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The Quality Imperative

The pre-service training of teachers – does it meet its objectives and how can it be improved?

Keith M Lewin
2004

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Introduction

The pre-service education and training (PRESET) of teachers is central to the achievement of the Dakar and Millenium development goals for universalising access to primary schooling and achieving gender equity. In those countries furthest from achieving these goals meeting the demand for new teachers is a major constraint on increased access, retention and completion (Lewin and Caillods, 2001, Lewin and Stuart 2003). Gender equity ultimately requires universal enrolment; it is also likely to benefit from an increased supply of female teachers who can act as supportive role models to girls[1].

The Multi Site Teacher Education Research Project (MUSTER) has explored aspects of PRESET in five countries (Ghana, Lesotho, Malawi, Trinidad and Tobago and South Africa)[2] over four years. This paper explores the insights it has produced into how PRESET is conducted, the kind of knowledge and skills teacher education curricula seek to promote, perceptions of the effectiveness of training, and issues concerned with supply and demand and costs. The last section profiles ways in which PRESET could be improved to increase the chances of meeting the goals of Education for All (EFA).

Types of PRESET

There are many different modes of teacher education. Simplifying a complex reality there are four main pathways to becoming a qualified teacher that can be found in different parts of the developing world (Lewin 1999). These are:

- Full-time certificate/diploma/undergraduate college-based training in purpose-built institutions lasting for 1 to 4 years (with or without subsequent internships or probationary years)

- Full-time postgraduate training in higher education institutions subsequent to degree level award

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[1] Low enrolment countries, especially in SSA, generally have more men than women as primary teachers. Gender inequity in enrolments at primary is correlated with gender imbalance in the teaching force (Colclough et al 2003:70)

[2] See http://www.sussex.ac.uk/usie/muster/index.html for details. This website includes 37 discussion papers and five books arising from the project.

- In-Service PRESET systems with varied amounts of in College and in school study and practice

- Direct entry into teaching without training often with some form of subsequent certification related to experience and course attendance.

Table 1 identifies some distinguishing features of each approach in terms of duration, entry, curriculum, teaching practice, teaching methods, certification and probable costs per student.

Table 1: A Simple Typology of Pre Service Teacher Education Programmes

Description	Duration	Entry	Curriculum	Teaching Practice	Teaching Styles	Certification	Costs per student
Type 1							
College Certificate Diploma B.Ed	1-4 years full-time residential	Junior or senior secondary school leavers with or without experience	Subject upgrading, subject methods, professional studies	Block practice 4-12 weeks in one or more years; sometimes followed by internships	Lectures, group work, use of specialist facilities, mentoring	Written exams, school practice reports, projects or special studies	Relatively high
Type 2							
University Post Graduate Certificate of Education	1-2 year full-time residential after first degree	University degree, mostly under graduates without experience	Subject methods, professional studies	Block practice 2-10 weeks, sometimes followed by internships	Lectures, group work, use of specialist facilities, mentoring	Written exams, school practice reports, projects or special studies	Relatively high but for shorter duration
Type 3							
In-Service training of untrained teachers based in schools leading to initial qualification	1-5 years part-time residential and/or non-residential work shops etc	Junior or senior secondary school leavers with experience as untrained teachers	Subject upgrading, subject methods, professional studies	Teaching in schools in normal employment	Residential lectures/ workshops, self-study, distance learning, mentoring	Written exams, school practice reports, advisors/ inspectors reports	High or low depending on duration and intensity of contact with tutors
Type 4							
Direct entry	0-4 years probation	Senior secondary, College or University graduates	None, or supervised induction	Teaching in schools in normal employment	Apprentice-ship	Inspectors reports, school reports	Low

Type 1 programmes to have different characteristics depending on the level of entry and qualification. Degree level B.Ed programmes may or may not have additional Honours years dependent on completion of the basic qualification. University-based B.Eds may have different entry criteria and curricula to college-based programmes. Curricula may treat academic and subject method courses concurrently in each year or sequentially with a shifting emphasis as the course proceeds. In some systems teachers can move from Certificate, through Diploma, to Degree status (taking 6-9 years in training) with full time study interspersed with teaching in schools. Some

programmes include internships of a year or more after College based components are complete (e.g. Ghana, Tanzania).

Type 2 Post Graduate Certificate of Education courses for primary are not common in low income countries and are not usually the dominant mode. The mix of curricula requirements varies widely, especially in relation to teaching practice, content upgrading is generally assumed unnecessary since entrants are graduates, and programmes may be offered part-time and non-residentially where population density is great enough.

Type 3 arrangements have two common origins. First, they have been used to upgrade un or under-qualified teachers. Historically this may have been as a result of periodic needs to certify those recruited as untrained teachers as an alternative pathway to qualified status (QTS) alongside pre career programmes. Or they may have been introduced as minimum conditions for appointment as a teacher have risen above that of many of those teaching (as in South Africa). Second, Type 3 programmes have been developed to meet large increases in demand for teachers arising from the implementation of universal primary education policy (as in Zimbabwe, and Malawi. Where demand has greatly outstripped training capacity radical measures have sometimes been necessary to increase supply. These generally involve short induction periods (emergency training) followed by mixed mode (residential and distance) programmes where trainees are largely based in school. The Malawi Integrated In Service Training Programme (MIITEP) is an example.
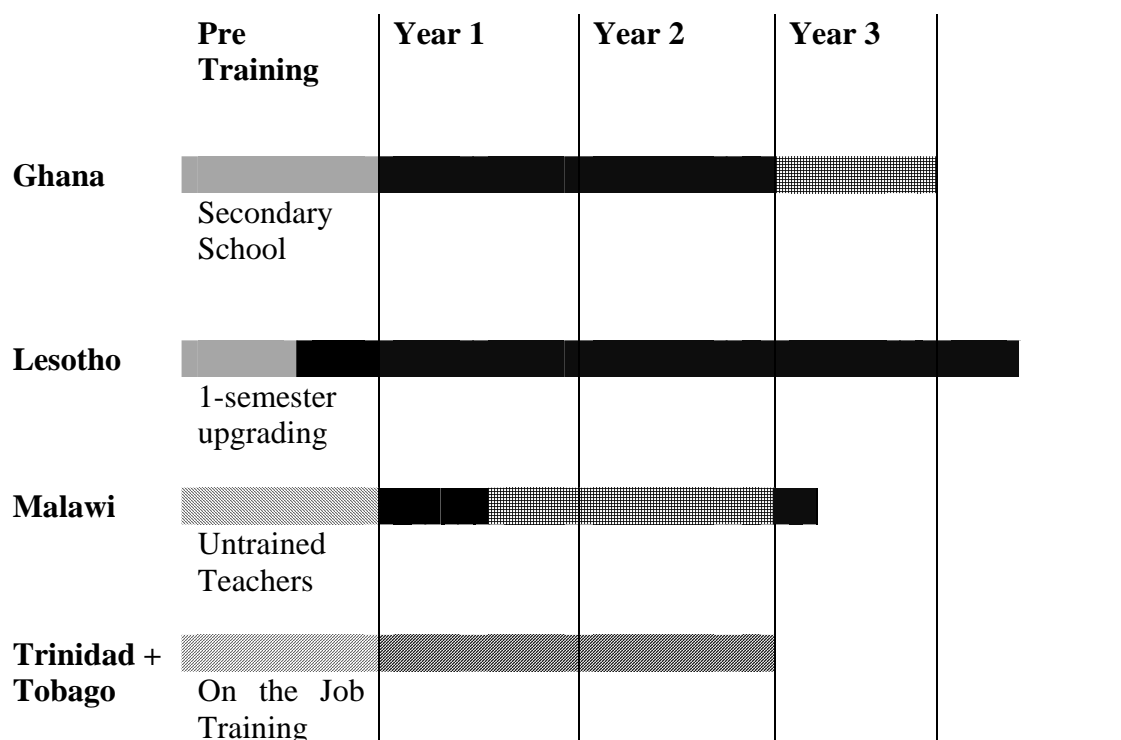
Type 4 patterns resemble apprenticeship. Untrained teachers are allowed to enter teaching by virtue of their final academic qualification. In some cases this is sufficient to teach indefinitely; in others a probationary period has to be completed successfully. Induction may be systematically supported and monitored or may depend on informal arrangements with minimal reporting. Higher levels of academic qualification may be accepted in lieu of training. Sufficiently long service may result in recognition as a qualified teacher with or without INSET.

The patterns of provision in the MUSTER countries[3] are illustrated in Figure 1 and Table 1. The detailed configuration of these different training systems is detailed in Lewin, Samuel and Sayed 2003, Akyeampong 2003, Lefoka 2003, George and Quamina-Aiyejina, 2003, and Kunje, Lewin and Stuart 2003). In brief Ghana has a 2+1 system with a conventional two year post school full time residential programme followed by one year internships in schools. The internship year was introduced from 2002 partly in order to increase training output by shortening the residential period. Conventional PRESET in Lesotho lasts more than three years full time and is College based. Malawi adopted the MIITEP mixed mode system (three months in College followed by 20 months in school with distance support and local in-service seminars, culminating in one month in College and final examinations[4]). Trinidad and Tobago operates a two year full time PRESET system preceded by an On the Job period of two years which acts to prequalify trainees for the College based programmes.
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Figure 1 Length of college and school-based training in four countries (2000)

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[3] Excluding South Africa which has many different pathways
[4] The latest form of MIITEP changes these time allocations to allow more College based time.

	Pre Training	Year 1	Year 2	Year 3
Ghana	Secondary School			
Lesotho	1-semester upgrading			
Malawi	Untrained Teachers			
Trinidad + Tobago	On the Job Training			

Key
Full Time Residential
Full Time Non Residential
School-Based Training
In School Pre Training
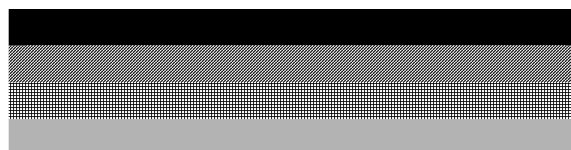
Table 2 PRESET in Four Countries

Country	Ghana	Lesotho	Malawi	Trinidad And Tobago
Entry level	5 O level credits	4 COSC credits	MSCE + 2 yrs work in schools (or JC)	5 CXC passes, On Job Training + 2yrs work
Length	2+1 years[5]	3 1/2 years	2 years	2 –5 years
Location of Training	TTC + Schools	TTC	TTC + Schools	TTC
Qualification	Certificate	Diploma	Certificate	Certificate
Awarded by	MOE	NTTC	MOE	MOE
Mode of training	Pre-service, Residential + internship	Pre-service, Residential	In-service, Mixed mode TTC and Schools	FT after 2 Years On the Job Training

Who Becomes a Teacher?

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[5] After the research started Ghana shifted to an In-In-Out system of two years in College and one year in school based training.

Questions concerned with the effectiveness of PRESET and its appropriateness to purpose have to recognise the characteristics of those who are to be trained. The backgrounds and dispositions of trainees have implications for selection, the design and realisation of teacher education curricula, and the subsequent performance of trainees. Some general themes that emerge from the MUSTER data (Coultas and Lewin 2002, Akyeampong and Stephens 2002, George, Mohammed et al 2001, Lefoka, Molise et al 2001, Samuel 2003) and which have currency in other systems (e.g. Osler 1997) are outlined below.

First, in two of the countries (Lesotho and Malawi), the median age of entrants to PRESET is relatively high (26 years). In Ghana and Trinidad and Tobago entrants averaged 21-22 years old. Thus in all these cases most entrants are young adults who have had a gap since leaving school, many have family experience and responsibilities, and large proportions have some experience of teaching. Their training needs are likely to be different to those entering straight from school. MUSTER data suggests that prior experience is rarely recognised explicitly in training curricula or in College transactions.

Second, the majority of entrants in all the countries come from family backgrounds where the cultural and academic capital they bring with them to the training experience is constrained. Many are from households with low levels of parental education and non-professional livelihoods[6]. Disproportionate numbers do have relatives who are teachers. This may be an advantage - some of the realities and possibilities of teaching should be known to such students. It might also be a disadvantage - the demonstration effects provided by family members who are teachers may present the most compelling role models whatever the college curriculum tries to promote, and these may or may not be consistent with new pedagogic aspirations.

Third, the academic level of many entrants is weak. Many have the minimal qualifications necessary for entrance and are unlikely to have secure grounding in core subjects. Low academic achievement in the medium of instruction (in all cases English) is very worrying. None of the teacher education curricula in the countries makes special provision for upgrading language fluency, or for that matter working with pupils in a multi-lingual environment where linguistic code-switching is likely to be common. In most cases simply raising minimum entry qualifications for language or other core subjects would reduce the numbers of qualified entrants and exacerbate supply problems. This suggests that more appropriate strategies may include bridging programmes (to raise the academic achievement prior to entry), and/or enrichment of college curricula to recognise needs for language and subject upgrading from low levels.

Fourth, trainees often do have well-developed images of good primary teachers which typically focus on the personal and affective aspects of the role, rather than methods of effective teaching and learning of content. Many refer to role models exemplified by successful teachers they experienced as pupils. These provide powerful aspirational images. Often these models resonate with modes of teaching which are

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[6] This is less true in South Africa, and to some extend Ghana reflecting higher levels of educational participation of the populations as a whole.

essentially transmission-based, and which stress hierarchical learning of knowledge and conventional teacher-centred classroom organisation. These images can be contrasted with those found in much recent curriculum literature which promote more reflective and child-centred (rather than knowledge-centred) methods of teaching. The images and beliefs of trainees about teaching and teachers constitute a starting point for training. Their qualities and diversity need to be appreciated and incorporated into the curriculum development process.

The qualitative data MUSTER collected suggests that often tutors have surprisingly little detailed knowledge of the characteristics of the cohorts of students they train, and also of the school environments that newly trained teachers enter. Sometimes the colleges appear to be training students for schools as tutors think they ought to be, rather than for schools as they are. This cannot be an asset in tailoring curricular experience to a realistic appraisal of antecedent conditions and learning needs. Nor can it be a basis for more responsive and reflective modes of training that recognise differences, address questions of motivation and commitment, and prepare trainees purposefully for their first appointment.

The key issues raised here are that who becomes a primary teacher is a question that needs answering carefully on the basis of evidence rather than supposition. There is evidence that those applying are not similar to those who entered primary school teaching in the past when College training systems were established. Many are several years beyond school leaving, have some experience of teaching, many are drawn from families with limited cultural capital, many have minimum academic qualifications and limited fluency in the medium of instruction, and substantial proportions see primary teaching as a career choice of last resort or as a transitionary phase in a quest for opportunities for further study. More effective PRESET depends on recognising the realities of entrants changing characteristics.

What Skills are Developed by Pre Service Training Curricula?

Pre service teacher education has a range of goals. Emphasis differs from programme to programme. Analyses of teacher education curricula (Stuart 1999, Lewin and Stuart 2003) identify common components that appear in most programmes. These are:

- Subject content: knowledge and understanding of school subjects in the primary curriculum

- Pedagogic content knowledge (often known as methods courses): teaching methods and ways of assessing learning related to specific subject areas and matched to the capabilities of learners (cf. Shulman 1987)

- Professional Studies/Education Studies: understanding of how children learn and how cognitive, affective, psychomotor, and social development take place, knowledge and skill in classroom management and pastoral care, craft knowledge of effective techniques to promote learning, acquisition of professional identities as a teacher, awareness of relevant educational history, psychology, sociology, philosophy, legislation, responsibilities etc.

- Teaching Practice/Practicum: in school and in college opportunities to practice teaching under supervision with support from experienced mentor teachers

In addition some pre service programmes include more general programmes for trainees to support personal growth, develop social confidence and leadership skills, and prepare young adults for taking on the responsibilities of being a teacher.

These are wide variations in the proportion of time allocated to these different components of PRESET in different systems. There is also a great deal difference in the composition of each component. Most systems attempt to prepare trainees to teach across the primary curriculum i.e. to be able to teach all subject areas, and to play a full role in pastoral development. Some provide for a degree of specialisation, especially for upper primary teachers. This is most often related to core subjects e.g. language, mathematics, science and in some cases also to subjects which are thought to require special expertise e.g. art and craft, music and dance.

Subject Learning

PRESET in most systems is based on the presumption that entering trainees have acquired basic competencies in core subjects. Most obviously these include language of instruction and mathematics. They may also include basic science and a second language where the mother tongue is not the language of instruction. Several SSA countries now permit teaching in the early years in the mother tongues with transition later to a national language instruction (e.g. Ghana and Malawi); others have more than one national language (as in South Africa).

An analysis of recommended contact time for different subject areas across institutions in five countries illustrates some of the variations in time allocation to different subject areas (Table 3).

In all the MUSTER countries language, maths and science form a core, though there are differences in time allocation. Language studies include both English and a local language. Time allocations appear modest given the complexities of language issues and levels of fluency in the medium of instruction[7]. Observation of language bridging programmes within the English syllabus in Lesotho revealed an old-fashioned grammar approach which did little to enhance communication (Lefoka and Ntoi 2002, Lefoka, Jobo, Moeti et al 2001). All the evidence from the African sites[8] suggests trainees need to be much more fluent and confident in the relevant language(s) of instruction.

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[7] In all cases English, except South Africa which has several media of instruction, and where lower grades are mother tongue.
[8] With some exceptions for South Africa where English is much more widely spoken.

Table 3 Proportions of Contact Time (%) suggested for Different Subject Areas

Subject Area	Ghana*	Lesotho	Malawi	T & T	South Africa (Uni. Durban Westville)**
Education	14	10.4	16.3	24.1	30
Local lang.	6	13.8	8.4	-	5
English	14 + Elec.	13.8	13.9	22.4	15
Maths	8 + Elec.	13.8	12.3	10.3	15
Science	13 + Elec.	13.8	11.2	7.8	15
Social Studies	*Cultural Stds.* 6 + Elec.	*R.E. & Dev. Stds.* 10.4	*Soc. & Gen. Stds* 8.6	*Soc. Studs.* 6.7	5
Expressive Arts	[extra-curricular]	*Art & craft, PE, music, drama* 10.4	*Music* 4 *Creative Arts* 3.6	One from *A & C, music, dance, drama* 5.9	5
Technical/ Applied Science	*Tech. Skills Voc. Skills* [Elec. only]	*Agric., Home Econ., Health Ed.* 10.4	*Agric.* 6.3 *Home Econ.* 6.1	*Agric.* 2.7	Econ. Ed. 5 ICT 15
Religious/ moral educ.		-	*R.E.* 4.4	*Family Life Educ.* 6.7	*Life Skills* 5
Physical education	4 + Elec.		*P.E.* 4.6	*Physical and Health Ed.* 4.4	
Electives	35	-	-	9	10
Study Skills	-	2.7	-	-	

* Several core courses can also be taken as electives, which form over 1/3 of the course
** Students choose between certain core subjects.

There are several key policy issues related to the nature and extent of subject teaching/ subject upgrading in PRESET.

First, how much time is needed to in PRESET for subject teaching clearly depends on the levels of achievement of those who are selected. In Malawi formally a pass in the Malawi Certificate of Education (four years of secondary schooling) is a prerequisite to become a primary teacher (Table 2). However, the number of teachers needed as a result of universalising primary schooling has been so large that many trainees have been accepted onto the Malawi Integrated In Service Teacher Education Programme with only the Junior Certificate of Education (two years of secondary schooling). It is unlikely that many of the latter have mastered basic subjects or that they are fluent in the language of instruction. In South Africa in the late 1990s surveys of College entrants into the primary training College system indicated that most entrants had minimum passes at matriculation level, and some had failed the medium of instruction. Ghana has better qualified applicants as does Lesotho. In both cases this is partly a result of restricted supply of places well below levels needed to achieve EFA targets. In Trinidad and Tobago many applicants had good passes in the Caribbean Examinations Certificate at secondary level in five or more subjects and a rising number had achieved two A level passes. This is possible partly because primary teacher demand is falling as population ceases to grow so PRESET can be more selective.

There is no general policy prescription that can be reached. However, where the academic quality of applicants is low, and the ratio of those selected to those applying is also low, it is clear that new teachers need to be brought up to levels of basic minimum competence in core subjects.

Second, upgrading content mastery at College or University teacher training level is expensive. Costs of College/University training in the MUSTER studies varied from about 18 times the cost of a primary school place to 100 times as much. If content teaching in PRESET is essentially at the level of the secondary curriculum this raises the question as to whether it might be more cost effective to undertake such improvement in basic academic subjects in bridging courses organised more like secondary schools than colleges. This has been attempted (e.g. in South Africa) with a certain amount of success but is not a common approach.

Third, language fluency is a critical aspect of PRESET. Teachers need to be fluent in the medium of instruction. They may also need to be fluent in a different home language. Many observations suggest that home languages are widely used in the lower grades of primary schools, even where this contravenes official policy. Many primary trained teachers in the SSA countries which took part in MUSTER lacked confidence in English. Surprisingly the language of instruction was not given special emphasis in PRESET programmes, entry procedures generally only stipulated a secondary certificate pass in the subject as measured by a conventional written examination (no guarantee of fluency), and no examples were found where much attention was given to pedagogic aspect of teaching in a multilingual classroom.

Fourth, the subject mastery needed by primary teachers depends on the level they teach at (especially in the longer primary systems that may have as many as eight grades), the language policy for the medium of instruction, the quality and language levels of learning materials, the attainment targets related to different subjects and grades, and the fluency of pupils. These things can be assessed. However they are not universals across systems. PRESET subject based curricula have to be tailored to the contextual realities.

Pedagogic Content Knowledge (PCK)

Pedagogic content knowledge (PCK) refers to the knowledge skills and attitudes that are needed to teach subjects effectively. They differ in important ways between subjects though there may well be overlaps between cognate fields. Gardner's theory of multiple intelligences (Gardner 1993) is one of many ways of perceiving different domains of learning and cognition. He identifies seven different types of intelligence with characteristic core operations. These are logical-mathematical, linguistic, spatial, musical, bodily-kinesthetic, interpersonal, intrapersonal intelligences. Primary school curricula are commonly organised around subjects that draw on these kinds of distinctions, though there may be no explicit recognition of such a typology.

Teacher training PCK courses have the goal of giving teachers skills in creating the conditions under which learning can take place. What is to be learned in different subjects is shaped by the knowledge and skill associated with mastery of the subject at level appropriate to the learner. Thus, methods for developing logical-mathematical

reasoning are different to those designed to improve linguistic fluency or spatial awareness. The PCK of inter personal relationships is different to the PCK needed to introduce scientific reasoning.

There are several issues that relate to PCK.

First, PCK is not only subject specific. It may also be curriculum specific in so far as what is to be learned in different primary school classrooms in different countries is defined in different ways with different emphases. Thus primary science can and is taught and assessed predominantly in some systems as a kind of nature study accumulating facts and observations with limited attempts to apply the intellectual tools of science to their analysis (Lewin and Dunne 2000). It can also be taught as an exploration of the natural world where the facts and observations are less important than the relationships between them and their value in explaining, predicting, and determining why things happen as they do (Caillods, Gottelman-Duret and Lewin 1997). Similarly mathematics can be taught as a series of drills and memorised abstract operations and algorithms, or it can be taught with central concerns for fundamental properties of number, space, and shape and related to real world applications. The PCK needed for different cognitive styles of teaching the same subject is different.

Second, PCK may best acquired through a mixture of theory and practice. Knowledge of the theory behind direct method language teaching or guided discovery science may be a precursor to it application. Learning experiences in training that move trainees between principles to practice and back again may be more powerful in translating ideas into classroom competencies than lectures which precede practice with no subsequent feedback. MUSTER research indicates that dynamic linking of College/University based learning to its application is the exception rather than the rule (see Teaching Practice below). PCK needs to be demonstrated as well as discussed. Thus lecturing about the potential of group work rather than whole class teaching, yet not adopting it as a pedagogy in the training process, may send ambiguous messages. Poor College practice, where large groups of trainees are lectured for much of the time despite relatively low staff student ratios, suggests that advocacy of new pedagogies may sometimes be more in name than in belief.

Third, PCK that is nationally grounded is widely unavailable. Training content more often than not is derived from external sources (method books published internationally, lecture notes from overseas training courses etc), and in major subject areas is not based on grounded classroom based research. This is a partial explanation as to why some key dimensions of PCK (teaching large classes, multigrade strategies for small schools, language code switching, constructivist approaches to lesson planning) are often absent from the curriculum materials reviewed by MUSTER. Much of the teaching of mathematics, science and literacy and language may have some common international pedagogic structures. But how knowledge and skill can be transmitted and acquired clearly does have contextual and cultural dimensions that suggest effective PCK should be derived from local good practice.

Fourth, the PCK that relates to assessment is important. Teachers cannot reliably assess the learning without systematic ways of measuring learning outcomes. Where there are high stakes terminal examinations (primary leaving certificates used for

selection to secondary), the form and content of these (and the classroom practice used in preparation) come to determine much learning and teaching (Dore (1997), Little (1997)). Developing expertise in assessment accounted for small proportions of time in the College curricula reviewed. College assessment practices themselves lacked rigour and sometimes validity.

Fifth, surprisingly most College programmes related to subject teaching did not include substantial elements exploring, auditing, and trying out materials derived from school text books. Specific and systematic review of school work grade by grade linked to possible teaching methods, questioning strategies, and learning tasks is rare. Much material was general and abstractly treated. Thus methods of teaching reading were often not explored in depth, analysis of text material for suitability to different learners was often absent, and critical review of learning tasks found in school learning materials linked to theories of cognitive development was infrequent. Though some tutors were aware of a range of widely promoted pedagogic styles e.g. constructivism, few seemed to practice it or apply it to lesson planning advice etc.

Professional Studies/Education Studies

PS/ES include those aspects of becoming a teacher that extend beyond subject expertise and teaching methods specific to subjects. A minimum core generally embraces introductions to educational psychology, sociology and philosophy; history of education, national legislation; health and safety; classroom management and pastoral care; discipline; and extra curricula activities. The development of appropriate professional and personal identities of teachers are part of this component as are Hargreaves' Professional Common Sense Knowledge (PCSK).

Important issues here are:

First, PS/ES core subjects (psychology, sociology and philosophy, history of education) are needed to locate children's learning in the social world and sensitise new teachers to features of cognitive and affective development (not least the stages of growth that children pass through), social aspects of learning within the classroom (affinity groups, motivational strategies) and beyond the school (home background and cultural capital, family status), underlying pedagogic assumptions about the nature of knowledge and skill (subject and more objective perspectives), and to recent educational developments (the introduction of new curricula, the origins of different types of schools). All these need coherent learning material and systematic curricula focused on what new teachers need to know and do. However, PS/ES programmes are more often an ad hoc collation of material from different sources, rather than systematic learning experiences cross related to other aspects of the training curriculum. This area probably has least consensus about what is needed and how it should be provided.

Second, PS/ES may or may not be taught by those with substantial classroom experience at the primary level. Many College lecturers are appointed on the basis of high levels of qualification at degree level of above. This can lead to large proportions being secondary trained with limited experience to primary schools. Where this is so PS/ES may become theoretical and idealised and lack some credibility with trainees

as a result. It may be ritualised (to the point that one programme now revised allocated over 60 hours to blackboard writing practice!).

Third, as with PCK PS/ES should be supported by locally written and produced learning material grounded in context. This is widely unavailable.

Fourth, PS/ES should address critically general assumptions about the role of the teacher and teachers' identities as professionals and role models. There are assumptions that there is consensus about what these should be, that the experience of training promotes professional behaviour, and that what is advocated is characteristic of the majority of teachers in the schools in which new teachers will teach. Where these assumptions do not hold, trainees may receive mixed messages and acquire identities that reflect the practice they observe. Thus reflective practice (Schon 1983) is widely advocated in recent teacher education literature (Kanu 1996). If such reflection is not a feature of the training curriculum or those who deliver it the chances of it being internalised may be slim. Similarly, good time keeping and well planned learning need demonstration in by College staff.

Teaching Practice (TP)

TP is a fairly universal feature of PRESET programmes. At one or more points during the training period trainees spend anything from a few days to several months working in schools as classroom teachers under supervision. Linked to this College programmes may include initial periods of classroom observation in advance of TP, practice micro teaching with peers, and may provide follow up seminars and discussions building on the TP experience. In some countries PRESET includes extended periods in the classroom, supported by distance programmes, school based and locally organised in-service training, and residential workshops. TP is often he most expensive part of initial training because of the costs of travel, subsistence, supervision, and assessment.

First, whether or not TP is a constructive supportive and enlightening experience depends on how it is organised and supported. Much TP in SSA occurs in schools distant from Colleges with substantial proportions of untrained teachers and poor physical resources. Though many trainees interviewed valued their experiences on TP, many also noted that they had been left largely to their own devices to accumulate teaching survival skills. Much placement in schools appeared ad hoc rather than designed to ensure that TP was undertaken in situations where there was good practice. Given the numbers involved in TP in some systems this is perhaps not surprising.

Second, data on the realities of TP highlight major conceptual weakness of the so-called 'technical rationality' model (Schon 1983, Calderhead and Shorrock 1997, Tabulawa, 1997) where theory and practice are taught and learned largely separately. The assumption is that trainees will go into the schools and apply theory. Often, however, trainees are faced with many confusing situations which they do not know how to deal with, and they have access to very limited support to help them solve problems. Learning to teach effectively requires that trainees integrate the insights and concepts derived from the public propositional knowledge available in colleges, with the contextual and situated knowledge of specific classrooms and pupils. This implies

that the theoretical and practical elements of the curriculum should be intertwined and presented in a dialogic relationship, rather than as discrete elements. Too frequently this is not so in content, timing or structure (George, Worrell et al 2002).

Third, College based supervisor visits are usually deemed essential in the absence of well trained school based mentors. Where numbers of trainees are large and distance great, a lot of tutors time may be allocated to supervision. There are real economic and logistic problems providing practical experience for large numbers of students in countries with poor infrastructure and where schools are widely scattered. Either students are crowded into schools near Colleges, as has happened in Ghana and South Africa, or they select schools which will accept them and where they can find accommodation which may be distributed across a wide geographic area, as in Lesotho and Malawi (Lefoko, Jobo et al 2001, Kunje and Chirembo (2000). If the latter, then it becomes expensive and time-consuming for tutors to visit. If the former, the experience may be largely of demonstration schools atypical of the schools in which trainees will work. Tutors visits tended to be badly timed, rushed, irregular, and mostly orientated to assessment. Sustained formative feedback geared to the student's own development does not generally occur. Well founded school based approaches which give schools responsibilities for supervision are very problematic where many co-operating teachers may themselves be un- or under-qualified and lack the skills or confidence to give appropriate advice and support.

Fourth, the timing and duration of TP carry implications for its effectiveness. Short periods give little insight into children's development or the durability of learning that may take place. They also limit opportunities for new teachers to settle in to responsibilities for a class and establish relationships with class groups. Longer periods raise difficult problems of support and mentorship.

Some Curriculum Priorities

Our analyses of teacher education curricula suggest that many suffer from deficiencies that could be a focus of development work (Stuart and Tatto, 2000).

First, national and College level curriculum documentation for teacher education is patchy and incomplete. In many cases it does not exist in a single integrated form but as a compilation of government circulars, course outlines, teaching timetables, lecturers notes, and assessment rubrics (Lefoka and Stuart, 2001). One consequence is that the core aims of teacher education programmes can be elusive, extensive, and even contradictory. There is little evidence from curriculum analysis that a consensus exists across institutions about the essential knowledge, skills and competencies that new primary teachers should acquire during pre-service training[9]. Often it is not clear what is essential and what is desirable, what is best acquired during training, and what can be learned later. Systematic approaches to curriculum development are needed.

Second, the dominant pedagogical stance in much of the material reviewed remains one where trainees are largely regarded as 'empty vessels', with little knowledge or experience of teaching, who need prescriptive advice and guidance from lecturers about how to teach, whether or not the prescriptions appear to suit the learning

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[9] With the exception of South Africa where at least national documentation does lay out core competencies and outcomes etc.

contexts in the schools where trainees work or the demands of new primary curricula (Akyeampong, Ampiah et al 2000). The teacher education curricula that have been analysed do not conspicuously engage with the images, metaphors and myths that students bring with them, with the exception of some in South Africa (Samuel 2002). Nor do they recognise that some skills and competencies may already have been acquired as a result of teaching as untrained teachers. This can only be addressed if stakeholders really do embrace different pedagogic assumptions and begin to redefine the role of tutors in relation to those they train.

Third, the academic expectations of parts of the teacher education curricula we examined were not well matched to the levels of achievement of new entrants, most of whom only achieved minimum entry level qualifications. Often the difficulties of learning in a second language appear to be under-estimated (and under-researched), and no real allowances are made in for the difficulties that trainees will experience when they themselves are far from fluent in the medium of instruction.

Fourth, distinctions are rare which clearly separate that kind of professional knowledge that can be acquired in a college environment, from that which requires an experiential base and cumulative development through practice and reflection. Curricula can present subject methods in the form of 'recipes' to be applied regardless of context, rather than as 'pedagogic content knowledge' which could be adapted flexibly to widely varying school conditions. Much of the text material that supports professional studies originates from disciplines (e.g. psychology, sociology, organisation and management theory) whose conceptual structures and exemplars are grounded in the cultures of high income countries. This can mean that some aspects of educational theory are culturally remote; the range of topics may be dislocated in time and space from a particular system; and that some areas critical to current practice (e.g. teaching very large classes, organising multi-grade teaching, coping with pupils of widely differing ability and achievement levels) are neglected or treated superficially. Gender issues were seldom highlighted in the materials we analysed (Croft 2000).

Fifth, although new pedagogic approaches were often advocated and included in aims (e.g. learner-centred lesson development, group work, role play, project assignments, reflective debate) there was little evidence of their application to the training process itself. Decisions on timetable organisation, teaching group size, the format of teaching, and the presentation of text materials often seem to militate against methods which diverge from chalk and talk. Much teaching in Colleges is delivered to passive learners in large groups and seems unlikely to encourage independent learning amongst trainees. This conspicuously does not model effectively many of the novel pedagogic practices advocated for primary school teaching, though often this could be achieved within the existing resource constraints.

Sixth, much assessment of trainees is narrow in scope, restricted in cognitive level, and paper- rather than practice-based. Where there is continuous assessment its emphasis is frequently on the reproduction of material contained in texts. The assessment of professional studies is widely problematic and it often remains unclear what is being tested apart from the recall of taught material. Professional skills are generally not assessed directly. Though there is some agreement that effective teachers need good interpersonal skills and appropriate attitudes, curricula largely

neglect these and other aspects of personal development and growth, and make no attempt to assess them.

Some Effects of Training

The MUSTER evidence presents a very complex picture on the effects of training from which it is difficult to draw general conclusions across countries. Initial teacher training can have an impact on competence and confidence; equally it can appear disappointingly ineffective given the resources it consumes.

The analytical difficulties associated with measurements and judgements of the effectiveness of training are considerable. Most studies which attempt this either assess the extent to which training programmes change trainees in relation to subject competence and/or professional skills, or they focus on the degree to which trained teachers are more effective in the classroom than those who are not trained. Linking these two perspectives - to establish whether those who are trained acquire relevant competencies, subsequently transfer these to classroom teaching, and as a result their pupils learn more effectively - is very ambitious. What appears simple in principle is very complex to research in reality[10] (Tatto, Nielson, Cummings, Kularatna, and Dharmadasa 1991).

MUSTER did attempt in many different ways to evaluate and judge the effectiveness of training. Trainees were interviewed and surveyed at different stages from entry to completion of PRESET and as Newly Qualified Teachers (NQTs) in first appointments. Tutors and principals were also interviewed. Within Colleges test scores were analysed where available and some tests administered. It proved difficult to each robust conclusions, not least because of the elusiveness of longitudinal samples and the changing characteristics of cross sectional ones, and the difficulties of comparing scores from instruments with variable reliability and validity.

Amongst the insights that emerged were the following. First, in none of the countries was data available which could indicate the predictive validity of trainee teacher selection methods. In most cases selection was based largely or solely on academic qualifications. It was only in Trinidad and Tobago that some additional information was available from the On the Job Training scheme. Few Colleges interviewed prospective applicants. There is no obvious reason academic examination scores might correlate with the non subject based parts of teacher education. Where it was possible to test this possibility there was little inter relationship, raising question marks about selection methods (Lewin, Ntoi et al 2000).

Second, attempts to discover whether trainees improved competence within subjects over the training period were inconclusive. Whatever the effects might be they did not appear to be strongly visible. Since most assessment systems in Colleges remain norm

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[10] A brief reminder of some of the problems creates the following incomplete list. School effectiveness research indicates how important school effects may be on achievement independent of individual staff attributes. Pupils' achievement generally cannot be viewed as the outcome of individual teachers' competencies since pupils may experience several teachers. Teachers' effectiveness is unlikely to be independent of who is taught under which circumstances, and out-of-school factors may vary in importance between pupils, classes, schools and subjects.

referenced, and often different tutors follow different curriculum programmes and set different assessment tasks, this may not be surprising.

Third, the problems in identifying a consensus about how to assess some attributes (e.g. of PCK and in professional studies) made it very difficult to validate judgements made by interested parties. Tutor set assessments generally had high pass rates, as did certification examinations. This seemed to sit uneasily with qualitative data which suggested dissatisfaction from some tutors and principals with NQTs competencies, and impressions of falling standards. The problems that College tutors had in developing and defending assessment tasks in PCK and PS themselves indicate deep seated difficulties in at least some of the teacher education curricula in action.

Fourth, much assessment of TP is known to be unreliable in that it is not standardised, highly context dependent, and difficult to manage consistently (George, Worrell et al 2000, Kunje 2002). Many of the assessment instruments reviewed used lists of discrete skills or 'teacher behaviours' which observers graded, usually on a 4 or 5 point scale, and then totalled to give a letter grade or percentage mark. In most cases grades were based on one short visit by a single tutor, raising doubts about validity and reliability. Ratings can vary greatly between observers, reports from school observations are not always collected and collated, and it is often unclear how TP assessments are incorporated into a final grade. None of the assessment systems studied gave insight into whether trainees were organising effective learning for pupils, or were learning from their mistakes and developing their practice. Very few trainees fail TP. Marks on TP rarely make much difference to final achievement grades despite the cost and effort put in to obtaining ratings.

MUSTER research does indicate most Newly Qualified Teachers (NQTs) do value their training - it appears to boost their confidence, raises their awareness, and provides them with a new discourse – they can talk the talk of teachers. The evidence suggests they have feel that they have gained some knowledge of curriculum content, and of a range of teaching methods. They have been alerted to aspects of psychology and child development. They have acquired a number of skills – lesson planning, record-keeping, managing children and resources in a classroom, keeping time – which enable them to fit into school routines and work with colleagues. Importantly, they have been provided with or developed their own resource materials in the form of notes, books and teaching aids, which can be used in resource-poor schools. Most principals we interviewed believe that trainees bring a slow but steady stream of new information and practice into schools.

On the other hand, the training we have explored does not appear to have had dramatic effects on NQTs' behaviour, attitudes or understandings. NQTs seem to teach rather more competently than untrained ones, but not very differently. Their attitudes towards the profession, and towards teaching itself, change only marginally through their college years, and sometimes in directions which suggest declining levels of enthusiasm and commitment (Lewin and Coultas 2001, Akyeampong and Lewin 2002). There is not much evidence that the majority of trainees have gained deep insights into teaching and learning that would enable them to continue to develop and improve their own practice, though there are obviously exceptions and the programmes researched do vary in their effects.

None of the countries studied had a formal policy for induction of NQTs. Practice varied in the different cases but most commonly it was left to the discretion of principals to orient new teachers as and how they thought fit, with varying degrees of support from class teachers. In some cases there was some input from district officials and advisors. The lack of systematic arrangements for guidance and support in the first year on the job was striking. This almost certainly contributes to the 'washout' of training, to the extent that NQTs' learning is not reinforced purposefully in their first appointments. It may also lead to problems with morale and lead to premature career changes if support to overcome problems is not forthcoming. NQTs do benefit from a first placement in schools with basic teaching resources, supportive heads and teacher colleagues, and effective school management. Our evidence, especially that from Ghana (Hedges 2000, 2002), also shows the importance of help with the social and economic aspects of becoming a teacher. For many NQTs establishing appropriate relationships with the local community, finding adequate housing, and getting paid on time are the most important problems which have to be solved before concentrating on becoming more effective teachers.

The research also highlights the possible consequences of different practices on the posting of NQTs. Thus for example, in Lesotho and South Africa NQTs apply for jobs of their choice, whereas in Ghana and Malawi trainees are posted to where they are needed. Circumstantially those with more choice over where they teach may be more committed to the positions they accept than those posted, especially if such postings are in unattractive locations as can be the case in Ghana. Attitudes of NQTs in Ghana are also strongly influenced by policy on further study which encourages trainees to think of their first qualification as a springboard to higher qualifications. After three years NQTs can qualify for upgrading, and move into full-time courses leading to degrees which may take them out of primary teaching. Large proportions of NQTs have this ambition. It is clear that the transition from pre-service programmes into work is a crucial but neglected stage of training, where new policies are needed.

Teacher Educators – A Neglected Group?

The MUSTER study shows the extent to which teacher educators as a group have been overlooked, and suggests some of the reasons why most colleges are not playing a more creative and innovative role in their education systems (Stuart 2002). Some of the key issues that emerged are summarised below.

Firstly, there are no policies for recruitment and career development for teacher educators in the MUSTER countries. School teachers become teacher trainers in a variety of haphazard ways: in Ghana and Malawi they are 'posted' in ways that imply this is just a further step up the civil service ladder which brings benefits in terms of salary. Elsewhere they apply for the job, sometimes for reasons of status and pay rather than interest and commitment. Increasingly conditions for appointment as a teacher trainer require degree or post-graduate degree status. This makes it difficult for experienced primary teachers to qualify with the result that substantial numbers of tutors have been secondary-trained.

Secondly, few of the tutors we have interviewed and few of the colleges seem to have clear models of teacher training to guide their work (Stuart, Kunje and Lefoka, 2000). Often trainees are treated and taught like secondary students. Many tutors seem to

have a 'banking' view of training which simply assumes that trainees need to acquire subject knowledge and standard methods of teaching which can then be applied fairly uniformly in schools. In discussing the kind of teacher they want to produce, tutors seem to share many of the same images and beliefs about the 'good primary teacher' encountered among the entering students, and often emphasise affective rather than cognitive aspects, with rhetoric about personal characteristics and professional commitment. Where tutors espouse theories of student-centred learning, few put these into practice in their colleges, or directly help their students do so in schools. Though many individuals are dedicated and hard-working we found widespread frustration and low morale amongst substantial numbers of trainers, for reasons connected with lack of policy on teacher education, poor remuneration, uncertain promotion prospects, and poor working conditions.

A final point is how difficult it can be for tutors' thinking to transcend the systems in which they are embedded. The intellectual horizons of many college staff seem out of date, narrowly cast, and parochially constrained, for reasons of history and resources. There has been much borrowing of ideas from high income countries, but there is little evidence of critique and adaptive development of key constructs and theories of professional learning. Without the stimulus of further professional development, and an innovative working environment, it is difficult for tutors to pioneer more effective teaching and learning strategies, and to create models of teacher education appropriate to local environments.

Supply, Demand, and Costs

The size of the challenge for PRESET presented by EFA varies. Most of the countries in SSA furthest from EFA goals have school age population growth rates between 2.5% and 4% - the former requires the number of teachers to double every 30 years, the latter every 18 years. Attrition rates amongst primary teachers in SSA can be between 5% and 10% annually, and are highest in those countries most seriously affected by HIV/AIDS. These teachers need replacement along with those who retire, elect to take other jobs, or leave teaching for family or other reasons.

14 countries in SSA have net enrolment rates below 60%, 10 below 80%, and 7 below 95% (UNESCO 2003). For them to reach NER 100% many additional teachers will be needed unless there are dramatic efficiency gains from reduced repetition. Moreover, pupil teacher ratios exceed 60:1 in several of low enrolment countries, and in those that have seen rapid increases in enrolments related to EFA programmes. To reduce these ratios requires pro rata increases in the numbers of teachers. Untrained teachers can make up as much as 40% of the cadre of primary teachers in some countries in Sub Saharan Africa (SSA). Upgrading these teachers creates additional demand.

A comprehensive analysis of teacher supply and demand is beyond the scope of this paper. It is clear however that PRESET systems are likely to need to substantially increase output of new teachers if targets are to be met. Estimates from MUSTER for three countries are illustrative (Lewin 2002, Akyeampong, Furlong and Lewin 2000, Lewin, Ntoi et al 2000, Kunje and Lewin 2000). In Ghana if Free Compulsory Universal Basic Education (FCUBE) is to achieve its objectives the total additional number of teachers needed will rise dramatically to between three and four times

current output. In Lesotho the numbers needed represent as much as five times the historic output of the conventional PRESET system. In Malawi, which has adopted a mixed mode in-service training system split between Colleges and schools in order to increase output, numbers would need to double. Projections of teacher demand in South Africa are complex. So also is the restructuring of providers (Sayed, 2002, Parker 2003, Steele 2003). Nevertheless recent estimates suggest both a considerable shortfall in output related to need, and a crisis in supply of willing and qualified applicants (Crouch 2003).

A major challenge for policy on PRESET is therefore quantitative. On the lower margin enrolment expansion of existing capacity may be sufficient to meet demand. Above a threshold determined by the distance that exists between current conditions and satisfying EFA targets, more fundamental questions are raised about whether new modes of training are needed that can increase output at affordable costs without unacceptable losses in quality.

PRESET systems need to provide enough newly qualified teachers entering primary schools to meet targets for universal enrolment at reasonable pupil teacher ratios (usually defined as being between 35:1 and 45:1). The demand for PRESET is most simply determined by the number of pupils enrolled and the number needed to reach universal enrolment, existing and target pupil teacher ratios, and rates of attrition amongst the teacher workforce. Over time the rate of growth of the population of school age children will influence the number of new teachers needed each year. So also will ambitions to ensure all teachers are qualified (by training the unqualified or replacing them).

Broadly relevant parameters for PRESET planning are indicated in Table 4 for Ghana, Lesotho, Malawi, and Trinidad and Tobago. Ghana and Malawi have relatively large populations and teacher education systems compared to Lesotho and Trinidad and Tobago. The latter is a middle-income country whereas the others are much poorer in terms of GNP per capita. Demand for new teachers is high in three of the countries, but for different reasons. In Ghana the GER at primary is still well below 100% and more teachers are needed to achieve universal enrolment. Ghana also has a high rate of growth in the school age cohort, and teacher output must grow at least at this rate to maintain the current pupil-teacher ratio, and more, if untrained teachers are to be trained (Mereku 2000, Akyeampong, Furlong and Lewin 2001). In Malawi demand arises mostly from the rapid growth in primary numbers in the mid 1990s, the need to reduce very high pupil-teacher ratios and proportions of untrained teachers, and the very high rates of teacher attrition associated in part with HIV/AIDS (Kunje and Lewin 2000).. When the MIITEP system was fully enrolled[11] the ratio of teachers in post to newly trained teachers was low (6.2:1) indicating a high level of effort in training.

Lesotho is different. It has high enrolment rates and low cohort growth[12]. Its primary pupil-teacher ratio is high, but not excessive, and about a quarter of teachers are untrained. The main factor creating demand for new teachers appears to be the very low output of the training system (Lewin, Ntoi et al 2000) . The ratio of 65:1 teachers

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[11] For about two years no new cohorts were recruited (2000-2002) as a result of funding difficulties.
[12] Partly due to migration to South Africa which may change

in post to training output is insufficient to meet the need to maintain the pupil-teacher ratio at current levels, and replace teachers who leave. Trinidad and Tobago also has a negative rate of growth in the school age cohort[13]. In this case pupil-teacher ratios and teacher attrition are low, and the output ratio of the teacher education system is sufficient to maintain enrolment rates (Lewin, Keller et al 2002).

Table 4 Teacher Education System Characteristics[14]

	Ghana	Lesotho	Malawi	Trinidad and Tobago
Population	18.7 million	2 million	10.1 million	1.3 ,million
GNP per Capita	US$390	US$570	US$200	US$4250
Claimed Gross Enrolment Rate at Primary	79%	108%	130%	99%
Rate of Growth of Primary Age Cohort	4% possible falling to 3%	Declining 0 to –1.5%	+2% but may be falling	Declining –2% to –3%
Primary Enrolments	2,290,000	370,000	2,800,000	171,000
Primary Teachers	63700	8100	43400	7311
Pupil Teacher Ratio in Primary	36:1	45:1	65:1	23:1
% Untrained teachers	13.5%	23%	Up to 24000? – 40%-50%?	23%
Primary Teacher Attrition Rate	5%	5%-10%	10%+	3%
Number of Primary Teacher Education Colleges	38 (includes training for junior secondary)	1 (includes some secondary training)	6	2
Enrolments	20,400 Fulltime	Total about 900 including secondary level and part time students == about 650 FTE	About 2500 per cohort, 3 cohorts per year. Programme periodically suspended	791 Full time
Lecturers	1044	43	About 150	60
Student Staff Ratio in College	19.5:1 Target 15:1	1:14 in primary division	Between 11:1 and 21:1	13:1
Annual Output of New Primary Teachers	6000	100-150	7000 when fully operating	400
Ratio of Total Number of Primary Teachers to Annual Output of Training	10.6	About 65:1	6.2	18.2

Lesotho and Malawi allocate the greatest amounts of GNP and over 30% of their national budgets to their education systems. Ghana also allocates a high proportion of public expenditure to education and its college system absorbs 6% of the education budget, a level exceeded by very few countries. Total costs in Malawi are a similar proportion of the education budget which has been heavily externally supported. Lesotho allocates less, and Trinidad and Tobago the least (partly because teacher

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[13] In this case due to outward migration which seems likely to persist
[14] Data from 2000-2001

educators are paid secondary school teachers' salaries, unlike in the other countries where lecturers are paid much higher salaries than teachers). Cost per trained teacher as a multiple of GNP per capita are lowest in Trinidad and Tobago, and in Malawi where trainees are working in schools within MIITEP. Ghana has higher relative costs[15]. Those in Lesotho stand out as the highest. Malawi and Lesotho have the highest costs of training relative to the recurrent cost of a primary school child. Table 2 shows this.

Table 5: Profile of Training Costs

	Ghana	Lesotho	Malawi	Trinidad and Tobago
% GDP on Education	3.8%	6%	5%	4.5%
% Public Expenditure on Education	35%	34%	30%	13%
% Education budget on Teacher Education	6%	2.5%	3%-6% (College costs – total costs)	1.8%
Recurrent Public Cost per Teacher Education Student per Year	US$700	US$1500 or, say, US$2500 including stipends	MIITEP system	US$5500
Recurrent Public Cost of a Trained Teacher	US$2100	US$4500-US$7500	US$560	US$11100
Recurrent Public Cost per Trained Teacher as a multiple of GNP per capita	5.4 Full time 3 years	7.9 – 13.1 Full time 3 years	2.8 One fifth time over two years in College; fourth fifths in school	2.6 Full time 2 years
Recurrent Public Cost per Trained Teacher as % of the Annual Cost of a Primary School Place	45:1	60:1 –100:1	70:1	18:1

Several issues emerge. First, in Ghana, Lesotho, and Malawi the challenge posed by national targets for enrolment and pupil-teacher ratios is immense. None of these systems can produce enough new teachers to meet projected demand within existing capacity. Moreover the costs of current modes of training suggest that simple expansion of existing capacity is financially unsustainable. Malawi has adopted a mixed-mode approach to training which is relatively low cost and high volume. The other countries retain lengthy conventional full-time pre-career training with limited output.

Second, in three of the countries the size of the school age group appears to be shrinking or static. In Lesotho the potential benefit from this of reduced demand for new teachers is compromised by the small output and high costs of training. It is

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[15] These costs relate to the 3 year full time training which predates the new 2+1 system. Projections suggest the 2+1 system may not be much cheaper but it will have higher output (Akyeampong, Furlong and Lewin (2000).

likely to be negated by the increased demand which is arising from the introduction of Free Primary Education. In Trinidad and Tobago demand is small and is not growing as the school population declines. Here there is a window of opportunity to invest in quality improvement and extending the role of colleges into professional support pre- and post- training. In South Africa the number of primary age children appears to be falling[16], possibly for reasons linked to HIV/AIDS, which is also an important factor in some of the other countries. HIV/AIDS is effecting enrolments and also reducing the working lifetime of teachers in ways which are complex to predict.

Third, Ghana has the problem of an under-supply of the number of teachers necessary to maintain current enrolment rates. This is compounded by the fact that it is the country furthest away from achieving a GER of over 100%, and this creates an additional demand of magnitude. The current system, even with a modified 'In-In-Out' system, does not have the capacity to meet demand.

Fourth, the composition of costs and patterns of resource utilisation (teaching staff, space, allowances and stipends etc) indicate that there is often the scope for increases in internal efficiency. There are opportunities to make better use of staff and physical resources, especially if management and accountability systems monitor costs with efficiency in mind, which is rarely the case. There appear few incentives to optimise the utilisation of staff. Non-salary recurrent costs of colleges are often greater than salaries, except in Trinidad and Tobago where the colleges are not residential. This may also be an area where efficiency could be improved. Student stipends are the major component of recurrent salary costs, and these allowances are often paid at levels comparable with those of teachers' salaries.

Fifth, though the detail is complex, some simple conclusions are clear. If the national and international targets for universal enrolment and reasonable levels of pupil-teacher ratio are to be met, alternatives to full-time, pre-career training over two or three years have to be considered. Moreover, heavily front loaded investment in training, may become less attractive in countries where teachers working lifetimes appear to be shortening. MIITEP in Malawi uses short college based periods linked to school based training supported by local workshops and distance materials. It has strengths and weaknesses (e.g. Kunje & Chirembo 2000, Stuart & Kunje 2000, Kunje 2002). This approach can produce an output of new teachers that more closely matches demand. However, it reduces time in college, anticipates effective support whilst trainees are working in schools, and implies substantial development costs if modified versions of this kind of approach are to be considered for different national contexts.

Improving PRESET – Options and Possibilities

There is no 'one-size-fits-all' solution to the problems of teacher education MUSTER has explored. New ideas for methods and structures have to recognise the realities of differing needs, circumstances and resources. Suggested improvements have to be formulated within the assumptions, processes and expectations of the wider national education systems. The MUSTER research identifies a range of reforms that might

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[16] Enrolment and census data showed suggest this, but the trend may not continue.

offer improved PRESET at affordable costs (Lewin and Stuart 2003). These are summarised below.

Improved Selection and Preparation

Selection into PRESET based only on academic performance in school leaving examinations may not have high predictive validity. Interviewing candidates may improve selection but is logistically demanding and unless carefully managed may not add much to selection decisions. Wider ranging selection tests might help if these can be developed in technically sound ways. An alternative is to make more use of pre enrolment assessments of suitability through evaluating periods teaching as untrained teachers where is common for entrants to have worked in schools before entering training. Pre-training teaching experience as an untrained teacher is common but is usually ad hoc and unsupported. Trinidad and Tobago has institutionalised an On-the-Job Training (OJT) Scheme (George, Fournillier and Brown, 2000). The development of OJT-like schemes has several attractions – trainees can be selected partly on the basis of their performance over time, rather than initial academic qualification; trainees contribute to reducing teacher shortages through the work they do; managed OJT schemes could greatly enrich the skills and competencies of those entering training.

PRESET Curriculum Development

Teacher education curricula suffer in varying degrees from fragmentation (e.g. lack of integration of subject-based and professional studies, uneven and sometimes contradictory pedagogic assumptions), disjunction with learners' characteristics (non-recognition of prior experience, little emphasis on problems of large class teaching, multi-grade schools, teaching with few learning materials, language issues), and inappropriate assessment schemes (ritualised assessment of teaching practice, recall based written examinations). In most systems curricula are not developed dynamically or incrementally (they remain the same for long periods), neither are they suffused with contributions from teacher educators at college level. Written materials for trainers and for trainees are in short supply and often derived from a variety of sources which lack coherence or consistency in approach. Revitalised teacher education systems could transform this situation through systematic and cumulative approaches to developing and enriching the curriculum and its learning materials base at college level, and through coherent national level programmes to generate more relevant core materials within an agreed framework of desired learning outcomes.

All the college systems MUSTER has researched have difficulties in striking an appropriate balance between up-grading content skills in subjects (and in the medium of instruction), and developing PCK and general professional skills. Most attempt all these simultaneously with more or less successful integration. Where the entry level characteristics of trainees suggest that subject-based knowledge and skill, or language fluency, are inadequate, the radical choice may be to develop pre-course bridging programmes focused specifically on these. This could be in the training institution. But it could also be undertaken in nominated secondary schools given this task. The latter is likely to be more cost-effective. If initial training programmes really could assume students' mastery of basic content and language skills, then they would be

free to focus sharply on professional and pedagogic competencies, and might be shorter and more cost effective as a result.

Changed Working Practices and Orientation of Providers

Working practices in teacher education differ widely. However, MUSTER data indicates that there is considerable scope to improve quality through more effective management focused on trainees' learning experience. Training institutions need to be much more demand-led, in terms of being responsive to the needs of trainees, rather than to the preferences, priorities and familiar practices of those who work in them. In many cases lecturing to large groups of up to 100 is favoured, though it is not necessary where student-staff ratios are below 20:1. This reflects choices in timetabling that restrict teaching staff contact time with trainees to levels that are low by international standards. Small group work, and structured independent and peer learning is unusual, but potentially very valuable. It is often advocated but not practised. Few colleges make much use of experienced teachers drawn in to inform discussions about pedagogy, class management, and curriculum realities. Even fewer college staff spend periods in schools in a professional development role which could help inform their college-based teaching.

Two more radical suggestions emerge from MUSTER data. First, none of the colleges in the research have strong and free-flowing professional links with schools. They play little role in curriculum development and implementation at school or any other level, and seldom provide central resources for teachers' INSET and CPD. With a different mandate, managerial commitment, and appropriate resources they could become developmental institutions with substantial outreach to schools. Their staff could acquire responsibilities to improve learning and teaching at school level directly as well as through the training of teachers (Tatto 1997).

Secondly, college lecturers could be appointed on different types of contracts than those which prevail. Most college staff are appointed from the ranks of practising teachers in mid-career. For many this becomes their occupation through until retirement. Employment practices usually favour those with higher levels of academic qualifications and this can have the effect of excluding those with extensive primary experience in favour of those who have taught at secondary level and who are more likely to have degree level qualifications. The staffing of a developmental college might not look like this. It could be staffed by experienced and effective teachers, given appropriate professional development, and seconded from primary schools for, say, five year periods. Permanent college staff could be required to work in schools periodically to give them relevant and recent experience and ensure that their training activities were closely grounded in the realities of schools and learning problems. With imagination groups of staff could be periodically tasked with development activities related to curriculum implementation, improving training effectiveness and supporting the induction of NQTs. In the long term, most countries will probably aim to have an all-graduate teaching profession. As part of the preparation for this, colleges could be more closely affiliated to local universities. This will help provide more chances for staff development, and open access to wider frames of reference.

Teaching Practice

All the MUSTER training systems include periods of teaching practice in schools. This can have high costs associated with supervision by college tutors. However much of this supervision is directed to summative assessment rather than formative appraisal. Trainees' experience of teaching practice suggests that it can be very valuable, but that for many learning is not coherently managed, and supportive supervision is not available consistently. There is little clear thinking on what learning outcomes can and cannot be achieved through existing patterns of teaching practice, most of which have not undergone any fundamental reappraisal since they were first introduced. There is considerable scope for improvement, including integrating teaching practice much more closely and extensively with college work, re-evaluating the merits of college-based micro-teaching and other methods of acquiring professional skill which can be more resource-efficient than largely unsupported teaching practice, and arranging teaching practice placement and support more effectively. Teaching to learn may need more emphasis than learning to teach in relation to knowledge and skill associated with effective practice.

Infrastructure and Learning Materials

Most colleges in MUSTER countries have poor physical facilities and infrastructure, few learning materials, and under-utilised space (sometimes because of its quality) as a result of periods of neglect. They are nevertheless frequently the only post-secondary institution in an area with a concentration of educational professionals, and thus the only source of advice and support to practising teachers (alongside any teacher centres that may exist). Impoverished facilities compromise the effectiveness with which training can be conducted and have a depressing effect on morale. Relatively small investments could transform at least some of these institutions into much more vibrant, accessible and attractive professional development nodes with outreach capabilities. Non-salary budgets are widely under-funded to the extent that basic services fail (water, sanitation, electricity), learning materials are unavailable in quantity, and crisis management preoccupies senior staff to the exclusion of any focus on improving the quality of the training experience.

Learning material for trainee teachers and NQTs located within national contexts in MUSTER countries is scarce. Yet print material is relatively cheap, durable and can be immensely helpful to those starting teaching in school environments where good practice may not be common and informed advice is difficult to come by. Colleges, which could and should be a major source of such material, often do not produce text material in volume and are unable to ensure trainees leave with a portfolio of supporting manuals, enrichment materials etc. This problem is more readily resolvable than textbook supply to all children since the numbers are much smaller. The radical proposition may not sound radical – flood the trainee teachers with quality support materials. It is radical in the sense that it has yet to be prioritised or realised in the systems we have researched (although a start was made with the Student Handbooks in Malawi).

Teacher Educator Staff Development

The college lecturers are a neglected resource. Their main needs are: better personnel management, deployment and induction, and a clearer career structure linked to staff development and promotion opportunities, which would attract, motivate and retain suitable tutors. These things are achievable without excessive costs, but require different approaches to staff development which could improve morale, create incentives and rewards for improved performance, and attract new talent into the profession. They may require changes in appointment and promotion procedures.

Changes in Approaches to Learners

Teacher educators may need to develop or rediscover culturally appropriate visions of what is an effective teacher. They should provide opportunities for growth and development of personal attributes that can help trainees become confident and competent in their diverse professional roles. Student teachers need to be treated as adult learners and helped to study in more independent and proactive ways, so they experience themselves new ways of learning and teaching; they need to learn to reflect in ways that enable them to improve the quality and effectiveness of their teaching. To the extent these approaches are culturally unfamiliar, they raise much broader questions about the relationships between children and adults, role models and aspirants, and professionals and those for whom they provide services. Such issues need to be opened up and debated so that culturally appropriate ways are found to develop curricula and pedagogy consistent with the demands of Education for All.

Many of the curriculum materials we analysed seemed premised on the idea that if students are given enough knowledge and skills at college these can be applied unproblematically, like recipes, in any classrooms. A more useful model is one that sees teaching as interactive problem-solving, requiring a thoughtful and reflective approach to one's own practice. Thus learning to teach means acquiring not only knowledge and skills, but also a situated understanding of pupils and how they learn, along with repertoires of skills and strategies for dealing with unique and ever-changing circumstances. The aim of the training should be the development of professional reasoning ability, rather than the acquisition of pre-defined behaviours (Akyeampong 2003). Such a model requires an epistemological shift towards a view of knowledge that recognises the value of teachers' personal, experiential and craft knowledge as well as the public propositional knowledge offered in college.

Reprofiling the Location, Length and Structure of PRESET

Location

There are three common options for the institutional location of PRESET. These are colleges of education, university education departments, or in schools. College-based systems for primary training are common in many low income countries and reflect how training systems have developed. They are often associated with post-secondary opportunities for particular groups who have a political stake in the continuity of the institutions. College systems seem likely to persist unless or until political decisions are made to adopt another arrangement. South Africa has taken the step of making all initial training university-based or affiliated with universities. However, the

circumstances under which this has come about are unique (Parker 2003, Steele 2003, Sayed 2003).

College-based systems may have advantages in terms of local location linked to communities or clusters of schools, a focus on a single profession, a role in pre-service and in-service education, and usually lower costs than tertiary level institutions. Our research suggests that these potential advantages are not necessarily converted into realities. They also have to be balanced against the risks of parochialism associated with the local (especially when colleges are rural, and physically and intellectually isolated), the limits of expertise and insight associated with training institutions divorced from research, and the high costs that may be associated with small size.

University-based training offers the prospect of inputs from staff with high levels of disciplinary expertise, enrichment through research relevant to learning and teaching, multi-disciplinary perspectives, and access to superior teaching resources. On the other hand critics suggest that university-based training may be a long way removed from the issues of practice in primary schools, high levels of academic knowledge in disciplines are largely irrelevant, and tutors' career advancement is likely to depend more on research recognition than training competence.

School-based training has become increasingly common in rich country systems. There are many good pedagogic and professional development reasons why training located in the work environment is potentially attractive, including its direct links with practical problems, advice from successful teachers, and socialisation into professional norms and standards. However, the basic assumptions of school-based training – namely that there are sufficient schools to offer appropriate training environments and enough qualified teachers to act as professional mentors to trainees – are often difficult to meet in low income countries. Most schools may not be appropriately resourced as training sites, lacking both qualified teachers and enough teaching and learning materials. Nor do teachers necessarily see their role as including training new teachers and they are unlikely themselves to have any training as trainers. Under these circumstances, school-based training may simply become a form of 'sitting by Thabo', with new teachers simply copying what is done around them whether or not this is good practice. The MIITEP experience does suggest that with enough support, some elements of school-based training are possible even in very resource-poor circumstances. But expectations of what can be achieved have to be realistic: serious investment has to be made in print-based handbooks and manuals for trainees and for trainers; field-based peripatetic resource persons and selected members of school staff have to be trained in supervision and support.

School-based training is generally associated with various forms of distance education, as it is in MIITEP. Distance education methods are attractive because they allow teachers to be trained while on the job, which saves the costs of replacement. It should also reduce the direct costs if a proportion of the training is self-instructional and based on print or other low-cost media. However, the problems of distance learning are well known (Sayed, Heystek & Smit 2002, Reddy 2002, Perraton 2000). For primary teachers in rural Africa there are particular problems. The materials have to be at the right language level for second language learners and cover a wide range of topics. Book-based learning may be particularly difficult where oral

communication is culturally favoured (Croft 2002). Motivation is difficult to maintain in isolate circumstances. Aural media such as radio programmes or audio-cassettes may be attractive if the technology is available. Video is much more expensive, and unlikely to be as cost-effective. The research on MIITEP indicates the many difficulties that exist in realising a technically coherent model in practice where infrastructure is weak (Kunje, Stuart and Lewin 2003). Many planned support activities simply do not happen and such systems have to be engineered with characteristics that are realistically sustainable.

Though new information technologies based on computers and the internet appear to offer many potential benefits, these are yet to be demonstrated in practice in mass systems of teacher education in Africa. They have high initial costs, very substantial on-costs, carry risks of rapid obsolescence of hardware and software, and have great diseconomies for small-scale utilisation (Lewin 2000). Regular face-to-face contact with peers and a tutor are likely to remain essential components of training, albeit supplemented by other methods as and when these become available at sustainable and attractive levels of cost. This situation may change over the next decade. Until it does it will remain the case that print material offers far more durable opportunities for support for training at a distance, though of course it lacks the interactivity that ICTs could potentially provide[17]. If infrastructure improves to the point where connectivity at sustainable cost can be assured, then ICTs clearly have a complementary role to play in training. This is likely to be most often the case on site in college locations.

Length

Conventional teacher education systems are heavily front-loaded in terms of the investment of resources i.e. most if not all the resources are committed to pre-career full-time residential training. This has several disadvantages e.g. it leaves few resources for investment in managed induction and subsequent continuing professional development, a proportion of those who enter training may qualify but seek and find other jobs, and some kinds of professional skill and competence may be best acquired after experience on the job rather than before. Where demand is high long periods of pre-career training will be expensive and slow to produce large numbers of new teachers.

In principle an initial qualification is precisely that, and not a terminal stage in a career ladder. The balance between the time and money spent on initial training and subsequent INSET and CPD is a critical policy question. If most investment is front-loaded (i.e. at the beginning of a teachers' career), if teacher attrition is high and rising, if teachers' career lifetimes as primary teachers are shortening[18], and if

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[17] Interactivity is only of value where it suits the purpose (i.e. it provides a pathway to desired learning outcomes), and is available at affordable price levels. Interactivity that requires responses from people can quickly become very expensive in staff time, or simply inoperable when the volume of messages requiring considered response overloads the capacity to respond.

[18] There are several possible reasons why this may be the case. HIV/AIDS has increased attrition rates in the countries worst affected (Bennell et al 2002). Primary school teaching is regarded as a stepping stone to higher qualification by substantial numbers of entrants to PRESET in some countries. Migration may be significant where adjacent countries are more attractive to qualified professionals. Where pay and conditions of service for primary school teachers are poor other occupations may be more attractive.

substantial effort is to be directed to changing school practice through direct support for whole school development, then it may make sense to shorten periods of initial training in favour of more training inputs for NQTs as their careers develop. Amongst other things this has the benefit of directing more investment of training resources towards those on the job and likely to remain so.

Alternatives which provide shorter periods of introductory training, followed by periods of work as assistant teachers interspersed with subsequent training inputs building on the base acquired from school experience, could be both more efficient (those who are trained are on the job, therefore costs are lower), and more effective (theory and practice are placed in dialogue, college-based work has to respond to real problems and skill needs). It is therefore possible to conceive of training which is 'drip fed' over time rather than provided in a single long period pre-career. There are many possibilities that include short intensive (e.g. 3 months) residential training, vacation workshops, complementary distance learning support, local cluster groups to support trainee teachers on the job etc. If this were linked to incremental progression up the career structure – e.g. trainee teacher, assistant teacher, junior teacher, fully qualified teacher – it could provide incentives to stay with the programme and accumulate skills and competence.

Alternative Modes of PRESET

A wide range of possibilities can be imagined, and seven of these are identified in These are displayed in Figure 2 and can be summarised as:

> Mode 1   Conventional full-time college-based training preceded by no experience, and followed by no structured support
>
> Mode 2   Conventional full-time college-based training preceded by pre-course training and followed by mentored induction into schools
>
> Mode 3   Teaching experience as an unsupported untrained teacher followed by conventional full-time college-based training
>
> Mode 4   Mentored pre-training experience on the job, followed by conventional full-time college-based training and mentored induction into schools
>
> Mode 5   Mentored pre-training experience followed by a short period of conventional college-based training followed by school placement with INSET support
>
> Mode 6   Mentored pre-training experience followed by alternating short periods of conventional full-time college-based training followed by mentored induction into schools
>
> Mode 7   Mentored pre-training experience followed by wholly school-based training on the job supported by distance learning and followed by mentored distance support in school

Figure 2 PRESET Training Modes

Mode	Year 1	Year 2	Year 3	Year 4	Year 5
1					
	No teaching experience	Full-time training	Full-time training	Full-time training	No structured support
2					
	Pre course Training in school	Full-time training	Full-time training	Post course mentoring	
3					
	Unsupported Teaching	Full-time training	Full-time training	Full-time training	No structured support
4					
	Mentored Teaching	Full-time training	Full-time training	Post course mentoring	
5					
	Mentored Teaching	Full-time training	In school + INSET	In school + INSET	
6					
	Mentored Teaching	Full-time + in school	Full-time + in school	Full-time + in school	Post course mentor support
7					
	Mentored Teaching	School INSET+distance	School INSET + distance	Mentor+distance support	Mentor+distance

There are many other possible mixes that carry different resource and cost implications. We can note four key observations. First, extended full-time institutional training is only one of many options. Second, what comes before and what comes after core periods of training may be just as important as what occurs in the core, though rarely is it systematically considered as part of the training process. Thirdly, there is no necessity for core periods of training to be continuous or front-loaded in terms of costs or training inputs. Fourth, mixed-mode methods, which make use of distance education and learning while working, are clearly options which have potential cost advantages The resource implications of different approaches can only be identified when their component parts are specified in particular country contexts.

Restructuring PRESET invites attention to three phases - pre training, in training, and post training. Pre training options include unsupported teaching as an assistant teacher; bridging programmes to upgrade subject mastery; orientation courses and short emergency teacher survival training; well founded On-the-Job apprenticeship training using distance learning and mentor support.

In training options include: 1-3 year residential College/University based course with short periods of TP; combinations of in College and in school mentored internship (e.g. In-In-Out, or In-Out-In); mixed-mode course with intensive residential study periods and school experience; school-based course with distance learning, vacation courses, and local support.

Post training options include short school- or district-based induction courses; probationary years or locally-supervised internships with support; regular recurrent district- or region-based INSET designed for NQTs (preferably linked to whole school development programmes, continuing professional development (CPD) leading to further qualifications, or up grading of those begun during PRESET.

In Conclusion

Reform of PRESET is both feasible and necessary. There is enough evidence to suggest that, with exceptions, conventional PRESET as practised in the MUSTER countries has limited effectiveness, high costs, and modes of delivery which are based on assumptions which have been slow to adjust to the demands of EFA programmes and the realities of changing qualities of entrants. If EFA goals are to be met many more teachers will need training, a sharper focus is needed on what knowledge and skills are essential for NQTs, and realistic consideration has to be given to how to match supply and demand at sustainable levels of cost. PRESET can be improved in many ways that which build on existing capabilities and infrastructure along the lines suggested in this paper.

- More strategic use of untrained teachers supported by orientation programmes and school-based apprenticeship-like relationships to pre qualify for formal PRESET. The experience of working as a teaching assistant would discourage some, reinforce the aspirations of others, and allow the unsuitable to be selected out more effectively.

- Reshaping the location, length and structure of PRESET to allow training to be acquired with less front loading, and more incremental sequential development over time. Investment in skill and competency would be cumulative and could take place through a variety of routes (full-time, part-time, day release, residential, distance etc) and in a variety of locations (in school, at teacher centres, in colleges and universities). The important differences would be that this would not be a single-shot qualification process but a continuous pathway leading to higher levels of competence. Those who received more training would be those who continued to teach; training would be more demand led and available when most likely to have an impact, and training would mostly take place whilst teachers were in post [19].

- Developing PRESET curriculum to reflect changed conditions and needs. As argued above this would include more diagnosis of what trainees bring with them and clear understandings of the desired outcomes of training in terms of knowledge and skill; greater integration of the training experience across domains, more linking of theory into practice, sharp focus on the benefits of different modes of organising teaching practice, improved assessment, and much greater supply of teacher education learning material developed locally.

- Giving systematic consideration to first appointments and the induction of NQTs. Trainees are likely to take on the characteristics of the institutions they work in. If these are radically different from those for which they have been prepared the effects of training may be swamped and washed out of the practice of NQTs. First appointments are likely to shape long term practice and to the extent possible should be where at least some good practice occurs. NQTs need support, encouragement and advice. PRESET institutions should see this as part of their responsibilities.

- Developing a staircase of training beyond PRESET linked to career progression. This could embed the training process more firmly in the school and the learning needs of its pupils (especially if PRESET is seen as the atart of this process not a terminal qualification). This would need to be articulated with post of responsibility and promotion to different grades based on experience, qualification level and competence. It would make it possible for more training to take place in closer proximity to professional practice both in space and time. It might allow possibilities for schools (and colleges) to acquire some of the attributes of learning institutions. It could obviate the need for special induction and support of NQTs if a seamless web of Continuing Professional Development began to develop which could include the induction of NQTs.

- Teacher educators at all levels, whether school or college based, need to have induction and continuing professional development. Those who lead them also need managerial competencies. This could ensure that they are aware of recent developments, can judge whether these should be incorporated into training, have

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[19] E.g some current training content in PRESET e.g. curriculum development, school management, some cognitive psychology and sociology may be best assimilated by those with several years of experience as qualified classroom teachers, rather than in initial training.

perspectives that run beyond their direct experience, and have a rich range of material to draw on to support and stimulate trainee teachers.

- PRESET institutions might then move away from being mono-technic institutions focused purely on residential pre career long course qualifications, towards becoming dynamically integrated nodes of innovation, professional development activity, and advisory support. They could be challenged locally and nationally to make a real difference to learning in schools and the development of the potential of the populations they serve.

All the points in this paper presuppose that PRESET is conducted within a coherent policy framework that has some stability over time, which is founded on analysis of supply and demand, costs, and linked to judgements of effective and ineffective practice. The centrality of teacher supply and quality issues for universalising primary education is self evident. Too often these have yet to be prioritised in ways that reflect this reality.

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