

# Addressing the Successes and Failures of the Campaign for Universal Primary Education

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## Abstract

*The report card of the global campaign to achieve universal primary education (UPE), which began at the Jomtien Conference in 1990 and was reinforced by the Dakar Forum in 2000, is a blend of success and failure. Both present new challenges. Getting 40 million additional children into primary school between 1999 and 2007 was a considerable success. It has created a growing surge of children now looking for secondary schooling. In many developing countries they will not find it. However, on current projections the 20-year campaign for UPE will still leave 50 million children out of primary school by the target date of 2015.*

*The paper proposes responses to each challenge. 400 million children aged 12 to 17 are not in secondary school. All feasible methods must be used to expand secondary systems. Open schooling, the application of distance learning at the secondary level, is a cost-effective way of increasing access. A primary requisite for completing the UPE campaign is to recruit and train 2 million teachers. To expand secondary education and replace retiring teachers will require an additional 8 million teachers. Scaling up teacher education requires much wider use of distance learning, which also provides a mechanism for the desirable reform of moving the focus from pre-service to in-service training.*

## Why Education for All?

Why is it important to educate everyone? This is a relatively new ambition for human societies. It was not until the 18th and 19th centuries that countries began to take seriously the idea of educating the whole population.

This ideal did not feature in the international agenda until the Universal Declaration of Human Rights was promulgated in 1948. At article 26 that declaration included the statement:

*(1) Everyone has the right to education. Education shall be free, at least in the elementary and fundamental stages. Elementary education shall be compulsory. Technical and professional education shall be made generally available and higher education shall be equally accessible to all on the basis of merit.*

There is another proviso in that article that is often forgotten by governments:

*(3) Parents have a prior right to choose the kind of education that shall be given to their children.*

Why is education for all important? Various arguments have been used.

In his classic, *The Wealth of Nations*, Adam Smith wrote:

*'The more (ordinary people) are instructed the less liable they are to the delusions of enthusiasm and superstition, which, among ignorant nations, frequently occasion the most dreadful disorders. An instructed and intelligent people, besides, are always more decent and orderly than an ignorant and stupid one... They are more disposed to examine, and more capable of seeing through, the interested complaints of faction and sedition, and they are, upon that account, less apt to be misled into any wanton or unnecessary opposition to the measures of government. In free countries, where the safety of government depends very much upon the favourable judgment which the people may form of its conduct, it must surely be of the highest importance that they should not be disposed to judge rashly or capriciously concerning it.'*

Note also that Adam Smith strongly supported public investment in education:

*'For a very small expense the public can facilitate, can encourage and can even impose upon almost the whole body of the people, the necessity of acquiring those most essential parts of education'. (Smith, 1776)*

For Adam Smith educating everyone was important to underpin of peace, order and good government. Two centuries later education became a human right in the Universal Declaration of Human Rights. Then, in the latter part of the 20th century, education was justified on economic grounds. The World Bank promoted what it called 'human capital development' and much research was devoted to trying to prove cause and effect between education and economic growth.

Bill Easterly, a former World Bank employee, reviewed all the evidence and concluded that education is not, in and of itself, a motor of economic growth (Easterly, 2001). This is consistent with experience. Jurisdictions as different as Cuba and the Indian state of Kerala have long had excellent education but continue to have weak economies.

But this does not mean education is a waste of time. The most reasonable conclusion from the evidence is that education helps countries to develop faster once they put in place economic policies that are favourable to growth. An example is China, which grew faster than India once it adopted market economics because it had a better education system.

The most convincing justification for education has been given by Amartya Sen (1999). Sen understands development as freedom. Freedom is both the measure of development and the means of development since free people do more to develop their families, communities and nations than those that are not free. For Sen, the aim of development is to increase the freedoms that people can enjoy and education is important because it promotes freedom in many ways.

## The Campaign for Education for All

The global campaign to achieve education began in 1990 with the World Conference on Education for All in Jomtien, Thailand. It was convened because in 1985 some 105 million children aged between six and eleven were not in primary school, the majority of them girls. Forecasts suggested that the number of out-of-school children might double to 200 million by 2000.

At Jomtien 155 governments and a bevy of international organisations and NGOs committed themselves to a set of targets covering education at various levels. However, on the primary indicator of children in school Jomtien was a failure because a decade later the number of children out of school had grown to 125 million. The international community determined to hit the nail harder by convening another World Forum on Education for All in Dakar in 2000. The Forum again came up with a set of targets, but this time put more effective mechanisms in place to support countries that wanted to make progress. These mechanisms concentrated mainly on just one of the six Dakar targets: Universal Primary Education. One mechanism was the Fast-Track Initiative. Its purpose is to provide concentrated support to complete the task of achieving the quantifiable EFA goals in countries where conditions are judged to be propitious (Packer, 2008).

As a result of this and other mechanisms much faster progress was made toward Universal Primary Education in the first decade of this century. The goal has not been achieved but large countries like India and Bangladesh are making big strides although Nigeria and Pakistan still face great challenges.

What are the consequences of the success and the failure of the campaign for Universal Primary Education? The success is that enrolment rates have increased significantly. The average net enrolment rate rose from 54% to 70% between 1999 and 2006 in Sub-Saharan Africa and from 75% to 86% in South and West Asia. The result was that numbers in school increased by 40 million between 1999 and 2007, representing a tremendous input of resources and effort by developing countries.

The flip side is the failure. Many children are still not in school. The current figure is about 70 million. Earlier this was projected to drop to 30 million by the target date of 2015 but recent UNESCO figures are more pessimistic, suggesting that 50 million children will still be out of school by then. The difference reflects a concern that the global economic downturn will reduce the funds dedicated to education (UNESCO, 2010).

The challenge of success is the tidal surge of children toward secondary schooling whereas the challenge of failure is the need to train millions more teachers.

## Expanding Secondary Education

The numbers of children needing secondary schooling are considerable. Up to 400 million children from 12 to 17 are not in school (Binder, 2006).

### Secondary education and climate change

There are many arguments for the importance of secondary education but we simply note that it is the best medium-term weapon against climate change. The most powerful driver of climate change is increasing population. Since the industrial revolution the world's population has grown by a factor of seven and the demands that each human makes on the earth's resources have also increased by a factor of seven. That represents a fifty-fold increase in the impact of humankind on the planet in two centuries.

Slowing population growth is one way of limiting that impact. Women with secondary education have, on average, 1.5 fewer children than those without. A difference of one child per woman means 3 billion more or fewer people on the planet by 2050. Secondary education for girls must be a priority (Cohen, 2008).

Expanding secondary education is now – or soon will be – the key priority for many developing countries. Yet in many of these countries secondary education is very inefficient and cannot be expanded far with the resources available.

### Alternative approaches needed

It will not be possible to accommodate the secondary surge through the conventional provision of secondary schooling, skills training and adult education in classrooms in public institutions. Governments must encourage alternative approaches, particularly providers that can deliver quality learning at scale with low costs.

As well as extending conventional public school systems, governments should encourage the expansion of private schooling for the poor (Tooley, 2009; Umar, 2008), draw lessons from projects involving information and communications technologies (ICT), and give special priority to expanding open schooling, which is the adaptation of open and distance learning at pre-university level.

However, we do not simply propose the creation and expansion of open schools as separate and distinct elements within national school systems aimed solely at coping with excess demand. Open schools should be seen as catalysts for integrating all elements of schooling into an educational ecosystem fit for the 21st century. Developing open schooling is a particularly promising alternative that can also be integrated with other approaches to make them more cost-effective and cost-efficient. An integrated approach also holds the promise of providing education that is better adapted to the needs of the 21st century. It can blur the unhelpful distinction between formal and non-formal education; build a bridge between knowledge acquisition and skills development; and has the potential to reduce the inequalities of access that blight conventional provision in most countries.

## The cost factor

Most importantly, open schooling is less expensive than conventional schooling and that differential is increasing. The expansion of conventional public schooling at the secondary level faces major challenges of both cost and effectiveness in developing countries.

Research shows that if unit costs at secondary level are more than twice those at primary level, a country will never achieve universal secondary education (Lewin, 2008). In most developing countries the difference is far greater than that, ranging from factors of 3 to 6 and beyond in most African countries. Moreover, despite this expenditure in some countries public sector schooling is losing credibility – and often pupils – as parents choose alternatives to schools plagued by decrepit facilities, uncommitted or absent teachers and a general lack of accountability.

## Can ICTs help?

Many assume that information and communications technologies can help to expand quality education cost-effectively.

We report later on three major ICT initiatives in the developing world: One Laptop per Child; the Hole in the Wall; and the NEPAD eSchools demonstration project. Computers do enrich and enhance learning, but this review shows that they need to be embedded within a wider framework if they are to make a systemic contribution to achieving EFA. Open schools could help to provide that framework.

The essential challenge is to develop learning systems that: a) can be conducted at scale; b) are inexpensive; c) deliver acceptable quality consistently; and d) can be adapted to diverse needs. In large scale distance learning systems specialisation and the division of labour are usually identified with three sub-systems: administration and logistics; course materials development and student support. Open schooling carries these principles over into secondary schooling.

## Open Schools and Mega-Schools

The term ‘mega-university’ is used to designate distance-teaching universities with over 100,000 active students (Daniel, 1996, p. 29) and these institutions have multiplied in number and grown in size since the term was coined. Because secondary schools are usually much smaller than universities Daniel (2010, p. xxi) has defined a mega-school as an open school with more than 10,000 active pupils. In the school sector this is an indication of useful scale, even though some open schools in high population countries have much larger enrolments, exceeding a million in the cases of India, Mexico and Indonesia.

However, even small countries can have mega-schools. The total population of Namibia is only 2 million, yet the 28,000 students in the Namibian College of Open Learning (NAMCOL) account for 40% of the country’s secondary enrolment. Daniel (2010, p. 107-140) provides profiles of eight open schools and mega-schools in various countries. Abrioux & Ferreira (2009) give further examples.

## Open schools: means and ends

Most open schools deploy distance learning methods with the sub-systems just mentioned. They carry out the three functions of administration and logistics, course materials development, and student support in much the same manner, even where they use different technologies.

Differences between open schools become apparent, however, when we examine the ends that they pursue through these means. Open schools can achieve various purposes. Any country seeking to establish an open school must decide on the priorities that it wishes to pursue.

The term ‘open’ may designate different types of openness when used in the term ‘open university’ and the same applies to open schools. The degree and type of openness is a decision for those designing a particular open school. Admission may be decided on exactly the same criteria as the conventional schools or it may be more liberal. The curriculum may be exactly the same as in the conventional system – as it must be if both open and conventional schools prepare pupils for the same examinations – or more specifically adapted to the clientele.

However, given the considerable dissatisfaction with conventional secondary school curricula in many countries, open schools present the opportunity to do something different. Too often the regular curriculum is geared to preparing a small proportion of pupils for access to tertiary education, rather than giving the majority a basis for lives and livelihoods in the 21st century. Because open schools usually reach out to those who do not have ready access to a conventional school they may serve them better by offering something different from the conventional curriculum.

Extending the analysis of Rumble and Koul (2007) we distinguish three models of open schooling: complementary, alternative and integrative.

### Complementary open schools

Complementary open schools offer the same curriculum as the conventional schools to children who never had a chance to attend a regular school or had to drop out because their grades were too poor. The open schools in France, Botswana, Indonesia (to some extent), Mexico and Namibia are complementary open schools. Each reaches a significant proportion of the national secondary-age population and enables its pupils to study for the same certification as those in the conventional schools.

Because they operate at scale, these open schools can invest in the production of better learning materials than the conventional schools could hope to develop. It is clearly desirable to share these materials across the whole education system because lack of good learning materials often undermines the quality of conventional schooling.

What are the challenges facing complementary open schools? How can they improve their performance and contribute more fully to their national education systems? The answer is a seemingly paradoxical combination of closer integration with the wider educational system accompanied by greater autonomy in governance and management.

Closer integration – or at least better communication with ministries of education – is particularly desirable in the area of curriculum. By definition, complementary open schools teach to the national curriculum. But since good distance learning courses require significant lead times and investment to develop and produce, governments should involve their open schools in all curriculum revision processes from the earliest stages.

Governments should regard open schools as helpful allies in national curriculum development in the era of ICTs. The Commonwealth of Learning has facilitated a programme in which open schools from six countries worked together to create secondary curricular materials in the form of open educational resources. They can be readily versioned for each country and for individual schools.

Complementary open schools must do everything possible to improve the performance of their pupils. Since they teach to the same examinations as the conventional schools, the performance of the two systems can be compared directly. Open schools must continue to gain credibility by showing good results even though – or especially because – their pupils often have a background of educational disadvantage.

### Alternative open schools

Alternative open schools may cater to some of the same children as complementary open schools but they also aim to engage older youths and adults by offering programmes that are more vocationally oriented and have a greater focus on life skills. India's National Institute of Open Schooling (NIOS), the Papua New Guinea Open College and, to some extent, Indonesia's Open School can be considered as alternative open schools although they have very different national contexts, mandates and governance structures.

Alternative systems that break new curricular ground are steadily becoming more attractive in comparison to complementary systems that simply extend the conventional programme at a distance. Clearly, however, adapting the school curriculum and the school year to meet the needs of youth who could not access the conventional school system – and who may be employed – poses a dilemma. How far should the system aim to produce the same results as the conventional secondary schools? It used to be thought that parents and students would not wish to contemplate studies that do not hold the promise of certification identical to that of the conventional system.

But today this sounds too pessimistic. Both India's NIOS and the PNG Open College have shown that programmes that focus on life skills and work-oriented content are attractive to students and their parents. In these two cases, of course, the institutions provide their own certification, which is accepted at par with certification from the conventional system by employers and tertiary institutions.

The alternative open schools can claim considerable success. NIOS is not only drawing many school-age youth into its alternative route (74% of its secondary students are aged 15 to 20) but also has achieved parity of enrolment between male and female students in its vocational courses. To the extent that the young women see a greater sense and purpose in education that promises economic independence and a better life, NIOS is acting as an important agent of social change (Pant, 2009).

## Integrative open schools

Finally, there is the concept of an integrative open school that is placed at the heart of the whole school system in order to improve and strengthen the quality and reach of that system, to be a source of innovation, and to act as a catalyst for reform.

For most educational authorities the pressing issue is to make the conventional system more effective and improve its quality. How can open schooling help? UNESCO conducted a thorough review of what makes for effectiveness and quality in schooling and developed the following list of factors (UNESCO, 2004).

- good learning materials
- focus on the curriculum
- regular, reliable, and timely assessment of learning
- pedagogical materials for teachers
- relevant content
- teaching of reading and writing
- structured teaching: direct instruction, guided practice and independent learning
- appropriate language of instruction and,
- larger classes if accompanied by better inputs (assistants, materials, etc.).

In this list of quality criteria we can identify various items could be achieved more readily with an open school acting as a resource for the whole school system. Having a source of good learning and assessment materials is a particularly important foundation of effectiveness that supports other elements of quality, such as focus on the curriculum and pedagogical materials for teachers. Today learning and teaching materials can be produced and shared in a very modern way as open educational resources, allowing open schools act as leaven for entire school systems.

## The collaborative creation of learning materials

Open schools have to produce learning materials, usually in a variety of formats. These materials have always been useful to the conventional schools. Two developments have made the learning materials produced by open schools potentially even more useful to the wider school system.

First, most learning materials are now developed in digital formats, even though they may eventually reach students in the form of printed materials. Holding materials electronically has three advantages: they are easy to move around; they can readily be adapted and revised; and they can be converted to eLearning formats when online learning becomes a possibility.

Second, there is growing movement, inspired by the ideal that knowledge is the common wealth of humankind, to create a global intellectual commons in which learning materials are shared. This movement involves many thousands of teachers, at all levels, creating open educational resources (OERs).

The William and Flora Hewlett Foundation, which has supported various OER projects in higher education, is now supporting similar work in open schools through a programme that combines the professional development of teachers with the development of OERs. For example, 20 sets of self-instructional learning materials on the secondary curriculum have been produced in six developing countries: Botswana, Lesotho, Namibia, Seychelles, Trinidad & Tobago and Zambia.

This material is suitable for use in both open and conventional schools and permits open schools to offer current and new subjects through both print and online teaching. The programme also created a pool of one hundred trained and experienced master teachers, who now train other teachers in their countries and support online materials development. These master teachers have been trained in the use of the Commonwealth of Learning's instructional design template and have the skills to develop learning materials collaboratively online through a common Learning Management System, thus creating a new network of expertise in developing countries.

### Computers for children: can open schools help?

Open schools could also act as organising elements for the expansion of ICTs in secondary schools generally.

Daniel (2010, p. 32) reviewed three projects that put computers in the hands of children in developing countries. The One Laptop Per Child (OLPC) and the NEPAD eSchools demonstration project placed computers in schools, whereas India's Hole in the Wall (HITW) experiment put them in playgrounds and public spaces. Although the two projects involving schools gave disappointing results, especially to those who expected a revolution in teachers' pedagogy and students' performance, there continues to be a strong drive in most countries to get more computers into the schools.

Open schools could help whole school systems implement computing more effectively. Collaborative projects in OER curriculum development can help to create locally adapted eLearning materials of quality that are always in short supply. Moreover, since open schools have to be technologically savvy to take advantage of new developments for their own students they are a natural source of expertise for wider use.

Student assessment is an area of special relevance in this context. Regular, timely and reliable assessment is an important tool in securing students' attention to content and the curriculum. Bernard and his colleagues at Concordia University have shown that reinforcing interaction with content – rather than with tutors or fellow students – is the most important way of promoting learning (Bernard et al., 2009). Although reliable and regular assessment encourages students to focus on content, student assessment is the element of their role that many teachers like least.

Because of their scale and flexible entry requirements open schools have to operate with large banks of assessment instruments (quizzes, examinations, etc.) for both formative and summative assessment. These are held as databases on computers so that they can be made available on demand. By strengthening this function of open schools, governments could create an extremely valuable resource for their entire school systems.

In summary, we are seeing the beginnings of a process that will lead to much closer integration between open schooling and conventional schooling. Materials that are aimed, in the first instance, at the pupils of open school will very quickly find their way into conventional classrooms.

## Expanding Teacher Numbers

We turn now to the consequences of the failures of the campaign for Universal Primary Education. The major challenge is the need to expand teacher recruitment and education in order to complete the drive to UPE and to expand secondary. While the expansion of schooling is primarily a challenge for developing countries, recruiting and educating large numbers of teachers is a necessity for rich and poor countries alike. In the last decade, for example, California was employing 30,000 untrained teachers in its schools.

The worldwide shortage of teachers has several causes. First, completing the drive to Universal Primary Education and beginning to expand secondary education will require large numbers of new teachers. Second, many countries – both developing and industrialised – will see a significant proportion of their teaching force retire between 2010 and 2020. Finally, the ravages of AIDS have been particularly severe for teachers in Africa. At times in the early years of this century, in both Kenya and Zambia, the annual deaths of teacher from AIDS were greater than the output of the teacher training colleges.

In aggregate UNESCO estimates that at least 10 million additional teachers will be needed worldwide by 2015 if Universal Primary Education is to be achieved and a serious start made on expanding secondary education (UNESCO, 2008, p. 22). This is a substantial proportion of the current global teaching force of around 75 million (UIS, 2009). Fortunately, progress is being made and the number of teachers worldwide has increased by some 1.5 million annually since 2000. However, many of these teachers have little or no training before they join their schools.

Two related aspects of teacher education must be addressed. First, how can we recruit and train more teachers more rapidly? Second, what kind of training is best suited to the needs of the second decade of the 21st century?

## Teacher recruitment

In teacher recruitment there is a three-way correlation between the status of the teaching profession in a country, the performance of its schools and children, and the ease of recruiting able people as teachers. In countries like Austria, Canada, Finland, France, Germany and Ireland teacher recruitment and retention is not a major issue. Teaching is a high status profession and most of these countries score highly on international surveys of pupil performance such as the OECD's Programme for International Student Assessment (PISA).

Sadly, however, the status of teaching is declining in most countries and the blame for this lies with both teachers and governments. Where teacher absenteeism is a constant problem the public cannot be expected to admire teachers. Where governments have eroded teachers' salaries and the deployment of teachers is infested with corruption good people will not be attracted to the profession.

A century ago the Irish playwright George Bernard Shaw (1903) made the oft-repeated remark that ‘those who can do; those who can’t teach’ to which Laurence Peter (1977) later added ‘and those who can’t teach, teach the teachers’. But today’s knowledge economy has stood at least the first of these catty comments on its head.

The training and skills that teachers acquire are highly valued in the contemporary labour market. Indeed, the UK’s Secret Intelligence Service, MI5, advertised for teachers in 2009, seeking their ‘relationship-building skills’ (*The Week*, 2009, p. 13).

The combination of the low status of the profession and the attractiveness of teachers’ skills in the wider labour market no doubt explains why 50% of teachers in the US leave the profession within five years of completing their training (UNESCO, 2007, p. 130).

Faced with the problem of teacher shortage and the necessity of putting an adult in front of each class of children, at least in primary school, many governments have had to resort to employing untrained teachers, as in the example of the 30,000 untrained teachers in California.

This approach can be a cynical ploy as well as a hard necessity. The Global Campaign for Education railed against:

*‘(Large expansion) para-teacher schemes where pre-service training is compressed or abandoned completely, wages are lowered, working conditions are poorer and career paths are limited. They are being used by many governments to cut the costs associated with expanding educational access to all children. The price such governments are forced to pay is the quality of training (Nock, 2006, p. 27).*

Such a strategy is not going to lead a country towards a viable and sustainable education system.

However, sending people into the classroom with minimal initial training can be a very good strategy for our times if they are then provided with appropriate on-the-job training. Two interesting examples of this from developed countries are the Teach for America programme in the US and the Teach First programme in the UK.

There are differences of detail between the programmes but essentially they recruit the best graduates they can find, ask them to make a two-year commitment to teaching, and send them into the classroom, often in the toughest schools, with just a minimal orientation beforehand. In the UK they are given the opportunity to acquire Qualified Teacher Status during their first year and to engage in training for management jobs once they leave teaching. In fact almost three-fifths of the Teach First graduates elect to stay in teaching once their two year commitment is over (Hutchings et al., 2006).

It is revealing that these highly qualified graduates are positively attracted by the description of teaching, in the Teach First advertisements, as ‘tough and demanding’. Conversely, they are put off by the standard one-year postgraduate route into teaching as ‘too slow’, ‘too theoretical’ and ‘too boring’ (*The Economist*, 2009, p. 49), although they value such training more after they had gained experience in the classroom.

## Teacher education: pre-service or in-service?

Combining these strategies of putting unqualified teachers straight into the classroom in developing countries and doing the same with good graduates in developed countries suggests that the concept of teacher education needs radical revision.

Moon claims that ‘more policy attention was given to teacher education in the 1990s than in all the hundreds of years of history that preceded it. And most of the activity has focused around quality’ (Moon, 2008). Unfortunately this 1990s policy-making has little relevance to today’s world because it failed to address the crisis of teacher recruitment, it was poorly coordinated with school systems, and it did not take account of the potential of technology to do things differently. 1990s policy focused on long programmes of pre-service training whereas today’s emphasis must be on shorter and recurring programmes of continuous professional learning.

Lewin (2002) argued that because the continuing professional development or upgrading of primary teachers is carried out without reference to school needs – often without the knowledge of the school head – it encourages them to move to other jobs rather than improving their effectiveness in their schools.

Furthermore, policy usually ignored the gathering momentum of distance learning and its enhancement by ICT and open educational resources. Today distance learning cannot be ignored because it provides the only way of addressing the two central requirements of teacher education just identified: the emphasis on continuing professional development and the focus on the teacher in the classroom. These requirements complement each other. Any form of continuous professional development that involves bringing teachers regularly to institutions in the towns is inherently expensive and inconvenient. More importantly, to judge by a report on continuous professional development in teacher resource centres in Africa (DFID, 1999), it seems to have little impact on their performance as teachers.

The locus of continuous professional learning must be the school and its focus must be the classroom. This has always been the strength of distance learning systems for teacher education.

## Distance learning in teacher education

Information and communications technologies – and the possibility of open educational resources that they have created – have significantly increased the power of distance learning in teacher education. However it is not new.

Daniel (2010, pp. 141-170) gives profiles of eight successful applications of distance learning to teacher education, going back to PERMAMA, an early 1970s in-service programme for Quebec mathematics teachers. The impact of that programme is still being felt in the very high performance of Quebec pupils in the PISA mathematical literacy surveys.

However, PERMAMA, like its more recent California equivalent, CalStateTEACH – and to some extent the teacher education programmes of the UK Open University – had to face the hostility of traditional teacher educators who were so heavily invested in long, theoretical pre-service programmes that they felt threatened by programmes that reached teachers on the job and taught them there. Yet these programmes

are rated as positively by employers as other university programmes and more positively than most. External independent evaluation is giving the programmes very high ratings (Moon, 2007, p. 14).

One of the great contributions of information and communications technologies to in-service programmes has been to make it possible to gather the teacher learners into a community of practice through computer conferencing (Leach, 2002). This virtual environment provides a secure setting in which novices can gain experience through contact with veteran practitioners.

## The TESSA programme

Open educational resources are already making a powerful contribution to teacher education in Africa, most particularly in the programme Teacher Education in Sub-Saharan Africa, abbreviated as TESSA.

TESSA is a consortium of 13 African universities, the UK Open University and five international organisations. It works across nine African countries – with more participating informally – by creating teacher education materials in Arabic, English, French and Kiswahili. In 2008 nearly half a million African teachers worked with materials and resources produced through the TESSA community. Since these are classroom-based in-service materials they have a direct impact on millions of children through their use in the classroom.

Because they are open educational resources, institutions and schools can adapt them to their needs. For example, Nigeria's National Teachers' Institute, one of the world's largest programmes of teacher education at a distance, uses the materials differently from the University of Fort Hare in South Africa, which has developed a distance learning programme for teacher education alongside its campus offerings because it could see that the campus programmes were not reaching most of the teachers who needed continuous professional development.

Devereux and Amos (2005) have written a moving account of the Fort Hare programme and the enthusiastic response that it has evoked from female teachers in a poor rural region of South Africa.

## Conclusion

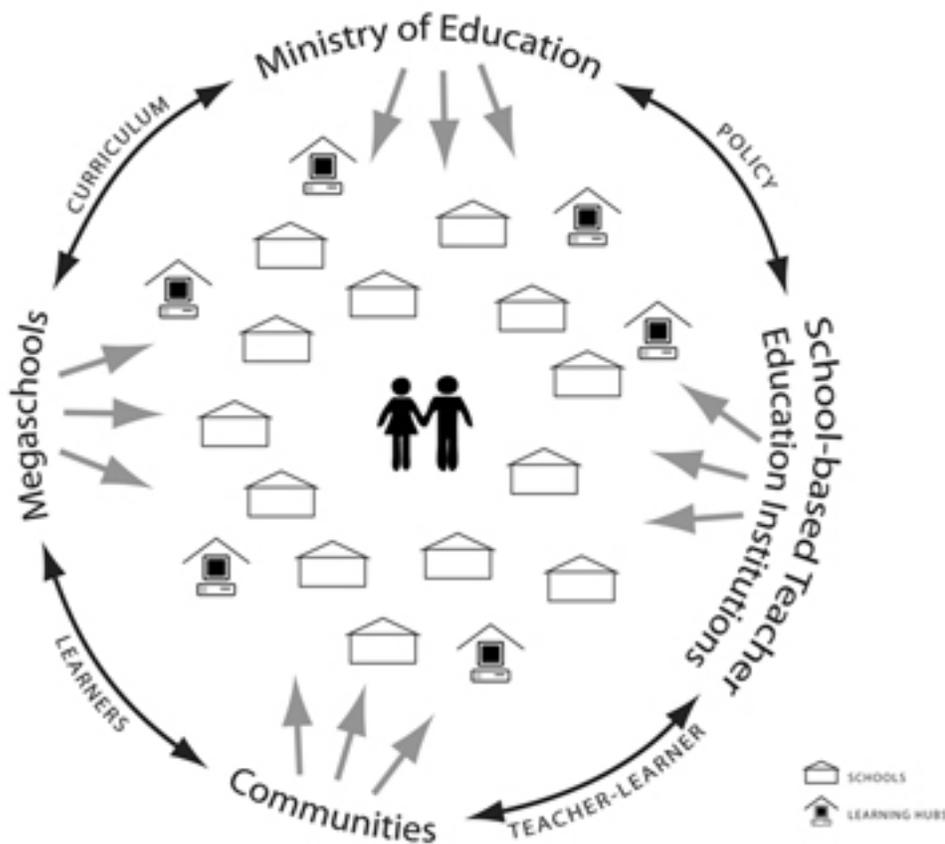
We have examined the successes and failures of the campaign to achieve Universal Primary Education. The success of that campaign has generated the imperative of a massive expansion of secondary education. All effective approaches must be used. Open schools are a particularly promising option because they can operate at scale with low cost. The expansion of secondary education, and the needs of the 50 million children that projections indicate will still not have access to primary school by 2015, will generate a requirement for many more teachers, which UNESCO estimates conservatively at 10 million.

We have proposed that teacher education needs radical rethinking to meet these challenges – and not just in developing countries. Henceforward the most effective policy will be to put teachers into schools with the minimum training necessary for them to function, and then to concentrate most of the resources of teacher education on recurrent in-service programmes of professional learning that are resolutely based on school practice and the classroom experience.

Once that paradigm shift is made, all teacher education institutions will have to give themselves the capability to offer distance learning programmes in order to reach teachers in their schools. Today information and communications technology can make distance learning a richer experience than learning in a university classroom. Furthermore, drawing on the growing body of open educational resources allows institutions to take materials of world-class quality and adapt them to local conditions in a thoroughly authentic manner. Evidence suggests that this approach of classroom-based in-service education is successful where it most counts: that is to say in the learning and performance of the children.

We end by suggesting that combining the development of open schooling with a shift to educating teachers in-service through distance learning would provide opportunities for much greater synergy among ministries of education, schools, communities, open schools and teacher education institutions, suggesting a set of interacting systems that we propose as an educational ecosystem for the 21st century.

### AN EDUCATIONAL ECOSYSTEM FOR THE 21ST CENTURY



This is an interlocking set of systems rather than a single entity. Figure 1 captures some elements of the interactions, interrelationships and interdependencies of these systems without implying that the whole is driven or controlled from any central point. The most effective systems have a high degree of self-organisation.

In the wider educational system competition is another process of self-organisation. While taking advantage of common resources, such as learning materials and OER, public and private schools will work to maintain their distinctiveness and promote their comparative advantage to parents. Similarly donors and vendors will want to encourage projects and experimentation in particular schools. Other parts of the system will review the results and may change their own practices based on their observations.

The figure shows that there is a national school system, including public and private schools and a network of learning hubs, under the authority of the ministry of education. The ministry is also linked to the open schooling sub-system, particularly through its curriculum and examinations function, and this sub-system also relates to the schools, notably as a source of learning materials, and to the learning hubs where it locates its study centres.

Also linked to the ministry, through its teacher education unit in particular, is the teacher education institution (TEI) sub-system. All TEIs have links with the schools and these are particularly strong for school-based teacher education. They will also relate to a national higher education system and to international groupings such as TESSA.

The learning hubs act as resource centres for teachers, giving them access to a richer ICT infrastructure than they have in their schools. Finally, intersecting with all these systems and subsystems is the community system, which has a highly complex set of sub-systems of its own.

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