

Chapter 8 Implications for practice: challenges, constraints and policies

The problem posed in Chapter 1 was:

- *How do policy and practice interact in Malawian primary education, in the case of mathematics teaching?*

The answer has been a complex story. It has involved descriptions of practice, the multitude of constraints on that practice, the policies that had been created as part of an attempt to implement changes, and some indications of the extent to which the policies were having, or not having, an effect on practice. The story has attempted to suggest some of the reasons for the considerable lack of effect of many policies. All this takes place in an environment beset with many challenges.

In this chapter I offer a fresh way to look at the situation. Most Malawian policies appear to be lists of what the administration would like to have changed: head-on attempts to address the formidable challenges by decree. Instead I wish to suggest that policies *and their implementation* could be used as attempts to *reduce the constraints* on good practice and in this way start to meet challenges. This derives in part from the following statements, taken from the summary of a DFID literature review of 'In Service for Teacher Development in Sub-Saharan Africa'.

1. Teachers' actions are not ones of whim or fancy. They are constrained by the classroom resources, social as well as material, of the teacher's circumstances. Whilst variation is possible, it is within circumscribed limits. The material and social features of a teacher's environment exert selection pressures as to which varieties of action will continue to be sustainable in the classroom.

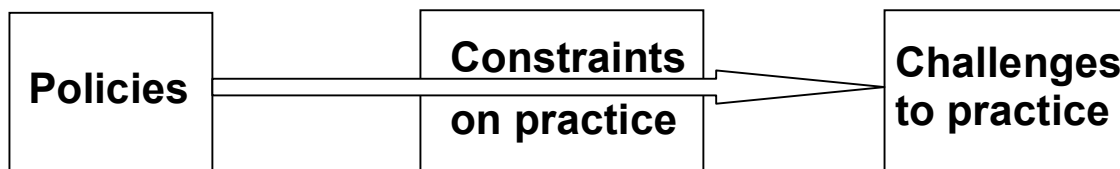
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6. The circumstances which exert selection pressures for the teaching strategies that are workable, and against those which are not, can be modified through managerial intervention.

(Monk, 2001, p 9)

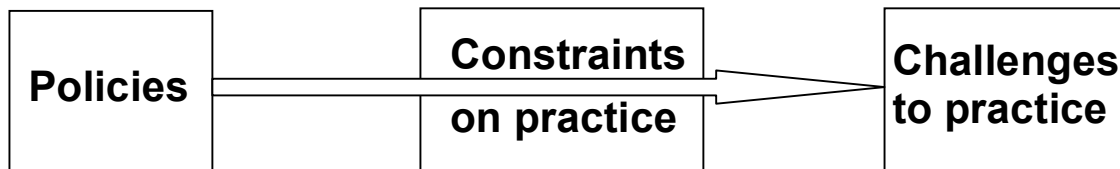
Taken together, these points offer the suggestion that the actions of teachers (such as attempting to implement a desired policy) are greatly constrained by the circumstances in which they are teaching. These constraints may cover many areas of their teaching, such as physical, intellectual, emotional, social and political. However 'managerial intervention' (read 'policy') is capable of enabling teachers to overcome constraints.

The simple theoretical model I have in mind is this. The diagram suggests that policies can offer ways through the constraints.



Policies are designed to help the system to meet its challenges. But the constraints of the present situation can easily overwhelm a teacher in a situation like Malawi. The challenges define the goals they wish to achieve, but the constraints are barriers to meeting those challenges.

In this view, *the purpose of policies is to help find ways to overcome some of the constraints, so that, over time, challenges may be met.*



I will examine this diagram from right to left. I will first look at the most pressing **challenges for practice** that the education system was trying to meet in 2005 ([section 8.1](#)). Then in [sections 8.2](#) to 8.6 I will examine the **constraints** on practice that impact on the pupils, teachers and policy makers (including curriculum developers and textbooks writers). In [sections 8.7](#) and 8.8 I will examine some of the ways **policies** could be conceived to help plan a way out of this situation. [Section 8.9](#) focuses entirely on what I have learned about mathematics education in this setting, with wider implications.

Why consider constraints?

Policies in Malawi and many other countries operate in a very constrained environment. The constraints provide a multitude of reasonable excuses for the lack of progress towards implementing policies that have been stated and written into official documents. To ignore the effects of these constraining forces in a study of policy would be to pretend they do not exist. Many of the constraints discussed below are inadequately considered in the formulation of educational policy in Malawi. It is very likely that similar situations apply elsewhere.

After section 8.1 summarising the challenges to practice in 2005, the following three sections describe the constraints on three types of curriculum, with a focus on mathematics where appropriate. These are:

- what is learned by pupils (the *learned* curriculum) – in section 8.2
- what is taught by teachers (the *taught* curriculum), – in section 8.3, and
- what is designed by the curriculum developers and textbook authors (the *intended* curriculum) – in section 8.4.

This enables me to examine separately three parts of what is, of course, an inter-related system.

Below I spell out those constraints I believe are

- (8.2) restricting the ability of *pupils* to learn as they would hope,
- (8.3) limiting the ability of *teachers* to teach as they wish and
- (8.4) preventing *curriculum developers* from creating the kind of curriculum that they desire.
- (8.5) restricting *teacher educators*, and
- (8.6) limiting *policy-makers* and the implementation of their policies.

Sections 8.7 and 8.8 suggest how policies could help make the difference. I have reserved the implications for mathematics education, in Malawi and possible elsewhere, for the final section, 8.9.

Strengths of the current situation

There are several practices that work, and work very well. These are valuable assets, and strengths on which the system can build.

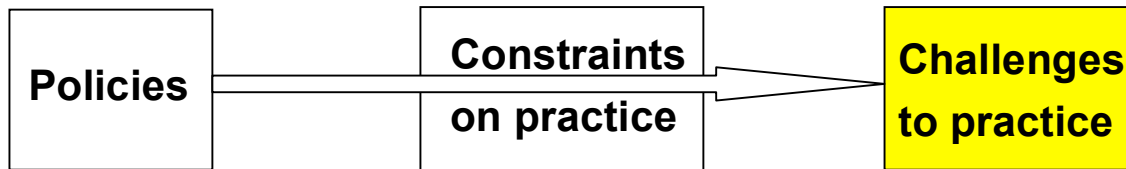
- Children are generally well-behaved and are keen to learn. In general, education is highly valued in the community.

- In general, teachers are hard-working and dedicated, striving to do their best in very difficult conditions.
- Despite the variety of home languages, often in the same classroom, all children appear to learn at least the national language, and many also learn some English.
- Those teachers *who understand what they are teaching* are able to overcome considerable constraints on their teaching.

It is important to keep these good things in mind. It is easy to be overwhelmed by the big problems, and fail to celebrate the everyday successes. By using policy to limit some of the constraints many of the natural assets of the education system can be freed to meet some of the challenges.

8.1 Challenges to practice

Chapter 7 concluded with a summary of the many challenges facing the Malawian education system in 2005, arising from analysis of the research results. This section takes a broader view of the challenges this over-stressed system was trying to meet in 2005, and makes some attempt to explain why they remained challenges.



There was undoubtedly some progress being made towards some of these, but on the whole they seemed far out of the reach of many teachers, educators and administrators.

8.1.1 Poverty alleviation

This arises directly from the research variable *The purpose of primary education*. This variable has been derived from questions arising from the literature ([sections 2.2.1](#) and [2.2.2](#)); the results were presented in [section 6.3](#) and discussed in [section 7.2](#).

The stated major goal of the education system in Malawi was ‘poverty alleviation’. There are many documents describing plans for the national development of Malawi. In all of them, education is mentioned, though the relationship between education and development is not at all clear.

The Policy and Investment Framework (MoESC, 2001) is very vague about how education can contribute to poverty alleviation. The major principles of the PIF focus on addressing the ‘main constraints facing the system’, but these do not directly relate to poverty alleviation, only to remedying system inefficiencies.

[Section 3.2.1](#) reviewed literature that challenged the common assumption that education can reduce poverty. That section demonstrated that formal academic education often has the opposite effect. As currently practised, education favours the wealthy, and does not alleviate the poverty of the rural poor. The actual goal of pupils’ involvement in education is to do well enough each year to pass the examinations and move into secondary school, where the process is repeated. The type of education offered is based on memory, with little understanding and very little chance for application to the real problems of Malawian rural life. My research has verified this claim for the area of primary mathematics. A more practical type of education might make more impact on poverty alleviation, but it does not happen at present.

My research has indicated that Malawian primary teachers whole-heartedly support the use of practical examples from rural life to teach mathematics. The 1991 course that was still in use in 2005 had as its major goal ‘the use of mathematics in everyday life’. However the 1991 course made little attempt to provide these examples; as a consequence they did not make their way into the textbooks or teachers’ guides, and as a further consequence, they were not found in the examinations or classrooms.

This is a world-wide phenomenon, as the ‘western’ abstract view of mathematics for schools has become a dominant influence in all nations. (See my discussion of this in [section 3.1.3](#)). In 2005 it would have been helpful if Malawian textbook writers had been able to break free from this dominating pattern in order to genuinely create a mathematics education in schools that assists with poverty alleviation. I have made many positive suggestions about how this might be done in [section 8.9](#).

8.1.2 Social equity

This arises directly from the research variables *Meeting the needs of all* and *Gender*. These variables have been derived from questions arising from the literature ([sections 2.2.3](#) to 9); the results were presented in [sections 6.2](#) and 6.4 and discussed in [sections 7.1](#) and 7.3.

Social stratification

It would seem possible that the examination and selection system is performing the function of stratifying society, although this is something that the government does not wish to happen.

... the PIF stresses the need for ensuring that Malawi's education system does not intensify existing inequalities across social groups and regions.
(MoESC, 2001, Executive summary)

In [section 2.2.6](#) I showed that the rural poor are the first to drop out of school in Malawi. Only those families with relative affluence can afford to allow a child to stay at school for as many years as it takes to finish primary education – in 2003, an average of 9.65 years for the eight-year course (EMIS, 2004) – and then try to complete secondary education, paying secondary school fees in a private school if needed.

In a majority (developing) nation education is a scarce commodity. The competition to use education to win ‘the race for status, power, occupation and income’ is invariably won by those with more wealth, as the poor drop out. Education actually acts to *increase*, not decrease, the socio-economic differences in a poor nation. In other words, at the present time education is actively reinforcing the inequalities in socio-economic status already present in the society.

This is not to argue that education cannot support the national goal of poverty alleviation. However at present it seems to be largely serving the needs of the more affluent urban families, rather than the rural poor who comprise the majority of the nation. Improving the efficiency of the education system will only improve the efficiency with which it creates further inequality in society. So how could education be targeted to better assist the survival of the rural poor, by alleviating poverty?

The Malawi Poverty Reduction Strategy Paper (Government of Malawi, 2002) comprises four pillars that are believed necessary to achieve the goal of poverty alleviation. The first is ‘Sustainable Pro-poor Growth’, through which poor families are enabled to ‘generate their own incomes’. The main areas are agriculture and diversification into small businesses of many kinds. The kinds of skills that achieve such goals come from schooling – but not the present kind of schooling aimed primarily at a secondary selection examination conducted in the foreign language of English. Agriculture and small businesses can address at least literacy and numeracy, presumably in a Malawian language. This is the major aim of the first four years of primary education.

However at present a large number of pupils from poor rural families are unable to complete even Standard 4. Reasons for dropping out are many, but largely relate to their poverty. At present the education system and the Government ignore them educationally once they have dropped out of the system. So there are a very large number of teenagers and young adults who were once somewhat literate and numerate in Chichewa, but are no longer at school. These people are the *best* educated of the rural poor. They urgently require help to make use of the knowledge they have already so that they can eventually generate their own incomes. Growing from being barely literate and numerate to running a small business is not going to happen without a lot of educational and other support, such as financial. There are important components of literacy and numeracy related to even simple trading that make the difference between success and failure.

My interviewee Francis Moto believed that English was being used to divide the nation socially. Those who speak English well do well in school and go on to earn more than the majority, but those who do not learn adequate English cannot achieve in school and consequently fall even further behind. The use of English in Standards 5 to 8 and in the external examination is a political decision imposed on the education system that decreases social equity, as the better English-speaking children of the rich get more education and hence reap its benefits. Such a system is characteristic of most majority world education systems. See my discussion in [section 2.2.8](#).

There is a clash between an education that truly meets the needs of the rural majority, and an education aimed at secondary selection. Somehow, any country in this position (including Malawi) must create an education system to achieve *both*, without reducing social equity.

The disempowerment of girls

The literature and my research have combined to present a picture of a society with a strongly gendered tradition, where girls and women are treated as an under-class. In [section 2.2.3](#) I presented literature about this gender bias, with an emphasis on its effect on schooling for girls. [Sections 2.2.4](#) and 2.2.5 presented more research enumerating the pervasiveness across schools and society, and the kinds of interventions that have been made in the past.

Girls suffer from lack of opportunity in all parts of life, and education is certainly one of them; my own limited research results (questionnaires, observations and interviews) support this. But what is the Ministry of Education doing to reverse this trend? Their policies are deliberately even-handed, aiming to support girls and boys equally. However there appears to be a case for action to counter the great discrimination already taking place against girls, at least in education.

In early 2008, Grames Chirwa wrote to me about a pilot project about harassment of girls in schools.

A pilot project has now been established in Machinga and Balaka districts in 2007 which is being co-ordinated by Eve Chinguo and it is called Safe Schools Project which is a sensitization project on harassment of girls in the schools. It holds sensitization workshops with teachers on harassment of girls and I hear that it will be rolled out in all the districts in Malawi very soon.
(Chirwa (2008), private correspondence)

8.1.3 Quality of learning

This arises directly from three research variables [Meeting the needs of all](#) (discussed in [section 7.3](#)), [Language of instruction](#) ([7.4](#)) and [Teaching style](#) ([7.8](#)). These variables have been derived from questions arising from the literature ([sections 2.2.6](#) to 2.2.11, [2.3.4](#) and [2.4.1](#) to 3); the results were presented in [sections 6.4](#), 6.5 and 6.9.

For those in schools, the value of their education is measured by its quality. But what is quality of learning? It is here that the tension between the dual goals of the present education

system: poverty alleviation (for the majority) and selection for secondary education (for the minority) make definitions difficult.

The UNESCO (2005) report on EFA explores quality of education in terms of ‘pupil characteristics’, ‘enabling inputs’ and ‘outcomes’ (p. 36). Educational quality is often measured by means of a limited number of ‘outcomes’, such as literacy and numeracy. Their ‘systems’ approach takes the position that when we look at why such outcome measures might be low, we should look at the ‘pupil characteristics’ and the ‘enabling inputs’. I will deal with these under the heading of ‘Constraints on learners’ in [section 8.2](#) and ‘Constraints on teachers’ in [section 8.3](#) and other constraints in later sections. The challenge for Malawi is to find ways to overcome these constraints on learning and on teaching.

8.1.4 Recruiting teachers

This arises directly from the research variable *Meeting the needs of all*. This variable has been derived from questions arising from the literature ([sections 2.2.6](#), 2.2.7 and 2.2.9); the results were presented in [section 6.4](#) and discussed in [section 7.3](#).

The greatest single ‘enabling input’ lacking in many majority world countries (including Malawi) appears to be the critical shortage of teachers. The PIF policies show a clear recognition of this problem. Firstly PIF recognizes the need to improve teachers’ pay levels to attract more people to the profession.

- 3.3.5 For both the basic and secondary school levels, the level of teacher recruitment, and the quantity required to sustain the system demands that a strategic plan for teacher recruitment is formulated. Such a plan should also take account of the need to train teachers who are more flexible with regard to what they can and should teach. ... Given that both the recruitment and retention of teachers for all levels of the education system has much to do with their economic and social status, a review of the remuneration package for teachers and other educational staff is a matter deserving urgent attention.
- 3.7.3 Another inefficiency in resource allocation is the skewed distribution across inputs. Firstly, teachers' emoluments have always accounted for the largest proportion of the education recurrent expenditure. ... Having said this it needs to be appreciated that salaries of teaching staff at all levels of the system are extremely low and constitute the main reason for their generally low morale.
- 4.1.6 #6 Primary school teacher recruitment and deployment will acknowledge the scale of teacher attrition due to a variety of factors including the HIV/AIDS pandemic.

Secondly PIF isolates the under-supply of women, particularly in rural areas.

- 4.2.3 (a) #1 The MoES&C shall put in place appropriate measures aimed at addressing the gender imbalance in teacher supply, provision and deployment.
- 4.2.3 (b) #1 The MoES&C will introduce relevant incentives to ensure that more women are recruited as primary school teachers.
- 4.1.3 #5 The MoES&C shall devise and implement strategies whereby teachers (including female teachers) are encouraged to teach in remote and difficult areas. The proportion of rural schools meeting the 60:1 pupil ratio will increase from 15% in 1997 to 25% in 2002.

Teacher deployment

However in Malawi there is not so much a shortage of total numbers but a problem with deployment – where they teach; very many rural schools are desperately short of teachers. [Section 2.2.7](#) explored some of the literature on class size, teacher shortage and teacher deployment. The large class sizes in Malawi arise not only from a teacher shortage, and massive numbers of pupils (at least before they start dropping out of the system), but from imbalances in the deployment of teachers. That section outlined the rural/urban imbalance, particularly from the point of view of female teachers.

A school-based imbalance in deployment became very clear from my data and is also addressed by Mulkeen (2005) using case studies in Lesotho, Malawi, Mozambique, Uganda and Tanzania in 2005. This is the system whereby teachers are allocated one per Standard level, no matter how many or how few are the numbers at that level. In line with the

prevailing gender bias, men usually make sure they have the upper levels, where the numbers are much smaller. Grames Chirwa commented on this in 2008 as follows:

In Malawi, sometimes educated women choose teaching compared to office work because they say that it gives them a lot of time to care for their children at home. Lower classes teaching and learning hours are less and the female teachers therefore knock off early, at least by 11:30 a.m. ... the women are also seen somehow to be better in handling the smaller children in the lower classes than male teachers... So when females teach in the lower classes where there are small children, school leadership has confidence that the children will be properly cared for.

The other reason has to do with gender stereotyping in Malawian tradition where it is believed traditionally that women cannot perform well like men ...

(Chirwa (2008), Private correspondence)

Mulkeen (2005) suggests that multigrade teaching of two or more levels in the one room would be a more efficient way to use the space and the qualified male teachers; there is much printed and other support for multigrade teaching in parts of South Africa (see for example, Vincent, 1999). Male Malawian teachers could argue against this, wanting smaller classes as better preparation for the selection examinations. Here we see yet another way in which the selection examination works against the interest of the majority of pupils in the lower level classes.

An ADEA report (Marope & Sack, 2001) tells of a radical approach in the Cameroon (p. 32, paragraph 4.42). They changed the teaching methods to include large amounts of group work and hired teacher aides (paid at a lower salary) to help out the teacher. This might be useful in Malawi, but would not encourage more teachers, particularly females, to live in rural areas. Mulkeen (2005, p. 13-15) suggests three possible strategies to overcome the imbalance: building decent houses specifically set aside for teachers near rural schools; sending women off to rural schools in pairs, to support each other; and making career promotion contingent on serving some years in a rural school. In early 2008, volunteer teachers are permitted to teach in schools; they are neither paid nor recognized by the government, but may be paid by the community. Chirwa says “there are cases where the whole school is run by volunteer teachers” (Private correspondence, 2008).

8.1.5 Professional learning for mathematics teaching

This arises directly from three research variables [*Purpose and relevance of mathematics education*](#), [*Teachers' content knowledge of mathematics*](#) and [*Teaching style*](#). These variables have been derived from questions arising from the literature ([sections 2.2.13, 2.3.1](#) to 3, [3.1](#) and [3.2](#)); the results were presented in [sections 6.6, 6.7](#) and [6.9](#) and discussed in [sections 7.5, 7.6](#) and [7.8](#).

This section concentrates on the challenge of moving both the present and future teaching force towards knowing more useful and relevant mathematics, and being able to teach it well to their pupils.

In Malawi inservice (INSET) and preservice education have been confused, because untrained teachers have taught for many years before their ‘initial training’. However for the sake of generality I have separated the two categories of teacher professional learning.

INSET

Belenky et al (1986) have classified ‘ways of knowing’ by the way the learner relates to knowledge. After the surface level of ‘*silence*’ (no knowledge) comes the shallow level of ‘*received knowledge*’, the level of rote memory and memorised abstractions having no connections to anything else, including real-life. The next level down is ‘*subjective knowing*’ where the knowledge is personalised and related to daily life, still possibly with no understanding or transfer; teachers at this level have competence and confidence but do not recognise connections or reasons. The second deepest level is called ‘*procedural knowing*’ to which I will equate good textbook learning, with secure awareness of procedures and some

awareness of links between them; the majority of teachers in Australian schools are at this level. At the deepest level comes '*connected knowing*' or '*constructed*' learning, in which relationships between concepts are explored through investigative problem solving and deep study of the mathematics in real life situations; some Australian teachers are moving into this level, and it has been an aim of professional development for several decades.

In a former section (6.9.5) I described my evidence that many Malawian teachers operate and teach at the 'instrumental understanding' level; there is little or no concept that mathematics is an inter-related set of ideas, that it all 'makes logical sense' or awareness of how it relates to real life. In Belenky et al's terms, most of the Malawian teachers I observed and interviewed appear to be at this 'received knowledge' level, while their pupils are struggling to get below 'silence'. Most teachers seem to operate at a level of barely competent performance only, and have no idea that there is more to understand.

To move to a greater depth requires that teachers become learners, solving problems in groups that challenge them to work at deeper levels of knowledge. Some will be able to move only to being more aware of applications, but through suitable activities and good support, some will achieve 'relational understanding' or 'connected learning'. This might be done in specialised expert-led workshops (such as are run by MTTA), but to make it happen in the classroom will require teachers to support one another by working in teams in their own schools.

Croft (2002c, p. 6) lists these four beliefs as the basis for the successful Malawi School Support System Program (MSSSP).

- 'Activities originating from teachers themselves probably have greater impact on teachers than those organised on their behalf' (MSSSP, undated, about 1998 :i)
- A culture of collaboration needs to be encouraged among teachers within the zone as well as their own schools
- Partnerships between neighbouring schools can 'import' and 'export' good practice
- Teachers can be encouraged to reflect on and research their own practice, as well as learning from others, and perhaps share their insights from this.

There is no doubt that continuing support for teachers is necessary in order that they can continue to grow in their professionalism and meet the continuing challenges of education.

There is substantial research on effective ways of supporting teachers; see for example, Association for the Development of Education in Africa, 2003a, b; Beeby, 1966; Crossley and Guthrie, 1987; Dembele, 2003; Dembele & Miaro-II, 2003; DFID, 2001; Diallo et al, 2001; IEQ/Uganda, 1999a; Diphofa, 1997; Joyce & Showers, 1995; Kunje & Chimombo, 1999; Schubert & Prouty-Harris, 2003; Stuart & Kunje, 2000. Taken as a whole, it strongly supports the collaborative-team model, where teachers meet at a local level on a regular basis for mutual support, sharing of what works and group problem solving about those aspects that need attention.

Below is my summary of the research on best practice in education for teacher development. It is based on reading and summarizing the papers listed above.

- Let teachers work in groups to take charge of their own development, at their own chosen rate.
- Let the teachers meet regularly in teams to build their own confidence in content knowledge and to discuss methods that work.
- Encourage teachers to work collaboratively with the community to overcome some of the constraints on quality education.
- Where 'expert' INSET is given on pedagogy, it should mimic the kinds of methods that might be then followed by the teachers.

- Where possible, work with whole schools to reduce or remove the constraints on teaching practice, and to create opportunities for better practice.

Malawi has hundreds of Teacher Development Centres (TDCs) designed for this kind of purpose. For a variety of reasons they were in 2005 not as effective as they should be. The Malawi Teacher Training Activity (MTTA) program has elements of the recommended best practice, but local school networking on a continuing basis is not yet built into that program. This direction deserves support. The potential for good practice in teacher development exists, but it requires political will, money and organisation.

Pre-service

I was informed that during MIITEP the courses lectured about generalised teaching methods, such as pupil-centred activity approaches, etc. The observations reported in this research have shown that both class sizes and teachers' confidence with the subject matter of mathematics make such activity methods inappropriate at present – see chapter 6. Pre-service education could be modeled on the 'best practice' for inservice education using the principles above.

8.1.6 Assessment reform, and 'Continuous Assessment'

This arises directly from the research variable [Assessment](#). This variable has been derived from questions arising from the literature ([sections 2.2.12](#) and [2.2.14](#)); the results were presented in [section 6.8](#) and discussed in [section 7.7](#).

The challenge of reforming assessment

It is clear that assessment drives the teaching and learning at present. This is likely to continue, as the Standard 8 examination is part of the essential framework of the education system that holds it together. At present Malawi cannot do without the selection examination, as there are still very few secondary schools. So a fresh approach to improving assessment is needed, one that recognises both the importance of the selection examination and the tradition of testing.

An important innovation would improve the role of assessment from 'ranking and repetition' to 'improving the quality of learning and teaching'. The first task is to remove the practice of ranking, since it is based on highly dubious statistical practices, and fails totally as a motivator of most pupils. Then, as teachers' understanding of mathematics and its applications improves, so will the ability of teachers to write better tests that better demonstrate pupils' understandings and not just rote recall. As this happens, better analysis of the tests they give will enable the teachers to achieve two things: give better feedback to pupils about how to improve, and be better informed about what still needs to be taught and to whom. In addition to tests, teachers might eventually gather information about a pupil's understanding using interviews, well-chosen oral questions, projects and close observation of pupils in class. All of this requires a vast amount of professional training and support.

Many of the proposals in the above paragraph are new for Malawi. If they were to be attempted, they may succeed within the next decade, since they build on strengths already existing.

However in 2007 Malawi embraced *Continuous Assessment*. This was first trialled in 2003, and that trial was described in [section 2.2.14](#). The views of policy developers on Continuous Assessment were illustrated in [section 7.7.3](#). In general these can be described as 'optimistic'. This section describes the views of teachers, from my own research and from the 2007 research of a Malawian curriculum developer.

In 2005 there were many ideas about what Continuous Assessment meant. The most common, 'continuous testing', would be a disastrous outcome should it be the way teachers choose to interpret the new idea. Malawi does not need more of the normal testing, with its emphasis on ranking and no link to improving learning or teaching.

An intermediate approach was put to me by one of my observed teachers – Alippo, the principal of the Domasi Demonstration School, who should be one of the best informed teachers in the system because of her close association with MIE and Domasi College. She thought CA meant testing at least once per month (in Standards 6 to 8) to provide a school-based component of a final assessment at the end of Standard 8. Alippo had this to say:

Continuous assessment is very good. ... You find that a pupil in the classroom she does very well, but at the end of the day, fails. ... But if we are doing continuous assessment what we have seen that, no, this one should have been passed.

I asked her what kinds of assessment was involved in ‘continuous assessment’.

They say after finishing a topic you assess, you give them a test, a sort of revision after giving them your report. It is a series of tests after each topic. After a month we have to test, so that at the end of the term we have three month's test results, so you can see how your pupils are doing.

The intentions of the PCAR developers for Continuous Assessment are described in [section 7.7.3](#). If its details follow the model from Ntcheu, then it will take the form of regular (monthly?) interviews with each child to monitor progress – and this will have to be in every subject. It will use locally available materials for interviews as well as learning. It will have a new purpose, to provide feedback to teacher and child, and will lead to remediation or enrichment when required. There will be a great need for record-keeping, something with which teachers have had little experience. There is no doubt that teachers will need adequate resources, constant support and excellent training.

The changes envisaged also encompass new learning styles for pupils. Because the teacher will be often occupied in one-on-one interviews, the learning will take place in groups, often with no teacher assistance, using ‘job-cards’ in the hands of group leaders.

There is also a new role for teachers, emphasising one-on-one interviews, individual assistance, managing resources and group work in the classroom. Malawi's teachers are used to running classes from the front, so this change of role will be a considerable challenge. Meeting the learning needs of a very diverse group of pupils is a very challenging part of teaching, even when classes are under 40 and facilities and traditions are well-established. How it will play out in Malawi, with its tradition of promotion or repetition of years, will provide a significant challenge. Indeed pupils will have to learn to take more responsibility for their own learning; this might be a good thing, but will not be easy to achieve in the short run.

If the continuous assessment ‘individual-interview’ model is adopted, suitable interview questions should be prepared for teachers for all levels. This should be managed by someone who thoroughly understands both numeracy and mathematics, and who also understands the best questions to ask pupils in order to determine their levels of development. Similarly suitable ‘job cards’ (good quality group-learning activities for the rest of the class) should be prepared for all levels by an expert team. This task is presently beyond the capacities of most teachers, both in terms of paper, expertise and time.

Research in Standard 1, in 2007

I wrote the section above in 2006. In 2007 Continuous Assessment was formally introduced, and my research assistant, Grames Chirwa, was able to conduct research in several Standard 1 classes near Domasi. This took place as part of his Honours degree from the University of the Witwatersrand. Mr Chirwa was an author of the PCAR Expressive Arts curriculum for Standard 1.

Having observed many lessons in Standard 1 Expressive Arts he wrote:

There is a strong mismatch between the methods of assessment stipulated in the curriculum documents and the assessment practices of the teachers. ... Continuous assessment is not being done in Expressive

Arts as it was planned in the curriculum documents.
(Chirwa, 2007)

He observed little support for teachers from head teachers or parents, support that was ‘expected’ as part of the curriculum innovation. It seems that the ability of teachers to manage this innovation is not being monitored and evaluated, as compared with the plans in the curriculum documents.

In his descriptions of the lessons there was no evidence of any of the features that made the trial at Standard 3 level so successful: differentiated learning, pupils learning independently or in groups, regular one-on-one interviews of students and careful monitoring of the progress of pupils through a series of steps (e.g. the ‘rainbow charts’ used in Ntcheu). One of the essential ingredients, the ‘job cards’, was totally missing, making it impossible for the teachers to find any time to observe and record the extent of pupils’ success with the learning tasks they had been given.

Although the teachers knew they were supposed to assess each pupil on each activity, and not give separate class tests, they were unable to develop the tools to do this.

Teachers do not have tools for continuous assessment, such as standardised rubrics and checklists which they can use as criterion against which they can measure the learners’ performance in the lesson activities.

... the teachers have problems in integrating continuous assessment within the process of teaching the learners. The teachers’ failure to do continuous assessment is partly due to time constraints for them to combine teaching and assessment at the same time. The pupil to teacher ratio is also too big to enable the teachers to assess each and every learner in the course of teaching.

(Chirwa, 2007)

In addition Chirwa reported that class sizes were all over 50, there were inadequate learning resources including textbooks, teachers had trouble understanding the Teacher’s Guide, and teachers have only one teaching method (‘question and answer’) that they can use successfully.

Comments

I have spent much time and space on Continuous Assessment because it represents a very large challenge for Malawi. Continuous Assessment as trialed in 2003 requires a totally different view of both assessment and teaching, since assessment is largely by interview and teaching is by remote control via ‘job cards’. There is a totally different understanding of the meanings of assessment reports for parents, as ‘Rainbow charts’ replace percentages, ranks etc. These changes will take many years to achieve and a vast amount of professional support and training. There is evidence that, despite its apparent successes in the trial, those teachers were especially motivated and dedicated, as a result of which they were over-worked and felt under extraordinary pressure to succeed, a condition that is unlikely if the practice ‘goes to scale’ in the near future.

The potential for disaster is considerable, and careful planning and massive support are essential. Chirwa’s research has shown that, at this stage, this support does not exist. Indeed, the total package (i.e. continuous assessment, differentiated teaching, group work with adequate resources and support) has been ‘watered-down’ to the extent that few of its anticipated benefits are likely to occur.

As I will argue later ([section 8.7.2](#)) successful innovations *can* be spread – slowly – and will eventually catch on across the wider system, but ‘going to scale’ by edict is a recipe for disaster, particularly for a change as complex and fundamental as this one.

There is an additional challenge lurking behind the scenes; if learning and assessing does improve the quality of education, there will be fewer pupils leaving the system, and hence class sizes will be much larger. This will imply the need for even more classrooms and

teachers, training and resources, and all the rest. If automatic promotion is also introduced, this will exacerbate the problem greatly.

To change the system of assessment and learning to this extent is an enormous challenge for any country to take on, and represents a giant leap into the unknown for Malawi. It appears to follow from the fact that several other African countries have taken this route. The extent of the Malawian determination to try Continuous Assessment shows just how entrenched is the examination-driven curriculum. And yet the reason that the Standard 8 exam tends to dominate the curriculum, the need for selection into secondary education, has not been removed. It is possible, and even likely, that the selection goal will undermine all the good educational intentions and that the exam will continue to 'drive the education'.

One of the worthwhile goals of Continuous Assessment is to disconnect teaching and learning from the pressure to achieve at the selection examination so that pupils learn relevance to everyday life. However the Malawian compromise on Continuous Assessment will not remove that pressure, only compete with it – another reason why this version of Continuous Assessment has only a limited chance of success. The present situation has teachers teaching to an examination using a syllabus written for that purpose, and continuous assessment will not remedy that situation.

The most useful assessment is already taking place informally and is being used by teachers to modify their teaching to assist the needs of pupils: informal 'formative' assessment through which teachers make spot judgments about how well pupils are coping. Even if final results of each year level were to include some 'continuous' and some 'summative' test assessments, it is most unlikely to replace much of the emphasis on the summative assessment at the end of Standard 8.

8.1.7 Community education, including REFLECT

This arises directly from the research variables [*Meeting the needs of all*](#). This variable has been derived from questions arising from the literature ([sections 2.2.6](#), 2.2.7 and 2.2.9); the results were presented in [section 6.4](#) and discussed in [section 7.3](#).

In this section I will look at the education of those who are outside the present education system, but only because they found the education system unable to meet their needs, at least at the price they had to pay. Former learners, with partial literacy and numeracy, exist in vast numbers in much of Africa and elsewhere.

It is reported that at present over 40 million primary-school-age children are not in school. This region is also the only one in the world where the number of out-of-school children has been growing at a faster rate than that of enrolment.... This is now the only region in the world in which numbers out of school are going up".
(Hoppers, 2005, p117)

In Malawi in 2004, only 17% of primary pupils had 'survived in the system' until Standard 8, this comprising 14% of girls and 20% of boys (EMIS, 2004). The reasons for dropout rates have been discussed in section 2.2.6. To appreciate the nature of the challenge it is more helpful to consider the average number of years of education of those who have left school. Using the government survival rates to each Standard level enables a weighted mean to be calculated. The mean numbers of years of education of those who have left school are very similar for each sex, 3.7 for boys and 3.5 for girls.

The graph shows drop out rates for each level and sex. Note the extremely large dropout rates at the end of Standard 1.

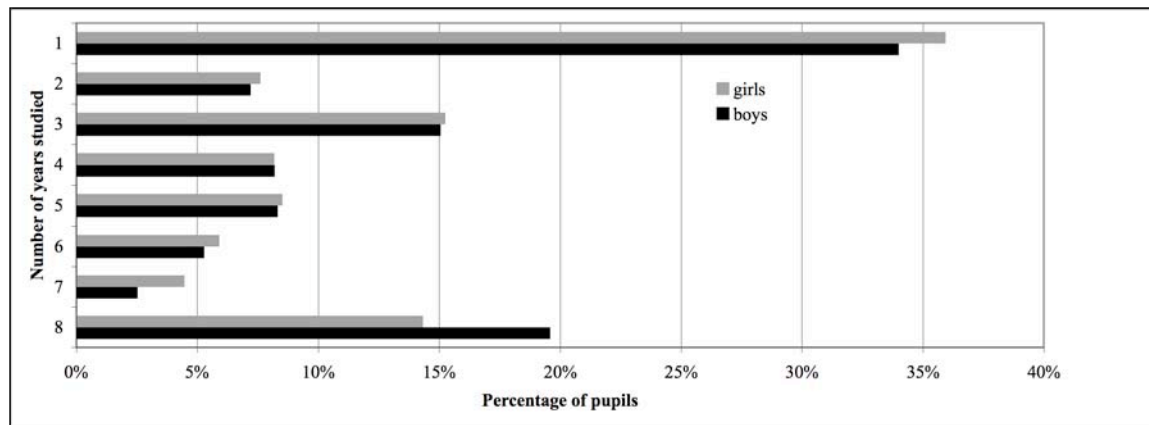


Fig 8.1

In this section I will examine the conclusions about what the Government and other agencies can do about assisting the education of the 83% of pupils for whom the mean number of years of education is less than 4.

Education for survival: some African examples

Avenstrup and Swarts (undated) refer to four types of education: community learning, vocational training, complementary education and formal education. They then compare the extremes in the context of rural Africa. They go on to describe two highly innovative projects in Namibia, one involving literacy in the mother tongue, and the other involving a 'mobile school' that moves with the pastoralists as they move with their cattle. They offer these as examples of 'equitable diversity'.

Tanzania provides an example of 'complementary education'. The COBET program provides basic education to 'orphans and single-parent children especially girls, who for some reason or other couldn't continue with formal education'. (Manyaga, 2001) The normal seven-year primary program has been compressed into just three years, and 14 to 18 year old girls manage to achieve this. This is leading to some rethinking of the way primary education could be run in Tanzania.

This is where COBET promises to be a major revolution in Tanzania's educational thinking and practice. It is no longer far-fetched to imagine a day when children won't be forced to do seven years in primary school before they qualify to enter secondary schools.
(Manyaga, 2001)

There are several other examples of non-formal education which follow many of the same principles. Uganda offers the COPE (Complementary Opportunities for Primary Education) program. Kajula's research into the effectiveness of this program highlights the importance of community involvement.

COPE is an alternative educational strategy specifically designed to equip Ugandan children who are unable to participate in the formal education system with basic literacy, numeracy and life-coping skills.
(Kajula, undated)

One of the areas in which NGOs have played and will continue to play a significant role is the provision of 'alternative' or 'community' schools (e.g. Hoppers, 2005). These are schools run by the local communities and providing some type of education vaguely similar to that provided elsewhere by state-run schools. According to Miller-Grandvaux and Yoder (2002) it is claimed that, compared to government schools, (many or some) community schools

- increase access to education, and are often more relevant to local development needs
- include more pupil-centred teaching and learning, and thus increase student achievement
- are cost-effective, and include more community involvement, increasing educational quality.

Governments are not happy with this lack of 'quality control' as often untrained teachers are used and yet community schools often call on governments for financial support. Parents who

send their children to community schools want their successful graduates to be able to continue into the state-run system, and government are increasingly having to concede this. Governments are learning to cooperate as they are beginning to concede that 'the idea of alternative education' may be used 'as a development strategy' (Miller-Grandvaux and Yoder, 2002).

Zambia offers 'community schools' which cater for a similar group of children who have dropped out of, or never started, formal schooling.

Against the continued failure of formal education to meet the learning requirements of a large proportion of the population (and thus to alleviate poverty), non-formal education may be able to do so by diversifying, and by involving the community in the entire process. At the same time as these non-formal programs are achieving these goals with young people, there have been a substantial number of successes in adult education, and indeed they frequently go together. The adult education arises from parents' involvement in the education of their children.

Malawian beginnings

The term 'Complementary Basic Education' (CBE) has been used in Malawi to indicate provision of education outside the basic system. The research team in CERT, the Centre for Educational Research and Training, has done a pilot study indicating both the size of the challenge and some possible solutions (Kadzamira, 2005). This is not the only research done in this seriously neglected area, but is the most comprehensive and the most recent. It will form the basis of this section.

The major activities of these non-school children and youth are farming (both sexes) with household chores (girls) and earning money (boys) being the second most prominent. These clearly relate to helping the family survive in a subsistence culture, where food supply is insecure. Future aspirations of these children and youth were farming (both sexes) with second most popular being trades (boys) and nursing and teaching (girls) (Kadzamira, 2005, p. 32).

The research found that only about a quarter of those tested could read simple words in Chichewa. Girls were considerably better than boys and 14-18 year-olds much better than 9-13 year-olds. The numeracy assessment in this research was extremely basic, being skills that would normally be taught to Standard 1: counting up to 10 objects, adding 4 and 1, and subtracting 3 from 6. Unsurprisingly, most could do these skills.

When the focus groups examined what they wanted to learn, literacy naturally was of highest priority. However the practical numeracy skills they hoped for were much more demanding than the test items described above. Numeracy is part of farming and also business management (e.g. 'calculation of profits and losses', 'manage credit and loan facilities') and it is clear that the numeracy program that develops will have to take place in the context of its real-life applications. As of early 2008, the CBE program has started a trial in several districts.

The learners are being taught Standard 4 upwards equivalent content. All the curriculum material has been translated into Chichewa to be user friendly to the teachers. It emphasizes content which will help learners to develop skills to enable them to earn a living in their daily lives as this education is just part-time...

(Chirwa (2008, Private correspondence)

The potential learners need to develop their confidence and remove any distaste for traditional educational approaches, so that alternative methods seem necessary. One of these, already successfully used in Malawi and very many other countries, is REFLECT.

REFLECT

This non-formal education program, designed for adults and already in use in parts of Malawi and many other parts of Africa, has the potential to accomplish the continuing education of the members of poor rural, semi-literate and semi-numerate, families. It is the program run through Action Aid known as REFLECT. It uses participatory methods to help people by empowering them to rediscover literacy and numeracy in the solution to many everyday problems they meet. It does not use textbooks, but has been used, by skilful leaders, to improve literacy and numeracy as it assists people to understand and improve their own life situations, to start small enterprises, and even to hold governments accountable through learning to monitor budgets. It has already been used with some success by YONECO, a group with many achievements to its credit – see ‘AIDS education’ below.

The most significant successes of the non-formal educational approach known as REFLECT have been in adult education, but it has also been used as part of non-formal education programs. The report cited above (CERT, 2005) mentions the positive response of youth to participatory (PRA) methods. The deep but low-key approach of REFLECT to learning, both literacy and numeracy, through the discussion circle’s group solution of genuine problems generated by the participants, or at least to developing their understanding of genuine issues, seems very suitable to the development of a positive approach to education for illiterate and disenchanted youth, of whom there seem to be vast numbers in Malawi.

It could come about that a non-formal education program (such as REFLECT) be used with rural poor to accomplish the first pillar of the MPRSP. It would achieve this over time by helping them take the many steps between ‘partial literacy and numeracy’ and being able to ‘generate their own incomes’. One possible outcome is a village cooperative, able to achieve so much more together, even to making a dam for better communal agriculture and vital food security. Such a program would serve the national goal of poverty alleviation far better than merely increasing the efficiency of the present formal system. I have suggested a non-formal educational solution rather than a radical change to the formal system because I believe non-formal solutions have more chance of being adopted.

AIDS education and prevention

The dynamic approach and wide intervention experience of Youth Net and Counselling (YONECO), run by MacBain Mkandawire. His major focus has been on AIDS education and prevention, but as a part of that he has recognised the value of educationally empowering girls, through improving literacy and functional numeracy, as one of the keys to the health goal.

The entire school system has AIDS education as a major focus, since the Malawian rates HIV/AIDS are close to the highest in the world. YONECO believes that the first step is to ensure that a girl engaging in unprotected prostitution knows the risk, but the second step is to develop her ability to make decisions that will reduce the urgent need for cash. Along with literacy, numeracy has a role to play in reducing the constant threat to life and health due to AIDS.

Numeracy is there. There are life skills, home management, literacy... This curriculum should help these girls realise the importance of education, develop the necessary skills and make informed decisions as to whether they should continue as child labourers or they should leave and do something and continue with school.

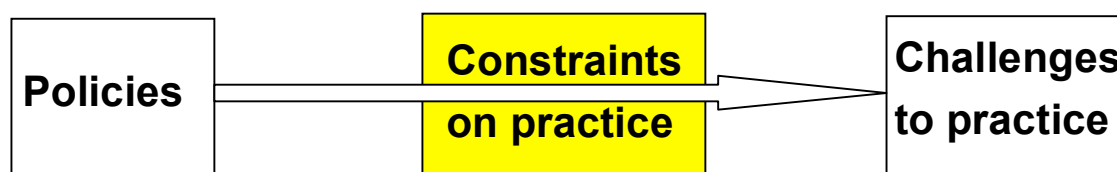
(Mkandawire, interview, 2005)

Joining the informal economy

In section 8.1 ‘Challenges’, I have explored some of the relationship between education and national development. In particular I tried to find ways to connect education to the national goal of poverty alleviation. It is my judgment that one of the most effective ways to achieve this is to help the vast majority who are no longer in school to join the *informal* economy. Education can help them to develop trading skills, low-level manufacturing skills, and the

skills of working with others in a cooperative enterprise to improve the efficiency of farming, leading to greater food security and ultimately to better lives.

8.2 Constraints on learners



As every teacher soon learns, there is a great difference between what you teach and what the pupils learn. In Malawi, as elsewhere, there are very many constraints on the pupils that restrict their ability to learn what is taught. A realistic policy response should take account of these. Some of these constraints are so great that children do not attend school at all, or drop out very early.

8.2.1 Constraint: Poverty and rural opportunity

Children who are not in school are not learning the school curriculum. Those who start and drop out for any reason are also limiting their chances in life. The strong Malawian evidence about who drops out of school (Rose, 2002, cited in section 2.2.6) supports the international evidence regarding completion of schooling.

The impact of poverty on enrollment, retention and completion is particularly striking. Whereas almost seven out of every ten students from the wealthiest families complete successfully, fewer than three out of ten from the poorest families do so. The second important variable is whether a child lives in an urban or rural area.

(ADEA, 2003d, p. 16)

The wealthy also live in the urban areas and not in the rural countryside. Poor children, especially those in rural areas, are required to perform many chores in order to help their family to survive (CERT, 2005, Chapter 5). These often clash with the time required to attend school, and force premature dropout. In some cases they lead to children starting Standard 1 very late in childhood; some areas report mean starting ages of 11 years (Chimombo et al, 2002). Such later starting means that puberty and initiation rites impact on the pupil before literacy has been established, and dropout often follows (Chimombo et al, 2002). Schools have reported an absence rate of up to 30% daily.

8.2.2 Constraint: Cost of education

In much of Africa, education still incurs fees.

In situations where education is not free, unaffordable school fees, corruption in educational institutions and the need to work when a family needs the child's labour in order to survive, tends to keep large numbers of such children from completing their education. This is also because, for poor children the pressures to leave school entirely for work are intense, and dropout rates are exceptionally high. Additionally, even in situation where schools are accessible, they are, in the majority of cases of low quality or too distant to reach.

(Lefoka et al, 2003, p. 10)

'Free primary education' is not really free in Malawi. Several of my respondents support the data from Rose (2002) that also shows that the costs of schooling, both actual costs and opportunity costs, are substantial in preventing the poor from completing schooling. The major 'real' costs are notebooks, clothing and other essentials such as soap, and the opportunity costs involve the loss of either family labour or of money for the family earned by working for someone else (CERT, 2005, Chapter 5). For poorer families this burden soon becomes too much and the pupils give up school. For a variety of largely cultural reasons, girls give up before boys.

8.2.3 Constraint: Gender bias

Less than half the countries in Sub-Saharan Africa have equality in primary enrolment for boys and girls. Girls still tend to drop out earlier, and fewer girls than boys complete primary schooling. The female : male ratio in Sub-Saharan African schools was 0.89, where it was 0.76 in Malawi. (UNDP, 2003, p. 200)

I have dealt in [sections 2.2.3](#) and 2.2.4 with the level of gender discrimination in Malawi, as in many other African nations; see for example, Mulemwa (1999, a and b). My interviews on gender policies with educators and several teachers support the widely held view that girls experience systematic discrimination. From a westerner's point of view, females are the exploited half of Malawian society, being restricted to a serving role and generally limited to home and family life. This view is reflected in the policy documentation of NGOs, such as UNESCO, UNICEF, FAWE etc. There is concern that Malawi is proving more resistant to change than many other African nations.

The effect on children is that girls have to work much harder than boys to succeed in schooling, being expected to perform more early morning chores both at home and often also at school, and supported less in classrooms by teachers. Both these were reflected in my observations. I was told that girls often return home from school to a day of child minding, whereas boys can play, study or work on a farm. Girls are the victims of casual sex, experiencing both pregnancy and often HIV leading to AIDS. Often they are forced into early marriages to avoid the 'shame' of unwed motherhood.

Teachers' attitudes in general seem to take the government line – that boys and girls should be treated equally – but many teachers seem blind to the systematic discrimination against girls – within their own classrooms, in the education system and in society as a whole.

8.2.4 Constraint: Food security and health

There are times when many rural children will be very hungry, between maize harvests or in time of drought, when the harvest fails. For poor families food is continually in short supply, and younger children, particularly girls, seem to lose out. Particularly at these times, children arrive at school unable to concentrate, having had no breakfast and bringing no lunch. Not only does lack of ability to concentrate affect learning, but children are more prone to common diseases, such as malaria. Lack of food and being ill are the major reasons given for poor attendance at school. For girls there is the extra burden of staying home to care for sick relatives.

Nutrition and health has a considerable effect on education as well general ability to perform household chores or to earn a living.

Statistics show that 49 percent of children are stunted (height for age); 25 percent are under weight and 6 percent are wasted. In addition, malnutrition has caused widespread mental retardation. For the past decade there has been no significant improvement in the nutritional status.
(Government of Malawi, 2002, p. 63)

8.2.5 Constraint: HIV/AIDS orphans

HIV/AIDS has had a devastating effect of schooling in Africa (for example, Malaney, 2000). All over Malawi there are increasingly large numbers of children made orphans by HIV/AIDS. These children are usually farmed out the grandparents, or to other more distant relatives, who have less interest in their education than in their 'free' labour. Children exploited for their labour is a common phenomenon in Malawi, and organisations such as YONECO (Youth Net and Counselling) are trying hard to find ways to end it (Mkandawire, 2005 interview).

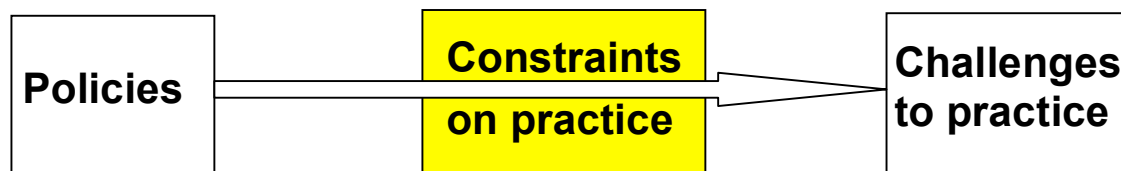
8.2.6 Constraint: Lack of support for education at home

Malawi is at a stage where many adults have had little or no education, and the quality of what they might have experienced was not high. Education may have seemed a waste of time. Hence many adults are not supportive of an irrelevant, low-quality education for their children, particularly girls, seeing it as irrelevant to their vision of the future. For this to change they will need a new vision of the future Malawi.

The alternative for many children is work, usually for their family but often for others to obtain income for survival. For many families survival comes before education.

There are three major causes for children not enrolling in school or dropping out of school to work, often in abusive or exploitative situations. *Poverty* is the main reason. At the family level, the rural and urban poor often decide to expose themselves to exploitative relationships because of the need for immediate survival and the search for viable, income-generating strategies.
(USAID, undated, piv)

8.3 Constraints on teachers



Teachers are generally dedicated, hard-working people who do their best under extremely difficult circumstances. However they have to balance competing demands from school principals, educational advisors, parents, pupils and the community. And they have to look after their families, frequently working a second job or gardening to feed children, orphans and others.

Teachers' actions are not ones of whim or fancy. They are constrained by the classroom resources, social as well as material, of the teacher's circumstances. Whilst variation is possible, it is within circumscribed limits. The material and social features of a teachers' environment exert selection pressures as to which varieties of action will continue to be sustainable in the classroom.
(DFID, 2001, p. 1)

My observations and interviews strongly support this position. Many of the constraints on teachers are due to the explosive expansion of the system in 1994, from which it shows few signs of recovering. None of these are criticisms of teachers; one can only admire teachers who persist steadfastly against such formidable odds as the following.

8.3.1 Constraint: Class size

In Sub-Saharan Africa, the World Bank (1998) has recommended that 'classes should be no larger than 40 (for primary) and 35 (for secondary).

In the ten schools I sampled the average class size was 101. This was unduly affected by two extreme outlying values, and the median is more representative: 90 pupils per class. The Malawian Ministry of Education statistics claim that the mean pupil teacher ratio for rural areas in 2004 was 77 : 1. Since there are known to be many classes without teachers, this would imply that the mean class size is actually smaller than 77. As noted above, the absence rate was often about 30%, so the actual attendance is somewhat smaller.

This mean or median value hides the extraordinary difference between class sizes in lower and upper Standards. My own data showed that the lower classes shoulder all the burden of numbers. In three schools there were two Standard 1 teachers and sometimes two Standard 2 teachers sharing the massive numbers.

Standard	1	2	3	4	5	6	7	8
Mean class size	150	107	131	105	85	83	71	43

Table
8.1

According to ADEA (2003, p. 18) ‘class size up to 60 does not appear to affect student leaning [sic] significantly’. This implies that classes over 60 reduce the ability of teachers to teach and of pupils to learn. The expected practice is for schools to combine classes so that most have about 60 pupils, where there are enough teachers to do so. The Ministry’s stated aim to reduce each class to 60 seems supported by research. This would require combining senior classes (into ‘multi-grade’ units), and splitting junior classes among more teachers. However this is not done; instead the men take the smaller senior classes and allocate the massive number of junior pupils to women.

With class sizes of over 100, many classes are held outside under trees. Many teachers no longer wish to do this; it has become a serious safety issue, as this article from the Malawi Times attests.

The flip-side of using trees as classes under the free primary education revealed itself on Tuesday amid tears and anguish, when a trunk of one of the 19 tree classes ... snapped and fell on pupils attending lessons, killing two on the spot and injuring seven others. ... the trapped pupils could not be rescued instantly because bees emerged from the hollow space of the tree and started biting the volunteer rescuers.

(Munthali, 2003)

8.3.2 Constraint: Time on task

One of the few variables that always impacts on the amount of learning is the time spent on it. Kraft (1995, quoted in Stephens, 1998) tells us of a range of hours instruction per year across nations from 800 (Ghana) to 1440 (Japan). In Malawi the equivalent figure is 900 hours, near the bottom of the range. This assumes that the 36 weeks per year each have five days of 5 hours.

Malawi has a very short school year of three terms averaging 12 weeks each. Of these it is ‘traditional’ to allocate the last two in each term to revision and testing so there is really a maximum of 30 weeks available for learning. If we add to that the 30% absence rate, then some children may be only at school for 21 weeks of the year. Furthermore, most classes in Standards 1 and 2 are dismissed after about 3 hours. The children and those teachers may go home. My study of some teachers’ guides suggests that this is time to get through less than 50% of the expected material! Most primary children have no resources or opportunity to perform any supportive homework, particularly girls with a heavy load of household chores.

In a rural country where most families survive on subsistence agriculture, a short school year may well be demanded economically; in 2005 there were rumours of a move back to a year starting in October from one starting in January to make a vacation of the ‘hungry months’ between harvests. However this severely impacts on the ability of teachers to cover the course and of children to learn it, so it should be considered in planning policies. Expectations should be adjusted to allow for this. A move towards longer class sessions, such as 60 minutes in the Malawi Breakthrough To Literacy program (see [section 7.8.2](#)), is to be encouraged.

8.3.3 Constraint: Teacher absences

As well as pupil absences, teacher absences should be considered. This includes time away for INSET, caring for sick children and for personal ill-health, including absences due to HIV/AIDS. At the first school I visited there should have been five teachers present, but three, including the principal, were absent on that day. If we add to this the claimed number of classes with no teachers at all, we see reasons why children might lose interest in school. I also was told that many rural teachers must take one or maybe two days off per month to go

the nearby centre in order to collect their pay. Teachers might be forgiven for taking time off, as conditions have not improved over the years.

Teacher salaries, as other salaries in the Government sector, only cover between 1/3 and 1/2 of living costs. To make a living, most teachers earn extra income through farming or through tutoring...

"In 1966, I was a school teacher. My salary was approximately US \$80 per month, and I could afford to run a car. Thirty years later, my salary has increased manifold, but it is still only equal to US \$80, and I cannot even feed myself - let alone my family."

(DANIDA, 2000, p. 1)

8.3.4 Constraint: Lack of resources

For mathematics teaching, at least, the major resource needed would seem to be a textbook. The IEQ/Ghana project (Okyerere & Harris, 1997) suggests that, once teachers find the textbook numbers less than the numbers of pupils they severely restrict the use of the books. Some teachers bring out the books only when needed for a particular lesson.

It was typical for teachers to say, "There are enough books, so each child has been assigned a book." or "There are not sufficient of this book so I keep them locked in the cupboard." (p. 4)

The Malawian Government Education for All (EFA) plan claims that 'there is a 1:1 pupil textbook ratio for core subjects in primary schools' (MoEST, 2004, p. xxiv) but this was certainly not the case in the schools I observed. Even the official figures in 2005 produced an overall average of 1.5 pupils per mathematics book. (See detailed data in section 7.6.2.) Many teachers simply wrote the problems on the board. The textbooks do not allow for any diversity in the pupils. There is a glossary of difficult mathematical terms in the teacher's guide, but not in the pupils' textbook.

None of my observed teachers used textbooks. At the lower Standards many pupils were without pencils or notebooks. Their entire learning experience seemed to be sitting mostly quietly and listening, occasionally joining their friends in a chorused response. Pupils are expected to study at home, but even where they had a textbook there was no clearly set out steps for solving problems. The textbooks in mathematics have no explanations for pupils (or teachers) to read but only worked examples. Sometimes pupils were asked to copy an example from the board into a notebook, but the use of only one worked example for study purposes requires a level of generalisation from the pupil that is unlikely to occur. It seems as if the teachers were expected to remember every little thing they had been previously taught in training (if any), and no reminders were being provided.

This trend is continuing. In 2007 Chirwa observed four teachers at Standard 1, near Domasi. He concluded:

The plans in the state documents stipulate that there will be enough material and human resource, in terms of teachers for the teaching of Expressive Arts *prior to its implementation*. My research data however reveals that schools in my study did not have enough material and teachers as human resource for the teaching of Expressive Arts. Learners' books are not enough in the schools. In all the Standard 1 classes in both schools, the pupil-text book ratio on average was 1:3.

There is both lack of resources and in other cases inadequate resources needed specifically for the teaching of Expressive Arts such as coloured pencils, chart paper and other many materials to make the teaching and learning of Expressive Arts more effective.

(Chirwa, 2007)

One consequence of these shortages is a severe limitation on teaching method and an inability to tackle anything new, such as new forms of assessment.

8.3.5 Constraint: Multiple languages

Malawi shares the common African experience with multiple native languages and a dominant colonial language; see section 2.2.8. For the majority of pupils Chichewa is their home language and mother tongue, and they are taught in that language for the first four years at school. The major aim for those pupils is to achieve literacy in Chichewa. This sounds

good until you recall that the average class size up to Standard 4 is over 100. However there are many children who speak other languages at home, and maybe not too much Chichewa; for example Chiyao was the home language of many children in my observed schools – sometimes the majority – but no teachers taught in Chiyao, not even when Chiyao was the teacher's home language. This determination to make all children secure in the national language supports the compulsory teaching of Chichewa, and is a compromise necessary in a mixed language classroom.

It will be recalled that, except for the subject of Chichewa, the Teacher's Guides for Standards 1 to 4 are written in English, although the subjects are taught in Chichewa. After his field research in Standard 1 I asked Grames Chirwa, author of one of those guides for Standard 1, for his opinion on the matter.

... having Teachers' Guide written in Chichewa rather than English in the lower primary school. I also feel that this is a better idea. It really does not make much sense to have the pupils' books written Chichewa and the Teachers' Guides in English. It is better to have these curriculum documents in the same language. Having the Teachers' Guides written in Chichewa would also make the Teachers' Guides more user friendly for the lower primary school teachers whose understanding and command of English is very low.

As a curriculum materials writer, some of the problems which teachers are facing in teaching is due to the Teachers' Guides being not so user friendly because they are written in English in the lower primary school.

I also feel that having the Teachers' Guide in English is somehow not in line with the language policy which advocate the use of Chichewa as a classroom language of instruction in the lower primary school.

(Chirwa, 2008, private correspondence)

English is the intended language of instruction from Standard 5 to 8. At the lower levels, English is a special subject. Its use seems limited to that part of the timetable, but there are political pressures to make it more common, or even the language of instruction. This is because it is generally recognised that the English competence of many pupils at Standard 5 is inadequate to enable understanding of most of the curriculum. (The class I observed at Standard 5 seemed to follow well enough, but it was rather exceptional, being at a Demonstration School.) At the upper levels teaching seems to largely take place in English with code-switching to Chichewa when it is judged useful. At Standards 7 and 8, exposure to English is regarded as of the highest priority and code-switching is less common.

Language is a difficult political issue, but the nature of African society is that most adults are fluent speakers of at least two languages, and many are literate in more than one. Possibly making teaching bilingual and using bilingual resources such as textbooks can defuse the language tensions and make fluency in home language (or in Chichewa) and English a national goal. ADEA (2003d, p. 19) regards the use of 'colonial' languages throughout the cycle as a 'Blind Alley', and recommends 'bilingual programs using African languages as the medium of instruction in the early grades.'

8.3.6 Constraint: Lack of mathematical understanding

Many commentators have made the point that teachers who do not understand mathematics will learn enough to keep one step ahead of their pupils, and teach what they have just learned by rote (Mazonde, 1994; Bopape, 1998; Adler, 1991). In the context of mathematics teaching, the majority of teachers seem to use the word 'understanding' instrumentally – for describing the actions of pupils who can follow directions. This arises from the teacher's own lack of relational understanding and hence an inability to recognise that understanding at any deeper level is possible. It means that mathematics is being taught as a large number of separate procedures to be memorised, disconnected from each other and from the real world. One consequence of this is that pupils are not encouraged to establish concepts and form links between them. Unless separate 'application' procedures are taught and memorised, pupils will

be unable to relate mathematics to daily life, one of the major stated goals of the primary mathematics curriculum. Without a secure link to life outside school, the learning of mathematics becomes a rule-bound set of procedures that can make little contribution to poverty alleviation, the national goal.

The only long-term solution to this is to improve the relational understanding of teachers, and provide them with teaching resources that will enable them to help pupils to develop the same level of understanding of mathematics.

8.3.7 Constraint: Teaching style

In 2003c ADEA reported in 'Pedagogical renewal and teacher Development in sub-Saharan Africa: A thematic Synthesis':

The main findings and lessons drawn from this database include the following:

Undesirable teaching practices persist.

- Such practices can be described in a nutshell as being rigid, chalk-and-talk, teacher-centered/dominated, lecture-driven pedagogy. Such pedagogy places students in a passive role and limits their activity in class to memorizing facts and reciting them back to the teacher. It is also reflected in classroom assessment practices.
- They are reported to be the norm in the vast majority of classrooms in Sub-Saharan Africa and elsewhere, even in the most affluent countries.

Reading ability is critical for learning other subject matters as well as a strong predictor of educational "survival"; yet poor literacy levels prevail among Sub-Saharan African students.
(ADEA, 2003c, p.7)

This being the case, why does it happen? One of the chief characteristics of the present system is the great dependence placed on the teachers. If the teacher is not present, no learning takes place. If the teacher is not confident or knowledgeable, limited learning takes place. Because the classes are large, the teachers mainly feel forced to use 'front-of-the-class' methods involving lecture or demonstration, with low-level questions used to keep the class participating. There is no evidence that these methods are successful in improving learning. The use of group work may become a promising alternative.

Chirwa's (2007) observations of Standard 1 showed that teacher-dominated lessons ('question and answer') continued to be the only method used, and teachers refuse to use other methods, even though they copy them from the Teacher's Guide into their official 'lesson plan'.

teachers are only able to use one method of teaching successfully in teaching Expressive Arts, that is the question and answer method. The group work method which they also attempt to employ is wrongly used as they still treat the learners as individuals although they are put in groups to work as a team amongst themselves.
(Chirwa, 2007)

Western 'hands-on' mathematics activities for the whole class are not presently feasible, since the teachers do not have enough relational understanding of the purpose of such activities, and there are too many pupils with too many different needs. 'Discovery learning and open-ended instruction' is also treated as a 'Blind Alley' (ADEA, 2003d, p. 19).

One possible solution to this dilemma could be to move towards learning that is more resource-dependent and less teacher-dependent. The teacher's role would then be to place pupils into ability groups, guide them to suitable resources (such as a set of prepared tasks on cards) and act as a tutor assisting pupils to use the resources well to develop competence and deeper understanding. In the teacher's absence pupils can still continue to learn, and pupils can work in groups at their own level.

This approach was used in the trials of Continuous Assessment where 'job cards' were used to support learning while the teacher was interviewing pupils. It would be far more efficient if these cards were to be centrally produced and distributed, and not by teachers who have too

much else to do. When Continuous Assessment was officially implemented in 2007, many 'short-cuts' seem to have been taken – see section 8.6.7. It seems likely that 'continuous assessment' became just an extra burden imposed on over-worked teachers, and its educational payoffs were missed entirely.

8.3.8 Constraint: Teacher shortage and uneven deployment

This problem is widespread in Sub-Saharan Africa. Mulkeen's (2005) recommendations are particularly concerned with meeting the demand for teachers in rural areas.

- 1) Teacher deployment practices leaves fewer teachers, more unfilled posts, and more unqualified teachers, in rural areas.
 - 2) Teacher utilization practices result in larger class sizes at early grades. In other cases teachers without adequate preparation and materials are left trying to handle multigrade teaching. At the same time, qualified teachers may be found working with very small classes.
 - 3) Limited teacher management systems may result in higher absenteeism, and shorter working hours, in rural areas. In addition the systems to ensure and develop the quality of teaching (inspection and support services) are often weaker in rural areas. In effect, the weakest teachers receive the least support.
- (Mulkeen, 2005, p. 25)

ADEA (2003d) also tackled this issue. Their suggestions are to go for diversity rather than standardisation. The central recommendations are these:

- Government commitment to the principle of diversity, i.e. to a system with common core objectives that values local variations and recognizes there can be no single pattern for getting education to the learners.
 - Flexibility in recruitment of teachers and substantial investment in their training and support will often be required to allow hiring people from the community often with a limited general education.
- (ADEA, 2003, p. 22)

In Malawi there seems to be a massive shortage of teachers. The official goal is a pupil to teacher ratio of 60.

The number of serving teachers at present is 41,008; the number of teachers required to have a ratio of 60 pupils to 1 teacher is 53,344. The gap of teachers is 8,975. At present the number of teachers being trained in the TTCs is 2,000. However, the Ministry of Education is losing 2,000 teachers every year due to retirement, deaths and other ways.

(Chirwa, 2006, personal correspondence)

Due to the use of the teacher training colleges for upgrading 'untrained teachers' with the MIITEP program, there have been few if any new teachers added to the system for the seven or eight years. Unfortunately due to deaths from malaria and AIDS many teachers have to be replaced.

According to the Ministry of Education statistics for 2005 (EMIS, 2005), there were 5158 primary schools. On the assumption that each had one class from Standard 1 up to Standard 8 there would be 41 264 classes. The same statistics claimed there were 45 075 teachers. That makes 8.7 per school. There should be no shortage, although some might be taking very large classes. Yet I was told many times of rural schools with eight large classes but only three teachers.

I obtained a copy of the numbers of teachers and pupils in the Zomba Rural region for 2006. The mean pupil to teacher ratio was 137, while the median was 117, indicating some very high outliers. Examples of these include one-teacher schools with 598 pupils, 483 pupils, another one with 319 pupils, two teachers with 612, three teachers with 1480, and five teachers with 1548. The only way this could occur is that many teachers will not move to rural schools when posted there. This constitutes a severe deployment problem, with serious gaps in rural schools. The government's EFA plan (2004, p. xxiv) describes a system of allowances for teachers, but admits that

... the allowance policy does not cover incentives for teachers teaching in rural and difficult areas. The actual monthly salary of the teachers at all levels is still low.

and this is after also admitting that ‘almost 70 per cent of primary school teachers do not have houses (permanent) at the school they are teaching.’

It is possible to find more teachers in the short term only by taking on those who are less qualified than those at present in the system. Possibilities exist for teacher aides, and support staff to perform many of the clerical and preparation roles, freeing up the trained teachers to do a better job of teaching.

8.3.9 Constraint: Room shortages

Because primary education fees are abolished many Malawian children are able to attend school, at least for one or maybe a few years. The consequence of this is a massive swelling of numbers in the early years, and a consequent desperate shortage of suitable spaces to learn. (The first school I visited had one room for five classes.) The majority of classes do not have their own classroom, and many would not fit into one if it existed. The Ministry of Education statistics for 2004 show that 65% of rural and 88% of urban Standard 1 pupils did not have a permanent classroom. This figure falls for later Standards, and the means for Standards 1 to 4 were 49% of rural and 68% of urban pupils. The means for Standards 1 to 8 were 57% of rural and 72% of urban pupils.

Those classes without permanent classrooms are held in the sun or under mango trees. Some schools have attempted double-shift systems; only one school in my sample used ‘double shifting’, but ADEA (2003d, p. 19) regards double shifting as another ‘Blind Alley’.

8.3.10 Constraint: Assessment, ranking and repetition policies

In 2003 ADEA’s report ‘Monitoring Performance: Assessment and Examinations in Africa’ expressed concerns with national and international testing, and made specific recommendations regarding the use of assessment by teachers.

In recognition of the central role of teachers in improving the quality of student learning, steps should be taken

- to improve the assessment skills of teachers in preservice and inservice courses, which accord adequate regard to the conditions in which teachers work (class size, availability of resources);
- to provide guidance in the use of assessment information in making decisions regarding grade promotions;
- to provide examples of good assessment practices at the end of chapters in textbooks;
- to develop means of communicating information on assessment and reforms to classroom teachers, and
- to provide assistance in interpreting the significance of the information for classroom practice.

(ADEA, 2003b, p. 61)

The Malawian situation is common. In Malawi, because of the limited places available in secondary schools, a selection examination is held at the end of Standard 8 to determine who will be able to proceed. Not all who pass the examination will find a place in the government secondary schools, but there are many private secondary schools available for the others. This would appear to be a given for the system for many years to come.

Because of this, the teaching syllabus is treated as an examination-preparation syllabus, and most teaching in previous years has preparation for the end of Standard 8 as one of its aims. At all levels, the last two weeks of each term are lost for teaching due to examination timetables. I observed repeatedly that children not in the examination room were playing in the schoolyard.

In [section 2.2.12](#) I described the common practice of testing and ranking. This has no justification, at least in mathematics. The members of the class are ranked according to their ‘averages’ for all subjects, and these ranks are paraded in public. The argument goes that it keeps up the ‘standards’ but at least one researcher (Miske et al, 2003b) notes that many

pupils absent themselves on test days out of fear, and this usually leads to eventual dropout of school, since test absence is usually scored as 0 towards the average.

There seem to be severe problems here. For the many pupils who do not progress to the next level, the alternatives are repeating the entire year or giving up being educated. Often at least 10% of a class comprises repeating students whose presence is adding considerably to the class size, age range, marking and management problems. The research (IEQ/Malawi, 2003a) indicates that repeating students never catch up with their peers and often take even longer than the younger pupils they have joined to achieve a pass. There is an official policy aiming to discourage repetition at Standard 8, but this policy is not well understood by teachers, pupils or parents. Many of those who do understand it swap schools between repetitions so they are not recognized as repeaters.

The moves in 2007 towards Continuous Assessment offered some hope for changing the culture in schools. Considerable changes were required in the practice of teachers but these may develop over time. However, the basic reason for the examination-driven curriculum – the selection examination – is not being removed, so it is unlikely that the basic problem will go away.

8.3.11 Constraint: Class size in Standards 1 and 2

In 2004 the following nine African countries offered ‘free primary education’. Angola, Botswana, Democratic Republic of the Congo, Lesotho, Madagascar, Malawi, Mozambique, Tanzania, Uganda and Zambia.

Riddell’s (2003) review of some experiences with Free Primary Education offers a warning to others.

There is clearly a lot of similarity across the five different countries’ experiences with introducing free primary education. What is indisputable is that abolishing tuition fees overcomes some of the obstacles to attending school, as can be judged by the gross and net enrolment rate increases experienced in all the countries following FPE, but for Zambia. However, as the case study summaries show, a series of problems (some created or exacerbated by the FPE policies) remain. Added to these are the effects that HIV/AIDs has had on the education sectors of all these countries.

Unless quality is attended to from the beginning, high enrolment rates will not necessarily lead to an educated population. The Zimbabwe experience of one-third of its new schools becoming non-viable within the first five years of independence provides a warning for the more recent, rapid, quantitative educational expansion of these other countries in recent years.

(Riddell, 2003, p. 11)

So this is a characteristic of any education system that has become ‘fee-free’, something being tried in many African countries as part of ‘Education For All’.

Chirwa’s (2007) observations in Standard 1 indicate that teachers are overwhelmed by the numbers of pupils and demands of the system. At that stage, Continuous Assessment was not working. However he now sees how over-ambitious the innovation turned out to be, from the point of view of the hassled Standard 1 teachers.

The teachers’ failure to do continuous assessment is partly due to time constraints for them to combine teaching and assessment at the same time. The pupil to teacher ratio is also too big to enable the teachers to assess each and every learner in the course of teaching.

In designing Expressive Arts curriculum documents, I need to take into consideration all those problems which the teachers are facing ... I may need to avoid including in the curriculum documents teachers’ activities which are practically not possible for them to do such as assessing and recording each learners’ performance in every lesson activity. My training of the teachers also needs to change. I need to include demonstration lessons involving actual pupils in my training in order to give the teachers a model of how they can teach an Expressive Arts lesson effectively.

(Chirwa, 2007)

Standards 1 and 2 had unique problems. The classes were very large and unable to fit into a regular classroom, even if there was one. The pupils arrived at school often with none of the

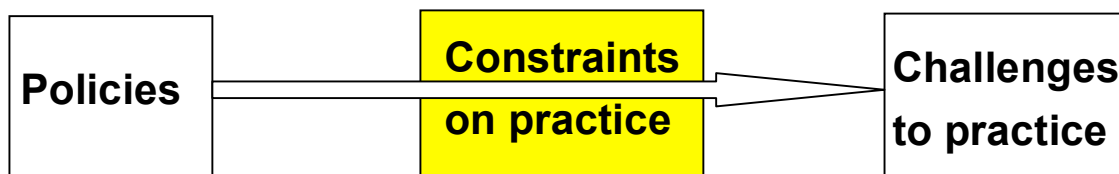
pre-literacy concepts, ideas about print, schooling etc. They often arrived hungry and were not used to being in a large group with others under the supervision of one adult. Because they could not read, print resources were of little value. Such classes often had a large age range, from four-year-olds sent from home to give them a head start, to 11 or 12 year olds who have just begun their educational journey (EMIS, 2005).

Teaching at this level relies almost entirely upon oral methods – singing, chanting, memorising – and the effectiveness of these methods for children to learn so much strange new material is in some doubt. Croft (2002) studied the methods used by primary teachers at Standard 1. Her description shows that ‘learner-centred practice’ in Malawi makes ‘use of the strengths of the local oral culture’.

... experienced, respected Malawian lower primary teachers in this study are learner-centred in that they take account of the physical, socio-cultural and emotional context of their pupils.
(Croft, 2002b, p. 195)

8.4 Constraints on mathematics curriculum writers

Curriculum as reflected in textbooks and guides is not necessarily what is actually taught by the teachers, and invariably is quite different from what is actually learned by the pupils. As we will also see, it also differs from the official, political goals for education or for the subject of mathematics. However what appears in print is the official record of what is intended.



8.4.1 Constraint: Aspirations and needs

In many developing countries, the government expects teachers to play a major role in somehow making ‘development’ happen. This includes training the pupils to become consumers, producers, democratic citizens, and making sure enough of them stay on the land to produce food for the rest in the cities.

The *official goal* of Malawian primary education is ‘poverty alleviation’ and in mathematics it officially means ‘mathematical calculations used in everyday life’. Malawian educators agree that this is what is required at this stage.

The *actual goal* is selection for further education. It is this goal to which all parents and pupils aspire. This has been the case for many years (Moyo, 1992, p. 284). It might seem good for a goal of primary education to be practical (to alleviate poverty), to deal with literacy and numeracy in a mother tongue or the national language, but historically since 1942 Malawians have wanted access via English to the clear financial advantages that go with having mastered education (Lambda, 1984, p. 161). There is thus both a political and social opposition to being told to have ‘limited’ goals for primary school or in lower primary education. This has been proposed many times before and has failed every time; see [section 2.2.2](#).

Malawi’s education system requires a resolution of this tension between the *actual* goal of selection for the few and the *official* goal of improved survival for the many. It needs a system that somehow accommodates *both*.

8.4.2 Constraint: The interaction between intended curriculum and examinations

Despite the fact that the uses of mathematics are very widespread in all societies, particularly 'developed' ones, there are very many pupils and ex-pupils who believe it to be quite irrelevant to their lives. The formalism (precise algorithms, clinical diagrams, exact use of language, etc.), absolutism (insistence on one right answer, the most efficient way to work something out, etc.) and abstraction (lack of clear connection to the world as experienced by the pupil) gives it an air of mystery and irrelevance.

The image often portrayed is that mathematics is a set of procedures invented by someone (certainly white and male) to be memorised, and then forgotten. However mathematics consists not only of its pure theorems and abstract formulas, but far more of its multitude of real-life applications, through which the world is organised, both naturally and by people.

So mathematics did not just arise out of the world by our sense experience, but also out of our inventions, our economic arrangements, our religious beliefs and cultural arrangements. My argument is that there is almost no evidence in school mathematics that mathematics has any bearing of these issues; in fact it has been almost completely dislocated from children's reality in particular. (Volmink, 1994, p. 57)

Despite the intentions of the policy to teach for poverty alleviation and use of mathematics in everyday life, the syllabus, textbooks and guides perpetuates the abstract view of mathematics described above. How does this mismatch persist?

Because I was in Malawi at the time the next printed (PCAR) syllabus was being constructed I observed the Malawian process in action. Officially the Malawi National Examination Board (MANEB) verifies the proposed questions written for each annual examination by carefully comparing them to the printed syllabus. The syllabus is written specifically to assist pupils to develop their skills so that they can do the kinds of questions that are presently tested on the examination. It is an examination syllabus, from Standards 1 to 8, and is written to preserve the standards of the past. No-one can miss the circularity of this procedure. The syllabus was not written with an eye to the 'official' goals of the course, but for skill development towards Standard 8 examinations. (For more details on this, and an analysis of a recent exam paper, see [section 7.7.2.](#))

The problem (tight link between the examination and the curriculum) will only be remedied by providing outside experience to the curriculum developers and their consequent ability to take the initiative and avoid the circularity described above.

8.4.3 Constraint: Poor support material for teachers

As described above, the textbooks and guides are carefully written to match the details of the syllabus, and hence themselves are carefully preparing pupils for the examination. Once teachers are in the field these books are the bulk of the assistance they will get. While I was in Malawi, the teachers' college tutors were preparing a course for preparation of new teachers that was designed to cover the new syllabus, and hence also by default, the preparation ritual for the secondary selection examination.

Part of the problem is that the writers of curriculum and texts, often the same people, have no experience outside their own country, and hence are unaware of alternatives. Their own ideas about school mathematics are conditioned by previous decades of mathematics teaching in Malawi.

In 2007 Grames Chirwa visited Standard 1 classes trying to implement his ideas. I asked him what he felt about this issue of having Teachers' Guides written in Chichewa rather than English in the lower primary school. He wrote:

I feel that this is a better idea. It really does not make much sense to have the pupils' books written Chichewa and the Teachers' Guides in English. It is better to have these curriculum documents in the

same language. Having the Teachers' Guides written in Chichewa would also make the Teachers' Guides more user friendly for the lower primary school teachers whose understanding and command of English is very low.

As a curriculum materials writer, some of the problems which teachers are facing in teaching is due to the Teachers' Guides being not so user friendly because they are written in English in the lower primary school.

I also feel that having the Teachers' Guide in English is somehow not in line with the language policy which advocate the use of Chichewa as a classroom language of instruction in the lower primary school.

(Chirwa, 2008, private correspondence)

8.4.4 Constraint: Tradition of word problems

'Word problems' has a long tradition in mathematics education. Bishop notes the extraordinary irrelevance of the application word problems in former colonial texts. For example, Tanzanian word problems included cricket, money (in farthings, half pence and half shillings), and escalators at the Holburn (UK) tube station. As Bishop notes, 'But then "appropriateness" was entirely judged in terms of cultural transmission' (Bishop, 1990, p. 55).

In order to give the impression of relating mathematics to everyday life the Standard 8 examination includes a high proportion of problems written out in words: 'word problems'. My analysis of a recent examination (section 7.7.2) shows that these are frequently highly contrived and not realistic, and are devoid of visual clues that might help a pupil with poor English to understand what is being asked. Word problems of this kind have been a burden to mathematics pupils for many generations all over the world, but in recent years their artificiality has been recognized and pupils are no longer being asked such tricky verbal questions, at least not under test conditions. Their continued use in Malawi is further evidence that what is being tested is a high level of competence in mathematical English rather than mathematics.

8.4.5 Constraint: Limited view of numeracy

In looking for the type of mathematics to be taught in schools that can achieve both poverty alleviation and development of advanced concepts, we ought to consider 'numeracy'. In official documents it appears to mean only 'beginning mathematics'. This is mistaken. A common international definition of numeracy is the 'confident use of mathematics to deal with particular situations in real life outside the school'. Here is an Australian definition.

To be numerate is to use mathematics effectively to meet the general demands of life, at home, in paid work and for participation in community and civic life.

(DETYA, 1997, Numeracy = Everybody's business)

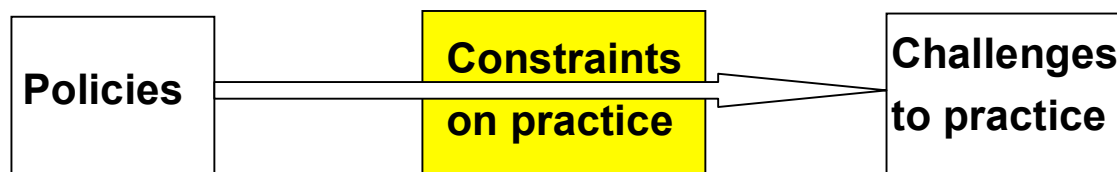
There is a considerable need to research the genuine applications of mathematics in rural life. These should start with those applications that most people actually engage in, without realizing that they involve mathematics, and then move to aspects of applied mathematics that, if used, would improve the quality of life. Examples of this would be the mathematics of trading, buying in bulk and selling at a profit, improved farming practices, better nutrition, managing on a tight budget etc. More examples appear in section 8.7.6.

These seem to differ greatly from the majority of content in the present syllabus. It might be argued that this approach to numeracy is unable to prepare pupils for more advanced, secondary school mathematics. If practical uses of mathematics were poorly taught, without any attempt at understanding the underlying mathematics, then it is quite possible that the development of mathematical concepts would not take place. However, when well taught, practical applications of mathematics *can* support a growing understanding of the mathematical concepts needed for more abstract mathematics at secondary level. Relevant practical applications can not only carry the big concepts of mathematics, but also demonstrate to pupils (and teachers) that mathematics is an important part of everyday life. The present approach is certainly not achieving this.

If the courses and support materials are to match the ‘everyday applications’ (numeracy) emphasis of the official goals of the course then the writers, firstly, will need a better understanding of mathematics, and particularly of the ways mathematics is used in everyday life in their own society. They may also need assistance to prepare text and guide materials for teachers that will share with teachers a better understanding of mathematics and how it is applied in real life. Clearly this is related to in-service programs.

8.5 Constraints on teacher educators

The ‘normal’ process of teacher recruitment and preparation has undergone massive disturbance in Malawi ever since 1994, when Free Primary Education required a massive influx of untrained teachers to fill the classrooms and take classes even where there were no classrooms. This led to a long-term program (MIITEP, see section 2.4.1) to train teachers already teaching in schools, and further recruitment of new teachers, trained in the Teacher Training Colleges (TTCs) was stopped. Only in 2006 has MIITEP finally completed its task, and ‘normal’ teacher training can begin. As a consequence of the unusual circumstances described above, in-service and pre-service training have become mixed and confused.



The competition between quantity of teachers and their quality will inevitably continue. Research in African countries has concluded that the level of education of the teachers can be over-rated as a factor affecting quality.

The academic level of teachers has variable effects; more than 10 years of general education may not have much impact on student learning... Short pre-service training accompanied by school level support for beginning teachers can be as effective as long pre-service training.
(ADEA, 2003d, p. 18)

The same summary of research findings suggests that current methods of supporting the growth of teachers in the field could be improved. ‘In-service teacher training as currently practiced does not appear to have much of an impact.’ (ADEA, 2003d, p. 18).

8.5.1 Constraint: Pre-service education

The design of a suitable and efficient preparation course for teaching is of concern all over the world. It is a particular challenge in many majority world countries (including Malawi) since they are dealing with the urgent preparation of massive numbers of teachers, many poorly prepared for such training, with a great shortage of competent tutors, and only a few teachers’ colleges.

The conduct of mathematics education by primary teachers is an area of concern all over the world. In most countries many primary teachers lack confidence in mathematics. As a result there is a tendency for teachers’ college courses to try to cram the primary mathematics content into a short teaching time. This happened in Malawi before and during MIITEP and is in danger of happening again in the new IPTER courses.

Because of the desperate shortage of teachers in schools, MIITEP was designed to place an adult in front of classes during the ‘practical experience’ part of the course. The balance was shifted in favour of practice (20 months in schools after three months theory) for this reason. ‘Student teachers’ have been placed in rural schools due to their greater shortage of teachers. But this has meant that supervision, either by their over-worked teacher-supervisors or college lecturers, has been limited in scope and value; visits from the college have been rare.

8.5.2 Constraint: In-service education (INSET)

Kadyoma (2004) summarises the present position of primary in-service education using a 'storm metaphor'. This arose from discussions Kadyoma had held with 'one veteran in-service officer'.

In his analysis of the teacher-learning milieu, he noted that the professional development programs being implemented in the country were numerous and rapid, but without much effect on the target groups they were supposed to impact. So, they were like a storm, characterized by strong winds, thunder, and lightning, but without bringing about the much-needed rain.
(Kadyoma, 2004, p. 144)

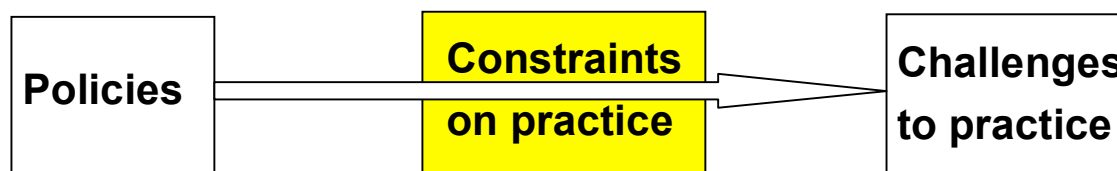
There is a widespread recognition that teaching should improve. Many donor countries have organized their own specific programs to do this, with UK, Germany, Japan and USA all running different programs aiming to improve different parts of teaching, both content and methodology. The MTTA program (described in [sections 6.7.2](#) and [7.6.2](#)) was one such program for mathematics science and English, of considerable value but limited scope due to funding limitations. Again, the number of teachers needing this kind of assistance is so great, and the capable leaders so few, that this type of INSET offers only a limited solution.

The research on effective INSET does not support this type of practice. The message from the research of Joyce and Showers (1995) is that INSET out of school (e.g. at a Teachers' Centre) must be followed up by 'coaching' provided in the school setting by a person with whom a mutual trust has been established. So teacher change requires providing a structure of support within the school.

The kinds of INSET activities that generally take place in developing countries mimics the most common types in developed countries, and fails just as often. Teachers commonly are asked to listen to 'experts' and are expected to find some way of using the information so gleaned to improve their own practice. This kind of INSET is used because it is the cheapest to run, and (like the lecture-style of teaching it copies) is the most efficient way to 'teach'. However for reasons described above, it is very ineffective in terms of its goal, the learning of teachers. An alternative must be found, one that works well 'at school level' and is inexpensive.

8.6 Constraints on policy-makers

At the start of [Chapter 8](#) it was suggested that to ignore the effects of constraining forces in a study of policy would be to pretend they do not exist. I have shown that that pupils are highly constrained in their attempts to learn, teachers are massively constrained in their teaching practice and that the 'intended curriculum' is highly constrained largely due to the community expectations of selection examinations for further education.



Policy may be used to help find a way through the constraints towards meeting challenges. A sympathetic but deep understanding of the constraints would lead a policy maker to be *realistic* in policy making and not indulge in a comprehensive list of 'things we would like to see improved' under the heading of policy. Policy at present could become a lot more realistic. So what are the constraints on policy making itself?

Much of the literature on failure in the implementation of educational policy deals with the issues discussed in this section (for example, Bah-Lalya & Sack, 2003; Psacharopolous. 1990; Moulton, 2001; Ward et al, 2003; Wolf, 1999). In broad terms these are due to management issues and the literature has been examined in [section 3.3](#). I will provide Malawian examples to illustrate the categories from that section, and further make the point that Malawian policies are well-intentioned, but generally too vague and unrealistic in terms of their expectations of success, given all the constraints.

8.6.1 Constraint: Policies and politics

[Section 3.3.1](#) described some literature on the political context of policy making in Africa. This is firmly in evidence in Malawi. Here are the best-known examples.

- The USAID-sponsored project GABLE was waiving fees from girls to encourage a better gender balance in primary education. This was over-ridden by the government when they proclaimed Free Primary Education.
- Malawi is still in recovery mode from the decision to make primary education free of school fees, a political decision of the first democratically elected government in 1994. It almost doubled the numbers, particularly at the lower levels.
- The language policy is intensely political, as the national language is also the home language of the largest ethnic group, the Chewas, and the minorities feel neglected; their languages are still unsupported by printed materials for use in schools. There is strong pressure from the elite for more use of English, even at lower levels.
- The government has been ambiguous regarding examination and selection policies; they are keen to support the selection examination, while as a national goal aiming for a broader education for the majority who cannot be selected. This ambiguity has led to an inability to successfully create a mathematics syllabus that helps the poor rural majority by alleviating poverty.
- Several educators told me in interviews that there is often a clash between the agenda of the donor countries and the preferred agenda of the Malawian educators. For reasons of financial support, the donor views always prevail, but it is felt that a lot of good money is wasted this way. Also there have been many times when good programs that are begun are unable to complete as planned because donor funding is withdrawn, e.g. MSSSP.

8.6.2 Constraint: Ambitious or vague policies

[Section 3.3.2](#) reported literature that describes how overly ambitious or vague policies can lead to inaction. Official policy documents in Malawi are often little more than a litany of these. Here are a few examples.

- Vision 2020 is a forward-looking planning document that has guided planning for some years. The section on education has 54 ‘strategic options’ for improving education, each no longer than one sentence. For example ‘improving access, quality and equity in education through (f) providing more and better school facilities;’ (Government of Malawi 1998, #7.2.2.2).
- The ‘Education for All Action Plan’ (Government of Malawi, 2004) describes the challenges ahead in achieving education for all. The action plan responds with six goals, each of which has a number of strategic objectives and major activities. In total there are 46 ‘strategic objectives’ listed. Again each is one sentence long. One example is ‘Reduce drop out and repetition rates’ (Goal 2, #4), but there are no suggested major activities that relate to this. Goal 3 includes an introductory paragraph on numeracy and is about ‘using methods which link numeracy to everyday practical situations, avoiding an academic approach’. However there are no strategic objectives or major activities related to this.

- The Policy and Investment Framework (PIF, 2001) includes policies and strategies for Basic education in eight areas: access (6 policies), equity (6), quality (14), relevance (3), management (5), planning (2) and finance (8). These 44 policies are all worthwhile long-term goals, but are more like descriptions of good intentions than achievable policies. Many policies do not have supporting strategies; for example,
‘The MoES&C shall investigate and tackle the main causes of chronic pupil absenteeism in primary schools’
(MoESC, 2001, 4.1.4, policy 5).

Many strategies are nothing but vaguely stated aims, for example,

‘Internal efficiency will be improved by repetition and drop out rates being systematically reduced.’
(MoESC, 2001, 4.1.8, strategy 2).

It seems that the implementation of Continuous Assessment is a recent example of this, and has suffered from being over-ambitious, and many of the features that made the trial a success have been dropped in an attempt to ‘go to scale’.

Chirwa (2007) reports on a Standard 1 curriculum in Expressive Arts with many worthy goals, most of which were unable to be implemented in the schools due to large classes, lack of resources and support.

This type of teacher to pupil ratio is not manageable in terms of outcomes based curriculum teaching which demands that a teacher should ensure that each learner achieves the intended outcomes of a lesson at the end of each and every learning activity.
(Chirwa, 2007)

8.6.3 Constraint: Policies not understood or ignored

[Section 3.3.3](#) describes the literature on policies that are not understood by those who are expected to implement them. Sometimes this is due to inadequate communication, but often it reflects a deeper problem, based on differing perceptions of the purpose of education.

- In 2005, depending on which document you read, there were between 44 and 54 apparently independent policies about education. They are not prioritised, and relationships between them are not conceptualised. There is no published evidence of an overall procedural plan, although an unpublished one might exist in the highest levels of planning. An administrator trying to decide which policies to implement has no guidance about sequence.
- The Standard 8 repetition policy is designed to penalise those pupils who are repeating Standard 8 in order to discourage this practice. However many teachers and principals do not understand it, many parents and pupils do not know about it, and many who know manage to circumvent it by moving between schools, so their repetition is not recorded in the system.
- The ‘Standard 1 to 4’ language policy has been mentioned several times as either not understood by teachers or deliberately ignored. It is not clear whether or not the ‘directive’ has been officially ‘withdrawn’. In many cases it is impossible to implement.
- Policies regarding gender have been created to try to make sure that girls have at least an equal chance to succeed in schooling. Teachers are aware of the general intentions but unaware of their own culturally-supported biases. The gender inequalities seem to be deeply embedded in the society and education system.
- The policy that requires pregnant girls to miss 12 months of schooling and then allows them to return (if the baby can receive care) is both misunderstood, and where understood, opposed on moral grounds. In addition, and possibly for these reasons, parents are not informed of the girl’s rights, and returns are bureaucratically delayed.

- The stated purpose of mathematics education is its use in everyday life, and is clearly related to the Government's goal of 'poverty alleviation', yet the syllabus, support materials (text, guides), and teacher training are clearly related to preparation for the selection examination. It is not clear whether the purpose is not understood, deliberately ignored, or whether tradition and ignorance of alternatives are combining to maintain the status quo.
- The preferred assessment policy as expressed by all the educators is in opposition to the practice of regular testing which leads to ranking and hence repetition of years. This traditional practice is not supported by anyone, but no clear statement of an alternative has been widely circulated at this stage. 'Continuous Assessment' is the preferred approach at this stage, and will require a vast amount of support in schools. (See [section 7.7.3.](#))

8.6.4 Constraint: Policies poorly implemented due to cost over-runs

[Section 3.3.4](#) reported some of the literature about policies that are badly implemented due to being far more expensive than realised. Malawi has a recent history of many of these. Here are some examples.

- Free Primary Education (1994) was probably never costed at all. If its costs had been realised, it might not have occurred at such an early stage. However it was widely acclaimed in the international community.
- There has been and will continue to be a massive teacher shortage, and this was partly due to the shortage of competent graduates from the present system. Short-term methods to overcome this have not been found, due to the massive costs involved. In 2005, teachers were leaving the system at about 2000 per year, largely due to death.
- There was an unwillingness of urban teachers to move to rural villages in order to teach, partly because housing for teachers in rural areas was in very short supply. Married female teachers were unwilling to move to rural areas, and leave their husbands and family. Unmarried females are unwilling, due to a potential shortage of suitable partners.
- There were many policies aiming to reduce the dropout rates, but should they even partially succeed, the costs to the system would be enormous: more schools, more teachers and salaries, more classrooms, more resources, more administration, and so on. The high level of dropout at present was what enabled the system to keep going!
- The 1996 language policy required pupils to be taught in their mother tongue. This meant that teachers were to be trained in teaching of all languages and native speakers should return to teach in their home areas. Print resources were essential. This had never occurred and had never been costed.
- The quality of teaching had been the subject of many enquiries. However teaching styles are largely dictated by class size and available resources, and the costs of improving these had never been recognised.
- Many pupils had no notebooks, pencils or textbooks, despite the fact that the government was responsible for providing these. Around 2005 the cost of distribution increased dramatically due to rising petrol costs.
- The previous curriculum was introduced in 1991 and many teachers were never given any orientation to it, having to work it out for themselves. The cost of this professional education was not built into the plans.
- There was a good network of Teacher Development Centres (TDCs) and Primary Education Advisors (PEAs) to run them, but the task of making these advisors into people who were able to do that task was neither properly planned nor costed.

- The teacher education policies required much more than the MIITEP, which was teacher preparation on the cheap. There were far too few colleges and a great shortage of good staff to teach in them. The number of places barely equalled the number of teachers dying annually.

8.6.5 Constraint: Policy implementation not well managed

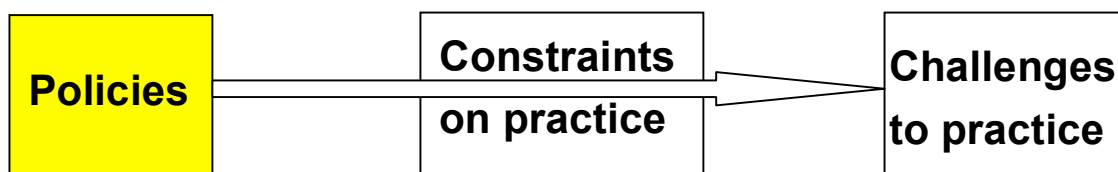
[Section 3.3.5](#) refers to management of implementation programs and how these can so easily go astray. The basic problems focus on communication, coordination, monitoring and evaluation. They arose largely because management personnel were often teachers promoted out of the schools. They worked on tasks for which they had no training and they had to learn on the job. They often moved around, and frequently held several positions at once while a colleague was ill or dying. Some of the consequences are listed below.

- Communication networks were poorly developed. Policies or directives given in writing were easily lost in a school with little storage space, and no copying facilities. The most common way for something to come to the attention of the staff was a small notice board in the principal's office, assuming there was an office. Policies explained at a meeting but not given in writing may well have been understood by those present, but were easily forgotten or misinterpreted by others who later heard them second-hand.
- In the past, donors had responded to proposals for projects separately and there had been little coordination. This improved around 2005, since donors now cooperated with each other and high-level education officials to ensure long-term plans were carried through.
- There was little monitoring of the effect of policies to see whether the implementation was working or achieving its aims. This was largely due to the shortage of time and resources. Even reportedly successful programs, such as the Continuous Assessment trials or Malawi Breakthrough To Literacy, could be stopped in their tracks because the wheels of evaluation and forward planning turned very slowly, and were subject to political whim.

Grames Chirwa, my capable research assistant, told me about the saying '*Azikaziwonera konko*' which means 'Whoever will have the responsibility (of implementing the policy at classroom level) will know what to do'. This seems to imply that the planners intend to leave the implementation planning to the classroom teachers; if so, it goes a long way to explain why implementation rarely occurs.

8.7 Policies and purposes

In this section I examine the idea of 'policy' and see how it is related to purposes and plans for action. I have written this section because many policy statements (in Malawi and elsewhere) read like 'statements of good intentions' rather than clear directions or carefully and realistically conceived steps along a pathway towards ultimate goals. So part of the reason that some 'policies' do not reach fruition may be that they are not fully developed as 'achievable policies'.



The view taken here is that policies must take constraints very seriously, and engage in actions that will **reduce constraints in order to meet challenges**. The first section explores the idea of a 'good' policy and the others explore some of the ways policies might be made achievable.

8.7.1 What makes a policy 'good'?

- Policy-making is a specialised skill.
- Policies are not just a list of wishes, targets or deadlines.
- Good policies involve detailed realistic planning.
- Good policies achieve what they set out to achieve.

A policy is 'good' if it aims to improve matters.

This seems self-evident, but in a politically sensitive arena such as education, and particularly in mathematics, an area of learning towards which many of the population feel either inadequate or genuinely fearful, there are vastly different ideas about goals and purposes – about what constitutes an 'improvement'. For example, in the area of language in the early classrooms there are genuine conflicts, some advocating the use of mother tongue and others advocating English, both parties with good reasons – from their own points of view.

Approaches to improving the educational lot of girls seem to founder because some teachers (males and females) feel that they wish to support stability through maintaining the traditional subordinate role of girls in society while others see potential in change.

It might be argued that policies that are in line with the stated national goal of 'policy alleviation' should be regarded as good. So governments support notions of basic literacy and numeracy for as many of the population as possible, reducing funding for secondary education in order to achieve what they believe will alleviate poverty fastest. However, from the point of view of parents and the community, poverty alleviation means accessing personal wealth, maybe from a paying job, and therefore they sacrifice a lot so that a son (usually) has a chance to get through primary school and maybe go as far as a certificate at Form 2 or 4, which offers the basis for a life-long income. This influences the choice of mathematics to be taught, as practical applications on the land are ignored in favour of abstract material (or pretend applications in the form of 'word problems') in preparation for the Standard 8 selection examination.

A policy is 'good' if it works.

There are many factors that must be in place and work together to achieve the policy outcomes. I believe that the principles are general; they are derived from papers by ADEA, 2003e; Bah-Lalya & Sack, 2003; Chimombo, 2005; Colclough et al, 2005; Moulton, 2001; Psacharopolous. 1990; Vithal & Valero. 2005; Ward et al, 2003; Wolf et al, 1999. I will illustrate each from the Malawian experience.

- *Policies must be stated very clearly and in words that are not 'open to interpretation'.*
Sometimes policies are deliberately vague to give the appearance of a consensus, but in reality different interpretations of words means that the required agreement is not actually reached. When the policy comes to be turned into a funded program, the disagreements come to the surface and the program is undermined, or fails to start.
- *Policies must be achievable in the relatively short term.*
If policies are too ambitious or too long-term in their expected time-frame, they will be constantly deferred and never implemented. This appears to be the fate of the mother tongue language policy, which has also suffered active political resistance.
- *Policies must be able to be turned into funded programs that will be able to complete their planned task and be adequately evaluated.*
If the funding is inadequate or doesn't stay the distance, the program will not achieve and the policy will not be implemented. There have been a number of recent donor-funded programs whose funding has simply ceased well before the planned program has met its planned targets. A number of educators complained to me about the cessation of funding for programs in which they had been involved.

- *Well-managed coordination of all the aspects of implementation is required.*
Lack of coordination has arisen in some programs such as MIITEP where resources in both colleges and schools have been unable to meet the demands.
- *Lines of communication should be clear and often used.*
For example, it seems the repetition policy at Standard 8 was not well communicated, and therefore that principals and teachers did not, and maybe still do not, understand how the chance of selection for secondary school is dramatically reduced for repeating students, no matter how good they might be at the second or further attempt. Equally I was told that many teachers and parents do not know about the policy allowing return to school of a first mother who became pregnant while a school-girl. For matters of public information radio might be effective, and for teachers, the regular delivery of copies of circulars might keep them informed of changes. When communication is limited to verbal exchanges from PEAs and inspectors the outcomes rely too much on memory and honest interpretation.
- *Any policies out of line with present community values can lead to lack of cooperation.*
One apparent example is the policy about girls returning to study after having their first child. There is evidence that many principals, teachers and parents see this as condoning free sexual activities among pupils and actively resist implementing this policy. In this religious society, such a policy is out of touch with conservative values. Similar concerns have been expressed about the sexual licence of some males leading to increased HIV infection; repression of information and varied euphemisms are reported to take the place of honestly facing difficult behaviour change.
- *Active resistance to policies is often due to politics, economics or religious conviction.*
Politics is actively shaping language policy; it is likely that views on morality are the major reason that teachers resist both the policies allowing new mothers to return to school and the limitations on repeating.
- *Many policies depend on the cooperation and availability of teachers.*
One of the biggest limitations of the present system is the inadequate numbers of teaching staff in schools. Recruitment of new staff requires promotion of the opportunities provided by a lifetime of teaching, and possibly higher pay levels. On many occasions I heard about the many rural primary schools with three teachers for eight classes, and in many schools the total absence of any secondary teachers who knew enough mathematics to teach the subject.
- *Even where teachers are available and willing they must also be properly prepared.*
Inadequate preparation of staff, both in terms of their own general level of education and their preparation to teach 'specialist subjects' such as mathematics. Over the years there has been an emphasis on trying to improve the traditional, lecture-demonstration methods of teaching, but the MTTA project has shown that teachers are not confident in their own knowledge of the content.
- *Management needs 'capacity building'.*
Inexperienced and untrained management is a consequence of a large system with many changes and staff replacements due to illness and deaths due to HIV/AIDS. Coupled with this is the difficulty of managing the present needs of the system and at the same time looking to the future. There are many difficulties inherent in doing both at once.

A policy is 'good' if it can be implemented within the constraints operating at the time.

There are very many constraints that make it unlikely that many of the present stated policies are remotely achievable. This is not to suggest that they are not good intentions, but that as policies for which programs are to be designed and implemented, they are unrealistic in present circumstances.

A policy is not ‘good’ if it is pointing to outcomes that are not achievable within the limitations of the present system, no matter how desirable those outcomes might be in the long run. Such a policy will waste resources on trying to achieve what is not possible at this stage. Furthermore, such policies will discourage people and hinder change. Some of the necessary factors are listed above. Some of the constraints on the present system are described above (in [sections 8.1](#) to 8.4) and these provide convincing reasons that many ambitious policies are not likely to succeed at present.

Many formerly colonial systems of education seem to progress through stages of ‘development’ (Beeby, 1966). Although they may progress at different rates, the stages cannot be skipped. It all takes time, and a direct transfer of methods and ‘solutions’ from more advanced systems simply does not work.

Policies ought to be inter-related.

It is not always recognised that success in achieving one policy goal would considerably change the likelihood of success at others. The over-riding reason for many of the present problems in the system is the apparently well-meaning and laudable policy of eliminating school fees so that all pupils could attend, no matter how poor they are. In the event, few of the consequences of this dramatic move had been anticipated and educational quality has suffered for a generation of pupils as a consequence.

The most obvious present example of this habit of ignoring consequences of policy involve those policies aimed at reducing or eliminating dropout of pupils from all levels of schooling, including keeping more girls in the system. Some of the consequences of achieving this, even partially, would be the need for even more qualified teachers, more salaries, more classrooms, more furniture, more resources, more teachers’ colleges, more secondary schools, more universities etc. Although no-one seems prepared to admit it, the present system is surviving only because 50% of pupils have dropped out by the end of Standard 4. One consequence of this is a need for a planned sequence in which to aim to achieve improvements. Section 8.8 begins some planning towards such a sequence.

8.7.2 ‘Going to scale’ with successes

Malawian education has a praise-worthy culture of trying new ideas, and as a result there are often very successful programs operating for a short time in some small regions of the country. Recent examples include the Malawian Breakthrough To Literacy, Literacy Across the Curriculum, and the trial of Continuous Assessment in Ntcheu.

There is a tendency to feel that these successes should be able to be opened up immediately to all teachers; this process is often called ‘going to scale’. Such impatience to spread the ‘benefits’ of a trial success is common all over the world. However there is well-researched evidence that most significant innovations *fail* in a most disappointing way when ‘taken to scale’.

A recent research report on this area from USA explores how innovations in mathematics and science education can ‘go to scale’ successfully. It forms the basis of this section (Carpenter et al, 2004). The three lessons below derive from that research.

The *first* lesson is that if institutional support cannot be guaranteed in the scaled implementation, it will probably fail. The support needed to make a significant innovation successful over the entire country is virtually impossible to achieve given current levels of expertise, funding etc. so it is reasonable to assume that ‘going to scale’ by decreeing that certain changes should happen is a recipe for certain failure. This has happened many times in recent years, but the lesson is rarely heeded.

The *second* lesson is that the teachers must be involved in the design and planning of the innovation and how it will be implemented in their own schools for them to want to

implement it. Teachers rarely get excited about someone else's innovation; it has to be their innovation for them to change their practice.

The *third* lesson is that once the initial trial has succeeded it is the *teachers themselves who have changed*. So the best way to move the educationally innovations to other schools is to *move the experienced, changed and committed teachers*. It is they who will convince others and help them overcome the barriers.

This implies that system-wide 'going to scale' is not feasible, and probably should not be attempted.

What is the alternative? If you can make something good work in one or two regions, then *move those teachers and the support to another region* and let the teachers make it work there. The effect of this process repeated several times will mean that getting all (or most) involved will have been achieved in smaller achievable steps, rather than risking the lot by trying to achieve the impossible by decree. Patience is a significant virtue.

There maybe case to rethink the design of pilot projects and deliberately conceive them as a series of innovations of a limited scope that do not deviate too far from existing practice, that can be adapted and applied by a large number of teachers without too much difficulty and support. Implementation over time of a series of those innovations, gradually increasing the capacity of schools to change would in fact combine the functional and the explosion strategy and be a real learning strategy. (ADEA, 2003d, p. 29)

8.7.3 Committed cooperative support from donors

Malawi has benefited from many generous donors over many years, but as each has operated in isolation from the others, sometimes even in competition, the gradual evolutionary change of the system has not had the benefit of their joint planning with the government of the day for the benefit of the country as a whole. The roles of donors have changed significantly with the concept of SWAps, the Sector-Wide Approaches. In 2005, this approach had only recently been implemented in Malawi and great benefits were expected in the long term. As 'sector-wide' includes pre-school, primary, secondary and tertiary, even teacher training and teacher INSET are being considered as part of a total plan.

8.7.4 Well-planned implementation of manageable change

Furthermore the success of a well-written policy can be anticipated because it has an implementation plan that does not include unrealistic expectations about support or other areas of achievement. Given the myriad of constraints listed in the sections at the start of this chapter, a successful policy is one whose success is likely because it has been planned. Important aspects of such planning includes considering the necessary conditions for its success and the implications for other parts of the system should it succeed.

The capacity of the central system to promote and manage change is limited. In fact the international consensus is now that centrally managed change is unlikely to succeed, and that change should be promoted at a school level. It is based on a belief that teachers and schools are aware of their inefficiencies, but feel powerless to do anything. However, so the belief goes, when teachers and principals realise that their attempts to innovate are supported and encouraged by officials they will develop confidence and even an appetite for innovation and improvement.

51. **Implementation** has long been recognized in developed and in developing countries as the Achilles heel of education policy reform, especially reform that aims at large scale changes in the process of teaching and learning. Many carefully designed programs have floundered on the rocks of implementation. The assumption that change is an orderly, rational and linear process that provides centrally defined fixes to the quality problems of schools is one that has been found to be false in almost every instance. In fact there is an emerging consensus that

- (i) change is essentially a local process with the school as the unit of change;
- (ii) local learning and adaptation is key;
- (iii) developing local capacity – at the school, the community and the district level – is a condition

- sine qua non* for success; and
 (iv) progress is incremental and uneven.
 (ADEA, 2003d, p. 28)

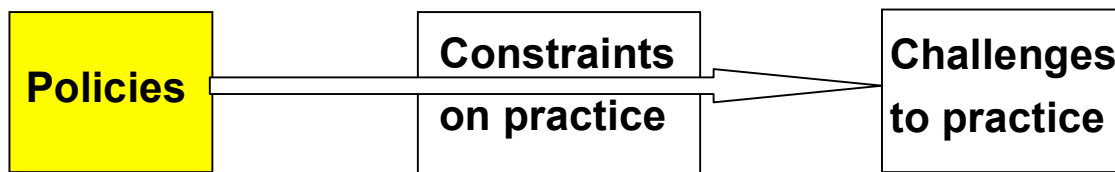
In Malawi, this means that the roles of Divisional Educational Managers, District Educational managers, Primary Educational Advisors and principals are central in the creation and management of educational change. This strongly advocates rebirth of one of the apparently most successful INSET programs (MSSSP) and strengthening the support role of the PEAs, with consequent better use of the TDCs. It implies a reduction in the role of MIE, TTCs, and other centrally directed attempts to promote change, such as PCAR, inspection and Continuous Assessment by regrom all this? Moulton (2001) presents nine findings of general value (p. 72). Here are my suggestions, specific to the Malawian situation.

- The gap in the education system between policy and practice can be reduced, but only in small steps.
- It will be achieved firstly by accepting the existence of the present constraints and working within them to change something significant.
- The first change should be important, achievable, widely understood and accepted.
- A change that will reduce the impact of one of the more significant constraints might be a good place to start.
- Use the public rejoicing at one significant educational change to assist in promoting the next one, and so on.

The next section examines some of the things that might be done, and what their effects might be. This leads to a consideration of what might be done first.

8.8 Future actions and likely effects

Through this research I have become aware of the inter-relationships of many variables at work in a system of primary education as it operates in a country like Malawi. As I near the end of this particular research journey I feel that I might attempt to share some of this with my friends in Malawi, and with others who might read this in later years.



8.8.1 Possible future policy actions and their effects

This section embodies a lot of my understandings of how the factors are related. I have classified the variables into two types:

- *future policy actions* that are possible and
- *effects* that can result from those actions.

This distinction is important, because they are often confused. For example, we might have a policy that says we will reduce the dropout rate, but we cannot actually do anything directly to make it happen. ‘Reduced dropout rate’ is an effect, not an action. It is only other actions that we take, such as having more teachers in front of classes, that will reduce the dropout rate. So ‘More teachers’ is a policy action, but ‘Reduce dropout rate’ is an effect.

Future policy actions

Based on my limited understanding of a very complex system, I offer these 23 ideas as possible future policy actions. The list is by no means complete, and not all will appeal to policy makers in Malawi or comparable countries. They are in order of likely effectiveness in

creating the effects (1 to 9) listed below them. This has been analysed using the ‘action matrix’ that follows and is explained in [section 8.8.2](#). I offer a brief explanation for each action.

A More teachers and better deployment

If there are classes without teachers, there must be more teachers; but they must agree to teach in rural schools. This is particularly true of women. In particular more and better teachers are needed for Standards 1 to 4, where about 75% of students are trying to learn.

B Use the best teachers for Standard 1

Bissell and Schiefelbein (2002) asked many experts about the cost-effective strategies for change.

the most cost-effective strategy for improving education quality in Latin America is allocating the best teacher to the first grade for students to improve their ability to read and write.

(Bissell & Schiefelbein, 2002, p. 43)

It is unlikely that this is a conscious policy of any school head in Malawi.

C Do not ask teachers to switch classes during a school year

The third choice of Bissell and Schiefelbein’s experts was a policy *not to switch classroom teachers during the school year*. This also has implications for Malawi. The IEQ/Malawi project observed that a high percentage of teachers they interviewed in March were not teaching the same class in November, and were puzzled by this loss of continuity.

D Relevant course and text (in mathematics)

I have argued that neither the courses in mathematics – nor the texts that support them – match the official goal of poverty alleviation, opting instead for examination preparation. Courses that are relevant to everyone’s numeracy will help with everyday life and can also be used for selection.

E Mother tongue instruction (Standards 1-4)

Research and the ‘Malawi Breakthrough To Literacy’ program have demonstrated that, when conditions are right, instruction in mother tongue is better for lingual minorities than in Chichewa. Support of this policy requires textbooks and teachers using the mother tongue. For the Chichewa majority, this makes no difference.

F Relevant examinations in mathematics

‘Relevant’ here refers to the official goals of the course, relating to applications of mathematics in everyday life. To achieve this, the course would have to be made relevant too. It is well-known that changing assessment practices is a fast way to change teaching practices.

G New lower secondary schools

This action arises from my experience in Samoa. In order to have more graduates of primary school going further than primary school, the Samoans created a new class of village junior high schools that were not part of the selection process to higher education and led to a more practical qualification.

H Pro-girls actions

It is established that the present system discriminates against girls, so any actions that can encourage girls to stay at school and do well are positive. However there is a wider discrimination against girls and women in Malawian society that at present seems out of the control of education.

I More teaching time in the classroom

Of all the variables that improve the quality of pupil performance on learning tasks, spending more class time learning is the most important. This is supported by many studies, including UNESCO, 2005, p 48. Malawian pupils spend less time learning in school than pupils in many other school systems. Three terms of 12 weeks, each reduced by two weeks of assessment, is too little to achieve the goals that are being set. In addition the fact that classes at Standard 1 and 2 finish mid-morning implies a loss of learning time in the most critical years. Bissell and Schiefelbein's (2002) experts believed that *enforcing regulations on the official length of the school year* was the second most cost-effective action that could be taken.

J Bilingual textbooks

In Standards 1 to 4 textbooks are in Chichewa, and yet some English mathematical terms have no equivalent in Chichewa. In Standards 5 to 8 the language of instruction is to be English; yet teachers find that they often have to use Chichewa to explain topics. At all levels (including secondary) bilingual books would solve these problems, making the content clearer to both teachers and pupils.

K Build more secondary schools

The reason that the selection examination has such a control over teaching and learning in primary schools is that there are not enough secondary schools. Ultimately Malawi will have no need for this selection, because every pupil can continue into secondary education. At this stage this appears to be a long-term goal.

L Automatic promotion system

In many countries, such as South Africa, pupils do not have to be ranked and meet arbitrary criteria to move to the next level; promotion is automatic. It is the responsibility of the teacher at the next level to deal with the educational needs of pupils who arrive in their class.

M Abolish ranking

The ranking system has many faults, the greatest of which is that it increases dropout rates, and frequently the more capable pupils are the ones who leave.

N More schools and rooms, with furniture

Given that many classes are held outdoors, in rain or hot sun, better provision of basic places to learn are required. However there is no point in building more schools and rooms if there are not yet teachers to use them.

O Bilingual examinations (at least in mathematics)

There is evidence that the selection examination in mathematics is actually testing for ability in English, due to the high number of word problems. This action suggests that the examination be available in Chichewa as well as English, so that it tests only mathematical ability.

P Sufficient good quality textbooks

Many schools have insufficient textbooks, and yet research has established that regular use of textbooks can strongly improve learning. Good quality textbooks would be ones that were relevant to the daily lives of pupils and helped the teacher meet the wide range of learning needs in the classroom. At present such books do not exist in Malawi.

Q Helpful guides

The teachers' guides that are in use at present make teaching suggestions that are impossible to accomplish with large classes and few resources. They also require more time than is

available. Guides should be realistic about their teaching suggestions (regarding both time and resources), and should help teachers to understand mathematics they are teaching.

R Community attitudes

Since it is known that some community members, particularly in rural areas, have little respect for education, involving parents in their child's education might have positive effects.

S Penalties for repeating Standard 8

In order to reduce class sizes in Standard 8 there is a policy penalising pupils who repeat this year when they sit for the examination.

T Free school lunches

With donor aid, some countries have encouraged children who might drop out to attend school by feeding them at lunch time. School then continues into the afternoon. Malawian schools start early, and higher levels end at 'lunch time' when pupils return home, hopefully for food. This policy would improve health and allow for increased time in class, with increased concentration.

U Teaching methods (at least for mathematics)

Some methods of teaching are more effective than others. If there are sufficient textbooks, teachers could learn how to use them to maximize the learning of pupils. Group work, allowing discussion, can be useful for improving understanding.

V Teacher's content knowledge (of mathematics)

Teachers will do a better job of teaching whatever the course requires of them if they know and understand it themselves. This requires both good resource books (texts and guides) and also INSET.

W Combined classes in Standards 5-8

Combining classes in levels 5 to 8, or 'multi-grade teaching', is a strategy that releases teachers to share the larger classes at lower levels. This policy would be most effective in rural areas.

Desirable effects

The list of desirable effects is culled from the literature on education in majority-world countries (including Malawi). The first three are rather difficult, if not impossible, to measure, but this must not reduce their importance.

1 Poverty alleviation

Poverty alleviation is the major goal of the education system. It seems to be a combination of basic skills (literacy, numeracy, etc.) and the entrepreneurial skills to use them to escape poverty. Some research suggests that two incomes are required for a family to break a poverty cycle.

2 Social equity

There is considerable social inequity in Malawi, largely related to income but also associated with language. Reducing this inequity is a stated goal of the system.

3 High quality of learning

By 'high quality' I mean educationally worthwhile outcomes such as 'improved literacy, numeracy, understanding, problem solving in everyday life', etc. These are not the same as 'better results on tests or examinations'.

4 Reduced class sizes at Standards 1 to 4

The majority of pupils are in the lower levels, because many drop out later. Smaller classes at lower levels can make a big difference to the basic literacy and numeracy of the majority.

5 Reduced dropout rate

Reducing the number who drop out, particularly girls, will allow more pupils to make use of the education system to free themselves from poverty, although the ability of education to achieve this depends on its focus on poverty alleviation and high quality of learning.

6 Even gender ratio

Research shows many benefits flowing from educating girls and women. The sexes start roughly equal in Standard 1, and we wish to reduce the girls' dropout rate to be equal to the boys', and preferably not at all.

7 Lower spread of ages in each class

In each class the spread of ages, and hence of learning stages, is one factor that makes teaching and learning so difficult, particularly in large classes. It reduces efficiency of the teacher and impacts on quality of learning for all pupils.

8 Reduced repetition rate

Pupils are required to repeat a year when they fail to achieve a nominal 'standard' and it is deemed that they must have more practice at a level. This makes classes larger, and increases the difficulty for all learners. Reducing this would presumably improve quality of learning.

9 Reduced competition for secondary selection

One of the major reasons that many pupils stay in school to Standard 8 is that there is chance of going further. The competition between pupils, teachers and schools seems to be a significant factor in upper level classes, and influences many other variables.

8.8.2 Interactions between policies and practice

The method I have used to rank the possible effectiveness of each of the suggested *actions* is to list them down the left of a table, list the *effects* across the top and suggest a numerical value for the size, and direction, of each effect.

I have tried to rate the improvement that each of the Actions, taken one at a time, might have on each of the Effects. Blanks indicate a hypothesized zero effect, 1 means a small improvement and 2 means a large improvement. A negative value means a hypothesized negative improvement – a situation to be avoided. I know that this is quite subjective, and requires much more research support than I am able to give it.

Here is an example of how I came by some of the numbers in the table. In my judgment, action A (More teachers in rural schools and Standards 1 to 4) has positive effects on almost everything. It should particularly improve the lower level drop out rates, gender ratio, allow for smaller classes of more similar ages, and reduce the repetition rate because pupils are able to learn more effectively. However by itself it will not affect poverty alleviation. The reason for this follows from the analysis above; poverty alleviation depends on having a curriculum more relevant to rural life. By itself 'having more teachers' will not improve poverty if the curriculum stays academic and exam-oriented. Further comments, explanations and observations follow the table.

Table of possible effects of 23 possible policy actionsTable
8.2**Effects (see 6 to 9 below)**

Future actions (A to W)	1 Poverty alleviation	2 Social equity	3 Quality of learning	4 Reduce class size (Std 1-4)	5 Drop out rate
A More teachers		1	1	1	2
B Best teacher at Standard 1	2	2	2		2
C No class switching	2	2	2		2
D Relevant course and text	2	2	2	-1	2
E Use mother tongue (1-4)	2	2	2	-2	2
F Relevant exams	2	1	1		1
G New lower sec schools	1	1	1		2
H Pro-girls actions	2	2	1	-2	2
I More teaching time	2		2		2
J Bilingual textbooks	1	1	2	-1	1
K More sec schools		1	1		1
L Auto promotion system	1	2		-2	2
M Abolish ranking	1	1		-2	1
N More schools and rooms				2	1
O Bilingual exams	1	1	1		1
P Enough good textbooks		1	2	-1	1
Q Helpful guides			2		1
R Community attitudes	1	1			
S Penalties to repeat Std 8					-1
T Free school lunches	2	2	1	-2	2
U Good teaching (maths)			2	-1	1
V T's knowledge (maths)			2	-1	1
W Combined classes in 5-8			-1	2	1
Future actions (A to W)	6 Gender ratio	7 Age range in class	8 Repetition rate	9 Competition for selection	Total score
A More teachers	2	2	2	1	12
B Best teacher at Standard 1	1		1		11
C No class switching	1	1	1		11
D Relevant course and text	1	1	2		10
E Use mother tongue (1-4)	2		1		10
F Relevant exams	1	1	1	2	10
G New lower sec schools	1	1	1	2	10
H Pro-girls actions	2	1	1		9
I More teaching time			2		8
J Bilingual textbooks	1		2	1	8
K More sec schools	1	1	1	2	8
L Auto promotion system	2		2	1	7
M Abolish ranking	2	2	2	1	7
N More schools and rooms	1	1	2		7
O Bilingual exams	1	1		1	7
P Enough good textbooks	2		1		6
Q Helpful guides	1		1		5
R Community attitudes	1		1	1	5
S Penalties to repeat Std 8		2	2	2	5
T Free school lunches	2	-1	-1		5
U Good teaching (maths)	1		1		4
V T's knowledge (maths)			1		3
W Combined classes in 5-8	1	-1	-1		1

I have shaded the cells that include negative effects. Many of the positive actions are likely to result in even larger classes, particularly in Standards 1 to 4. For example, use of mother tongue instruction in Standards 1 to 4 would make no difference where this is already Chichewa, but in other language areas research suggests it would make learning much easier and more enjoyable. But this would mean more children attending school, and larger classes. Another positive action that would increase class sizes would be more encouragement for girls to stay on at school. While these actions are to be encouraged, actions that make school more popular would have to be accompanied by a different significant action to reduce the class sizes. Of the actions listed only A (More teachers more evenly deployed) and L (More schools and rooms) would compensate for the class size increases at upper primary levels.

8.8.3 Where to start

1 Deployment of teachers to rural schools

Given its widespread positive effects, recruiting and training more teachers would seem to be the most obvious thing to do. However, making better use of the teachers already on the payroll would seem to be a more effective option for a first action. This means doing something about *deployment*. When urban schools have more teachers than they can use, and rural schools are very short of teachers, some specific actions are called for that will spread them out more evenly. This has been discussed in [sections 8.1.4](#) and [8.3.8](#), with positive suggestions and inducements.

2 Use the best teachers for Standard 1

Researchers believe this to be the most cost effective method for improving quality (Bissell & Schiefelbein, 2002, p. 43). Improved learning at all levels depends on good literacy and numeracy from Standard 1.

3 Do not switch classroom teachers during the school year

Another highly cost-effective method for improving quality, based on supporting the teacher-pupil relationship, widely regarded as the key to successful learning.

4 Make the curriculum at Standards 1 to 4 much more relevant to rural life.

In relation to the mathematics course, textbook and guides, I strongly recommend that they heed the teachers' call for more practical numeracy. I have expanded on this below in [section 8.9](#).

This could lead to a more relevant mathematics curriculum ('practical numeracy with understanding' also in [8.9](#)) in Standards 5 to 8, supported by bilingual textbooks (Chichewa and English) and leading to a bilingual selection examination that is truly related to the course but also true to the overall goal of poverty alleviation and the other national goal supported by most of the public – preparation for global competitiveness. This should lead to pupils being more successful in mathematics in secondary school and hence eventually more mathematically capable primary teachers, while providing many other benefits as well.

8.8.4 Possibilities for pre-service mathematics education

Preparation of teachers in mathematics as part of pre-service courses are highly constrained by time and the limited background knowledge and understanding of the potential teachers. However in this limited background, teacher trainees differ little from the majority of primary teachers already teaching. An approach that is realistic would be tightly based on the curriculum, but highly practical, acknowledging the many constraints teachers will meet in schools. It should be something that can be an ongoing source of learning, but immediately useful to a first year teacher.

My suggestion is that a Starter Kit be prepared that has within it the tools to do an adequate job of teaching mathematics to a primary class. It should support the many inadequately

prepared beginning teachers, lacking in confidence but faced with a large class and a desperate shortage of equipment. Such a kit would also be of great value to those presently teaching.

The time allocated in college to preparation for mathematics teaching should focus on helping the beginning teachers to use this kit as completely and as well as possible. In helping teachers to learn to use the Starter Kit of resources, the tutors would use every opportunity to boost confidence and use group processes to build mutual support and networks for later personal support.

There might be several Starter Kits, for different levels. These could include a large set of prepared TALULAR materials, with detailed instructions. The contents of such a kit could be based on researched needs of beginning teachers. The kit could be the personal property of the teacher as (s)he moved out into schools for both teaching practice and then later in her/his career. This would therefore also have a positive impact on teachers already in schools, as the resources in the kit would be copied and shared more widely.

8.9 Implications for mathematics education

I offer these implications, based on the experience of a long career in mathematics education, including work and research in Samoa, observations of teaching and resources in Malawian primary schools and careful thought based on many conversations and correspondence with friends in Malawi. It is for others to judge whether or not they have use for other countries, similar to Malawi.

8.9.1 Possibilities for Malawian mathematics education in the future

In the light of the comments made above, creating a relevant mathematics education is a major challenge to Malawi, as elsewhere in the majority ('developing') world.

Based on my experience as a mathematics educator, I believe that **it is possible to be relevant to both the stated goal of poverty alleviation and preparing pupils for a selection examination.**

*Here is the major educational issue: **mathematical concepts must be learned in the context of realistic applications in order to develop transfer.*** A curriculum based around rural applications of mathematics has the potential to develop rich understanding of mathematical ideas far more effectively than the abstract teaching methods devoid of context used at present. An application-based curriculum would also establish meaningful links to literacy, science and agriculture, health, commerce and trade. There is no conflict between such a curriculum through Standards 1 to 8 and the ability to select pupils based on their demonstrated abilities in the curriculum. It is consistent with the ideals of continuous assessment, but is testable in an examination if required.

Above all a mathematics curriculum based around rural application of mathematics is consistent with the stated national educational goal: poverty alleviation.

In order to elucidate what such a curriculum might look like, I offer the following suggestions. The challenges are different at different levels. In the sections below, I present a conceptualization of a future Malawian mathematics education at three stages of primary education.

Standards 1 and 2: creating literate and numerate Malawians

These beginning levels demand critical attention, both as the basis for further education, and because the class sizes at this level are so very large. The most obvious strategy for a school is to put their best available teachers together to make learning more successful at this critical level. Success at this level will enable children to become literate and numerate in Chichewa,

vital even if they leave school immediately for economic or other reasons. Success at this level will create a positive attitude towards education in pupils and particularly in the subject of maximum ‘strangeness’, mathematics. It makes great sense to put the best teachers at this level and to make the classes small enough that all can learn properly. In my observations, the greatest shortages of furniture, notebooks, pencils, textbooks and other aids were at this level. The senior classes were full of desks and chairs, while the junior levels were full of small bodies.

For most of Standards 1 and 2, pupils cannot read but are learning to do so. So materials should not depend on the pupils being able to read. This permits of ‘multi-language’ print materials, required by the present language ‘policy’ but which currently do not exist. Oral instruction also permits a great emphasis on useful mental calculations and the development of ‘number sense’ – the ability to feel comfortable with numbers, and to be able to estimate the results of a calculation.

School organisations are needed that will allow these pupils to learn in smaller classes that will fit into regular classrooms. The ‘Malawian Breakthrough To Literacy’ program (see [section 7.8.2](#)) has shown that there are successful ways of dealing with pupils at this level, but class sizes in the trial were limited to 60, largely by trial teachers agreeing to work two shifts. This class size might be possible for Standard 1 and 2 teachers prepared to work longer hours, since their classes often start at 7.30 and end at about 10.30 at present. Another strategy for achieving ‘smaller’ classes in early years is for senior classes to agree to multi-grade teaching. This is a common strategy in South Africa (see Jordaan, 1999); it would free up teachers to split the very large classes and make class sizes in the lower levels more reasonable.

Croft (2002b) reports that many Standard 1 classes include children who by rights should be still at home, but are allowed to attend by their parents. This practice needs to be discontinued, as it only increases the difficulty for the rest of the class; Standard 1 classes are not child-minding centres.

My observations suggest that teacher-centred teaching is the most common method at this level, and this is supported by Croft (2002b). However, if facilities allow it, group activities might be more useful. Croft argues that the oral culture of Malawi is being utilised for pupils to learn at this level. I agree, but the very high dropout rates at this level, together with the high strategic importance of achieving success at this level, suggest that more research could find a wider variety of ways for teachers to meet the very wide range of learning needs, and even of ages, in these Standards.

Standards 3 and 4: practical numeracy with understanding

All of primary education, but particularly the cumulative subject of mathematics, has dual aims and these seem to clash. The 1991 and PCAR syllabuses are clearly aimed at preparation for further mathematics in Standards 5 to 8 and above. I have made the case for a mathematics syllabus that presents pupils with a vast number of clearly relevant practical numeracy applications and built their confidence in using mathematics in everyday life. While only 50% of enrolling pupils remain to start Standard 5, the numeracy of those who have only a few years in the system would seem paramount.

Teaching methods could be less teacher-dependent and become more resource-dependent. This is partly because of the considerable shortage of teachers and because good resources for pupil use can also serve to educate the teachers. With pupils working from books or booklets, the teacher is free to coach, demonstrate, explain, question, test and keep records. Testing should be done frequently and in very small doses, integrated into learning (not just end of term) so that it can provide feedback to teachers and learners about what could be improved.

The ‘western’ approach at primary level of hands-on activities for the whole class is not feasible at present in Malawi, because the levels of teacher understanding and resourcing are

not high, class sizes are too great, and pupils are too diverse. However smaller groups could work independently with resources and simple equipment, if equipment and clear instructions were available.

Well-written lessons transmitted to schools by radio (in Chichewa) would serve to motivate pupils and teachers, and be accessible to the general public. They would concentrate on numeracy – real-life uses of mathematics, such as interviews with traders, banks, government officials, etc. (I understand that such a radio program was being trialled in early 2008, sponsored by USAID.)

Standards 5 to 8: practical numeracy with understanding

At this level there is an even greater urgency to ***achieve preparation for secondary education through practical numeracy, taught so it is understood***. The methods used, as well as the content, could achieve *both* these aims: preparation for secondary education and preparation for daily life. If practical applications of mathematics are taught in a manner that will also achieve mathematical understanding then the required abstract ideas and exploration of some applications would lead to transfer to other real situations.

Some of the many areas that could be used are:

- ethno-mathematics (as used by adults in rural life),
- money (e.g. practical budgets, shopping, simple trading profit and loss, understanding the wage system, learning about credit and loans),
- measurement (for farming, growing and selling),
- the use of time,
- data (about Malawian society, in order better understand the past and the present), and
- chance (e.g. thinking about life decisions based on possible future scenarios).

However it should be noted that the interest of pupils might be enhanced if the contexts are real and personal rather than abstracted.

Here are some more detailed suggestions. A course based around these practical applications, and others not known to this author, could be designed to develop deep understandings of the big ideas in mathematics, and at the same time show its relevance to Malawian daily life.

Many of these ideas are found in the numeracy support materials from REFLECT (see [section 8.1.7](#)).

- Personal measurements, such as height, weight, girth, hand-span and area, foot length and area, ages. Class averages of these can be found by sharing (total evenly divided) which can be done either with a model or with straight abstract calculation. The values can be ranked and the median obtained. These values can be compared with similar values from other schools (i.e. other villages) and with the national averages.
- Statistical surveys can be made, using quantities such as the personal measurements (above) which may be graphed (simple 1-1 graphing using stones). Additional surveys can be made of families (ages, gender, bicycles, radios, religions, etc) or the total community. These should be related to health matters.
- Health, food and water offer a large number of contexts for measurement and survey data. Water usage, information about its source, who collects it, how long does it take, what capacity is the container they use, personal usage of water per day. What people eat (variety, vegetables, meat e.g. chickens, goats, cattle), growing and harvest tasks and times (volumes and mass), labour needs, storage (capacity, wastage), cooking, including the gathering of firewood, and finally the disposal of rubbish, including toilets.
- Clothing and climate. Studying the seasons, variation in length of daylight and rainfall, and how crop planting and harvesting fits into this. Droughts and floods. Cash crops such

as tobacco: area planted, labour needs and activities, drying, prices at market, taxes, income.

- Buildings: their shape and design, material requirements (e.g. amount of thatch and mud), area of floor and how it is utilised, height of roof, volume of house, storage sheds, drying sheds, etc.
- Distances, speeds, maps: walking times to other villages, times on bicycles, concept of speed, maps of classroom, village, district, land area allocated to family and farm labour requirements.
- Money matters: sources of income, employment and wages, collectives, micro-business and shops (credit and interest, income and expenses, profit and loss, stock control, assets, bookkeeping), shopping to purchase goods, trading for profit.
- Games and gambling, Bawo, lotto and similar public games. Music - analysis of rhythms.

Many of the matters above might also form the basis for a numeracy course for Malawian rural adults. If schooling has the ability to assist not only children but also their parents, then the experience has much added value and could change the sometimes negative attitude of parents towards education. There could be more interest from parents in what is happening at school and more interest in genuinely assisting their children to accomplish these *relevant* goals of education.

Textbooks and ways to use them

If Malawi continues with textbooks they should include simple pupil-readable introductions to each section so that pupils can read them for understanding of the topic. It would help if they were copiously illustrated; the technology has long been available for this to be achieved on desktop computers. Research suggests that a comic book style (with pictures carrying a story) is the most helpful type of book. This would also support the many teachers needing mathematical reminders.

Many practical rural Malawian applications should be included so as to help pupils and teachers to integrate topics in their minds and learn to identify mathematical concepts in their application forms. It is possible that ethno-mathematical research may be required to identify where mathematical activities take place in Malawian village life.

There should be a close match between the time required to teach the content thoroughly and the time available. Present (2005) textbooks appear to ignore the realities of time required to teach the material.

It also makes educational sense for the textbooks to be *bilingual* in Chichewa and English. In this way pupils and their teachers can increase their understanding through links with their common language and also see how the same ideas are expressed in English.

Because of the very wide range of abilities and levels within every class, books could be replaced by booklets at a great range of abilities, so that teachers can provide learning material at a suitable challenge for each level. This implies that learning might best take place in ability groups, using their own resources. Group work of this kind would seem possible and might make class management issues simpler for teachers, provided only that good quality resources were made available. (The several teachers whom I observed using group work did not use it to cater for different levels, but to facilitate discussions among pupils and improve understanding. It never involved use of a textbook.)

8.9.2 Blind allies

A blind alley is a path that ultimately leads nowhere. For the foreseeable future there are paths that mathematics education in Malawi might be advised not to take, as they may lead

the country even further from its stated goal of poverty alleviation. In the following section I describe them briefly and explain why I believe them to be counter-productive.

Calculators

Even in Australia, with its ready availability of calculators and batteries, primary teachers rarely use calculators in primary school. The major reason is that they believe their use discourages pupils from memorising basic number facts (multiplication etc.) and prevents the development of number sense.

Textbooks in their present form

There are four problems with present primary textbooks in Malawi:

- Teachers do not get reminders of what to teach, or suggestions about how to teach it;
- Pupils do not learn mathematical ideas, nor generalized methods for solving problems;
- Pupils do not learn to transfer one method of solution to other problems, or to real life;
- All pupils are treated as if they are at the same level, which is blatantly untrue.

In the section above I have made positive suggestions about textbooks and the ways they might be used. It is counter-productive to continue as at present.

Pure, academic mathematics

In both the primary and secondary courses there are many topics that exist only because of a British tradition from generations ago; for example, the teaching of a metric system of length using units at each power of ten (as in France) when only four units are used in Malawi. Most of the 'pure' topics (such as Roman numerals) exist as preparation for secondary courses that few will enter.

Television and computers

American Samoa and some other countries with adequate funding have made much of the power of broadcast television to help children learn. It is not useful for schools without electricity or a TV set. Similarly making use of computers is too far away for most schools; those few in the town areas who have developed computer laboratories still have constant maintenance and security problems. However lessons about mathematical applications on public radio might achieve results if very well presented; most teachers have battery-operated transistor radios.

Activity methods for the whole class

Despite the well-documented advantages of investigations or 'activities' for learning mathematics, the ability to run them so that they lead to meaningful learning depends on several factors not present in most classrooms at present: small numbers, plenty of available equipment, teachers with a good grasp of the mathematics and the pedagogy to teach it in this way.

Distance education for teachers

Although MIITEP ostensibly used distance education methods to continue the learning of its student-teachers while they were on their long teaching experience in schools, it failed miserably to achieve its goals (Stuart & Kunje, 2000). Similar experience is documented in many countries; failure can be expected where the distance education system is not supported by large numbers of staff, a good infrastructure (mail, electronics) and plenty of money (Creed, 2001).