

Achieving Education for All



Commonwealth of Learning

*Programme update meeting
22 January 2010*

Seminar Presentation

*by
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Introduction

Colleagues: I am grateful to our Vice-President, Professor Asha Kanwar for asking me to be the guinea pig to start this seminar series to wrap up this and future Programme Update Meetings. She has asked me to talk about the book that I started writing a year ago as my New Year's resolution for 2009. It is now in press and will be published by Routledge any day now.

Its title is *Mega-Schools, Technology and Teachers: Achieving Education for All* and its purpose is to support our work at COL with advocacy and proposals for new ways of tackling the educational challenges of the age.

First, I should express my thanks to all of you. While the book is generally about COL's mission of using technology to take learning to scale, its particular focus is open schooling and teacher training.

So I begin by thanking Frances Ferreira, whose book *Open Schooling in the 21st Century* that she prepared with Dominique Abrioux was an invaluable resource. I am grateful to Asha who has willingly taken on an even heavier workload to help me find time to write; and to Dr. Abdurrahman Umar who has shared many documents and whose own previous research helped me with the most controversial part of the book.

But my thanks go much wider. COL is a very congenial place for reflecting on solutions to educational challenges and I thank you all for creating such a stimulating environment. Some of you have helped in very specific ways. Dave Wilson has given good advice about dealing with publishers; Amy Monaghan is brilliant at resurrecting long-dead literature and my administrative colleagues have been most supportive too. Any royalties from sales of the book will be shared with COL.

Today I shall give you an outline of the structure and main points in the book. I hope that you will feel motivated to read it when it appears.

Why Education for All?

The first chapter is entitled *'Education for All: Unfinished Business'*. It begins by exploring the background to the aspiration that everyone should be educated, which is a relatively new development for humankind. It wasn't really until the 19th century, starting with Japan, 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.

In chapter one I spend a few pages examining why education for all is important and listing the various arguments that have been used.

I begin with Adam Smith who wrote in *The Wealth of Nations*:

'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.'

I love that language and in North America, where we are constantly saying how excited we are by each new development, we would do well to remember the 'delusions of enthusiasm'.

Before I leave Adam Smith, lest you think he was simply a right-wing fanatic you should know that he 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.'

I also quote Adam Smith extensively in a later chapter about the nature of technology, entitled *'Technology is the Answer – What is the Question?'* For Adam Smith technology was about scale. That resonates with our work at COL, which is about scaling up learning. Many current thinkers and

writers on technology have lost sight of the importance of scale. Adam Smith explains clearly how technology achieves scale.

Coming back to his justification for education for all, you could say that for Adam Smith it was about peace, order and good government, right along the lines of the statement in the British North America Act that preceded Canada's constitution.

Two centuries later education became a human right in the Universal Declaration.

Then in the latter part of the last century education was justified on economic grounds. The World Bank got excited about 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 disaffected World Bank employee whom I quote here, studied all the evidence and concluded that education is not, in and of itself, a motor of economic growth. Intuitively you can see that he is correct. Jurisdictions as different as Cuba and the Indian state of Kerala have excellent education but weak economies.

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

Finally, the justification for education that I espouse, and which resonates best with our work at COL, is that of Amartya Sen. 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

After looking at the reasons why education for all is an important aspiration I give an account of the 20-year campaign to try and achieve it.

We can date this campaign back to 1990 and 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. There were various reasons for this which I won't go into – you will remember that the 1990s were a pretty turbulent decade.

The international community decided to try 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, which was recently headed by Desmond Bermingham, a former COL Board member who spent time on attachment to COL last year. 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.

As a result of this and other mechanisms, to cut a long story short, much faster progress has been made towards Universal Primary Education in the last decade. We are not there yet, but large countries like India and Bangladesh are making big strides. In the Commonwealth – and indeed in the world – Nigeria and Pakistan represent the biggest remaining challenge.

These figures are the background to the book, which essentially examines 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 is that numbers in school increased by 40 million between 1999 and 2006, 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).

These data are the starting point for the book's proposals, which address both the challenge of success and the challenge of failure.

The challenge of success is the secondary surge.

The challenge of failure is the need to train more teachers.

Expanding Secondary Education

Let's start with secondary education.

The first point is that the numbers are very considerable. Up to 400 million children from 12 to 17 are not in school. Of course some, like those in this slide, are well catered for. But others, like these, are not so lucky.

Much ink has been expended elsewhere in promoting the importance of primary education, so I use some space in the book to argue for the importance of secondary education.

Secondary education and climate change

The only argument I shall repeat today is that secondary education is the best medium-term weapon against climate change. That is because 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 each human being today, on average, makes seven times greater demands on the earth's resources. That's a fifty-fold increase in two centuries.

Slowing population growth is one way of limiting that demand. 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.

Indeed, expanding secondary education is – or soon will be – the key priority for many developing countries. Yet in a time of economic difficulty countries need to strive for greater efficiency and in many countries secondary education is not at all efficient.

Hence, I stress the importance of expanding open schooling, which is the adaptation of open and distance learning at pre-university level. But the book does not simply propose the creation and expansion of open schools as a separate and distinct element within national school systems. We believe that open schools should be seen as catalysts for integrating all elements of schooling into an educational ecosystem fit for the 21st century. I shall return to that later.

Alternative approaches needed!

The key point is that 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, draw lessons from projects involving information and communications technologies (ICT), and give special priority to expanding open schooling. I am most grateful to Abdurrahman for his careful study of private schools for the poor in Nigeria.

Developing and expanding open schooling are particularly promising alternatives 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

Very 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.

Professor Keith Lewin's 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.

In the book I examine three major ICT initiatives in the developing world: One Laptop per Child; the Hole in the Wall; and the NEPAD eSchools demonstration project that COL helped to evaluate. I conclude that while computers do enrich and enhance learning, they need to be embedded within a wider framework if they are to make a systemic contribution to achieving EFA. I argue later that open schools could help to provide that framework.

The essential challenge, which we at COL know well, 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

Fifteen years ago I coined the term 'mega-university' for large distance-teaching universities and set the threshold at 100,000 active students. The number and size of mega-universities has expanded significantly since I invented the word.

Secondary schools are usually much smaller than universities, so in this book I define 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.

But 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.

In one of the book's appendices I give profiles of eight open schools and mega-schools around the world and also an account of home schooling in North America.

Open schools: means and ends

Most open schools deploy distance learning methods with the sub-systems I 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 through it.

The term 'open' may designate different types of openness when used in the term 'open university'. It is the same with 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.

In the book I extend the analysis of Greville Rumble and B.N. Koul and distinguish between 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, Namibia, Indonesia (to some extent) and Mexico 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 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. Through Frances, COL is facilitating a programme whereby open schools from six countries are working together to create senior secondary curricular materials in the form of open educational resources. These can readily be versioned for each country and at the level of 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 that is identical to 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.

Integrative open schools

Finally, I suggest 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. Frances mentioned this morning, for example, that some of the videos that COL has facilitated for NAMCOL are also being used by conventional schools.

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 (UNESCO, 2004).

From this we can construct a list of desirable features that could be obtained more readily by having an open school as a resource for the whole school system:

- 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.).

Open schools can help national schools systems with many of the items on this list. 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 materials can be produced and shared in a very modern way as open educational resources and, more generally open schools can be a leaven for the entire school system. Our work with the Hewlett Foundation is helping countries collaborate in the production of learning materials.

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, COL is part of 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. 20 sets of self-instructional learning materials on the secondary curriculum will be produced in six developing countries: Botswana, Lesotho, Namibia, Seychelles, Trinidad & Tobago and Zambia.

This material will be suitable for use in both open and conventional schools and will permit open schools to offer current and new subjects through print and online teaching. The programme will also create a pool of one hundred trained and experienced master teachers, who can train other teachers in their countries and support online materials development once the formal project is complete. These master teachers will have been trained in the use of COL's instructional design template and will 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.

In the book I examined three projects that put computers in the hands of children.

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. 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. 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.

I conclude that 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

I turn now to the second part of the book, which is about the need to expand teacher recruitment and education in order to complete the drive to Universal Primary and to expand secondary.

Expanding secondary schooling is primarily a challenge for developing countries but 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, some developed countries will see a significant proportion of their teaching force retire in this decade. Finally, the ravages of AIDS have been particularly severe for teachers in Africa. At times in the last decade, in both Kenya and Zambia, the annual deaths of teacher from AIDS were greater than the output of the teacher training colleges.

Putting all this together 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 because 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.

In the book I focus on two related aspects of teacher education. 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

First, let me make a few comments on teacher recruitment. As we might expect, 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 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 this year, 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 that we noted earlier.

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, 2006:27).

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).

What is also revealing is that these highly qualified graduates are positively attracted by the description of teaching, in the Teach First advertisements, as ‘tough and demanding’. The obverse of the coin is that 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). Importantly, however, they did value this training once they had experience of the classroom.

Teacher education: pre-service or in-service?

Combining these examples of putting unqualified teachers straight into the classroom in developing countries and doing the same with good graduates in developed countries, my book follows others, such as Professor Bob Moon, in arguing that the concept of teacher education needs radical revision.

It has been said 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.

Third, 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.

In my book I give profiles of eight successful applications, going back to PERMAMA, an in-service programme for Quebec Mathematics Teachers that I worked on in the early 1970s. The impact of this

programme is still being felt in the very high performance of Quebec pupils in the PISA mathematical literacy surveys.

But this programme, just like its much more recent California equivalent, CalStateTEACH – and to some extent the teacher education programmes of the UK Open University, had to face the hostility of teacher educator colleagues 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 on the job. 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. One of the profiles I give is a programme of 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 including COL. It works across nine African countries – with more participating informally – by creating teacher education materials in Arabic, English, French and Kiswahili. Last year 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.

Summary

To sum up: in this address I have examined open schooling and teacher education in the context of the increasingly successful campaign to achieve Universal Primary Education. The success of that campaign has generated the imperative of a massive expansion of secondary education. In turn that expansion and serving the 50 million children projected not have access to primary school by 2015, will generate a requirement for many more teachers, which UNESCO estimates conservatively at 10 million.

I propose that teacher education needs radical rethinking to meet these challenges – and not just in developing countries. Henceforward the policy should be to put teachers into schools with the minimum training necessary for them to function, and then to concentrate the major 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.

Most importantly, some 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.

Envoi: towards an educational ecosystem for the 21st century

I end by suggesting that combining the development of open schooling with a shift to conducting teacher education 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 I present here as an educational ecosystem for the 21st century.

I refer to systems rather than a system for two reasons. First, this is an interlocking set of systems rather than a single entity. Second, the danger of representing systems as diagrams is that it makes them look monolithic, which is not the intent. The purpose of the diagram is to capture some elements of the interactions, interrelationships and interdependencies of the 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.

Some of the systems I describe in the book provide good examples. The accredited institutions (study centres) of India's National Institute for Open Schooling conduct their business and their interaction with pupils in a variety of ways. The teacher-learners in the University of Fort Hare's school-based teacher education programme ensured that it became fully indigenous to their schools and communities.

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 diagram 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.

Conclusion

I leave that idea with you. I am grateful to Frances and Abdurrahman for letting me trespass on their territories – and I must emphasise that the views I have expressed are my own. They may or may not agree with them!

I also thank Asha for her patience in working with a president who was doubling as an author. Let me say that I have greatly enjoyed this part-time return to scholarship and I hope that my long account of it has not totally discouraged you from reading the book when it appears!

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