Models for open and distance learning

1: Teacher education and training

THE COMMONWEALTH OF LEARNING

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Models for open and distance learning

This series of guides to good practice analyses policy issues about the use of open and distance learning and of information and communication technologies in education. The guides are for decision makers within educational institutions, in ministries of education, and in international agencies. Each guide is based on our understanding of the research evidence and aims to identify alternative models and options in a particular area of education. Each begins by examining the policy agenda and the key questions on it and goes on to address a list of themes – socioeconomic context, governance, purpose and curriculum, outcomes and costs, organisation, technology, funding, accreditation, and assessment – but the weight given to each theme varies according to the area of education being examined. In every case our aim is to give prominence to the more difficult issues. The models series is jointly published and promoted by IRFOL and COL.

1. Teacher education and training

This first guide looks at the way open and distance learning has been used for the education and training of teachers. It draws heavily on research carried out by IRFOL for the Department for International Development in Britain and for UNESCO. We are grateful to both organisations for their agreement for us to use material also used in their documents; much of the text below is adapted from these (mainly from Creed 2001 and Perraton, Creed and Robinson 2002).

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1. INTRODUCTION

This guide for policy makers starts by defining the policy agenda in terms of the potential for open and distance learning in meeting the 2015 target of quality education for all. It goes on to look at three related issues: about society's expectations of the teaching profession, about the stakeholders who are influencing and controlling it, and about its curriculum. It then examines the case for using open and distance learning for teachers, by looking at the evidence on its outcomes and costs. The guide then moves on from asking whether, and in what circumstances, it makes sense to use open and distance learning, to questions about how to use it, looking in turn at organisation, with a particular emphasis on teaching practice, at the available technologies, and at funding. The final two sections look at accreditation and assessment, examining how they may present different challenges to decision makers when learners are studying at a distance.

2. WHAT IS THE POLICY AGENDA?

Open and distance learning has most often been used to overcome a shortage of teachers, usually seen as a temporary stopgap. But alongside that stopgap solution, it has also been used as part of the regular system of initial teacher training, to support curriculum reform, to offer continuing professional development to teachers, and to prepare them for new roles as head teachers, administrators or inspectors, or as teachers' college lecturers. A range of organisational structures and a wide variety of technologies have been used. Critical questions for planners concern the organisation of teaching practice and the integration of distance-education and conventional approaches to teacher education. We devote particular attention to these issues below.

Good education demands good teachers. But many countries have too few teachers, or teachers who have themselves had only a limited, or outdated education. At the same time, the development of open and distance learning, and the promises held out by new information and communication technologies, suggest that there may be new ways of expanding the teaching service and raising its quality. We can, then, frame the overall policy question as:

> How far, and how well, can open and distance learning strengthen the teaching profession and help towards the 2015 educational targets?

There are, then, a set of subsidiary questions about the purpose, content and approach of teacher education. The planner needs to examine the context within which policies will be implemented and the way in which teacher education is managed and in which it relates to other parts of the educational service. Then there are questions about the ways in which an unconventional method of teacher education can be designed, organised, managed, funded and assessed. In order to answer these questions we need to look at both curriculum and organisation. The curriculum of teacher education may be dominated be one or other element, from general education to classroom skills, and varies in the emphasis it places on preservice and inservice approaches. Within different jurisdictions, responsibility for it may be shared among ministries of education, universities, curriculum agencies, and teachers' colleges. We examine each of these issues below.

3. CONTEXT: WHAT DOES SOCIETY EXPECT OF TEACHER EDUCATION?

At the time of the 2000 World Conference on Education for All there were some 113 million children outside school. Even when the targets agreed at the conference are achieved, 'success in improving access and quality at the primary education level leads to increased demand for post-primary education and for teacher training' (Cm 5006: 111). At the same time there is more than 40 years

experience of programmes to expand teacher supply, and raise the quality of teachers in schools, through the use of distance education. New communication technologies have been seen as a way of strengthening the use of distance education.

Throughout much of the south and especially in sub-Saharan Africa and south Asia, problems of teacher supply, of three kinds, threaten the attainment of the education targets. First, there are shortages of teachers. While school enrolments generally grew in the 1990s, teacher numbers only just kept pace with them, while AIDS is reducing the life expectancy of teachers and so increasing the numerical demands. With all the other pressures on educational budgets, it seems unlikely that teachers' colleges can be expanded at the rate necessary to meet these demands. Morbidity as well as mortality is affecting the teaching service: where teachers are too ill to work, their absence worsens teacher shortages. Second, in the same two regions, female teachers are in a minority. Progress in getting more women into the profession is slow; in Africa the proportion of women primary-school teachers rose from 39.4 percent to 43.3 per cent between 1990 and 1997, while in south Asia it rose only from 28.0 to 29.6 per cent. Where tradition, religion or social pressure means that only women can teach girls, these figures threaten the attainment of both the world targets.

Third, even where there are enough teachers, too many of them are untrained or undertrained, and the quality of training is often itself inadequate. A number of studies have found little difference between the effectiveness of trained and untrained teachers. 'About half of the teachers in developing countries are unqualified in terms of their own country's formal standards for teachers' education. Many teachers have little more than secondary education themselves. Teaching methods are often old fashioned, with too much focus on rote learning' (DFID 2001: 9). Problems of quality are compounded by a growing concern to reform education and change the role of the teacher: many countries wish not just to raise the quality of the teaching force to match the present demands on them but also to change the nature of those demands.

4. GOVERNANCE: WHO IS MAKING AND INFLUENCING DECISIONS ABOUT IT?

Responsibility for teacher education is often shared among different stakeholders while influence over its content and methods may be shared even more widely.

Ministries of education most often have primary responsibility for teacher education. In many cases this responsibility may be devolved or shared. Where a teaching service commission exists, it may have some responsibility for teacher education and for the recognition of qualifications. Curriculum agencies are likely to have an interest in and possibly a responsibility for teacher education and training. In some cases, and especially in large or federal countries, some responsibilities and activities are devolved. In India, for example, District Institutes for Education and Training (DIETs) have a major role in both the preservice and the continuing education of teachers. Ministries, too, have a financial concern for teacher education: not only are teachers' colleges generally funded from the ministry budget but any programmes that raise the level of qualification of teachers are likely to have a long-term impact on teachers' salaries, the biggest item in a ministry budget.

Teachers' colleges may be controlled by a ministry of education, or have a degree of autonomy, or be seen as belonging with universities in a tertiary sector of education. Their organisational location may change over the years. They have sometimes had a difficult and unrewarding link with distance-education programmes, where these were seen as being in competition with their regular, and

more conventional work. Where a distance-education programme needs to use the facilities of teachers' colleges then good relationships between the two are at a premium.

Universities may have a variety of different links with and responsibilities for teacher education. In some cases these include monitoring and accreditation; teacher education in Belize and Jamaica, for example, is supervised and accredited by a Joint Board for Teacher Education based at the University of the West Indies. Some teacher education programmes are run directly by universities and open universities in particular have often been called on by governments to use their skills in distance education to run programmes for teachers: the ministry of education in Pakistan, for example, has used the facilities of Allama Iqbal Open University to meet the need for continuing education of the country's serving primary school teachers. Thus universities may have different roles as an accrediting agency, as the implementer of programmes that rely on the expertise of its own faculty of education, and as the provider of specialist skills in distance education.

Teacher education is likely to have a twofold relationship with schools, at once influencing them and reacting to them. Short periods of teaching practice will take the students and may take the staff of teachers' colleges into schools. Where schools are responsible for mentoring trainee teachers, as happened with the postgraduate certificate course of the Open University in Britain, they become directly involved in teacher education. While this involvement may reduce the likelihood of conflict between teachers' college and school, it has also been criticised as weakening an opportunity of changing school culture through external influence.

The concerns of individual teachers will be reflected by their schools but may also be expressed by teachers' unions and professional associations, both nationally and internationally. Good policy planning will take their interests into account; many have been warmly supportive of measures that can be seen as raising the status and widening the opportunities of their members.

International agencies may in turn influence teacher education and the use of distance education within it. Both the Commonwealth of Learning and its francophone equivalent, CIFFAD, have been involved in the development of teacher education programmes using distance education, and have been able to share expertise internationally in their execution. A project in Burkina Faso to train head teachers, for example, could call on resources elsewhere in west Africa and in France through the network RESAFAD (Réseau africain de formation à distance or African network for distance education). The World Bank has sought to influence policy on teacher education while several bilateral aid agencies in Europe have funded distance-education projects for teachers in Africa. They have brought to their funding their own policy concerns as well as their cash.

The complexity of this web of responsibility and influence – a complexity that is inherent in the use of distance education - means that it is sometimes difficult to see who has a sense of ownership of teacher education. In India, for example, one programme for primary school teachers was executed by Indira Gandhi National Open University, on behalf of the ministry of education, in association with a national curriculum agency, the National Council for Educational Research and Training, and with responsibility for accreditation and monitoring resting with the National Board for Teacher Education. For the policy maker one conclusion is clear, and easy to state while demanding in practice: identify the stakeholders and create as simple mechanisms as possible to encourage their collaboration.

To summarise: in considering the governance of distance-education programmes for teachers it is necessary to identify the stakeholders with their lines of responsibility and to consider the relationships between them. This analysis should include an examination of the relations between any teacher-education programme and the schools and to ensure that there are effective channels of communication between the partners involved.

5. AIMS: WHAT IS ITS PURPOSE AND CURRICULUM?

Teacher education and training has to respond to the demands of the various stakeholders and therefore to do a number of different jobs. There are expectations that it will enable teachers to develop the potential of their pupils; help them serve as role models; transform education and through it society; develop changed attitudes to their work and to education; and encourage their own self-confidence and creativity. The curriculum of any teacher-education programme will be shaped by local needs and by the programme's purpose; the planner's first question is therefore about purpose.

There are two starting distinctions: between the initial education and training of teachers and their continuing professional development, and between preservice and inservice activities. The two sets of distinctions do not overlap: many teachers begin work without teaching qualifications so that they may get initial training while they are working inservice. Beyond those initial distinctions we can differentiate between programmes designed to support curriculum development and those to help teachers undertake a new role, often to work in administration or in a teachers' college. In practice, some of these distinctions may be blurred: programmes to support a changed curriculum may be directed at all teachers, regardless of their earlier training. In Pakistan, for example, a Primary Teachers Orientation Course was run in the interests of curriculum reform but served also as continuing professional development for many teachers and, in practice, as initial training for unqualified teachers already working in the service.

Table 1 Purposes of teacher education programmes

Purposes	*subcategories*
Initial training of unqualified teachers	programmes leading to certification short induction courses
Upgrading of teachers who already have a qualification	for subqualified teachers for qualified teachers
Training related to content of the school curriculum	for planned curriculum change refresher courses
Preparing teachers for new roles	as head teachers to work in teachers' colleges

Source: based on Greenland 1983

Many programmes of teacher education – and especially those that are providing initial training – include four elements: improving the general educational background of the trainee teachers; increasing their knowledge and understanding of the subjects they are to teach; pedagogy and understanding of children and learning; and the development of practical skills and competences. The balance between these four elements varies in relation to the background education of student teachers, to the level at which they will teach, and to the stage they have reached in their career.

Beyond this, the curriculum of teacher education is likely to be shaped by the circumstances of trainee teachers and by changes in prevailing attitudes to education or shifts in educational philosophy. In considering teachers' own circumstances we need to take account of:

> their educational background, which varies enormously between different countries and different levels of education.

> gender, where there are shortages of women teachers in many countries, and of men teachers in some. Programmes need to fit with the rest of teachers' lives and be sensitive to cultural norms and expectations that affect their jobs. In some countries there are restrictions on women teachers' mobility that affect their ability to attend initial or updating courses.

> their experience as teachers where trainees who have just left school with limited formal education are likely to have quite different educational needs from those with similar formal qualifications but long experience as untrained teachers.

In many countries teacher education gives an impression of rethinking, and restructuring of the curriculum, although it is often unclear how far this process has changed actual practice. One change has been a shift of emphasis from preservice to inservice education. At either stage a recurrent picture is the coexistence of traditional and newer curriculum models within one programme. This takes the form of two competing strands of thinking that, for convenience, can be labelled as traditional and progressive tendencies. The traditional is teacher-centred, based on behaviourist assumptions, has a transmission view of knowledge and regards the teacher as a technician; the progressive strand includes more active and participatory learning methods, is less authoritarian, places more demands on teachers and contains elements of constructivist thinking. The progressive agenda encourages the development of reflective practice among teachers. This in turn raises questions about the practicality of rapid change and the danger, identified by Beeby (1966) in a classic analysis of seeking over-rapid transformation and of holding unrealistic expectations of teachers who were themselves teaching at the limit of their knowledge.

Thus the planner needs to ask how far it is realistic to ask trainee teachers to adopt new roles and carry them out effectively on the basis of a limited educational background. Where programmes are available in parallel, at conventional colleges and at a distance, distance-education teacher trainees tend to have a lower educational background than those at regular residential teacher colleges. They are often older, have more practical teaching experience and include higher proportions of women who are trying to balance family commitments with part-time study. Distance education may have a particular role here in widening educational opportunities to people and to areas with an entrenched history of educational deprivation.

To summarise, the planner needs to take account of:

> **the balance between the four elements of the curriculum for the particular audience, taking account of teachers' own background education;**

> **the balance between preservice and inservice education;**

the debates between traditional and progressive approaches and views about the appropriateness of defining teacher education in terms of a set of stated competencies;

realistic expectations that will help the progress of curriculum reform but can be achieved with the support, interest and goodwill of teachers.

6. OUTCOMES AND COSTS: DOES IT WORK?

Once the aims of a particular programme of teacher education have been articulated it is possible to ask how far distance education may be useful in meeting them and how it should be planned and organised. The planner's questions here are about the trade-offs between conventional and distance-education approaches.

Distance education may have advantages in terms of access, scale, speed and cost. In principle it can reach students at any distance and, by reaching large audiences, provide inservice education to teachers more rapidly than would be possible through conventional means. In some circumstances, the cost per student is likely to be lower than the cost for conventional, face-to-face, programmes, especially where these require student residence with all its associated costs. On the other hand, at least some aspects of teacher education are about human interactions and mediated education, done through print or broadcast or computer, may be an inappropriate methodology. In our assessment of its strengths and weaknesses we argued in the following terms in our UNESCO report:

> But there is a threefold case to be made for its legitimacy. First, the evidence of public-sector open universities, and dual-mode universities that teach both conventionally and at a distance, is that students can achieve examination results that match those of conventional universities. A significant proportion of students give up along the way and do not complete their courses. But this is true of all students working part-time and not a distinguishing mark of students learning at a distance.

> Second, distance education has been powerfully effective in reaching audiences who could not meet their educational needs from conventional institutions. In Colombia, a radio-based school was, in the 1970s, reaching over 100,000 rural peasant students every year. The National Technological University in the United States is using satellite and broadcasting technology to meet the needs of engineers for postgraduate study without their having to leave their jobs and attend a campus. In China, the combined use of television, classroom sessions, and printed materials is providing university education to about a third of all the students in higher education. A church-based nongovernment organisation, the American private sector, and the government authorities in China have all perceived distance education as legitimate because of its power to widen access to education.

> Third, where open and distance learning provides opportunities for student interaction with tutors, it allows open-ended dialogue, often regarded as the touchstone of legitimate education. Thus, while open and distance learning may lend itself to rote learning – as does learning in large classrooms – this is not an essential or defining characteristic.

> The arguments are linked: open and distance learning is legitimate because it has a record of success in terms of the measures applied to conventional education, but would be of little interest if it simply replicated for the same audience what could be done conventionally, and of little value if it got people through their examinations at the expense of more serious educational purposes.

(Perraton *et al.* 2002: 12)

The policy maker's judgment will be influenced by evidence on outcomes and on costs. The evidence on outcomes is not as solid as we would like, reflecting the shortage of good research on the outcomes of teacher education generally. Several developing-country studies have found little difference in terms of classroom effectiveness between qualified and unqualified teachers (cf. Avalos 1991, Perraton 2000: 59-60, Torres 1996). Few distance-education projects have followed trainee teachers into the classroom in order to see if their training made them better teachers. Where they have, notably in Tanzania and Zimbabwe the evidence shows that, while direct comparisons between teachers taught in different ways are difficult, the classroom practice of teachers' taught at a distance stood up comparatively well (Chale 1993, Chivore 1993, Mählck and Temu 1989, Perraton 1993: 394-5).

There is fuller evidence on three other indicators – of the number of students reached by programmes, on completion rates, and on examination results or learning gains. Many programmes have reached large numbers of students; Tanzania trained 38,000 teachers at a distance in the 1970s; China uses television-based distance education for teachers numbered in the millions; Pakistan and Nigeria have used distance education for teacher audiences of 80,000 and 180,000 respectively. Where trainee teachers have been enrolled en bloc in a training programme, with a guarantee of improved qualifications and status on successfully completing the course, completion rates have tended to be high. Lower completion rates are reported where training amounts to secondary equivalence (in Nigeria) and in a number of cases where students have enrolled individually on courses without any guarantee of direct financial benefit. In terms of examination passes, a review of nine earlier case studies found that pass rates were between 50 and 90 per cent and argued that 'while examination success cannot be equated with teaching capacity, we can legitimately assume that a reasonable examination pass rate demonstrates that a programme was effective in teaching academic subjects' (Perraton 1993: 393). Rather than look at examination results, we might want to ask how well trainee teachers learned. Teacher education projects in Indonesia and Sri Lanka set out to measure this and found reasonable evidence of effectiveness that is in line with the evidence on examination results (Nielsen and Tatto 1993). Evidence on the outcomes of a number of projects is set out in table 2, together with information about costs.

Table 2: Effects and costs of some teacher education projects

Project, date, purpose	Numbers	Outcomes	Costs
Inservice upgrading of unqualified primary school teachers, Botswana, Swaziland, Uganda 1967-78	Each in range 600 to 1000	Successful completion rate 88-93%. Anecdotal evidence of impact on classroom performance.	n/a
Kenya programme for unqualified primary school	8433 over 7 years; annual	91% passed examination and gained promotion.	Cost per enrolment relatively high in

teachers, to improve general educational background and achieve secondary examination passes 1967-73	enrolment 850 to 2000	No firm evidence on classroom performance.	comparison with alternatives
Brazil Logos II inservice programme for primary-school teachers using print and attendance at teachers' centres	24,400	80% pass rate Availability of Logos II may have led to increased migration from rural schools by teachers acquiring qualification	Costs lower than alternative
Tanzania programme to recruit and train on the job primary school teachers for introduction of Universal Primary Education 1976-84	45 534 in three annual cohorts	83% qualified. Positive evidence on classroom performance. Weaknesses in science teaching and self-confidence among female teachers	Cost per successful trainee about half cost of residential course
Nepal RETT Basic teacher education courses, using radio to upgrade rural primary school teachers	3000	Completion rate 85%, pass rate 57%	Cost slightly lower than alternative
Zimbabwe Integrated Teacher Education (ZINTEC) for secondary school leavers, trained on the job for expansion of primary schooling 1981-8	7353 over four years	80 % pass rate. Positive evidence of classroom performance but difficult to draw comparative conclusions	n/a
Nigeria National Teachers' Institute training primary school teachers TCII course after 2 years secondary education 1984-90 NCE course after 5 years 1990-	186 713 over period Enrolment of 14 909 on 1st cycle and 26 657 on 2nd cycle	Success rate thought to be in range 25 to 30% of those entering; compares favourably with alternative; no evidence on classroom practice 21 000 students graduated 1994	Cost probably lower than conventional college
Pakistan Primary Teachers' Orientation Course (Allama Iqbal Open University) introducing new curriculum to primary school teachers 1976-86	83 658 total	56% completed course; 38% of original enrolment passed examination Positive self-report on usefulness. No direct evidence of classroom effects	AIOU graduate costs 45-70% of conventional university costs
Indonesia Universitas Terbuka upgrading course for lower secondary teachers	c 5000	Positive effects on subject mastery and in theory and practice in skills; relatively poor results in mathematics; apparent decline in attitudes towards teaching	Cost about 60% of equivalent
Sri Lanka National Institute of Education training primary-school teachers with secondary level qualifications	c5000	Positive effects on subject matter and in theory and practice in skills; less successful than conventional college in mathematics	Cost one-sixth to one third of alternative
Uganda Northern Integrated Teacher Education Project for primary school teachers 1993-95	3 128 enrolled	88% completed and passed examination; some evidence of improved skills in teaching competencies	Cost per student about $2000 compared with $2500 in conventional college

Source: Perraton 2000: 80 – 1; Perraton and Creed 2000

The evidence on outcomes needs to be set alongside the evidence on costs. A number of studies have made broad comparisons between the costs of training teachers conventionally and face-to-face. While these comparisons are necessarily crude, they consistently show that,

> with the relatively high completion rates often achieved in teacher education, costs per successful student tend to compare favourably with those of conventional education. This differential holds true both for projects with quite modest costs per student, reflecting limited student support, as in Pakistan [at the Allama Iqbal Open University Primary Teachers Orientation Course], and those with relatively high costs incurred for extensive student support and supervision of classroom practice, as in Tanzania [in its large teacher education programme of 1976-84].

> (Perraton 2000: 128)

The actual cost per distance-education student, or cost per successful student, is a function of a number of factors of which the most significant are the scale of the number of enrolments, the amount of face-to-face support provided, and the sophistication of the technologies used. In looking at the comparative cost effectiveness of conventional and distance-education approaches, some of the most important differences flow from the fact that distance education is non-residential, often part-time, and allows learners to work and study at the same time. This in turn has led to differences in policy about funding (see page 19 below) and in the opportunity costs of studying.

In considering options, the planner is likely to seek information and base decisions on:

> **the scale of the programmes;**
> **the media or technologies used (see below page 18);**
> **the costs of face-to-face or residential study;**
> **the cost of other student support;**
> **the costs of teaching practice and of supervising or examining it; (see below pages 15 - 16)**
> **policy on charging fees (see below page 19);**
> **the opportunity costs of taking teachers out of school for their own education.**

Some of the differences between conventional and distance education are set out in table 3.

7. ORGANISATION: HOW IS IT ORGANISED AND MANAGED?

The planner considering the use of open and distance learning for teachers is faced with a series of organisational questions:
> how far should a programme be structured or unstructured?
> what kind of tasks need to be undertaken to make distance education work?
> what are the options in terms of organisational structure?
> within each of these options, where should responsibility rest for each of the tasks?
> how can teaching practice be organised, monitored and assessed?

Programmes and projects vary widely in the extent to which they are structured. At one extreme, the BBC, along with other public-service broadcasters, puts out broadcasts for teachers both nationally and internationally. They are intended to

Table 3: Comparative costs of conventional and distance education for teachers

	Conventional	Distance education
EXPENDITURE		
Residence	Likely to be a significant proportion of total costs	Cost likely to be reduced where students are in residence for smaller part of total study time
Grants, allowances	Often paid to full-time students	May be paid only for short periods of residence
Staffing	Staff time dominated by face-to-face teaching	Proportion of staff time required for materials development and for tutoring at a distance
Materials, media, communication	Likely to be modest	Costs likely to be higher and influenced by sophistication of media chosen; economies of scale are possible
Student support	Level of expenditure determined by amount of field supervision provided	Significant expenditure often needed for isolated students and to supervise classroom work
Annualised capital	Cost of teachers' colleges and facilities likely to be a major capital item	Some capital required for distance-education activities but these are counterbalanced by reductions in costs of college accommodation
OPPORTUNITY COSTS		
For students	Students may forgo notional income by attending college	Teachers may forgo income from private tuition while studying
For ministry of education		If students teach while they study ministries avoid costs of funding their replacements
INCOME		
Student fees	Rarely charged	Are sometimes charged, especially where students are voluntarily upgrading their qualifications

provide continuing education for teachers but without any requirement on teachers to enrol, or take part in any formal activity in relation to them. With a slightly more formal structure, the A-Plus programme in Brazil consists of a television series for teachers combined with optional sessions in teachers' centres that teachers can attend if they want to follow up ideas in the broadcasts. In other, more formally structured programmes, teachers enrol on a course which is taught, by print or broadcast or computer, and are required to submit assignments and study regularly, much as if they were enrolled on a conventional face-to-face course. The National Teachers' Institute in Nigeria, for example, enrols students this way so that they have a route to becoming qualified teachers without attending a conventional college. While the main focus of this policy guide is on structured and semi-structured approaches, this is not meant to undervalue unstructured and nonformal approaches; the need for the guide follows from the complexity of the management issues involved in structured approaches. The convenience of broadcasting, and the increasing availability of making materials available on the internet, suggest that these approaches may be of major value to many teachers.

Unfortunately the shortage of research studies means we have all too little data on the impact of unstructured programmes.

An analysis of the functions needed to make open and distance learning work is necessary in order to inform the choice between administrative options. To make distance education work you need structures and facilities for seven main functions.

> Governance, planning, management and funding
>> Some of these functions will rest within a distance-teaching institution and some outside.
>
> Materials development and production
>> The development or acquisition of materials is fundamental to distance education. Materials may be developed in-house, or externally, in a variety of media. An institution will need not only writers but people who can edit them, so that they work effectively at a distance, and people to brief and train writers and editors.
>
> Materials reproduction and distribution
>> This may be done physically, often through the mail, or electronically in the case of broadcasts or computer-based teaching.
>
> Student recruitment, advice and support including the supervision of classroom practice
>> Mechanisms will be needed to recruit students and then to support them and provide feedback on their work. Where teacher education programmes include a practical element, concerned with their competence or skills in the classroom, arrangements are also needed to supervise this.
>
> Assessment and evaluation of learners
>> In many, though not all, programmes students need to be assessed and their work examined or evaluated. The formal award of qualifications may be outside the responsibility of the teaching institution or may require accreditation by another agency.
>
> Feedback system to allow for formative evaluation
>> While, in a sense, this is necessary for any organisation it needs particular attention in a nonconventional form of education and one in which students may be too far away for their dissatisfaction to be heard when things go wrong.
>
> Record systems
>> A formal system of records, of students and organisational processes is indispensable.

A range of different organisational structures have been used for teacher education at a distance which can be classified under six headings as in table 4.

Ad-hoc arrangements
In some cases a ministry of education has set up a project directly, making ad-hoc arrangements for all the necessary functions. While this approach may harness resources rapidly, it has not usually proved sustainable beyond a short-term emergency.

Table 4: Some models for organising teacher education

Model	*Example*	*Comments*
Ad-hoc arrangements made by ministry of education	Mubende Integrated Teacher Education Project Uganda (emergency basic training programmes for primary school teachers)	While this makes it possible to deploy resources quickly it may not be a sustainable model
Single or dual mode teachers' college	National Teachers' Institute Nigeria (initial teaching training and continuing professional development)	The Nigerian case is the only example of a specialised distance-teaching teachers' college
Single or dual-mode university	Indira Gandhi National Open University; University of the West Indies (both offer inservice programmes for teachers)	Many universities with distance-teaching capacity have been asked by ministries of education to run programmes for teachers
Multi-country programme	RESAFAD (Réseau Africain de Formation à Distance) (running a programme of head teacher training in west Africa)	Can share international resources and be of particular value for small states
NGO single-purpose project	Open Learning Systems Educational Trust (using radio to support English teaching and help train teachers inservice)	Speed and vibrancy of ngo activity has to be balanced against problems of sustainability and of coherence with government activity
Consortia and partnerships	TV Futura Brazil (making training opportunities available using broadcasting, print and sessions in study centres)	If problems of integration can be overcome, a partnership of this kind may, as in Brazil, bring together an ngo, a broadcasting station, schools and a private-sector publisher

Single or dual-mode teachers' college

More often, prime responsibility rests with a teachers' college, often teaching conventionally as well as at a distance. Within the small country of Belize, the one teacher-training college developed a part-time distance version of its conventional initial teacher education programme, drawing on existing faculty members to develop materials and train those who were to be responsible for classroom supervision and marking assignments. Nigeria has a National Teachers Institute which is a single-purpose institution, teaching entirely through open and distance learning.

Single or dual-mode universities

Universities may have two relevant areas of expertise – in the content of teacher education, where this is a university responsibility, and in the practice of open and distance learning. While it may be possible to benefit from either of these areas of expertise, there are sometimes problems of fit and adjustment if a university has no experience, in, say, the education of primary-school teachers which has generally been the responsibility of non-university teachers' colleges. Dual-mode universities have also often faced practical difficulties in developing teaching materials, mainly because of competing pressures on staff time.

Universities have run supply-led and demand-led programmes. In some instances ministries of education have turned to a university to supply a national programme

because it has the infrastructure for materials development and distribution. In other cases, a university has responded to demand from teachers by developing courses relevant to their continuing professional development. Indira Gandhi National Open University in India, for example, runs programmes on which students enrol individually, paying their own fees, in order to raise the level of their qualifications.

Multicountry programmes

There is limited, but growing, experience of programmes that go across frontiers. In francophone Africa, RESAFAD has been working on projects to develop resources that can be shared across frontiers. The regional universities in the West Indies and the South Pacific have responsibilities in teacher education. The European Commission has supported a European-wide agreement on the content and certification of information and communication technologies in schools while the Commonwealth of Learning has designed a co-operative programme for teachers and administrators in eight southern African countries.

Nongovernment organisations

Some nongovernment organisations have played a part in teacher education at a distance, either in parallel with or linked with the public education service. With external, donor, funding the Open Learning Systems Education Trust (OLSET) in South Africa, for example, is offering training for teachers in the context of its radio programme for schools. Nongovernment organisations have played a particularly strong role where, as in Latin America, a pluralist tradition assumes they have a major role in public education.

Consortia and partnerships

In many cases, it will not be possible for any one institution to carry out all the functions needed for open and distance learning; instead they have to be shared between several partners. An open university, for example, may be contracted by a ministry of education for the development and central management of a programme but this is likely also to involve coordination or cooperation with any national accrediting agency, with curriculum bodies and possibly with public or private-sector broadcasting organisations. Cooperation with local colleges of education may be necessary for the supervision and management of the practical side of teacher education. Table 5 illustrates some of the patterns for cooperation that have been developed. It shows that, in every one of these cases, responsibility for some aspect of teacher training was shared between different partners.

Partnerships tend to be fragile especially where different partners could, if they chose, replace each other. They are stronger if their functions are quite different, as, for example, where one partner has a mechanism for developing material and another for accreditation, but with no overlap between them. The idea of partnerships has been driven by three forces: the shift towards decentralisation, an increase in school-based teacher education, and decisions to integrate distance-education and conventional approaches. While the benefits of partnerships are obvious, they present management difficulties and

> as might be expected, have functioned with varying degrees of success. The complexity, time and cost of managing these crucial relationships with partners tend to be underestimated at the outset, especially when several colleges and regional or district authorities are involved. Furthermore, consistency of quality is not easy to achieve in large geographically dispersed programmes with decentralised field operations, which also need to be responsive to local conditions. Problems in managing the system revolve around issues of responsibility, role definition, accountability, location of decision-making,

Table 5: Distribution of responsibilities within programmes

Location of responsibility	Certificate with School Experience, Belize	MIITEP Programme, Malawi	PGCE, Open University, UK	DEP-DPEPII, IGNOU, India	English in Action, OLSET, South Africa	A-Plus, Brazil	National Teachers' Institute, Nigeria
Governance, planning, management	Ministry of Education and Belize Teacher Training College (BTTC)	MoE	OU guided by Teacher Training Agency (TTA)	Collaboration of national, state and district agencies with management decentralised to districts	OLSET	Consortium of private-sector and ngo agencies	NTI
Funding	Government	Government	Government	Government	Donor	Private sponsors	Government, student fees
Materials development and production	BTTC	University of Malawi	OU with BBC for broadcasts	Indira Gandhi National Open University (IGNOU) in collaboration	OLSET	TV-Futura with Community Mobilisation Network (CMN)	NTI
Distribution material reproduction and distribution	BTTC	6 Teacher Training Colleges.	OU - BBC	IGNOU in collaboration.	South African Broadcasting Corporation,, community radio stations, OLSET	National educational channel and local re-broadcasting	NTI regional offices in 36 states.
Teacher trainee recruitment	BTTC	District Education Officers and TTCs	OU	Shared between IGNOU Delhi, IGNOU regional centres, District Institute of Education and Training (DIETs)	OLSET district coordinators	TV advertising and CMN	NTI regional offices.
Tutoring and counselling student support	District Education Centres, BTTC, field supervisors.	District tutors	School-based mentors and OU tutors.		OLSET district coordinators .	CMN and school coordinators	NTI
Teaching practice supervision	District classroom teacher-supervisors	College-based phase: college tutors. Distance-mode phase: head teachers, regional supervisors and college tutors	School-based mentors	School-based	Occasional by district programme supervisors	None	Limited, by staff of teachers' colleges
Assessment or accreditation assessment and evaluation of learners	Level 1: MoE Level 2: Joint Board of Teacher Education	Malawi National Examination Board	Certificate awarded by OU. Recognition as teaching qualification by TTA	IGNOU.	None	None	Accreditation: National Commission for Colleges of Education. Teaching practice externally moderated by mainstream teacher education colleges.

communication and the control and co-ordination of part-time support staff.

(Robinson, 1997: 126)

Choosing between organisational options

The choice between options – or the development of a new combination of them – is likely to be a function of five issues: governance, funding, timing, capacity and scale.

Questions of governance are about responsibility for and control of the various parts of the distance-teaching system. Who decides about which of the functions identified above? How are conflicts between any of the parties resolved?

The level and source of funding may be critical: donor funds, for example, may be available only to a government agency or, the reverse, only to a nongovernment organisation.

If a project is for a limited purpose and for a short period then ad-hoc arrangements may have a positive advantage. Tanzania, for example, was able to set up a teacher-education programme to expand its teaching force in a short time, calling on a wide range of national resources, in order to train an urgently needed 40,000 teachers. But it is often difficult to turn short-term arrangements into a permanent system and a one-off emergency solution to a problem may jeopardise the development of a sustainable structure.

Where an institution – whether an open university or an international agency like the Commonwealth of Learning – has existing capacity to undertake some distance-education functions, this may be a powerful argument for using them and setting up a programme in cooperation with them. In contrast, if a college is launching a new programme of distance education it will be necessary to set up the necessary infrastructure to develop materials and teach students.

The scale of a programme, or of a country, may determine the model to be chosen. Small states in particular may need to rely on a regional or international institution because of the limited facilities within country. Teacher education at a distance has, as already noted, been a major interest of the University of the South Pacific since its establishment.

In considering the balance of advantages for any one model, and developing proposals that take account of those issues, the most useful touchstone may be to consider the links between the programme and the rest of teacher education. Unless these links are in place then an unorthodox programme has little chance of effectiveness or even of survival. In developing the links it is necessary, too, to keep in mind relationships between the centre and the periphery: from the student-teachers' point of view the centre may be the school in which they are working and the distance-teaching institution the periphery; from the ministry of education, both may look remote. From the planner's point of view the links between them are of paramount importance.

Teaching practice

No matter which organisational option is chosen, decisions will be needed about the management, supervision and often assessment of teaching practice. This presents logistical difficulties in any programme of teacher education and these are

likely to be magnified for large-scale programmes and scattered student audiences. Some projects and programmes have avoided the issue. Where, for example, the aim is to raise the general education of teachers then it may be legitimate not to worry about their classroom practice. But where programmes aim to have a direct influence on teachers' classroom practice then the issue needs to be addressed. Five approaches are distinguished in table 6. The simplest is avoidance: Indira Gandhi National Open University's certificate programme was for experienced teachers and was about counselling rather than classroom activity. In Belize microteaching was used as a substitute for classroom visits. Where these are arranged they may be combined in a separate block – perhaps simpler administratively or integrated with the rest of the course – encouraging links between theory and practice. There are examples of the use of school-based mentors to supervise classroom work.

Table 6: Models of organising teaching practice

Model	Examples
1. No practicum offered at all	Certificate in Guidance, IGNOU (India)
2. College-based micro-teaching	Belize Teacher Training College
3. Classroom-based practicum as a separate block in a course, usually placed after academic blocks.	Diploma in Education, IGNOU (India),
4. Classroom-based practicum supervised by visiting staff from college or ministry	Zimbabwe ZINTEC project
5. Classroom-based practicum under the guidance of a mentor within the school	Open University (Britain) Postgraduate Certificate of Education

For the manager, the simplest arrangement is to avoid any element of teaching practice, or to centralise arrangements as in the Belize example. But, where programmes are intended to have a direct influence on teachers' classroom practice, there is an imperative to supervise and monitor this. In many countries the third or fourth model has been adopted so that staff from the distance-teaching institution or one of its partners visit teachers in their individual classrooms. Costs and logistics make this a difficult option but it is often the only realistic one.

The fifth model, of employing school-based mentors has attracted widespread interest. It needs teachers within the system who have themselves sufficient experience and understanding of education to act as mentors, as well as a structure to brief and train them and to monitor their work. In many developing countries, ministries of education conclude that these conditions cannot be met. It has also been criticised as a system which serves to replicate the existing culture and values of the schools where the mentors and their trainee teachers are working. On the other hand, in discussing their experience, the Open University argued that their school-based approach meant that it was possible to ensure:

> that all the open and distance course text and resources should be directly related to school practice. No activity, reading or observation could be set that did not directly relate to experience in schools: the link had to be explicit. The course therefore also prescribes a *curriculum of school activities*… This school activities framework is directly related to the course structure and assessment model and allows for increasingly demanding activities, covering all aspects of the teaching role, as the programme progresses.

(Moon and Leach 1997: 5)

To sum up, the planner's first option it between structured and unstructured approaches. Then, for any structured approach, it is necessary to arrange for and locate responsibility for seven functions: governance, materials development and production, their distribution, student support and supervision, assessment, feedback, and record keeping. A choice between organisational options then needs to be made, taking account of the available institutional infrastructure. In choosing between them, issues of communication and links between partners will be important as will the arrangements for trainee teachers' classroom practice. The choice will also be influenced by questions of governance and funding, by the short- or long-term nature of the programme, the availability of resources and the size of the country concerned.

8. METHODS: WHAT ARE THE CHOICES OF TECHNOLOGY?

In principle, distance educators may be able to choose from a wide range of technologies, from print to broadcasting to a variety of applications of computer-based information and communication technologies. In practice the choice is likely to be constrained by practicalities and costs, as well as by educational purpose. As a starting point the planner needs to consider how far the institution and the learner both have access to a particular technology: broadcasting, for example, may look attractive to the planner but is no use if most students are outside the range of a transmitter or broadcasting time is available only at inappropriate hours. Information about costs may be next in importance, as technologies vary in their costs and their cost behaviour. The most significant difference in behaviour is between costs where economies of scale are possible, such as radio, and those where they are negligible, such as face-to-face tutoring or marking individual assignments.

In choosing technologies it is also necessary to distinguish between their two main functions of distributing teaching material and allowing interaction between tutor and student. Again, economies are more likely to be available in distribution, where it costs no more to broadcast to a thousand students than a hundred, than in interaction. The division between the two functions is usually clearcut. Radio, for example, is a one-way medium which can only distribute teaching to learners while telephone tutoring, or face-to-face meetings, allow interaction. The new information and communication technologies provide the single main exception to this rule; if students have internet access then it can be used both to distribute teaching material to them and as a means of two-way communication. One consequence of this is likely to be a reduction in the institution's costs and an increase in the student's, where responsibility for reproducing printed matter is shifted from the institution to the learner. But this is very much the exception: more often the planner needs to balance the advantages of, say, broadcasting against print as media for distribution and face-to-face against written opportunities for feedback from students.

There is no simple match between educational purpose and technology. Generally, there is a case for using more than one technology in open and distance learning, partly because this is likely to be more interesting for the learner, partly as an insurance policy (if the mail does not get through the broadcast may), partly because there may be educational advantages in using one medium rather than another (audio tapes have an advantage over print in teaching the pronunciation of a language). This in turn may drive a teaching institution into seeking some kind of partnership (see page 13) if it needs expertise or facilities that are outside its own capacity. Beyond that, it is possible to draw some general conclusions about the strengths and weaknesses of a range of technologies and the preconditions needed for their use. Some of these preconditions are about facilities needed by

the teaching institution, such as access to broadcasting capacity for example, and others about what is needed by the learner. In looking at these options the planner will also need to consider where the costs are likely to fall and how they are shared between the teaching institution and the learner. These are set out in table 7.

Technology choice is likely to be a function of access, cost and educational function. A technology is useful only if both the institution and the learner have appropriate access to it. The cost structure, and the possibility of economies of scale, differ from one technology to another. Plans also need to consider how far costs, in relation to any particular technology, fall on the tutor or the student. In making an educational choice the key distinction is between the use of technology to distribute teaching material and to allow two-way communication for tutor-student, and possibly student-student, interaction.

Table 7: Some technologies for teacher education

Technology and application	Strengths and weaknesses	Prerequisites	Cost behaviour
Print Can provide information in a structured way Often used as major teaching medium	Permanent, convenient, medium Can play variety of roles May not motivate students if used alone	Modest for production and reproduction Lengthy preparation time Arrangements needed for physical distribution	Fixed costs for development of master copy, variable costs for reproduction and distribution
Radio Used to provide topical information, motivate teachers, and provide variety of authentic voices	Can be topical and lively Can reach all or most teachers at the same time Ephemeral Constrained by available time slots and sometimes regulation	Basic studio and production facilities Access to broadcasting agency Availability of radios and mains electricity or batteries	Production cost higher than for print Most costs fall on producer not receiver Economies of scale possible
Audiocassettes Many functions comparable to radio Can provide aural examples (e.g. languages)	Can provide useful, permanent resource without time constraints inherent in radio Demands physical distribution	Modest, subject to technical quality required Needs physical distribution and availability of cassette recorders	Costs for production, reproduction and distribution No economies of scale
Television To reach large audiences, raise awareness, show variety of processes and school contexts	Visual interest and appeal Not always accessible to teachers	Access to broadcast production and transmission facilities	High central costs for production and transmission; may be 10 times cost of radio Economies of scale make appropriate only for large audiences

Audio and videoconferencing Allows live interaction with learners	Can support development of scattered groups of teachers Needs access to sophisticated equipment at both ends	Detailed preparation needed for multi-site group discussions Technical facilities both for institutions and teachers or groups of teachers	High cost (especially for video) for conference equipment Costs may be acceptable if there are significant reductions in travelling costs for learners
Computers To provide access to material on cd-roms and local databases Necessary for some teaching about icts themselves	Potential availability of huge amount of material	Needs availability of software, technical support services, and training opportunities for teachers	Costs incurred for hardware, software, maintenance and training Significant costs borne at reception end especially for peripherals (e.g. printer, toner, paper)
Computer communication Enables teacher to participate in larger professional communities Allows learner rapid tutor interaction; access to internet resources Allows easy distribution of resources to teachers	Ease of communication balanced against costs and convenience of access to computer facilities	As for computers but also demands working access to internet service provider	As for computers but local costs increased. Savings for institution if used to distribute materials but costs then falling on recipient

9. FUNDING: WHO IS PAYING FOR IT?

Much, probably most, teacher education is paid for by governments. In particular, conventional full-time preservice teacher education has generally been funded in this way with little if any cost falling on the student or on other sources of revenue. But this is not universally the case. Where teachers are enrolling individually, with institutions in the public or private sector, in order to get an extra qualification, they are often expected to meet some of the cost. And where teachers are studying part-time while they are employed, some governments argue that they can therefore meet some or all of the costs of their study themselves.

The result is that distance-education programmes for teachers are funded from four different kinds of source: from government, from student fees, from the private, local and nongovernment sector, and from donors and funding agencies. Often a programme is funded from more than one source. A review of ten case studies of teacher education found the pattern of funding in table 8, with the British example being the only one where all costs were met by government and China, India and Nigeria relying on a mixture of government expenditure and student fees. Funding agencies have long been responsible for some expenditure on teacher education, through government programmes as in Mongolia or nongovernment as with OLSET in South Africa. Generally, students are more

likely to be asked to pay their own costs when they are enrolled as individuals, on a course leading to an advanced qualification.

There are trade-offs between each of the options. If teacher education is seen as fundamental to the quality of education, then there is a public-policy argument for its being funded directly by a ministry of education, alongside primary and secondary education. In practice, the shortage of central government funds have led some institutions to seek funds outside the ministry or to pass on some of the costs to the learners. While this may bring flexibility for the manager, the imposition of student fees may hold down enrolment and is likely to discourage students and to be socially regressive.

There is little reported experience of the use of community resources in teacher education of this kind. Nongovernment organisations have played a part in some countries. In Brazil, for example, funding was generated by an established consortium while in South Africa OLSET has drawn funds from international funding agencies. While nongovernment organisations may have a freedom to innovate, and a freedom from government regulation, these have to be balanced against difficulties they may face in integrating their work with regular state activity and in achieving long-term sustainability. External finance from funding agencies in particular may be unsustainable. Many funding agencies have been willing to meet capital costs, and to fund pilot projects, but expect governments to meet recurrent and continuing costs. The trade-off here is often between initial freedom of action, bought with external funds, and long-term integration and sustainability. If a teacher-education programme is more than a one-off solution to a crisis, then those questions of sustainability need attention from the outset.

The planner needs to consider trade-offs between alternative sources of funding which may include government funds, student fees, the private, local and nongovernment sector, and funding agencies. In considering these trade-offs, questions of equity and access and of sustainability, are likely to be all-important.

10. ACCREDITATION AND ASSESSMENT

Accreditation and assessment are linked and sometimes present particular difficulties for distance education. Accreditation refers to formal recognition of learning while assessment may relate to any process of testing students.
In principle, giving credit for teacher education at a distance is no different from its award for conventional programmes. In practice, difficulties of two kinds have been faced. The first set of difficulties is about parity of esteem. If a distance-teaching programme leads to a different qualification from that awarded for conventional course, the latter will generally be regarded as of higher status. If the same qualification, with the same examining structure, is used for two courses that are taught differently, then the methods of assessment may not be appropriate for one audience or the other. The second set of difficulties are about the practicality of examining, and in particular of examining any practical work, where students are scattered. (We come back to this below in considering assessment.) The link between the two sets bears on public perception of a qualification gained through distance education. Where distance-education programmes are tightly integrated with teacher education generally, both kinds of difficulty are minimised. Where, for example, distance education is part of the normal pattern of teacher education, with all students doing some of this in college and some at a distance, then problems of examining and of acceptability are likely to be reduced.

Table 8: Funding of some programmes

Programme	Source of funding			
	Government	*Student fees*	*Private, local, nongovernment sector*	*Donors and funding agencies*
Brazil (television-led continuing education on many topics, non-formal: 'journalism in the service of teacher education').			■	
Burkina Faso (structured programme of headteacher training)				■
Chile (structured programme for ICT training)		■		
China (structured programmes, mostly academic subjects, leading to qualification for teaching)	■	■		
India (structured programme for teachers and others on child guidance)	■	■		
Mongolia (resource-based, non-formal provision of materials on child-centred teaching methods)	■			■
Nigeria (structured programme of studies leading to teaching qualification)	■	■		
South Africa: OLSET (radio-based programme for improving English learning and teaching methods)	■		■	■
South Africa: UNISA (structured programme leading to teaching qualifications)		■		
United Kingdom (structured school-based programme of initial teacher training, leading to qualification)	■			

Source: Perraton *et al.* 2001: 37; Robinson and Latchem 2001: 42

In considering assessment, we need to take account of the different aims or purposes of teacher education. As noted previously, it may be concerned, at one level, with increasing teachers' knowledge and understanding of academic subjects or of pedagogy. At the next level, teachers may be able to apply their knowledge to their practice and then, beyond that, actually to do so in the classroom. In designing an assessment system we need to consider all three levels in this hierarchy. In an analysis of this in relation to open and distance learning, Robinson points out that the difficulties of assessing students working through distance education parallel the difficulties in using it for teaching (Robinson 1997: 130-3). Distinguishing between the levels of assessment, as in table 9 she points out that

Knowledge and understanding are easier for a distance education provider to assess than practice and performance. Assessment of a student's pedagogical skills, the outcomes, is difficult for distance educators to do alone since it needs first-hand observation and authentication. As the model in table [9] shows it becomes more complex organisationally for a distance education provider and the costs rise, as assessment moves from Level 1 (knowledge and understanding) to Level 3 (practice and performance), that is from standard patterns of assessment of knowledge for large groups to assessment of individual performance and difference. One strength of distance education is its capacity to deal with large numbers, one limitation is its inability to deal easily with the individual.

(Robinson 1997:131)

There are, therefore, no particular difficulties in assessing teachers' knowledge and understanding, which may be the main aim of a programme that concentrates on improving teachers' general education or their knowledge in one particular area; assessment can be built into teachers' written work It becomes more difficult if we move up one level and ask how far teachers are applying their knowledge to practice, although it is possible to design learning materials, in a variety of media, that ask teachers to undertake activities in the classroom and report on them. The tutor can then guide the student and at the same time assess how far knowledge has in fact been applied to practice. More difficulties arise at the third level, when we ask how far teachers are applying what they have learned in the classroom. Just as managing and supervising classroom practice present particular difficulties for open and distance learning so does its assessment. But without some measures of assessment at this level we will not know whether teacher education has worked in the basic sense of changing teachers' activities in the classroom. If this centrally important kind of assessment is to be undertaken, a distance-teaching institution needs to work with partners on the ground as it will in supervising teaching practice. There is some international experience to guide us here. The National Teachers' Institute in Nigeria produced a standard grid for assessment of classroom practice by external supervisors. At the British Open University, students were required to keep a 'professional development portfolio' throughout their postgraduate certificate; this included assessment by the school mentor and was submitted to the university at the end of the course for marking.

Accreditation may raise issues about the recognition of qualifications obtained at a distance and about the practicality of examining remote students and of their classroom work. Assessment needs to take account of the purpose of a teacher-education programme and the levels of assessment, from knowledge and understanding, through knowledge applied to practice to practice and performance. Assessment becomes more difficult as one moves up this hierarchy but is necessary if one is to know about the impact of a programme on schools and the children within them.

Table 9: Assessing teachers' knowledge and practice at a distance

Teachers' knowledge and practice	Nature of assessment	Implications for distance education
Level 1: *Knowledge and understanding*		
Of academic subjects to be taught. Of pedagogical concepts, ideas and theory.	Written work (assignments), essays, course tests of final examinations.	Can assess learning and give feedback to students on a large scale (hundreds or thousands). Can achieve economies of scale (standard assignments). Can provide well-designed assignments because of the resource put into course design; may also retreat into over-use of multiple-choice questions for administrative convenience. Assignments may remain too theoretical or unrelated to the realities of classroom life, or lack regional relevance.
Level 2: *Knowledge applied to practice*		
Application of knowledge to teacher's own context; testing out and interpreting ideas about pedagogy; evaluating practical activities and experiments, and reflecting on them.	Written reports and accounts of things done (description and analysis of activities such as teaching a mathematical topic a new way; collecting evidence in a child observation study; organizing a classroom differently; or developing new language and reading activities).	Good learning materials can structure this process for the teacher (distance not a barrier). Can support linkage between theory and practice. Not possible for a distance education provider to tell from the student's reports how authentic an account is given, for example, that classroom practice matches what is described. Can be more time-consuming and expensive for a distance education provider to assess (non-standard assignments, greater individual differences).
Level 3: *Practice and performance*		
Enactment of knowledge and ideas. Demonstration of competences and skills.	Direct observation and authentication of individual teacher performance.	Much more complex to organise and manage than Level 1. More labour-intensive and expensive than Level 1; approximates more closely to costs of conventional training. Requires more support staff in a variety of roles than Level 1; needs more staff training provision; more support materials; more monitoring and management. Needs local partners. Cannot be done at a distance (without sophisticated interactive technologies).

Source: Work undertaken by Bernadette Robinson and reported in Perraton *et al.* 2002

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