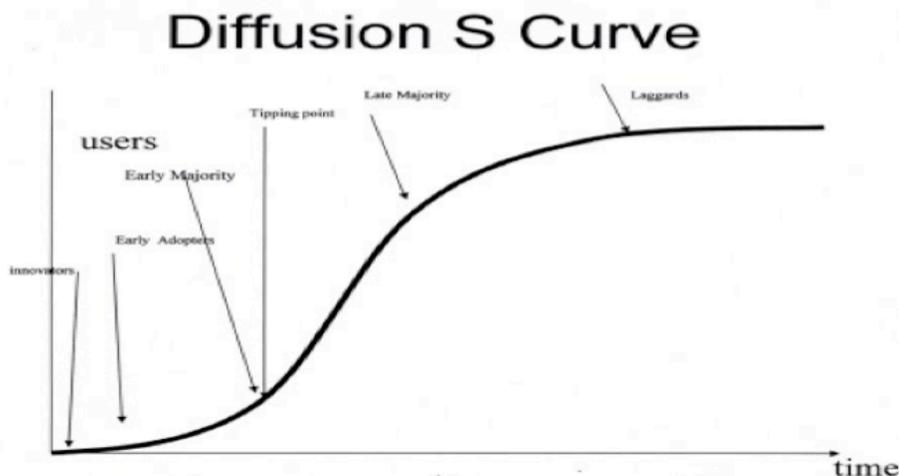
6. Promoting systematic management of learning;
7. Reducing variation in pupil teacher ratios, class sizes and teachers per child;
8. Exploring efficiency gains to increase investment per child and develop pro- poor financing instruments.

Concluding remarks

A short paper can only skate across the topography of all the issues that will determine the role teachers play in development over the next 15 years. Key issues have been summarised and lead to two final reflections.

First, improving teacher quality and addressing the problems that arise rise from matching supply and demand for teachers with an equitable distribution requires systematic and persistent efforts over a period of time. A single big push is unlikely to achieve sustainable results. The reforms and interventions needed will vary from place to place. It is likely that most successful attempts at change will follow an S curve of implementation and impact. Attempts to introduce massive changes across large systems risk the appearance of change in the short term without the transformations that will then embed new practices in self-sustainable ways.

Figure 24: The S- Curve of Innovation



Second, fundamentally new approaches to teacher development may be needed given the lack of impact attributed to many existing methods. One approach that can be used to shape policy dialogue is to explore what post-Fordist professional development might look like.

Figure 25: Fordist and Post Fordist Training and Teacher Development

“Fordist” Training	A “Post-Fordist” Training
Standardised programmes	Adaptive and resilient curricula
Supply “pushed”	“Demand led” production
“Just in case” supply	“Just right” supply
Minimise teacher inputs	Maximise teacher involvement
Intermittent innovation	Continuous improvement
Quality control at output	Quality control at input
Summative certification	Multistage competency levels

There are many possibilities. Both initial training and CPD could be:

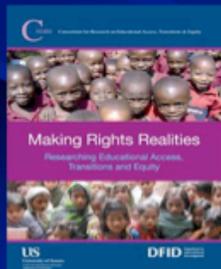
- Adaptive and resilient with different forms responding to need rather than presented as predetermined programs with standardised inputs and outputs;
- Designed to be shaped by the needs of the participants rather than of the training institutions so that they will be demand led rather than supply pushed;
- Characterised by delivering knowledge and skill to those who need it when they need it at just the right time rather than providing knowledge and skill across a wide range of other areas just in case it might be needed, leading to a lot of redundancy and unproductive use of development time;
- Deliberately using the resources represented by groups of trainees who can share experience and benefit from peer group learning techniques and action research;
- Institutionalising program improvement as an incremental process rather than an intermittent activity driven by summative rather than formative assessment of impact designed to provide continuous feedback;
- Developed to encourage and provide quality assurance at input rather than output to promote rather than undermine the maturation of professional capabilities, which promote effective self-regulation with shared ownership of quality assurance;
- Linked to multistage allocation of competence connected to both theory and practice with opportunities to develop different levels of competence over the career pathway.



Teachers and Development Supply, Quality, Distribution and Financing

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