

*Improving Educational Quality (IEQ) Project*

**EXPLORING FACTORS THAT INFLUENCE  
TEACHING AND LEARNING:  
COLLECTION OF SELECTED STUDIES USING  
THE IEQ/MALAWI LONGITUDINAL DATA 1999-2002**

*IEQ/Malawi*

A partnership among  
American Institutes for Research  
Malawi Institute of Education  
Save the Children Federation/US/Malawi Field Office

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## Acknowledgements

The findings presented in this document mark a unique activity in Malawi – a longitudinal study of primary school children in southeastern Malawi, conducted from 1999-2002. A partnership of three organizations – the American Institutes for Research, the Malawi Institute for Education and Save the Children/US (Malawi Field Office) comprised the Improving Educational Quality Project in Malawi team – IEQ/Malawi.

The longitudinal study took place in 64 schools in Mangochi and five schools in Balaka. The baseline sample (February 1999) focused on Standards 2,3,& 4 and each standard was followed through October 2002, except for October 2001 when teachers were on strike. Data were collected on: pupil achievement in literacy (English & Chichawa) and numeracy; teacher education and instructional practices; the classroom environment and interviews were conducted with Headteachers, parents and community members. Such data provide an illuminating profile and a rich source of information about individual pupils, their school life and family life, and the environment that influences their opportunity to learn. These findings offer highlights from the team's analyses but there is more to learn!

The IEQ/Malawi team worked with a large and committed group of practitioners, researchers and policymakers throughout this activity. We extend special appreciation to:

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Throughout the course of this activity, there were many other stakeholders: e.g., government officials from national and regional offices; data collectors from teacher training colleges, district education offices, Malawi National Examinations Board, local post secondary institutions; local schools; the teachers and pupils within our target schools; parents and colleagues from other donor agencies who have participated in seminars and workshops and IEQ Exchanges. Our work together has enriched the potential for improving the quality of education for all children in Malawi. Thank you all for your support.

Jane G. Schubert  
Senior Research Fellow  
American Institutes for Research

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## Prologue

Malawi was one of the first sub-Saharan African countries to open the doors of primary schools to all school-age children (FPE 1994). Since that time, policymakers and practitioners have been challenged to fulfill that commitment to Malawi's children and to ensure that having enrolled in school, children would receive a quality education. In 1998, USAID/Malawi invited the Improving Educational Quality (IEQ) Project to form a partnership with the Malawi Institute of Education (MIE) and Save the Children Federation/US (Malawi Field Office) to examine the implementation of Save the Children's Quality Education Through Supporting Teachers (QUEST) program. The research is unique because it follows a cohort of pupils through four years of the primary school cycle.

This two-volume series presents a summary of the findings and a collection of papers that report further investigation of key issues of that research. The longitudinal study of 64 schools in Mangochi and five in Balaka was conducted by the IEQ/Malawi team between 1999 and 2002: Data were collected at five points in time: February and October 1999; October 2000; and February and October 2002. A teachers' strike prevented data collection in October 2001. Within each school, one S2, S3 and S4 was selected per school. Sixteen pupils in each S2 and eight pupils in each S3 and S4 were selected per class. The Mangochi schools are located in 13 zones across the district and reflect the geographic, economic and industrial diversity of the area.

The type of data collected include: curriculum-based measures of pupil performance in literacy (both Chichewa and English) and numeracy; observations of teachers' pedagogical skills; teachers' proficiency in math and English (1999); teachers' formal and informal training; interviews with pupils, teachers, headteachers and parents. The team also tracked information about pupils in the sample who left school.<sup>1</sup> While pupils from S2 were followed throughout the study, those from the original S3 and S4 classes were surveyed, assessed and observed through October 2000. Tracking information was collected for all pupils during all follow-up study periods. A followup study of the 50% of the teachers present in February 1999 but not in the same class in October 1999 was conducted to determine what happened to the missing teachers. By design, the instruments were transparent. For example, children were asked to read from their textbooks and display numeracy through practical solutions. Classroom observations were based on factors deemed important by trainers.

The findings presented here about the experiences of primary school pupils as they move through the cycle, the factors that influence their learning, the learning environment of both the teachers and the pupils merely tap the surface of the magnitude of the information contained in the database. The potential for further exploration about teaching and learning within these schools exists! The data will be made available to other researchers.

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<sup>1</sup> See Appendix 1 for sample questions from the assessment instruments.

Key elements in the success of IEQ/Malawi in undertaking such an ambitious activity were:

- the inclusiveness of 100+ educators throughout the sector – national and district level educators, primary education advisors, lecturers from the teacher training colleges and the University of Malawi, MIE curriculum writers, SAVE teacher trainers, community organizers in data collection (thereby exposing them to the procedures and instruments used in the study) participatory nature of the research;
- the sharing of concrete findings about pupil performance and instructional skills and the discussions of how to use the knowledge throughout the period of the study – with parents and teachers, within the MIE and SAVE institutions at seminars and workshop, at IEQ Exchanges with policymakers and practitioners (around the same table) in Malawi and at international conferences;
- the location of the IEQ in Malawi institutions – Malawi Institute of Education and Save the Children in Mangochi so as to strengthen the capacity of members to use qualitative and quantitative methods in classroom-anchored research and apply the IEQ approach to new situations as useful and desirable;
- the excitement and renewed commitment to the efforts, particularly as team members visited the field and began to share insights and experiences from interacting with the community, the local educators and the pupils.

Volume 1 contains summaries in user-friendly formats of eleven key findings of the longitudinal study. These findings begin with a description of the pupils and are followed by: learning over time; comparison with a continuous assessment intervention; retention over four years; the use of mother tongue in the classroom and the relationship between mother tongue of pupil and teacher; the availability and use of instructional materials; teacher qualifications linked to pupil outcomes; use of instructional resources; followup of teacher mobility; role of communities in school; and external influences on learning.

Volume 2 presents the Context of the Study; Primary Education in Mangochi and Balaka; Language Policy and Education in Malawi; Teacher Qualifications, Classroom Practices, Classroom Resources and Pupil Learning; Pupil Characteristics Predict Learning; and the Effects of HIV/AIDS in the Classroom.

The IEQ/Malawi team strived to pinpoint opportunities for improving the quality of learning, by producing credible and accessible knowledge about factors that influence the influence such quality. Readers are invited to be users of this knowledge and to continue the exploration into the classroom – the workplace of learning. Through ongoing and systematic exploration of teaching and learning, the parallel goals of quality and access may be achieved and demonstrated by the successful completion of the primary cycle of all children.

## Chapter One: Introduction

By Cory Heyman and Gaylene Santilla-Crisafulli

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### A DECADE OF POLICY CHANGE

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The primary school system in Malawi has undergone substantial changes in the decade since the country held its first multiparty election. This began with the immediate fulfillment of a campaign promise by the new government in 1994 to open schools for free primary education. Within a year of introducing the new policy, the number of children enrolled in primary school increased from 1.9 to 3.2 million. This rapid influx of new pupils went far in increasing educational access, but it also created substantial strains on the system. One consequence was the urgent need for new classrooms. Existing school buildings could not accommodate the 68 percent increase in new pupils, so new space had to be sought in non-school buildings, such as churches, and outdoors, and through strategies such as multiple shifts during the day (Kunje & Chimombo, 1999, p.4).

The Government of Malawi also responded to the new pupil demand by immediately recruiting 22,000 teachers. Although 4,000 new recruits came from the ranks of retired teachers, nearly 18,000 had no previous teaching experience. These teachers received only two weeks of emergency training before entering the classroom. This sharp increase in the number of untrained teachers forced the government to shift the emphasis of teacher training colleges away from pre-service teacher education toward improving the quality of the newly established teaching force. Whether the revised in-service professional development program in the colleges has improved teacher quality, however, remains in question (Stuart & Kunje, 2000).

The change in government also brought a change in primary school language policy. Whereas the previous government had made Chichewa the language of instruction in primary schools, the new government instituted mother tongue as the language of instruction in standards one to four. The new policy was meant to make it easier for children from Malawi's other language groups to access quality education. The reality, however, is that it has been difficult to implement the policy across the country given limited support for language training and the development of curricular materials in multiple languages (Mchazime, 1999, 2000).

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### PURPOSE AND CONCEPTUAL FRAMEWORK

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These papers describe primary education in Malawi in light of these reforms and examine their potential impact on schools, classroom, and pupil outcomes. How are national policies implemented at the school level? How do reforms affect classroom practices? How do interactions among teachers and



Project (IEQ). This study began as an attempt to learn about education in schools in Mangochi and Balaka districts where Save the Children was beginning its Quality Education through Supporting Teachers (QUEST) project and has become a rich data source about the experiences of children as they have progressed through four years of primary school.

The schools included in the IEQ/Malawi Longitudinal Study are highly representative of schools across the country. Sample schools in Mangochi and Balaka are similar to other schools in those districts on key variables such as pupil home language, number of qualified and unqualified teachers in the school, and percent of pupils passing the primary school leaving examination. The only statistically significant difference between study and non-study schools was in Mangochi, where study schools seem to be much larger than non-study schools (80,000 compared to 40,000 burnt bricks, respectively).

Moreover, schools in Mangochi and Balaka are quite similar to schools elsewhere in the country but with a few notable exceptions. For example, schools in Mangochi and Balaka are much newer, have larger schools, and have more enrolled pupils per school than other districts; Balaka also has much more extensive access to piped water. The other main difference is in the ethnic/linguistic composition of Mangochi schools, where fewer than half as many pupils speak Chichewa as their home language (27 percent) compared to the national school average (57 percent). The majority of pupils in Mangochi speak Yao as their home language (69 percent) compared to 10 percent nationally (Malawi Ministry of Education, Science and Technology, pg 49). These differences notwithstanding, most findings in these ensuing studies are generalizable at the national level, as are the implications for reforms in educational policies and practices.

A variety of statistical methods were used to conduct analysis of the data. These include basic descriptive analyses, comparisons of sub-group means, and inferential statistics. Analyses that examine relationships between school or classroom variables and pupil outcomes required multi-level statistical techniques. These included “survey” and “mixed” procedures in the SAS statistical software package and “survey” commands in the Stata software package.

## ORGANIZATION OF THIS DOCUMENT

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The subsequent chapters of this collection summarize findings from IEQ/Malawi research studies. Each provides a) a historical overview of the issue, b) a description of the research questions examined and how they fit into the conceptual model of teaching and learning, and c) a summary of research findings. Discussions then reflect on the implications of research findings for national policies and school- and classroom-level practices.

Chapter 2 describes pupils, classrooms, and schools in Mangochi and Balaka districts. It examines the characteristics of study participants, trends in academic achievement, and changes in pupil status over

time. For example, how many pupils from the original 1999 cohorts remained in school through the 2002 school year? What were the primary explanations of school dropout?

Chapter 3 describes how Malawi's most recent language policy for primary school education has been implemented in these two districts, how policies have been translated into classroom practices, and how practices are associated with pupil outcomes. The issue of language policy and practice is complex in Mangochi. Mangochi is a district where the majority of pupils speak Chiyao as their home language but where the majority of teachers, hired from other parts of the country, speak Chichewa as their first language. The question, then, is whether teachers have the education, experience, knowledge, and skills to facilitate effective classroom practices in this environment. The language issue is further complicated by the fact that there is substantial language fluidity in Mangochi between Chichewa and Chiyao. This chapter therefore examines the extent to which language minority status is an impediment to learning in Mangochi.

Chapter 4 examines relationships among multiple concepts in the model of teaching and learning. The question is whether there is a direct association between teacher education/qualifications and pupil outcomes and whether classroom practices and resources mediate these associations.

The next paper, described in Chapter 5, is an investigation of pupil-level variables on pupil learning. It examines how pupil characteristics, such as gender, repetition and minority language status is related to pupil outcomes in math, Chichewa, and English.

HIV/AIDS is a major issue in all of Africa, including Malawi. Chapter 6 describes the impact of HIV/AIDS on their education system, focusing on agents in the classroom.

The final section is an epilogue that provides an overall reflection on the lessons of IEQ.

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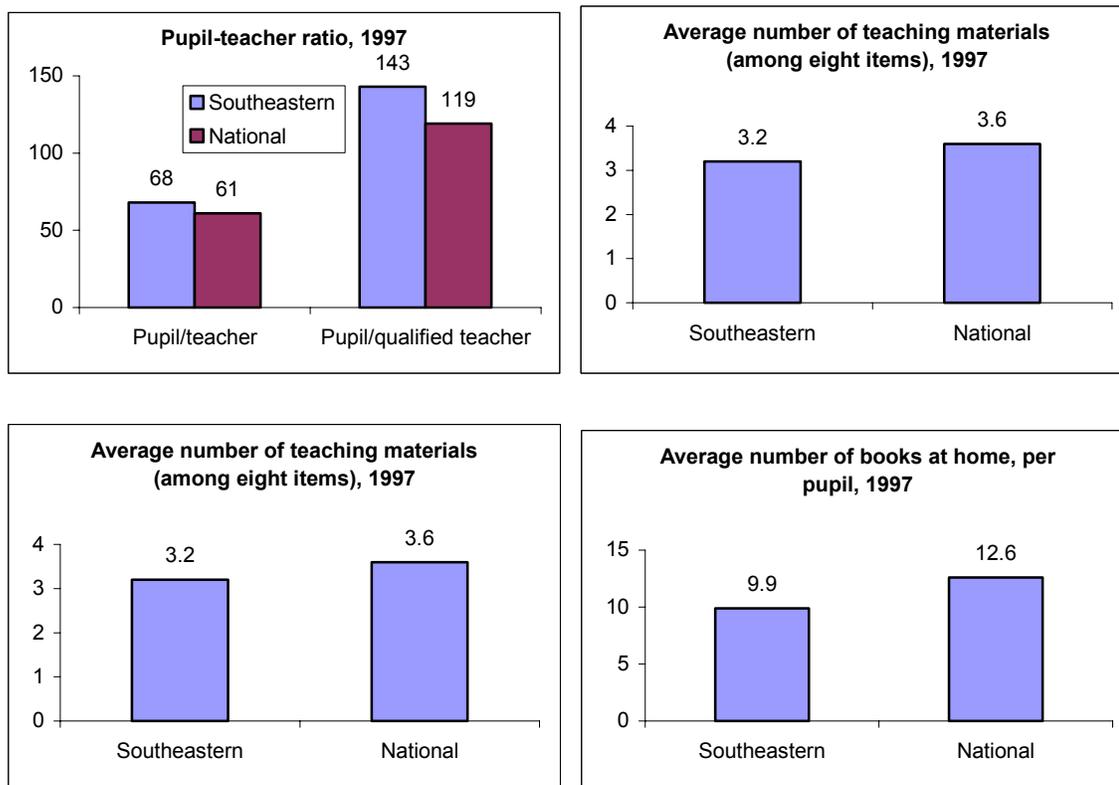


## Chapter Two: Primary Education in Mangochi and Balaka

By Cory Heyman, Cassandra Jessee, and Frank Winicki

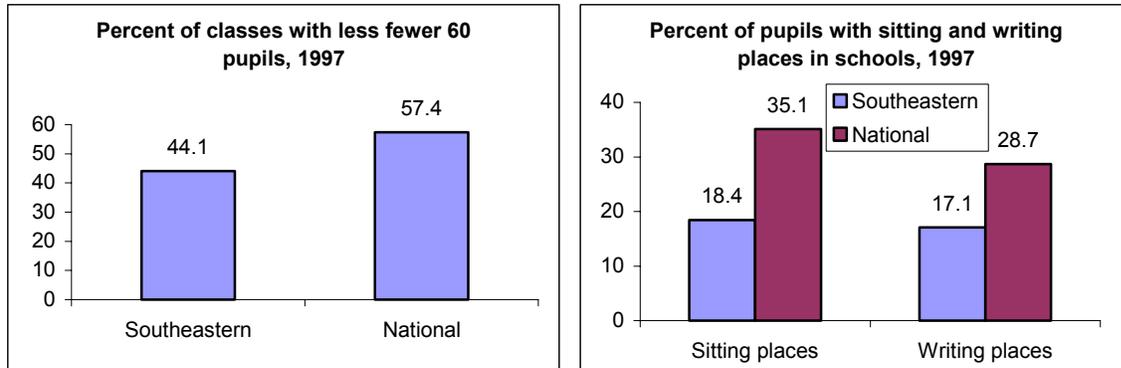
### MANGOCHI AND BALAKA DISTRICTS

Mangochi and Balaka are two rural districts in the southeastern division of Malawi that lie between the western side of Lake Malombe and the southern side of Lake Malawi. Mangochi is to the north of Balaka. Historically, the southeastern division has the highest teacher to pupil ratios in the country. In



1997, there were 68 pupils for every teacher and 143 pupils for every qualified teacher (Milner, et al., 2001, p.3). The southeastern division has one of the lowest number of books per pupil household (p.21), percentage of professionally qualified teachers (p.50), and access to teaching materials (p.30) in Malawi. Schools in the southeastern division are much newer than elsewhere in the country and a much smaller percentage are in need of repair compared to the national average (p.38). Nevertheless, it has the largest class sizes in the country (p.45) and the smallest percentage of pupils who have places to sit and write in the classroom (other than the floor) (p.47).

Save the Children/U.S./Malawi Field Office (SC/US) has been working in Mangochi schools since 1993, when it began its Village-based Schools program. The program began with eight schools, which became a model for district-wide reform six years later. USAID awarded SC/US a grant in 1999 to implement the Quality Education through Supporting Teaching (QUEST) project. The goals of the project were to decentralize responsibility and improve the quality of education in primary schools. Between 1998 and 2002, QUEST has supported more than 4,200 teachers in 472 schools in Mangochi, Balaka, and Blantyre Rural districts.



In 1999, USAID/Malawi commissioned the Improving Educational Quality (IEQ) project to study education in schools that were implementing QUEST to learn about the implementation of QUEST. IEQ brought together researchers from the Malawi Institute of Education and implementers from SC/US/Malawi Field office to design and implement the study.

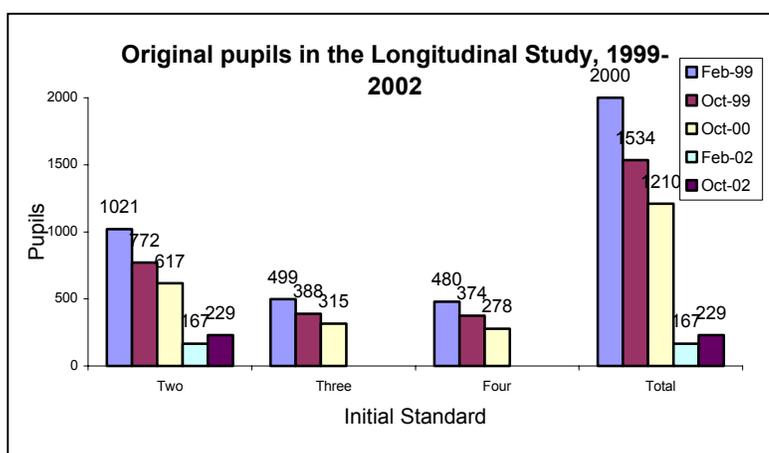
The longitudinal study includes 64 schools in Mangochi and five schools in Balaka. The Mangochi schools are located in 13 zones across the district and were selected to reflect the geographic, economic and industrial diversity of the district. One standard two, standard three, and standard four class was selected per school; and sixteen standard two pupils, eight standard three pupils, and eight standard four pupils—equally split between boys and girls—were selected per class. Data were collected at five points in time: February and October 1999, October 2000, and February and October 2002.

Table 2.1 summarizes the data that were collected as part of the longitudinal study from February 1999 to October 2002. These include surveys, assessments, classroom observations, and tracking information about pupils who left school. Appendix 1 shows example questions from the research and assessment instruments. While pupils from the original standard two were followed over the entire study period, those from the original standards three and four were surveyed, assessed, and observed only through October 2000. Tracking information was collected for all pupils during all follow-up study periods. Surveys were also given to all Chichewa, English, and mathematics teachers of pupils who were followed over time. Teacher proficiency in basic mathematics and English was assessed in February 1999.

**Table 2.1: Data collection instruments**

Data	Original Standard Two Cohort					Original Standard Three Cohort					Original Standard Four Cohort				
	F99	O99	F00	F02	O02	F99	O99	F00	F02	O02	F99	O99	F00	F02	O02
Surveys	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓		
Assessments	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓		
Classroom observations	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓		
Tracking		✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓

The first data collection took place in February 1999. In collaboration with international consultants, the new IEQ/Malawi team fielded a series of instruments to understand more about the linkages among pupils' background characteristics, classroom processes, school and community resources, and pupil outcomes with the ultimate goal of improving educational quality. Analyses have been used to inform policymakers and educators about the dynamics of Malawian schools and classrooms.



The following section describes the schools, teachers, classrooms, and pupils that were included in the longitudinal study.

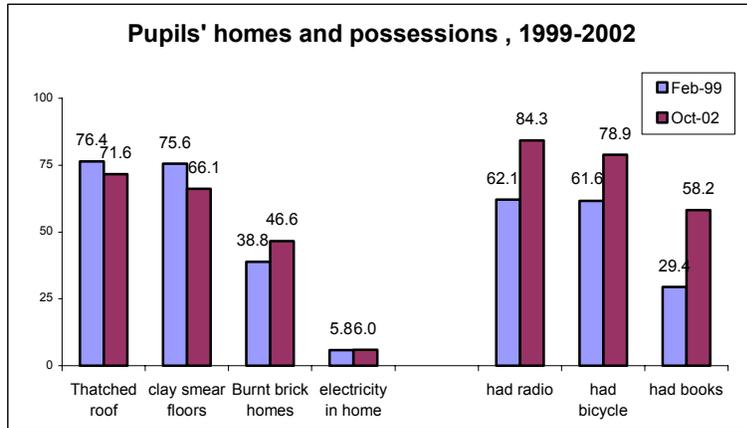
## PUPILS

Baseline February 1999 data collection included 2000 pupils from Mangochi and Balaka in standards two, three, and four of which 1000 pupils were in standard two. Those standard two pupils were followed through October 2002. The average pupil in the sample from standard 2 at the start of the school year in 1999

- Was 9.1 years old;
- Weighed 24.7 kilograms;
- Was 126.7 centimeters tall;
- Has 2.4 older siblings and 1.6 younger siblings; and

- Had spent 2.83 years in school.

By design, the sample was almost split evenly among boys and girls, with girls comprising 49.5 percent of respondents., equal numbers of boys and girls were randomly selected from standard 2 class lists in



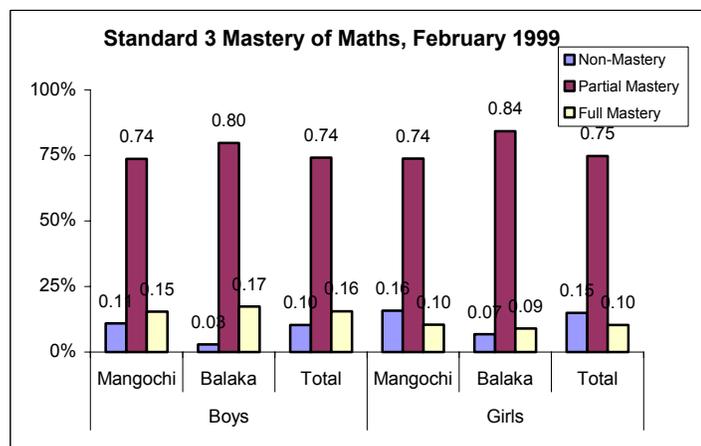
each of the 64 participating schools. Girls comprised 49 percent of the original sample. The majority of pupils spoke Chiyao as their first language (59.1 percent) and were studying in classes in which the teacher spoke a different first language than them (71.2 percent). In addition, a majority of pupils lived in homes with

thatched roofs (76.4 percent), clay/smear floors (75.6 percent), and had a radio (62.1 percent) and bicycle (61.6 percent) in the home. A plurality lived in burnt brick homes (38.8 percent) and a smaller percentage had books in their home (29.4 percent). Very few pupils had electricity in their home (5.8 percent). The majority of pupils worked in the morning before school (81.8 percent), and worked after school (81.3 percent).

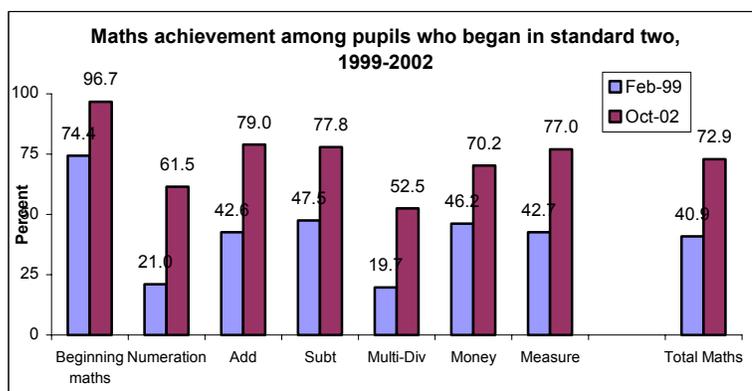
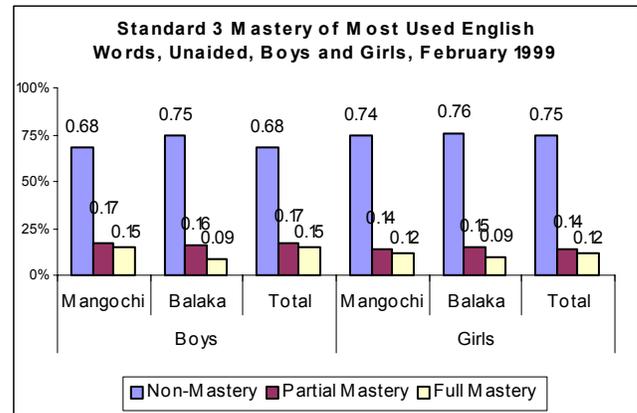
In October 2002, when we followed up with the pupils who had been in standard two in 1999, approximately 30% were still available in the school system to be interviewed. However, the profile of those still attending school was quite different. For example, although it was almost four years later, the average age of pupils in the sample was only 2.1 years older. Also, girls were underrepresented, by October 2002, girls comprised only 39 percent of the overall sample. Pupils still attending school were those whose standard of housing was higher and they reported their homes had more relatively possessions (19.1% more pupils had a radio, 14.4% more had a bicycle and 23.1% more had books).

While most pupils reported both parents still alive (79.9 percent), almost 20% of those pupils still in school had lost at least one parent. Pupils worked more as they got older. By October 2002, many more pupils worked in the morning before school (94.3 percent), and a majority worked after school (76.1 percent).

Baseline data indicated that pupils were performing substantially below curriculum

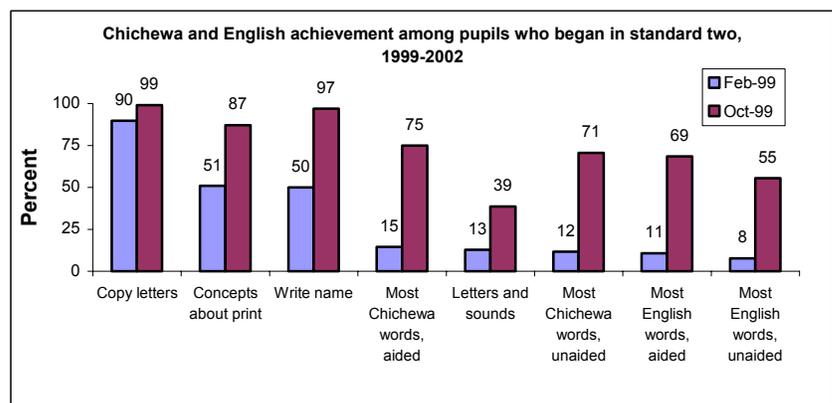


standards in academic achievement. In February 1999, only 13 percent of pupils in standard three were achieving full mastery of standard three math skills. Similarly, only 11 percent achieved full mastery in the identification of English letters and sounds, and 13 percent mastered the skill of identifying common English words. Analyses also indicated that boys were achieving higher levels of proficiency than girls.



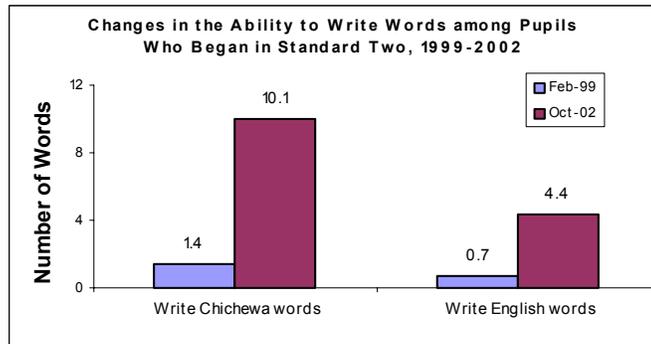
Among pupils who stayed in school, academic achievement did increase over time. Pupils in the longitudinal study were assessed using parallel forms in mathematics as well as Chichewa and English literacy skills during each data collection period in 1999 and 2000. Pupils from the original standard two cohort also

received the parallel form assessments in February and October 2002.<sup>2</sup> Results indicate substantial gains over time. The average score on the maths assessment, for example, went from 41 percent correct in February 1999 to 78 percent correct in October 2002. The largest increase was in multiplication and division. And by October 2002, the majority of pupils were able to identify letters and sounds, identify common Chichewa and English words unaided, and write more Chichewa and English words.



<sup>2</sup> Prior to the February 1999 data collection, pilot testing of items was used to develop three parallel forms for the mathematics assessment and the English and Chichewa reading passages for each standard. Forms were rotated in subsequent administrations. Other assessment tasks such as concepts about print, letters and sounds, most used words, and writing words remained unchanged from across administrations.

This does not mean that original standard two pupils are now achieving to grade level. In fact, there is substantial grade repetition among pupils. Nevertheless, pupils who remain in school are able to achieve basic mathematics and literacy skills over time.



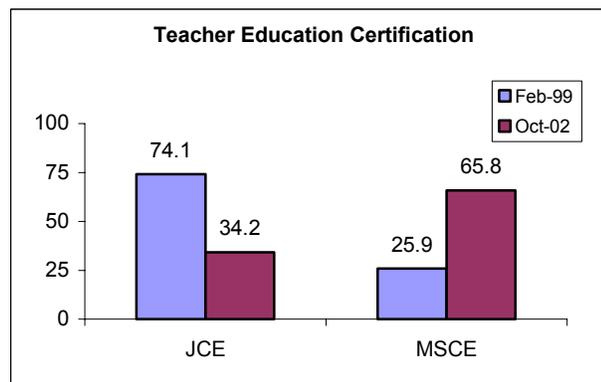
## TEACHERS AND CLASSROOMS

The longitudinal study also collected data about pupils’ Chichewa, English, and mathematics teachers over time. Among the original 186 teachers surveyed, the average teacher in the sample

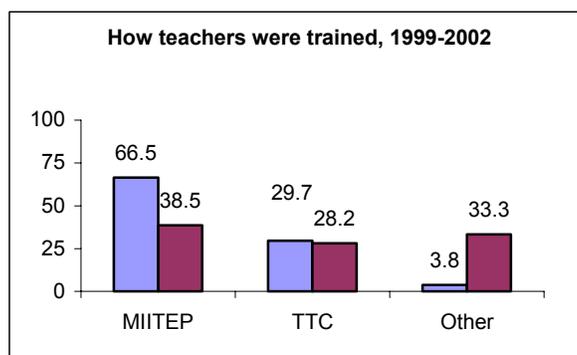
- Was 30 years old;
- Had completed slightly more than 12 years of schooling;
- Had been teaching for five and a half years and at the school where they were surveyed for three and a quarter years;
- Spoke excellent Chichewa and good English but almost no Chiyao; and
- Owned a radio and approximately ten books.

In contrast to pupils, the vast majority of teachers were male (71 percent), and many more teachers than pupils spoke Chichewa (68 percent) as their home language. Only 19 percent spoke Chiyao as a home language, as compared with 57% of the pupils. This difference, and the fact that very few teachers speak even “good” Chiyao, creates a substantial language mismatch in the classroom. By October 2002, this situation had improved; 62% of the teachers who were teaching the pupils from the original standard two cohort spoke at least a fair amount of Chiyao

Most teachers had more education than their parents. Only 45 percent of teachers’ mothers had attended school, and even fewer teachers’ (24 percent) fathers had attended school. Despite earning more education than their parents, though, only one of four teachers had passed the Malawi School Certificate Examination (MSCE).



Three-fourths had only completed the Junior Certificate Examination (JCE). By October 2002, teachers interviewed had even less years of schooling (11.3 years) but nearly approximately two-thirds had passed the MSCE, while the other third had passed the JCE.



In 1999, the majority of teachers had been trained to teach through the Malawi Integrated In-service Teacher Education Project (MIITEP) or through one or two years at a teacher training college. Nevertheless, the sample included a large number of uncertified teachers (61 percent). Only 39 percent had acquired a T2 or T3 professional qualification. In October 2002,

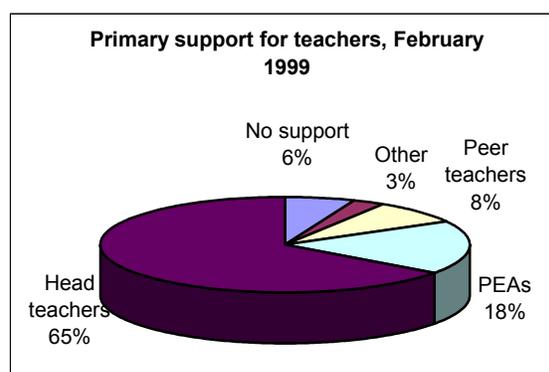
fewer teachers were trained in MIITEP, but more teachers were certified (57 percent).

In terms of school experiences, the average teacher in 1999

- Worked 1.1 shifts at school;
- Reported an average class enrollment of 84 pupils (93 pupils in standard 2) with an average daily attendance of 62 pupils (68 pupils in standard 2);
- Reported that he or she was only absent one or two days during the school year;
- Had attended one in-service training workshop in the last three years;
- Was observed teaching no more than once by the head teacher or primary education advisor during the last year; and
- Assigned homework no more often than once per week.

By October 2002, teachers' attendance at in-service training increased to once a year, they assigned more homework, nearly twice a week but managed slightly smaller classes, 71 pupils.

The majority of teachers reported their primary support comes from their head teachers, though primary education advisors (PEAs) and peer teachers were identified as the primary support in some instances. Only 6 percent of teachers said they received no professional support in their jobs. In 2002, more teachers indicated support from PEAs. On average, teachers said that they receive assistance from head teachers once or twice



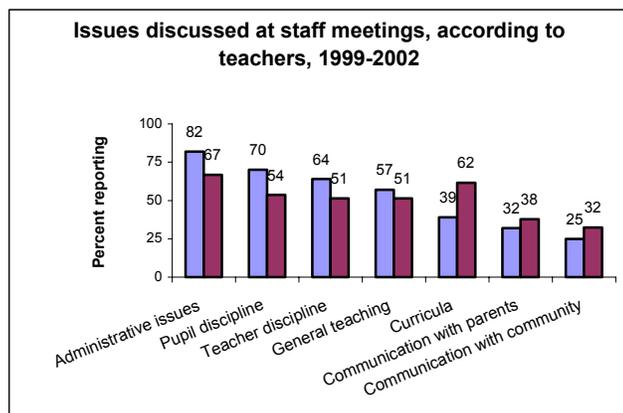
per month, from peers once per term, and from primary education advisors only once per year. In February 1999, most teachers also have teaching guides for Chichewa (91 percent), English (88 percent), general studies (89 percent), and mathematics (91 percent). By October 2002, while the majority still had teacher guides, there was a decline from 1999, particularly for math guides.

Teachers also reported on their use of various instructional methods. In 1999 and 2002, the most commonly cited methods were the use of textbooks and pupil work on the chalkboard. Teachers used these methods, on average, at least two to three times per week. Less frequent were the use of encouragement to help pupils learn, the use of teaching and learning aids, pupil work in pairs and groups, and questions and answer strategies, which were used only once a week on average. Less frequent still was the use of song, role playing, pupil writing, lectures, and reviews of homework, which took place only two to three times per month; and the use of exams, which were given no more often than once per month.

Lastly, teachers described their involvement in the school and community. On average, they

- Attended school staff meetings once every two months;
- Almost never met with parents to discuss parent-teacher associations; but once per year to discuss pupil absenteeism; and nearly once per term to discuss disciplinary issues, pupils' dropping out, and pupil health issues; and
- Participated in planning meetings with the community once annually but almost never participated in parent-teacher association meetings or involved community members in teaching.

At school staff meetings, most teachers said they discussed their school's administrative procedures, pupil discipline issues, teacher discipline issues, and teaching issues more broadly. At the same time, in 1999, only a minority of teachers discussed the school curriculum, relationships with parents, and the relationship with the community, but that shifted by 2002. Administration and curricula issues dominated staff meeting discussions and increase in discussions focused on communication with parents and community.



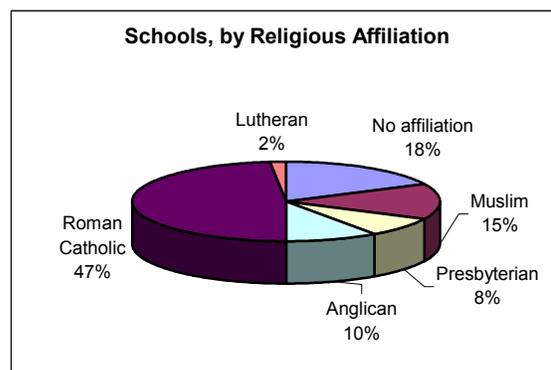
## STUDY SCHOOLS

The longitudinal study collected substantial information about its 64 schools, including their location, construction, facilities, resources, and populations. The average school in the study was two hours and eight minutes from either Mangochi or Balaka towns by car and had

- Three classroom blocks, with approximately 0.6 classes that met under trees or in the open air;
- Walls made of burnt bricks, floors made of cement, and roofs made of corrugated sheets;
- No electricity, piped water, library, or garden;

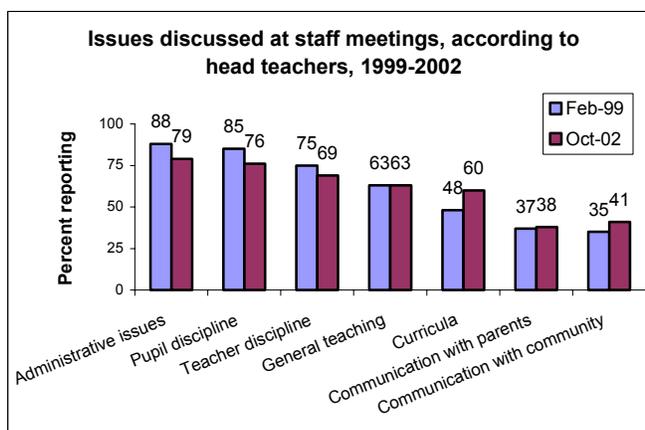
- Five latrines, including separate latrines for girls;
- A head teacher's office and a health facility.

Schools had an average of 766 pupils enrolled, representing five and a half villages per school, and an enrolled pupil to teacher ratio of 80:1. During the year prior to baseline data collection, an average of 27 boys and 14 girls took the standard eight leaving exam, and an average 20 boys and 10 girls passed the exam. There were also an average of 2.3 languages spoken at each school. Chiyao speakers predominated (61 percent of pupils), followed by Chichewa speakers (34 percent). In these Mangochi and Balaka schools, there was also a small proportion of Lomwe (3 percent) and Tumbuka (1 percent) speakers. This language breakdown mirrors language differences in school communities, 68 percent of which are primarily Chiyao speaking, and 29 percent of which are primarily Chichewa speaking. Given this language distribution, it is surprising that Chichewa is the primary language of instruction, at least for the lower standards, in 85 percent of schools, while Chiyao is the language of instruction in only 15 percent of schools.



In addition to linguistic diversity, the substantial religious diversity in Mangochi and Balaka are also reflected in schools. Seventy-eight percent of schools in the longitudinal study had a religious affiliation. The majority of schools with a religious affiliation were Roman Catholic, followed by Muslim, Anglican, Presbyterian, and Lutheran.

Surveys also asked head teachers about external support for schools, school management issues, and linkages between schools and communities. In terms of external support, head teachers said that their schools received an average of 3.3 visits from primary education advisors (PEAs) and 0.6 visits from district education officers the previous year. Seventy-two percent of schools have PEAs who live in their zones, and 29 percent of schools have PEAs who live within walking distance. Head teachers also said that they had observed only one teacher during the previous school year and held staff meetings on a monthly basis. Head teacher reporting of monthly staff meetings, however, is substantially different from teacher reports, which indicate an average of a meeting once every two months.



Head teachers in 1999 reported similarly to teachers about issues discussed at staff meetings. The largest percentage reported administrative issues and pupil and teacher discipline as the most common issues discussed at meetings. Also common were discussions about teaching in general, curricular issues, communication with parents, and communication with the community. By 2002, however, these percentages had changed somewhat. More head teachers reported that they discussed curricular issues as well as outreach to communities, while fewer discussed administrative issues and teacher and pupil discipline.

In 1999, most schools had functional school committees (81 percent), but only a small minority (12 percent) had functional parent-teacher associations. By October 2002, the number of PTAs had increased dramatically. Eighty-four percent of head teachers reported having functional PTAs. In addition, schools planned an average of 1.1 projects with communities, initiated 0.8 projects with communities, and implemented 0.8 projects with communities in 1998. They also resolved 1.5 problems with communities on average that same year. These community collaborations, however, did not increase substantially by 2002.

## CONCLUSION

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For those who are designing interventions and thinking of practical implications of policy changes, it helps to understand the system and all of its players. Descriptive data play an important role in contextualizing any discussion about policy changes. This section paints that picture of the education system in Malawi and provides a context for understanding the analyses and implications in the following sections.

## REFERENCES

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## Chapter Three: Language Policy and Education in Malawi

By Abigail Harris, Cassandra Jessee, Henri Chilora, and Hartford Mchazime

### INTRODUCTION

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When Malawi gained independence in 1964, they inherited a language policy that gave priority to the learning of English but also included two indigenous languages in the curriculum: Chinyanja and Tumbuka. In 1968, Chinyanja was made the national language and English the official language. The name Chinyanja was immediately changed to Chichewa. Chichewa was prescribed as the medium of instruction in the early years of primary schools and a compulsory subject in all classes throughout Malawi. Chichewa therefore became more prominent and, over time, more wide spread, than other local languages (Moto, 1999).

In 1994, the newly elected government of Malawi declared primary education free. The declaration saw a massive recruitment of untrained teachers. Although teachers were supposed to be recruited locally, some districts like Mangochi saw an influx of teachers from other districts. One result was that many teachers were posted in schools where they did not speak the same language as that spoken by their pupils in their homes.

Two years after the declaration of free primary education, the ministry of education wrote a circular to all district and divisional education managers revising the policy:

With immediate effect, Standards 1, 2, 3, and 4 classes in our schools be taught in their own mother tongue or vernacular language as medium of instruction. English and Chichewa will however continue to be offered as examinable subjects in the primary school curricula. In the past Chichewa was used as both a medium of instruction and a subject, making it difficult for beginners to grasp ideas. However, English will be used as the medium of instruction beginning in Standard 5.

The reaction of the Malawian society to the release of this language policy was mixed. According to Brown Mpinganjira, the then Minister of Education, “While the policy was applauded by some, it was misunderstood, misrepresented and even condemned by others.” (Kamwendo, Mtenje, Pfaffe, & Sandhaas, 1999, p. 6) He noted the following problems with implementing the mother tongue policy:

- Most teachers lack competence and training in the art of mother tongue education.
- Distribution of teachers makes it difficult to group teachers speaking a particular mother tongue.
- Retraining of serving teachers in mother tongue of their work area is very costly.

- Negative attitude: the teaching and learning of mother tongue in Malawi is looked down upon,
- Lack of instructional materials e.g., pupils' books, teachers' guides and supplementary readers in mother tongues.
- Demarcation of catchment area for a particular mother tongue on geographical and demographic trend has been difficult.
- Political influences beyond Ministry of Education's control have been difficult if not impossible to resist.
- Inadequate meaningful advice from relevant institution i.e., Malawi Institute of Education (MIE), University of Malawi's Centre for Language Studies (CLS), etc.
- Lack of comprehensive research on methodologies in the teaching of mother tongues.

He continued: "The Ministry of Education strongly feels that there is need for wide and comprehensive consultations amongst the main stakeholders like the Malawi Institute of Education and Malawi's Centre for Language Studies on matters relating to language policy in Malawi."

(Kamwendo, Mtenje, Pfaffe, & Sandhaas, 1999, p. 6)

Given the complexities raised by the Minister and the realities of the Malawi language context, it is not surprising that there was not a unified voice offering "meaningful advice" on how best to proceed. For some children in Malawi, Chichewa is the mother tongue. For other children, Chichewa may not be the mother tongue but it is the lingua franca in their community. And for other children, Chichewa is a language as unfamiliar as English.

A review of the international literature on language policies and mother tongue instruction provides guidance in conceptualizing the challenges faced in language education in Malawi. One such challenge is identifying the functions played by the various languages in this multilingual society and the implications for educational goals. A second challenge is identifying pedagogically and empirically sound instructional practices for achieving these educational goals.

Fishman (1971) theorized about three types of language policies adopted by developing nations. Countries with *exoglossic* policies (such as Ghana and Mozambique) have no one unifying or integrating language, and, often to repress persistent rivalries amongst local language groups, opt instead to use a colonial or imported language. These countries may use the home language as a stepping-stone to oral fluency and literacy in the official language but typically the languages become stratified with the official language having higher status. Typically, local languages are relegated to a secondary status and underdeveloped since they are viewed as transitory (Bamgbose, 1991, 2000). Countries with an *endoglossic* policy (such as Somalia) evidence a nationalistic attitude that favors pride in ones cultural heritage, departing from the use of an ex-colonial language and consciously promoting one indigenous language. Countries with *mixed exoglossic* and *endoglossic* policies promote both an ex-colonial or imported language as an official language alongside one or more indigenous languages as national languages. This third group balances the use of the imported language for "nationalism" and the

indigenous language(s) for maintaining cultural identity and nationalism.

Countries that fall into the third, mixed-policy group face the challenge of deciding how each language will function in the society (i.e., which languages will be used for local and national governance, commerce, communication and technology, medical and scientific inquiry, cultural activities, etc.) and the implications for educational policy. For example, a recent document by the Pan South African Language Board noted given that, “people cannot share power if they do not have access to the language(s) used by those in power,” language is central to creating access to a participatory government and is, therefore, a gatekeeper for South African democracy.” (Taylor, 2002, p. 327) They argue that if one regional or local language is designated for use in governance, does this not favor those for whom this is the home language? On the other hand, if governance is conducted in an imported language that is the second or third language for the citizenry, does this mean that all citizens need proficiency in imported and national languages, often in addition to home languages? Often, a decision is made to designate two or more languages for particular functions. This facilitates wider participation but it imposes on the educational system the burden of preparing teachers and learners who can function in multiple languages.

Language policy decisions are particularly difficult to resolve in countries where there is more than one national language. Nigeria’s language policy provides an example of an attempt to give equitable roles for different languages based on three tiers of population-determined categories of languages. The result is three major languages at the national level, several medium languages at the state level, and hundreds of smaller languages at the state levels. This policy while supportive of local cultures and traditions is costly in terms of resources and difficult to implement effectively. For example, to support this policy, there is a requirement that all secondary school students should learn a major Nigerian language other than their own language. Unfortunately, the dearth of qualified teachers, lack of commitment, and the granting of waivers have rendered this provision in the policy ineffectual (Bamgbose, 2000, p40).

The situation in Malawi is characterized by English as the official language along side Chichewa as the national language or the second official language. Although there is controversy about how this choice was made and the political motivations behind the decision, it seems that Malawians recognize the value of Chichewa for communication (Moto, 1999, Mchazime, 2000). Chichewa is used side-by-side with English in government and on the radio, English news bulletins alternate with Chichewa news. Although there have been suggestions to use Chichewa in Parliament, business is done in English. The constitution was written in English but it has been translated into Chichewa. Daily papers are produced in English but weekend papers are bilingual. Important press releases are usually bilingual (Chichewa and English). Finally, as examinable subjects at the end of the primary cycle, both languages are viewed as gatekeepers to higher education.

What remains is a decision about the function of other less widespread languages. The elevation by the ministry of education of vernacular languages for use as the medium of instruction in lower primary classes signaled that these languages still have a role to play but as yet that role is undefined beyond the education policy. Uncertain is whether sufficient resources will be made available to codify the other main Malawian languages which to date have not been standardized (Moto, 1999, p74) and to provide training and materials to teachers and pupils or whether these languages will be used exclusively for transition purposes to facilitate the acquisition of Chichewa and English. Also undefined are the functions these languages will play as time passes and Chichewa becomes more embedded in Malawian society in areas of the country beyond its original cultural boundaries.

Even when the national language policy limits the number of prescribed languages, the educational implications of aiming for a multilingual, literate citizenry are great. Kaplan and Baldauf (1997, cited in Taylor, 2002) identified 5 policy areas that must be addressed in implementing language policy: (1) curriculum policy—whether there is sufficient time devoted to language in general and how the curriculum may need to be modified to accommodate the language policy; (2) personnel policy and possible needs for teacher recruitment, training, or redeployment; (3) materials policy to assure the availability of adequate materials for teachers and pupils to support the policy and to integrate instructional strategies; (4) community policy implementation—securing community support; and (5) evaluation policy—monitoring and evaluating the learning impact of the language policy.

In Malawi, the applicability of these policy areas is clear from the mother tongue implementation problems raised by the Minister. Unresolved are issues of curriculum, personnel, materials and training, and community support. In terms of evaluation, this chapter presents findings of longitudinal research conducted by MIE, in collaboration with Save the Children, to investigate the role of language in current instructional practices and pupil achievement. It is hoped that these findings, in conjunction with findings from international research, will guide national policy in the other four areas. To achieve the country's multilingual goals requires distributing instructional time during the first few years of schooling between multiple languages. Without careful and cost sensitive planning, the country runs the risk that those who leave school without completing the primary cycle will not be literate in any language. Under these circumstances, efficiency of learning –identifying and supporting the most efficacious pedagogy and practice—becomes crucial.

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## IDENTIFYING EFFECTIVE BILINGUAL PEDAGOGY AND PRACTICE

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During and immediately following the colonial period in Africa, the dominant model of instruction relied on immersion in the ex-colonial language. It was popularly held that instruction in indigenous languages was detrimental to mastery of the imported language. However, reexaminations of early studies, which purported to document negative effects of bilingualism on school performance and

intelligence, revealed that most of the studies were not well controlled for social class, motivational factors, or extent and circumstances of the use for the two languages (Feitelson, 1979).

These challenges lead to a few well-known studies comparing a direct or immersion approach to various other models of incorporating home language into instruction. Ironically, the goal of most of these studies was more effective learning of the imported language (Akinnaso, 1993). Two reviews of these early studies (Engle, 1975; Dutcher 1982) came to a similar conclusion: neither the direct approach (instruction in second language-L2) nor the “native language approach” (instruction in the first language-L1) was clearly superior to the other for the teaching of initial reading and subject matter in multilingual contexts; rather a series of contextual issues needed to be taken into account.

Subsequently, other investigations have been conducted comparing a variety of instructional approaches. These studies are characterized by variations related to which language(s) are used as the medium of instruction (often referred to as Language of Instruction or LoI), which are used for literacy development (initial literacy as well as biliteracy), and which are taught primarily as subjects. Appendix 2 provides a summary of empirically based investigations focusing on options in language education in a multilingual country, particularly one that has several mother tongues and an official language that is not the first language for most of the citizens. Most of these bilingual research projects focus on how learning in the second language (L2) can be enhanced or impeded by learning in first language (L1), often an indigenous language, rather than on a genuine desire to ensure the use of the later in literacy education. (Akinnaso, 1993)

An important contribution to the question of when to introduce a second language as the medium of instruction came from Cummins (Cummins, 1979; Cummins & Swain, 1986) who proposed the threshold hypothesis of language instruction which states that there is a threshold level of language competence which bilingual children must attain in their mother tongue or L1 in order to avoid cognitive disadvantages when the medium of instruction switches to L2. In order to avoid such disadvantages, a late exit, long-term transitional bilingual program is preferred as opposed to an early exit or short-term transitional program.

Another important contribution comes from Chiswick (1996) who described determinants of second language proficiency as: Exposure, Efficiency, and Economic Incentives. Although he was referring to the factors affecting the fluency of foreign-born immigrants in the destination language, his research has applicability to language acquisition in multilingual societies. He defines exposure as the extent to which the language is used as a dominant language, lingua franca, and/or a language commonly studied in school. Efficiency is related to “linguistic distance” and refers to how easily or efficiently the new language can be learned. Efficiency is greatest when there is similar linguistic structure, grammar, vocabulary or cognates, and so on between the language of origin and the new language. Finally, economic incentives provide the motivation. The greater the importance of language competence to economic gain, the more likely the learner will become more proficient.

Finally, Dutcher (1997), in an updated review that takes into account many of the findings from studies included in Table 1, revised some of her earlier conclusions and came out more forcefully in favor of late-exit approaches. She noted that children require at least 12 years to learn their first language and that “development in this language with its related cognitive development is more important than more exposure to a second language.” (p. vii) She also concluded that, “Teachers must be able to understand, speak, and confidently use the language of instruction, whether it is their first or second language.” (p. viii) Less clear from her review and elsewhere is the approach that should be taken for what she terms “three tier instruction,” with instruction successively in the mother tongue (L1), a regional or group language (L2) and the national or official language (L3).

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## INVESTIGATING BILINGUAL EDUCATION IN MALAWI

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The present research is a longitudinal investigation that follows a sample of pupils during their primary school years. It is not an experimental study but rather a study that explores the role of naturally occurring variations in pupil and teacher home languages (Chichewa, Chiyao, and mixed), teacher use of mother tongue in instruction, and other factors (e.g., availability of textbooks and teachers guides, literacy in the home, pupil attendance, distance to the nearest commercial setting, etc.) in pupil achievement in Chichewa, English, and Mathematics.

As discussed in the introduction, the sample in this longitudinal study included standards 2, 3 and 4 pupils in 64 schools in Mangochi and Balaka districts, both of which are multilingual societies with Chiyao as the majority mother tongue language for children. In 1999 an equal number of boys and girls were selected from standards 2, 3, and 4 as follows: 16 pupils were selected from standard 2, 8 pupils were from standard 3 and standard 4, respectively. The data for standards 2, 3 and 4 were collected in February and October 1999 as well as in October 2000. Data on the original standard 2 pupils from 1999 were collected in February and October 2002. The months selected are significant as February is the start of the school year in Malawi and October is the end.

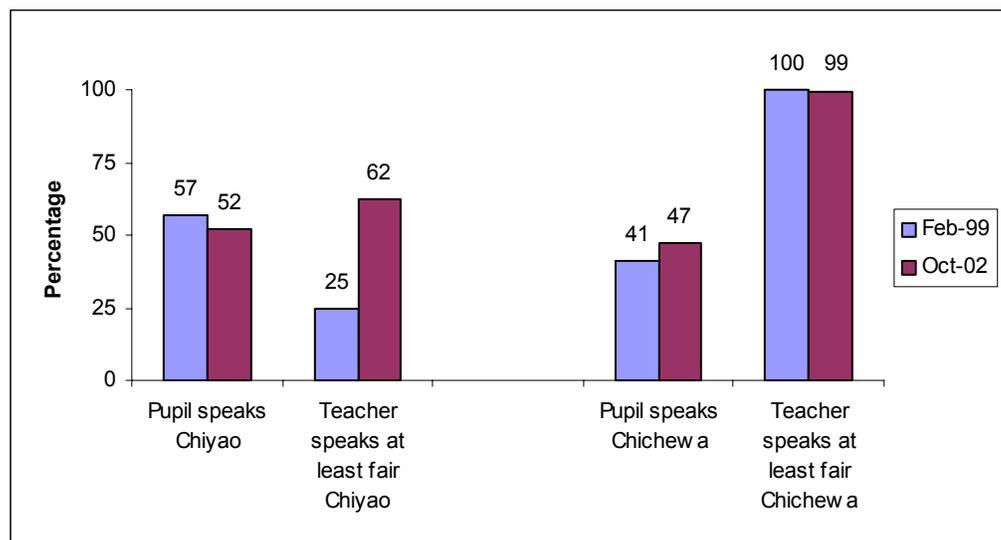
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## FINDINGS ON TEACHER’S HOME LANGUAGE

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During the interview, teachers were asked to report the languages which they speak at home and to rate their proficiency in the other languages. The results show that 75% of the Standard 2 teachers interviewed in the 1999 survey indicate that they could not speak at least a fair amount of Chiyao which is the predominant language of this area. This improved by 2002; 62% of the teachers who were teaching the pupils from the original standard 2 cohort spoke at least a fair amount of Chiyao. Nearly all teachers however reported that they could speak at least fair Chichewa, which is currently the national language.

**Figure 3.1: Percentage of Pupils and Teachers who speak Chiyao vs. Chichewa**



#### FINDINGS ON PUPIL HOME LANGUAGE

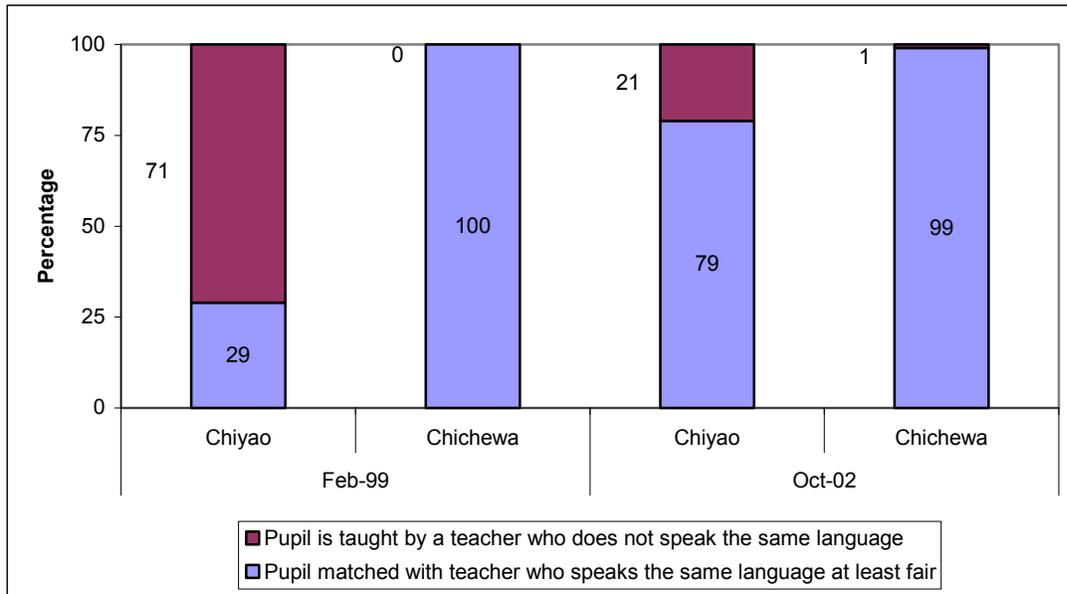
Data on pupil's home language were collected through individual pupil interviews. Pupils were asked to report on the language which they speak at home. The majority of the standard 2 pupils in 1999 (57%) indicated that they speak Chiyao, whereas 41% of the pupils reported that they speak Chichewa and only 2% said that they speak other languages. Three years later, there was a slight shift in that a greater percentage of the pupils that remained in school reported they spoke Chichewa (47%) at home and fewer reported Chiyao (52%) at the home language.

#### MATCH BETWEEN PUPIL AND TEACHER HOME LANGUAGE

In February 1999, less than a third of the Chiyao speaking pupils were matched with teachers who reported they spoke at least a fair amount of Chiyao. In October 2002, the situation improved when more than three-quarters of the Chiyao speaking pupils and teachers were matched. This change seems to be related to time, not higher standard level. An examination of the cross sectional data in February 1999 did not indicate a greater likelihood of Chiyao speaking teachers in the higher standards. Thus, the improved match in October 2002 suggests that the greater availability of Chiyao speaking teachers reflects a change in teacher's reported proficiency in Chiyao or the influx of Chiyao proficient teachers to the system.

In both February and October 2002, nearly all Chichewa pupils were taught by a teacher who had at least a fair ability to speak Chichewa.

**Figure 3.2: Are Pupils Matched with Teacher who Speaks Same Language?**

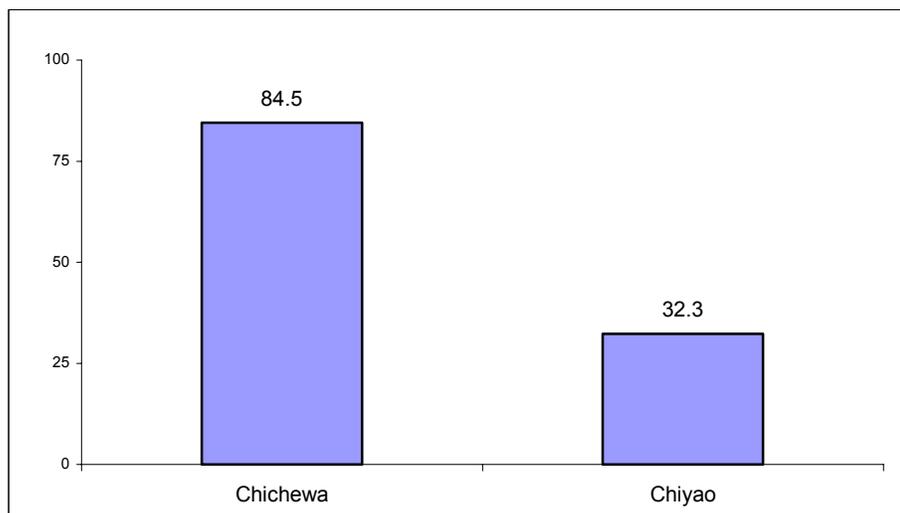


Given this situation, what is the impact on learning given differential prior exposure to the language of instruction? What is the effect of differential language use of the teacher and pupil on pupil achievement?

**FINDINGS ON THE MEDIUM OF INSTRUCTION IN STANDARDS 1 TO 4**

The data on medium of instruction were collected through interviews with headteachers of all the 65 schools in Mangochi and Balaka districts. During this interview, headteachers were asked to identify the languages that are used for instruction in standards 1 - 4 in their school. Headteachers could give more than one language as medium of instruction in their schools. Chichewa was given as one of the languages of instruction by 85% of the headteachers. Chiyao was given by 32%. A closer look at the pupils whose home language is Chiyao indicated that 43% of these pupils were in schools where Chiyao was not mentioned by the headteacher as a language of instruction in standards 1 - 4.

**Figure 3.3: Language of Instruction as Indicated by Headteacher**



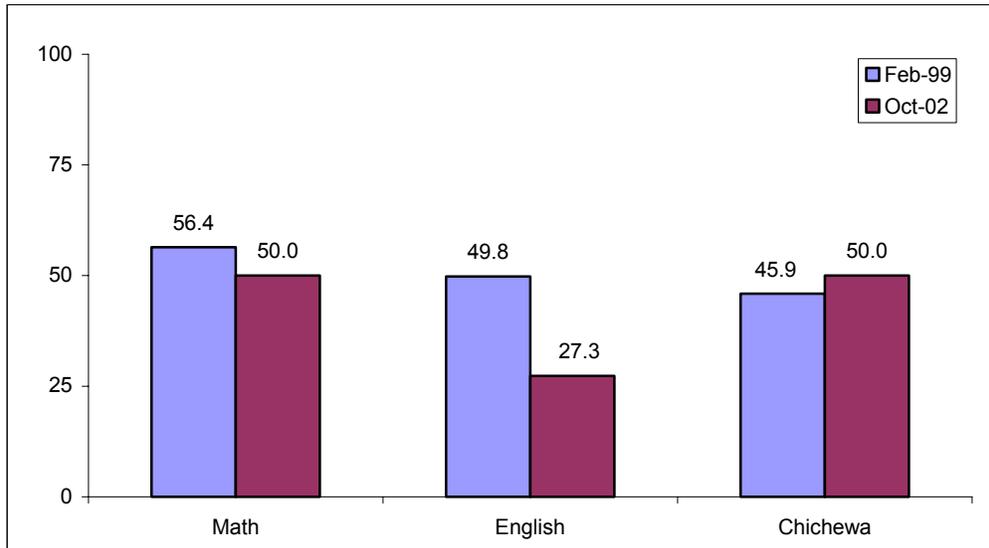
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TEACHER'S HOME LANGUAGE VERSUS MOTHER TONGUE INSTRUCTION POLICY

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In addition to headteacher interview, teachers were observed while teaching English, Chichewa, and Mathematics. One of the rated features in this observation was: "Teacher uses mother tongue to help the learner grasp a point being made." In February 1999, approximately half of teachers did not use or were weak in using mother tongue to help the learners grasp a point being made in the lesson. In Mathematics and Chichewa, the situation was unchanged by October 2002, however in English, even fewer teachers used mother tongue.

**Figure 3.4: Percent of Teachers' Use of Mother Tongue Instruction**



However, a closer look at the pupils whose home language is Chiyao indicated the following:

- Yao pupils whose teachers used mother tongue to help the pupil grasp a point performed better in English reading, and comprehension (standard 4 only), and in Mathematics (standard 2 only) than Yao pupils whose teachers were weak in using or never used mother tongue to help the learner grasp a point.
- On the other hand, Yao pupils whose teachers used mother tongue during Chichewa lessons performed less well in Chichewa reading and comprehension than Yao pupils whose teachers did not use mother tongue for Chichewa instruction. (This may reflect the classroom mixture - teachers using only Chichewa instruction may be doing so because more pupils in the class are competent in Chichewa - thus the Yao pupils would be in classes with Chichewa fluent pupils and have more opportunities to master Chichewa).

When a teacher uses mother tongue instruction, especially in Mathematics and English, the pupil learns more. Therefore not using mother tongue instruction for Mathematics and English denies the pupil learning. If a pupil is taught an academic concept in a language they do not comprehend, it is very difficult to understand and gain mastery in those concepts.

The English language, both in structure and vocabulary, is extremely different from the Bantu languages of Malawi. By contrast, Chichewa and Chiyao are very similar languages, both of Bantu origin. This linguistic similarity may facilitate or make more efficient the learning of Chichewa. However, because of these similarities, the use of mother tongue instruction while teaching Chichewa may confuse the pupil rather than clarify the concepts. This is especially true when the teacher code switches between the languages. The use of mother tongue needs to be used systematically when used for teaching Chichewa.

One challenge to successful implementation of mother tongue instruction is the lack of Chiyao materials to support Chiyao as mother tongue instruction or the medium of instruction in the school. If the language policy is to be followed, support for the creation of these materials is needed.

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#### FINDINGS ON CHIYAO PUPILS' PERFORMANCE WHEN TAUGHT BY A CHIYAO TEACHER AND A TEACHER WHO SPEAKS OTHER LANGUAGES

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Pupil performance in Mathematics, English and Chichewa by Chiyao speaking children is another area that was investigated during the study. Of particular interest was the performance of Chiyao speaking children who were taught by Chiyao speaking teachers compared with Chiyao speaking pupils who are taught by teachers who speak other languages. This was done by giving pupils in the target classes tests in Mathematics, English and Chichewa. The investigation reveals that Chiyao speaking pupils who are taught by Chiyao speaking teachers do much better in Mathematics in grade 2 than Chiyao speaking children who are taught by speakers of other languages. In grades 3 and 4, however, the difference in their performance in Mathematics is not quite significant. This trend is also revealed in English performance. As shown in table 3.1, Chiyao speaking pupils who are taught by Yao teachers read English with greater accuracy than Chiyao speaking pupils who are taught by non-Yao teachers.

**Table 3.1: Average English Reading Accuracy for Chiyao Pupils**

Grade	Teacher Home Language	Mean
2	Chichewa	18.93
	Chiyao	20.71
3	Chichewa	28.07
	Chiyao	39.19
4	Chichewa	38.96
	Chiyao	43.78

In Chichewa however, the difference between the performance of Chiyao pupils taught by Chiyao teachers and Chiyao pupils taught by non-Chiyao teachers is insignificant compared to their differences in Mathematics and English.

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#### CASE STUDY: MATHEMATICS WORD PROBLEMS

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The analyses in this study (Chilora, Jessee, and Heyman, 2003) used a paired t-test to compare mean percent scores between groups and between math word problems and similar numeric math problems. The analyses took into account the nested sampling frame of pupils in classes used in the longitudinal study.

For the mathematics assessment, the syllabus and textbooks were used to construct test items measuring crucial basic skills such as numbers, mathematic operations, and other numeracy concepts, including money and measurements. The word problems were read out loud in Chichewa to the pupil while the pupil could read along using the card displaying the problem in front of them. If necessary, the math problems were orally translated to Chiyao. All mathematics items came from or were adapted from the pupils' mathematics textbooks.

#### DIFFERENCES IN PERFORMANCE BETWEEN CHICHEWA AND CHIYAO SPEAKING CHILDREN

Comparisons in mathematics word problem achievement were made between Chichewa speaking pupils and Chiyao speaking pupils, between pupils taught by Chichewa speaking teachers or Chiyao speaking teachers, and between pupils who did and did not share the same mother tongue with the teacher.

The results were mixed, and it is difficult to determine the true source of the differences. There were a few statistically significant differences between Chichewa speaking children and their Chiyao speaking counterparts in their performance in mathematics word problems, particularly in standard 2, but there was no consistent pattern to the results. Where there were differences, Chichewa speaking pupils tended to score higher in mathematics word problems, but not always. This raised questions about the source of the differences. Is the difference due to the language minority status? Is it because teachers and pupils share the same or different mother tongues? Are some teachers and learners bilingual? Or do teachers use learners' mother tongue to help them grasp mathematics concepts? Or does the context or story line of the mathematics word problem have a greater effect on performance, regardless of pupil or teacher language. These questions led to further investigation to find explanations for these differences.

The IEQ researchers examined differences in performance on mathematics word problems between pupils who are taught by Chichewa and Chiyao speaking teachers, irrespective of pupil mother tongue or whether the pupil and teacher shared the same mother tongue. This investigation shows standard 2 pupils with Chichewa speaking teachers scored higher on money-related word problems at the beginning of the year than the standard 2 pupils with Chiyao speaking teachers did, but by the end of the year, the pupils who were with Chiyao speaking teachers outperformed pupils of Chichewa speaking teachers. However, this pattern only exists for standard 2. There are no consistent differences in performance by teachers' home language in either standard 3 or standard 4.

The IEQ researchers examined differences in performance on mathematics word problems comparing teachers and pupils who shared the same language. At the start of the school year, standard 2 Chichewa speaking pupils with Chichewa speaking teachers performed significantly better on the money word problems than Chiyao speaking pupils with Chichewa speaking teachers. By the end of that school year, however, the Chiyao speaking pupils with Chiyao speaking teachers performed

significantly better on many of the same problems. There are no consistent differences in performance by teachers' home language in either standard 3 or standard 4.

It appears language could have some effect, but it is unclear how. In standards 1 and 2, pupils are learning Chichewa as a subject, typically it is the language of instruction for other subjects and they are exposed to Chichewa in the general environment (e.g., radio broadcasts, market transactions). Also, Chichewa and Chiyao are both Bantu languages and due to their similarity coupled with extensive exposure to Chichewa, Chiyao speakers may achieve more readily a functional proficiency in Chichewa. Another explanation for the lack of difference in performance, at least within the realm of mathematics word problems, may be because the contextualization of the word problems transcends language barriers. For example, in standard 4, there were no statistically significant differences between children taught by Chichewa or Chiyao speaking teachers, irrespective of pupil language or when compared with teacher language on any of the money word problems. This may be because older pupils have more exposure to money, and that by standard 4, home language differences between teachers and pupils have less influence on pupil learning in this subject.

#### PUPILS' PERFORMANCE ON WORD PROBLEMS COMPARED TO SIMILAR PROBLEMS IN NUMERIC FORM

The idea that the story line or contextualization of a problem could have more influence on performance than language in mathematics word problems was investigated in this study by comparing pupils' performance on mathematics word problems to similar problems in numeric form. Table 3.2 shows examples of the numeric and word problems that were considered similar for analytical purposes. Both, numeric and word problems were presented in written form and orally.

**Table 3.2: Example Comparisons between Mathematics Word Problems and Similar Numeric Problems.**

Mathematics word problems	Similar Numeric mathematics problems
You have 4 bottle tops. So do your two friends. How many bottle tops do you have together?	Multiply these two numbers: $4 \times 3$
Lester has 66 pieces of chalk. He gathers 28 from the teachers in his school. How many pieces of chalk does he have altogether?	Add these two numbers: $27 + 67$
Joseph had 6 mangoes. He ate 3 of them. How many mangoes did he have left?	6 subtract 3

The results (see Figure 3.5) demonstrate that pupils scored better, on average, on mathematics word problems than they did on average for similar mathematics problems that were in numeric form. That

is to say, a pupil was more likely to answer a word problem correctly than he/she would a simple numeric problem.

**Figure 3.5: Comparing pupil performance on math word problems to similar numeric problems using pupils who were in standard 2 in 1999 and present in 2002**

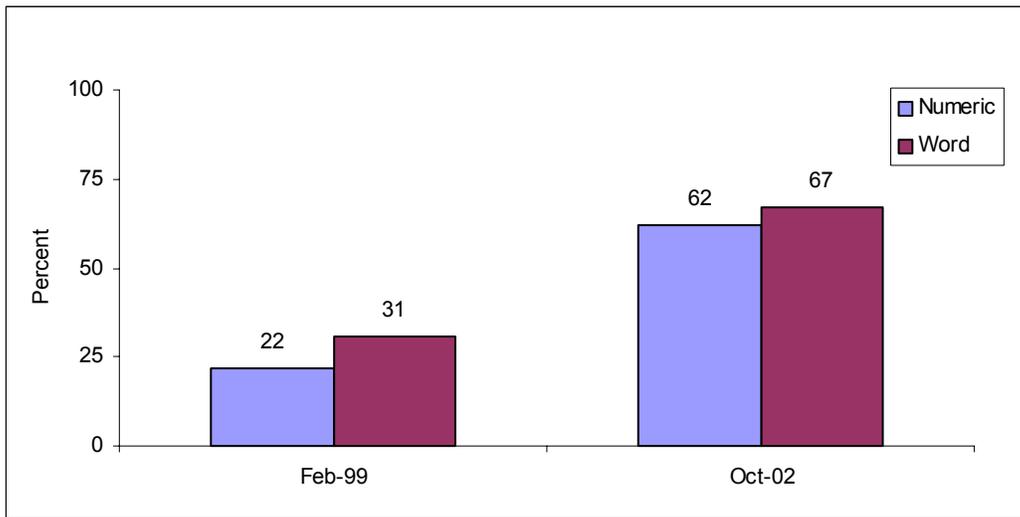
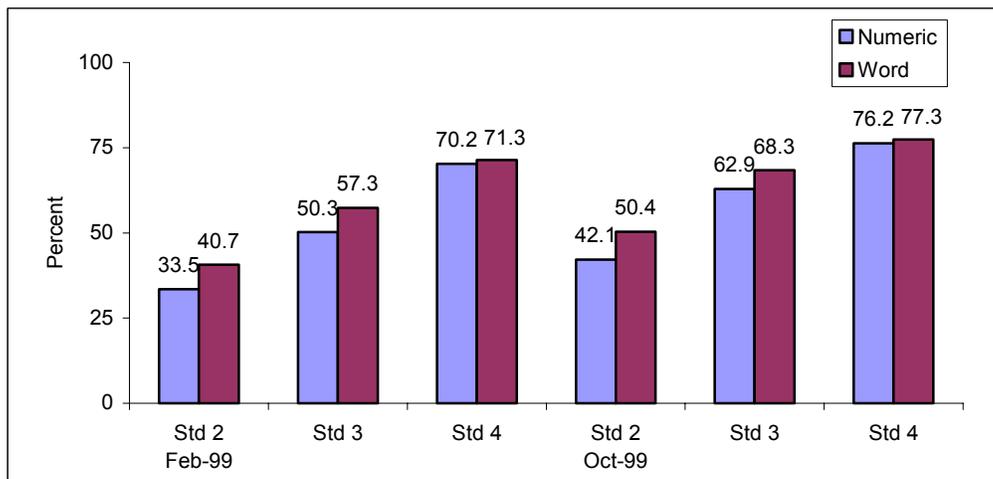


Figure 3.6 illustrates that differences between word and numeric scores for pupils in standards 2 and 3 are greater than in standard 4. This may be because pupils in standard 4 are more familiar with mathematic operator terms and symbols and less dependent upon contextual cues.

**Figure 3.6: Comparing pupil performance on math word problems to similar numeric problems across standards at the beginning and end of school year, 1999**

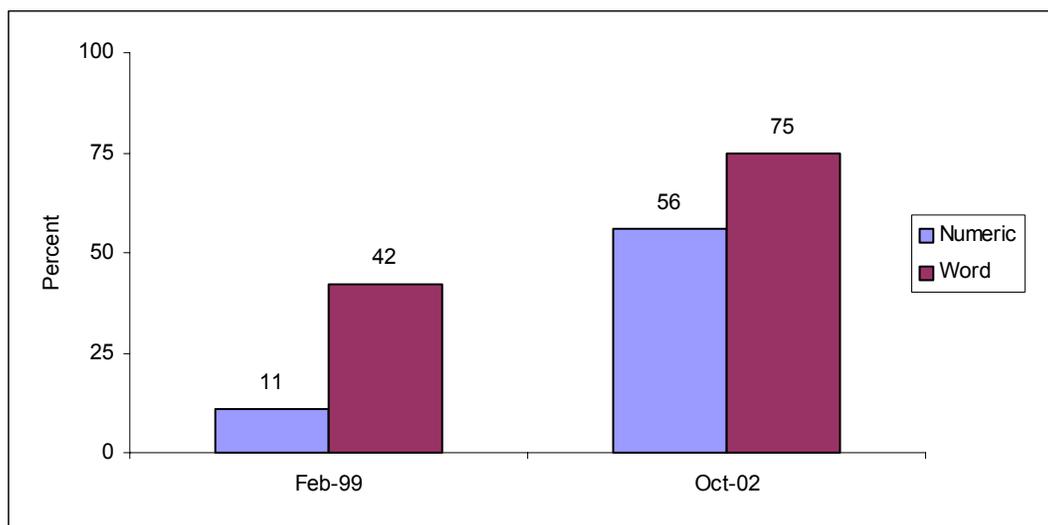


The fact that children seem to be achieving greater understanding on mathematics word problem was surprising because we had thought that language differences would negatively affect achievement on

word problems and that performance on numeric problems would be higher. However, it seems reasonable that word problems provide contextual clues to mathematical operations that particularly young children otherwise may have difficulty understanding, especially when questions are in abstract form such as symbols or operator terms.

Included in the problems were tasks that required learners to use certain familiar contexts, such as bottle tops, market goods or classroom materials to assess mastery of certain mathematic skills. As shown in Figure 3.7, this investigation also revealed significant differences in pupil performance in mathematics word problems that required the use of bottle tops compared to similar problems in numeric form. These differences suggest that learners understand more when the information is presented in a setting that is familiar to them. Pupils performed much higher on the word problems that used the context of bottle tops to assess mathematics skills than other problems measuring the same mathematical skills. When framing mathematics word problems, it is, therefore, important to consider pupil familiarity with the context in which the question is being asked.

**Figure 3.7: Comparing pupil performance on bottle top math word problems to similar numeric problems using pupils who were in standard 2 in 1999 and present in 2002**



Bottle tops are a common mechanism to teach pupils math skills and their familiarity with it highlights how context can aid understanding. Conversely, relying on familiarity can also be a handicap if pupils are not able to generalize their knowledge to other situations. These statistically significant differences between numeric equivalents to bottle top word problems can also be interpreted as pupils understand mathematics problems in one setting but are not able to generalize as readily to another. Alternately, it could be that although pupils can compute mathematically with concrete objects, they are not as prepared to handle the same computation in a more abstract form.

The study also revealed that pupil performance in mathematics word problems is related to pupil performance on various measures of Chichewa proficiency. Despite the fact that the questions are read in mother tongue, we identified positive, statistically significant correlations between mathematics word scores and measures of Chichewa mastery, Chichewa achievement, and Chichewa learning gains over time for nearly all instances in all standards. This means those pupils who perform well in mathematics tend to be those pupils who also perform well in Chichewa.

#### STUDY INSIGHTS

The familiarity of the mathematic word problems context may have a greater positive influence on pupil achievement in mathematics word problems than the potential negative influence of teacher and pupil language mismatch or the pupil language group. One reason could include the exposure of all pupils to Chichewa in society, the setting most closely emulated in mathematics word problems. This further emphasizes the importance context can play. However, while language differences in this situation may not negatively affect pupil achievement, it is important to understand and recognize that language interactions may strongly affect other areas of learning.

The setting or story line in which mathematics problems are presented to learners matters. There is some evidence that learners are achieving more in mathematics when the problems are presented in contexts that are familiar to them, like bottle tops, unlike when they are presented in unaccustomed contexts, possibly measurement or money if you are a girl. This provides an important signal to curriculum designers, instructional materials developers and classroom practitioners about the classroom practices use of materials so that learners gain more in mathematics word problems.

Similarly, in standards 2 and 3 pupils are consistently achieving more on mathematics word problem than on analogous numeric problems, with this difference declining as pupils progress to upper classes. This finding also gives the practitioners a challenge to find appropriate classroom practices that can help learners to achieve equally in numeric and word mathematics problems in standards 2 and 3. Such practices may include use of familiar contexts and connecting the lessons to more abstract concepts, such as mathematic symbols, that are likely to assist the learners to achieve more in mathematics tasks in numeric form.

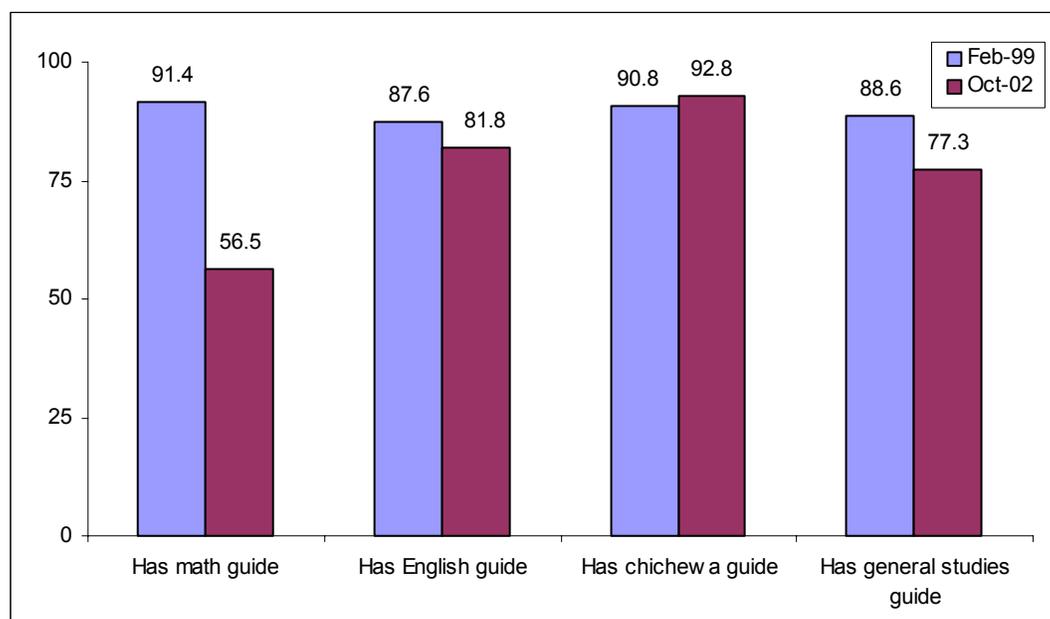
#### FINDINGS ON INSTRUCTIONAL MATERIALS

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- How well is the language policy implemented and supported? During the survey, instructional materials that are used for teaching Mathematics, English, Chichewa and General Studies were physically counted. This investigation revealed that a good number of the schools that were visited had teachers' guides for these four core subjects. However, some classrooms do not have teachers' guides in some subjects and the situation in October 2002 was worse than in 1999 (see Figure 3.8).

**Figure 3.8: Availability of Teaching Guides, 1999-2002**

It was also found that pupils' books (see books published by MIE: 1994) for General Studies and



Mathematics are written in Chichewa whereas their accompanying Teachers' Guides are written in English. Moreover all lesson plans, except those of Chichewa are written in English.

As discussed earlier, although the policy is in place to teach pupils using mother tongue instruction until Standard 4, there are no Chiyao books or materials to support it and therefore children are frequently taught in a language that is not their own. The simple answer would be to develop such materials, however, there is not standard orthography for Chiyao, as the language has not been codified. If the language policy is to be followed, a codification of Chiyao orthography needs to be developed, creating a school standard that is consistently applied to instructional materials.

#### TEACHER'S HOME LANGUAGE VERSUS MOTHER TONGUE INSTRUCTION POLICY

These findings suggest that disconnects exist between the teacher's home language, the pupils' home language and the language used in instructional materials. The implication that this scenario may have is that children in grades 1 to 4 may be learning some subjects in three or more languages. This is so because the books that the learners read are still written in Chichewa, the teachers prepare their lessons in English (except in Chichewa) and teach them using a local language which may be the children's home language or another vernacular (Chilora, 2000). Thus children may be exposed to Chichewa, English, the teacher's home language and their own home language in one lesson. Obviously this does not make learning any easier.

These findings also show that the majority of teachers in this target area are unqualified (61%). In addition, not much professional support (in the form of in-service training and supervision) is given to these teachers. Since the teacher may not be fluent and is unlikely to have had training in using mother tongue to support learning, Chiyao pupils may be disadvantaged in learning when compared to their Chichewa counterparts. This may have a disastrous effect on the implementation of not only a language policy reform but also the implementation of any educational reform at the classroom level. Therefore, if a policy on mother tongue instruction in early years of primary education is to succeed, there is a need to have a team of teachers who are competent in the pupils' home language and qualified in classroom practice.

This dynamic therefore, raises the following questions: How can policy makers ensure that a policy on mother tongue instruction is successfully implemented by those who are entrusted with this responsibility? What support should policy makers and other stakeholders give to teachers and learners during policy implementation?

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#### SOME LESSONS FOR MOTHER TONGUE POLICY DECISION MAKERS

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These findings suggest that there is a disconnect between the home language of the teachers and that of the pupils. Such a disconnect has important implications for the successful implementation of the mother tongue instruction policy in the early years of primary education.

A parallel situation was observed during the implementation of the preceding policy of instruction in Malawi in which Chichewa was used as a medium of instruction for standards 1 to 4 in all schools. Although teachers received some support in the form of instructional materials that were written in Chichewa and the formal training they received in using Chichewa as a medium of instruction (Mchazime, 1996) there were still many teachers who gave instruction in a local language other than Chichewa. It was noted, however, that they were familiar with and only switched to Chichewa when Ministry of Education Officials entered their classrooms (Ministry of Education, 1996).

A similar problem was also observed in Ghana. As Andoh-Kumi (2000, p.3) reports, teachers who could not speak a pupil's home language had to use English as a medium of instruction for teaching subjects such as mathematics. The lesson that may be learned from this is that the professional preparation of teachers is needed for a mother tongue instruction policy to be successfully implemented (see also Kathewera, 1999 and Mchazime, 1999). Moreover, in countries, such as Malawi, where a teacher's home language may be different from those of the learners, an appropriate teacher posting policy needs to be put in place so that mother tongue instruction policy is successfully implemented.

Another disconnect that these findings suggest is between the teacher's home language, the pupil's home language and the language used in instructional materials. The implication is that children in grades 1 to 4 may be learning some subjects in three or more different languages. Consistency between the language(s) used for teacher guides, lesson planning, textbooks and available instructional materials, and the medium of instruction should be part of the language policy and the allocation of resources to support the language policy.

## CONCLUSION

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The goal of the language policy for all primary school pupils in Malawi's that there will be fluency and literacy in Chichewa at the end of standard 4 and sufficient fluency and literacy in English for English to become the medium of instruction beginning in standard 5. Both subjects are tested as part of the primary school leaving exams and all pupils are expected to achieve full literacy in both Chichewa and English. At this time, it appears that indigenous languages other than Chichewa are used primarily to facilitate the rapid transition to Chichewa and English; in many cases they're not used at all.

For pupils whose home language is Chichewa, the official language policy of using mother tongue as the medium of instruction in standards 1 through 4 is supported by literacy development in the mother tongue. English is taught as a subject until standard 5 when it becomes the medium of instruction. Learning to read in English begins in standard 1. This model parallels the approaches used in several investigations of language learning and is supported by the research findings. In effect, it constitutes a late-exit transition approach because pupils are instructed in their mother tongue and achieve a threshold of literacy in their mother tongue before transitioning to English as the medium of instruction. Pupils' textbooks in standards 1-4 are written in Chichewa (with the exception of the English text) and Chichewa maintains status beyond standard 4 because it continues as an examinable subject. Furthermore, most pupils in Malawi are likely to have a teacher who is proficient in Chichewa. Since Chichewa was the medium of instruction from 1968, it is likely that current teachers were instructed in Chichewa from an early age.

The situation for pupils whose home language is Chiyao is more complicated. For some, although the home language is Chiyao, the lingua franca of the nearest community or market is Chichewa. Also, there may be signs or radio in Chichewa as well as other pupils in their school whose home language is Chichewa. These Yao pupils have exposure to Chichewa, and, in some instances, economic incentives to learn the language.

By contrast, other pupils whose home language is Chiyao have neither prior exposure nor economic incentives for learning Chichewa. The majority of the pupils in their community and school are Chiyao speakers. Learning of Chichewa takes place almost entirely at school.

For both Yao groups, the learning of Chichewa resembles an early exit approach with no attempt to establish literacy in the home language and a rapid transition to Chichewa as the medium of instruction and the medium for literacy. Textbooks are in Chichewa and mother tongue is used primarily to support learning and to speed the transition to Chichewa. Frequently, their teachers are not fluent in Chiyao so although the language policy calls for the use of mother tongue as the medium of instruction until standard 4, there is little curricular support for this policy. At the same time that Yao pupils are learning to speak and read in Chichewa, they are also beginning to learn to speak and read English.

Although there is considerable theoretical and empirical support for the late-exit approach that is used with pupils for whom Chichewa is the home language, there is very little empirical evidence of the efficacy of current practices as they pertain to pupils whose home language is other than Chichewa. Evidence from IEQ/Malawi research suggests that a disconnect seems to exist between the mother tongue instruction policy and teacher posting policy. This disconnect is affecting the successful implementation of the mother tongue instruction policy in Mangochi and Balaka where the majority of pupils speak Chiyao.

Another area of disconnect is in the availability of instructional materials in languages other than English and Chichewa. The current policy suggests a commitment to the standardization of these languages, the production and distribution of home language instructional materials, and the training of teachers in the use of the materials. This plan has enormous economic consequences for a system that is already overburdened, particularly since little is known about how to use these materials in an “early exit” context that gives preference and status to fluency and literacy in two other languages (Chichewa and English). Clearly more research will be needed as materials become available.

The paper has therefore suggested that appropriate measures that may ensure the successful implementation of a mother tongue instruction policy be put in place and experimentally evaluated. Otherwise we may have a beautiful policy on paper that no one may implement at the classroom level.

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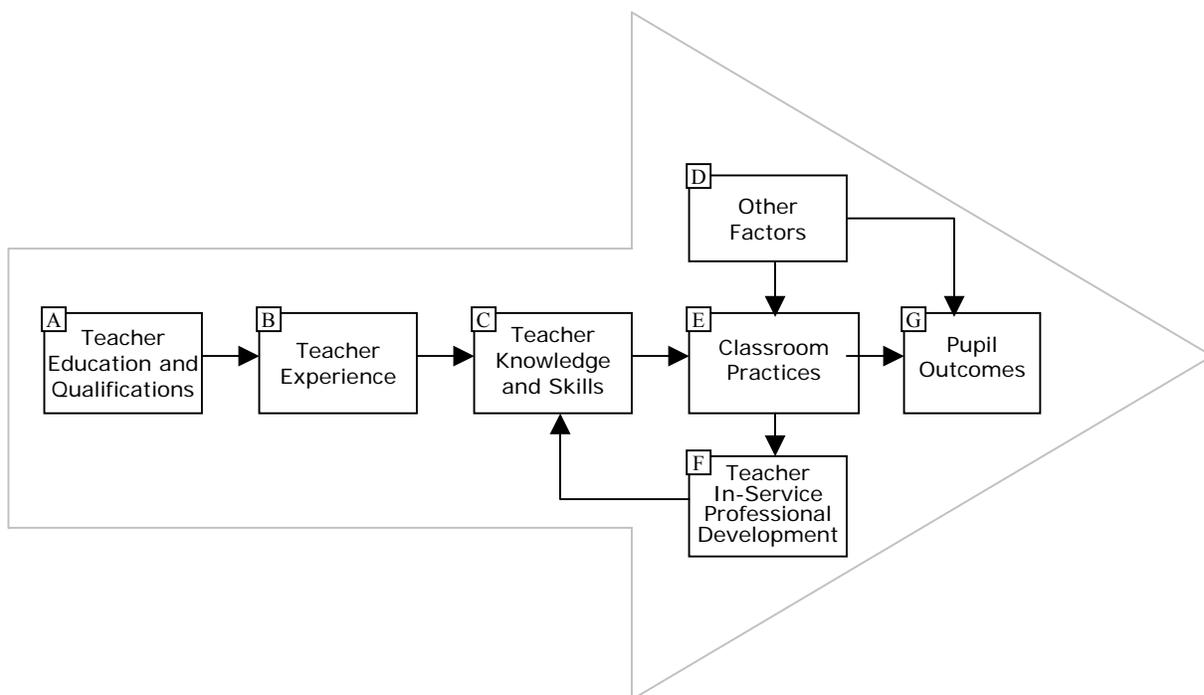
## Chapter Four: Teacher Qualifications, Classroom Practices, Classroom Resources, and Pupil Learning

By Yoas Kamingira, Gibson Zembini, Cory Heyman, Frank Winicki, Cassandra Jessee, and Gaylene Santilla-Crisafulli

### INTRODUCTION

The model of teaching and learning included in Chapter One, recreated below, primarily focuses on how teachers and their experiences affect pupil outcomes. Starting with the right-most box in the model and working backwards, the model assumes that two sets of factors directly affect pupil outcomes in education (Box G). The first set is everything that takes place outside the classroom (Box D). This includes home, community, and school environments; as well as pupil health and intellectual flexibility. Meanwhile, the second set includes all of the interactions that take place inside the classroom (Box E). This includes teachers' interaction with pupils, pupils' interaction with each other, and pupils' use of classroom resources.

**Figure 1.1: Model of Teaching and Learning**



Developed by C. Heyman and J. Schubert

Differentiating between classroom and non-classroom effects helps separate variables that are in control of teachers and variables that are not in control of teachers. We find, for example, that between 35 and 64 percent of the variation in standard two and three pupils' end-of-year achievement scores on pre-literacy and literacy assessments in Mangochi and Balaka is explained by pupils' proficiency at the beginning of the school year. Teachers do not have control over what skills and experiences pupils bring with them to class. Nevertheless, we also find that classroom-level differences explain between 10 and 30 percent of the variation in end-of-year achievement—a sizable amount of pupil learning that teachers can affect through their instruction and use of classroom resources.

What, in turn, determines teachers' proficiency in instruction and use of classroom resources? The model of teaching and learning assumes that teachers' knowledge and skills in facilitating a classroom environment conducive to learning (Box C) is based on their professional experience in the classroom (Box B) and that professional experience is conditioned by pre-service teacher education (Box A). This model does not ignore the fact that some people may be more predisposed to be good teachers than others. It does, however, assume that high-quality teacher education, both pre-service (Box A) and in-service (Box F) plays an important role in instilling effective teaching practices.

The purpose of this chapter is to examine the extent to which various aspects of the model of teaching and learning applies in the districts of Mangochi and Balaka. It begins with a historical overview of changes in teacher education policy in Malawi and the evolution of Save the Children's QUEST project as context for expectations about classroom practices, classroom resources, and pupil learning over time. The chapter then examines the following questions:

- What are the educational experiences of teachers in Mangochi and Balaka?
- To what extent do teachers use classroom resources effectively and promote good instructional practices?
- How might these factors in turn affect pupil outcomes?
- How have teacher education, the use of classroom resources, promotion of good practices, and pupil outcomes changed over the course of the longitudinal study as QUEST has been increasingly active in districts' schools?

Finally, there is a discussion of findings and their implications for educational policy in Malawi.

## HISTORICAL OVERVIEW

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How might one expect teacher education to affect instructional practices, including the use of instructional resources, in Mangochi and Balaka? To answer this question, it is important to understand how the system of teacher education began in Malawi and how it has evolved into the present system. In addition, given that Save the Children/U.S. (SC/US) has been supporting a substantial in-service professional development program in these sample districts over the past few years, it is similarly

important to understand how that program has grown locally and how it is has been designed to affect teaching practices.

#### TEACHER EDUCATION IN MALAWI

At the time of Malawian Independence (1964), there were approximately 360,000 pupils in primary school. Pre-service teacher education was comprised of a three-year residential course called Primary Initial Teacher Training, a program that accepted people with a Junior Certificate of Examination (JCE) or a Malawi School Certificate of Examination (MSCE).<sup>3</sup> By 1973, 13 teacher education institutions were in operation that had the capacity to train approximately 2,000 new teachers in a cohort.

Nevertheless, increases in pupil enrollment and the dearth of qualified teachers led to higher pupil/teacher ratios over time. By 1984, Malawi had a pupil to teacher ratio of 60:1. This includes the 11.5 percent of the teaching force that had not acquired a credential from the residential pre-service teacher education course and was therefore considered “unqualified.”

The Ministry of Education launched a one-year in-service teacher education course in 1987 to train all of the unqualified teachers in Malawi. This program was administered for four years and certified 2,121 teachers, some of whom had been in the field for 15 years. Evaluations of the program indicated that participants worked hard but achieved little substantively. Most participants passed the English language exam but still had problems in speaking and writing English. Also during the late 1980's, the traditional pre-service teacher education course was reduced from three to two years, and the number of pre-service teacher education programs was expanded. Nevertheless, the pupil/teacher ratio continued to grow (69:1 by 1988), as did the percent of unqualified teachers in Malawi (to 14.2 percent).

The next major change in teacher education was in 1989, when the Ministry of Education introduced the Malawi Special Teacher Education Program (MASTEP). The goal was to extend opportunities for teacher education to more people. Instead of requiring a two-year residential commitment, participants were able to combine short-term residential courses with local seminars and distance learning methods in a three-year program. Unfortunately, evaluations concluded that despite the fact that nearly 4,000 people had completed the program by 1992, their competencies were lower than participants in the traditional two-year program because of MASTEP's problems in coordination and integration among the various methods of course delivery. MASTEP was therefore replaced in 1992 with a two-year

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<sup>3</sup> A JCE is an examination given after the second form of secondary school, and an MSCE is an examination given after the fourth (and final) form of secondary school in Malawi. Teachers who pass the JCE exam and complete the teacher education program can be qualified as a teacher with a “T3” professional qualification, while those who also pass the MSCE exam and complete the teacher education program are eligible for a “T2” professional qualification, both of which have salary implications.

program that combined one year of field training with one year of residential courses. By 1993, the pupil/teacher ratio had leveled off to 68 pupils per teacher, but the percent of unqualified primary school teachers jumped to 19 percent.

The success of the first multi-party elections in the country's history (1994) sharply increased access to primary education in Malawi. The goal of the new government was to extend primary education to all. Nevertheless, the rapid increase placed even greater strains on the already overburdened educational system. To reduce the strain, the government recruited 17,000 untrained teachers and 5,000 retired teachers. This policy created a situation in which two of every five Malawian primary teachers were unqualified. The government attempted to give all new teachers a two-week orientation, but it was unsuccessful in reaching everyone.

International donor agencies stepped in to help mitigate the problem in 1995 and began to devise a new in-service teacher education program to train the growing "temporary" teacher workforce. With technical assistance from the German Cooperation and financial assistance from the World Bank, Malawian educators created the Malawi Integrated In-service Teacher Education Program (MIITEP). The goal was to train cohorts of 3,000 unqualified teachers at a time. The need was so great that the Ministry of Education abandoned all other pre-service and in-service teacher education programs in Malawi's six teacher-training colleges. The first 3,000 MIITEP participants began their studies in 1997. To date, eight cohorts of MIITEP participants have completed the program.

MIITEP is a two-year program that combines residential training, in-school training, and distance education. As the program was initially envisioned, teachers attend a three-month course at one of the six teacher education colleges around the country and complete an exam before returning to school. Over the next 20 months, teachers attend local seminars and continue to study on their own, completing assignments and using self-study handbooks. Participants' teaching is supposed to be supervised and assessed by the head teachers of their schools and the primary education advisor for their area. Teachers are then supposed to be visited by college tutors and a moderation team from the Malawi National Examinations Board. The last component of the program is a return to the college for a month to write final exams.

For its first cohort, MIITEP targeted teachers with MSCE certificates who had been in the field for one year for females or two years for males and who had attended an initial orientation course. For all subsequent cohorts, a JCE certificate was accepted as an alternative to an MSCE certificate, and priority was given to teachers who had been in the field the longest.

An evaluation of MIITEP published in 2000 (Stuart & Kunje, 2000) indicated serious challenges to its success. Tutors were dissatisfied with the course and teacher achievement. Tutors believed that there was a lack of planning and financial support. In the first three cohorts, only teachers with an MSCE certificate were able to complete the course successfully. Cohort six participants, surveyed at the time

of the evaluation, thought the course was more difficult for teachers with only a JCE and did not rate their tutors highly. Nevertheless, cohort six participants generally felt positive about MIITEP. They thought they had learned new strategies that they could apply in their classes.

### QUEST PROJECT

Many teachers in Mangochi and Balaka have participated in MIITEP and its predecessor programs, and almost all have been exposed to more intensive, ongoing professional development through the USAID-sponsored QUEST project. SC/US began working in Mangochi schools the year before free multi-party elections. The goal of its village-based schools program was to make primary school education more accessible and to increase the school enrollment levels of both boys and girls in Malawi. Beginning with eight pilot schools, the project helped communities construct and run schools. Teachers, some of whom are mothers of pupils in the schools, came from the local communities. At the same time, school management committees were responsible for school operations and supporting the learning process. Most importantly, village-based schools were constructed in communities themselves, making parents feel more secure about their children's safety in schools.

The lessons learned from the village-based school project became a model for district-wide reform throughout Mangochi, and subsequently, in Balaka and Blantyre rural districts. In 1998, USAID awarded Save the Children the QUEST project to further decentralize responsibility for school operations and improve educational quality on a larger scale, supporting more than 4,200 teachers in 472 schools between 1998 and 2002. A large component of the QUEST intervention is professional development for teachers, thereby providing or supplementing their experiences in MIITEP or its predecessors.

### HYPOTHESES

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The data in the longitudinal study are reflective of teachers with one or both sets of professional development experiences. Data from the baseline data collection in February 1999 reflect teachers' experiences at the start of the QUEST project. Even though teachers are not the primary unit of analysis and specific teachers' experiences are not tracked longitudinally, it is possible to examine the qualifications, practices, and use of classroom resources of groups of similarly situated teachers over time.

We expect a variety of outcomes from the ensuing analysis. First, we expect all our outcomes to improve over time. Between February 1999 and October 2002, for example, a larger number of teachers had an opportunity to acquire a professional qualification by participating in MIITEP. In addition, we expect that participation in QUEST activities helped teachers to increase their use of effective instructional methods, including the effective use of classroom resources. Last, we expect that increases in all these variables will result in greater pupil learning.

## DATA ANALYSIS

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A variety of data from the Mangochi and Balaka longitudinal and gain-score studies were used to conduct these analyses:

- Self-reported data from participating teachers were used in analyses of teacher qualifications (from the longitudinal study);
- Data from classroom observations were used to examine teacher practices and use of classroom resources (from the longitudinal study); and
- Pupil assessment data were used to examine pupil learning (from the longitudinal and gain-score studies).

All analyses are based on descriptive statistics, including calculations of frequencies and means, with comparisons of group means using t-tests. Analyses that examine relationships between classroom-level variables and pupil outcomes use multi-level statistical techniques.

## TEACHER QUALIFICATIONS

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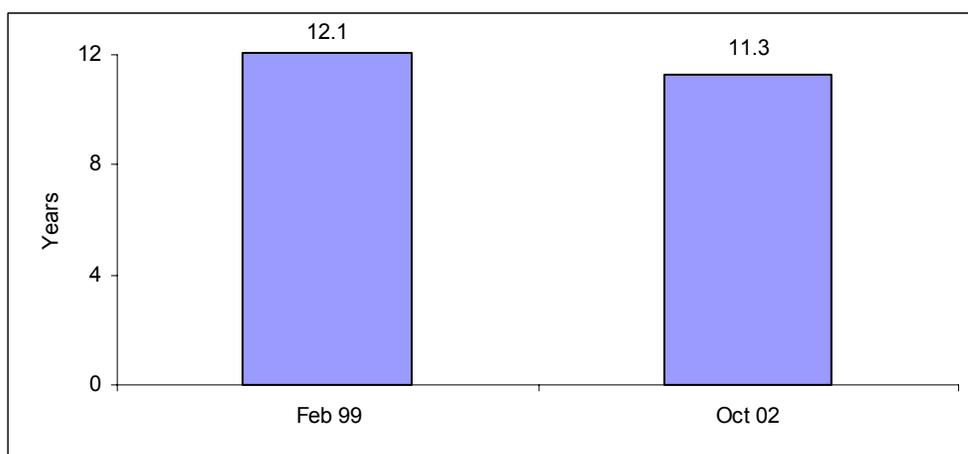
Analysis of data from teacher surveys in February 1999 and October 2002 do not indicate a clear trend in teacher qualifications. Although the groups of teachers are different in each period, we would still expect to see the hypothesized results discussed previously: 1) more education overall; 2) higher academic qualifications; 3) more advanced professional qualifications; and 4) more advanced professional training. These trends would indicate at least some improvement in the general pre-service preparation of Malawian teachers over time.<sup>4</sup> Some of these hypotheses have been borne out by the analysis, but not all.

First, the group of teachers surveyed in 2002 had less formal education than those surveyed in 1999. (see Figure 4.1 below and Table 4.1 in Appendix 3). In 1999, the average teacher had completed the cycle of secondary education (12.1 years of schooling). By contrast, the average teacher in 2002 had only completed 11.3 years of school.

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<sup>4</sup> Note that the groups of teachers are not directly comparable in both periods. Those surveyed in 1999 were responsible for pupils in standards two through four. In contrast, those surveyed in 2002 were responsible for the pupils who were in standard two in 1999, who presumably had progressed to higher standards in the four-year period. Given general trends in how teachers are allocated to classrooms in many countries, it is also fair to hypothesize that a finding of higher qualifications in 2002 could also be, at least in part, because pupils are in higher standards and therefore may have access to more qualified teachers.

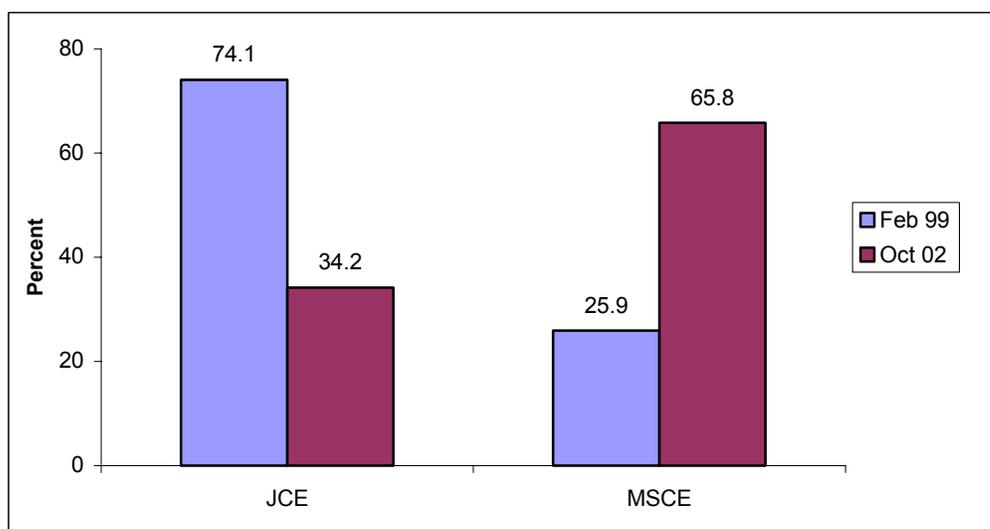
**Figure 4.1: Years of Schooling Completed, Sample Teachers, 1999 & 2002**



Source: IEQ/Malawi Longitudinal Study, Teacher Survey

At the same time, Figures 4.2 and 4.3 (and Tables 4.2 and 4.3, in Appendix 3, respectively) indicate that teachers in 2002 had higher academic and professional qualifications than teachers in 1999. In fact, analyses indicate dramatic differences in academic credentials between the two periods. In 1999, nearly three of every four teachers surveyed only held a JCE certificate. This statistic was almost the reverse four years later, when almost two in three teachers surveyed held an MSCE certificate.

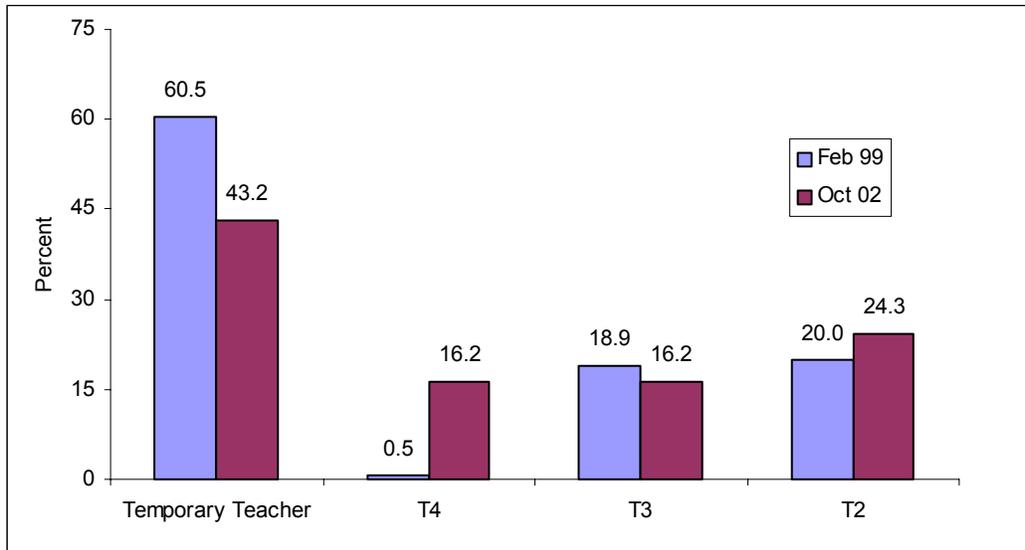
**Figure 4.2: Academic Qualifications, Sample Teachers, 1999 & 2002**



Source: IEQ/Malawi Longitudinal Study, Teacher Survey

Figure 4.3 further indicates a trend toward higher professional qualifications. Between 1999 and 2002, the number of temporary teachers fell by 17 percentage points, leading to a higher number of teachers with a T4 and T2 qualification. Again, a “T2” is given to teachers who have achieved an MSCE certification and completed a course in teacher education.

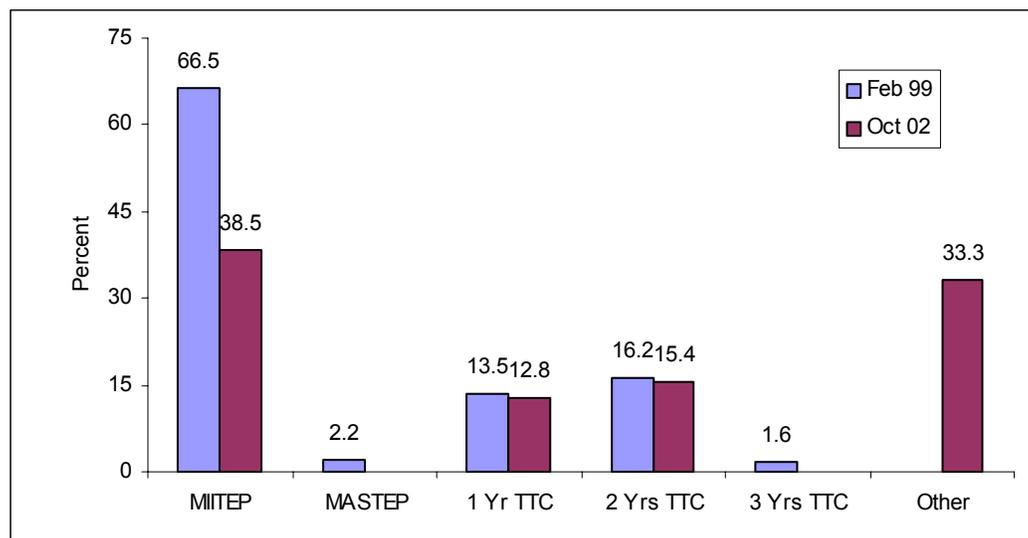
**Figure 4.3: Professional Qualifications, Sample Teachers, 1999 & 2002**



Source: IEQ/Malawi Longitudinal Study, Teacher Survey

Meanwhile, the path by which teachers were trained also changed over the four-year study period (see Figure 4.4 and Table 4.4, in Appendix 3). The main difference was in the percent of teachers who were trained through MIITEP versus other programs: 26 percentage points fewer in 2002 compared to 1999. In 2002, many more teachers were trained through other means, including the general orientation, entering teaching as volunteers with no training, or participation in other, unspecified activities. In addition, older teachers who were trained through previous professional development activities (e.g., MASTEP and longer-term residential courses in teacher training colleges) are starting to leave the profession.

**Figure 4.4: Professional Training, Sample Teachers, 1999 & 2002**



Source: IEQ/Malawi Longitudinal Study, Teacher Survey

In summary, Figures 4.1 to 4.4 indicate two trends in teacher qualifications in Mangochi and Balaka between 1999 and 2002. The first is a trend toward teachers with less formal education and less formal professional development training. The second trend, seemingly contradictory, is teachers with higher academic and professional qualifications.

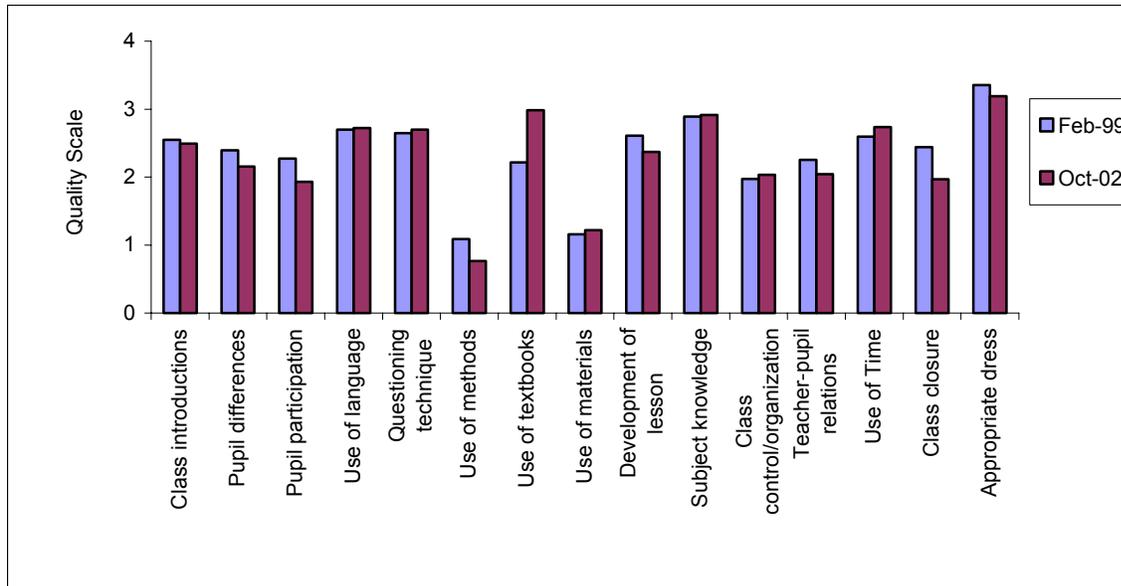
## INSTRUCTIONAL PRACTICES

The next question is how teachers translate their educational and professional experience into classroom practices. In 1999, researchers developed a set of classroom observation items to monitor effective classroom practices in schools (see Appendix 4). This instrument was used to learn about existing classroom practices as the first step in designing QUEST professional development strategies. The same instrument was used in subsequent data collection periods to examine changes in classroom practices over time. In addition, an attempt was made to work with the same data collectors over time to maintain the highest level of inter-rater and inter-temporal reliability possible.

Results of data analysis are summarized at two levels. Table 4.5a in Appendix 3 displays mean observed scores across Chichewa, English, and maths classes for individual items. Figure 4.5 and Table 4.5b then aggregate these scores to the level of groups of related observation items as indicated in the observation protocol. The scale ranges from “0 – not done,” to “4 – outstanding.” Results indicate a range of scores on categories of classroom practices. In 1999, for example, teachers scored “very poorly” on average with regard to the “effectiveness of methods used” and the “use of locally available

teaching and learning materials.” In contrast, teachers scored “good” on “knowledge of subject matter” and “presentability and appropriateness of dress.”

**Figure 4.5: Observed Classroom Practices, 1999 & 2002**



Source: IEQ/Malawi Longitudinal Study, Classroom Observations

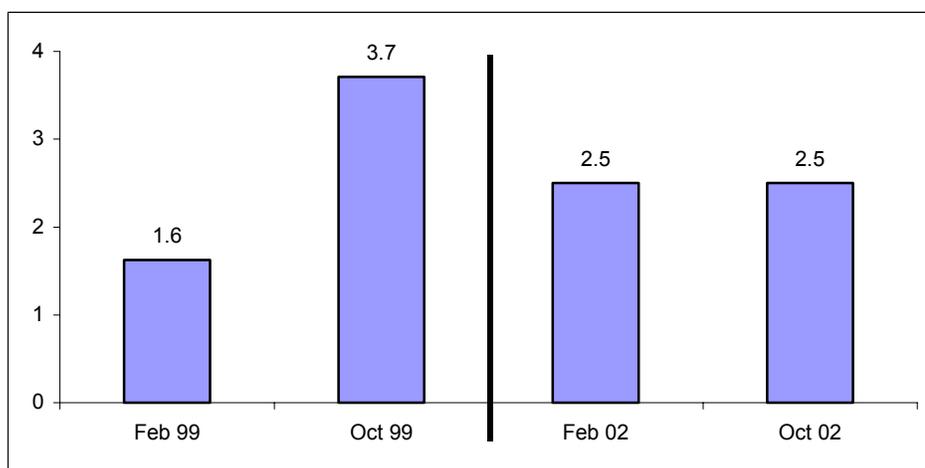
Most categories remained relatively consistent between 1999 and 2002. There was discernable growth in only one category—the use of textbooks—which went from “weak” to “good” over the project period. At the same time, there were also notable drops in three categories: “degree of pupil participation,” “effectiveness of methods used,” and “appropriateness of closure.”

Table 4.5a further summarizes changes in classroom practices over the course of the 1999 and 2002 academic years. An examination of changes in classroom practices between February and October of each year indicate improvements in classroom practices in most instances in 1999 but at least some deterioration of most practices in 2002. These dynamics are not necessarily inconsistent with normal patterns of project implementation that one might expect. It is common to observe striking positive changes in classroom practices when a new intervention, such as QUEST, is introduced into an educational system. This “spike” often represents a level of enthusiasm and introspection that may be difficult to maintain over time. Nevertheless, it is the responsibility of implementers and project participants sustain positive program outcomes throughout the life of the project and after the project period.

## EFFECTIVE USE OF CLASSROOM RESOURCES

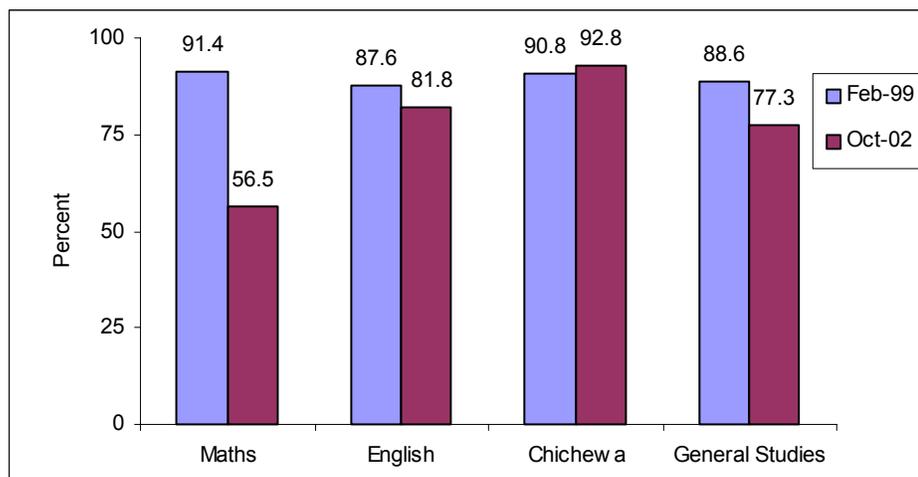
The effective use of classroom resources is an important component of effective classroom practices and an issue of particular interest in examining the QUEST project. Figure 4.6 and Table 4.6 indicate a trend in the number of teaching aids used in the classroom similar the pattern for classroom practices: a substantial increase in the average number of aids used between February and October 1999, a reduction in the number between October 1999 and February 2002, and a leveling out in the number between February and October 2002. Figure 4.6b illustrates a similar decrease in teachers' access to teaching guides over time. Access to maths guidebooks, for example, dropped by nearly 35 percentage points over the project period.

**Figure 4.6a: Number of Teaching Aids in the Classroom, 1999 & 2002**



Source: IEQ/Malawi Longitudinal Study, Teacher Survey

**Figure 4.6b: Teachers' Access to Teaching Guides, 1999 & 2002**



Source: IEQ/Malawi Longitudinal Study, Teacher Survey

Table 4.6 in Appendix 3 provides additional information about the use of classroom resources. First, table summarizes changes between February and October 1999 in the use of various kinds of aids. Comparable data were not collected in 2002. The results indicate substantial increases in the percentage of available aids used in lessons and aids that were hand made. At the same time, there were decreases in the percentage of aids made from recycled and natural materials.

Second, the data recreates individual observation items related to the use of teaching and learning materials from Table 4.5a. These include 1) the relevance of materials to the subject matter delivered, 2) the appropriate use of materials in lessons, 3) the suitability of materials for the particular age group of learners, and 4) the extent to which materials help learners grasp points being taught. Each of these statistics indicate improvements in the use of materials in 1999, a decrease between October 1999 and February 2002, but an improvement again during the 2002 school year. The gains in 2002, however, only bring the effective use of materials to their original level at the time of the February 1999 baseline study.

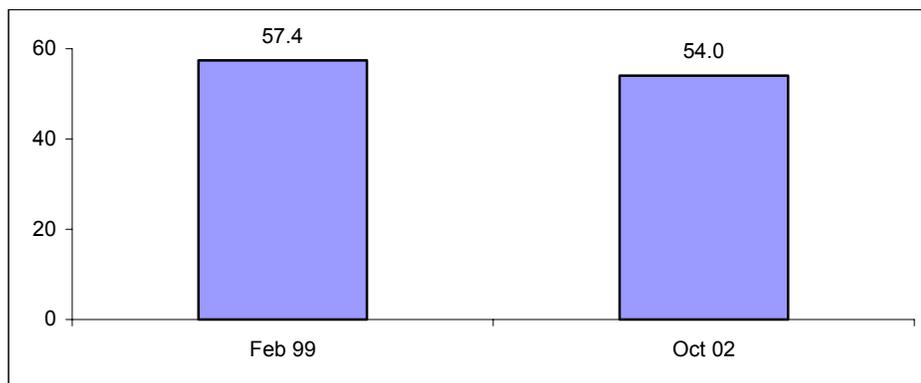
## PUPIL LEARNING

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The last set of analyses examines how pupil learning changed between February 1999 and October 2002. Again, the expectation is that pupil learning should have increased as a consequence of positive changes in teacher credentials, classroom practices, and classroom resources. These analyses are based on groups of standard-three pupils in sample schools in the two different periods. Both cohorts of pupils received the same English language assessments. Maths assessments had comparable items, but pupils in 1999 received a larger battery of items (N=80) compared to pupils in 2002 (N=50). Maths results are therefore reported in percentages instead of raw numbers.

Results from the maths assessment (Figure 4.7 and Table 4.7) indicate that standard three pupils in 2002 achieved slightly lower scores at the end of their academic year than pupils in the 1999 scored in the beginning of their academic year. This is based on a combination of items in beginning maths, numeration, addition, subtraction, multiplication, division, money, and measurement.

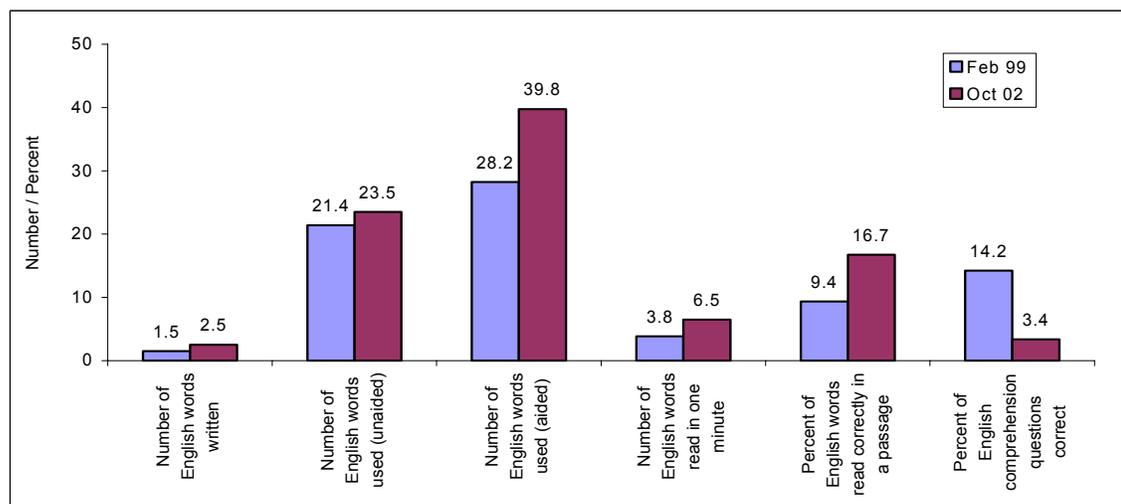
**Figure 4.7: Percent of Maths Items Correct among Standard-Three Pupils, 1999 & 2002**



Sources: IEQ/Malawi Longitudinal Study and 2002 Gain Score Study, Pupil Assessments

In contrast, Figure 4.8 and Table 4.8 indicate improvements on many English items. Compared to standard 3 pupils in 1999, those in 2002 were able to write more English words, read a larger number of English words in one minute, use a larger percentage of English words with and without assistance, and read a larger percentage of English words correctly. The exception is for English comprehension, in which the 1999 cohort scored better than the 2002 cohort.

**Figure 4.8: Standard-Three Pupil Achievement on English Assessments, 1999 & 2002**



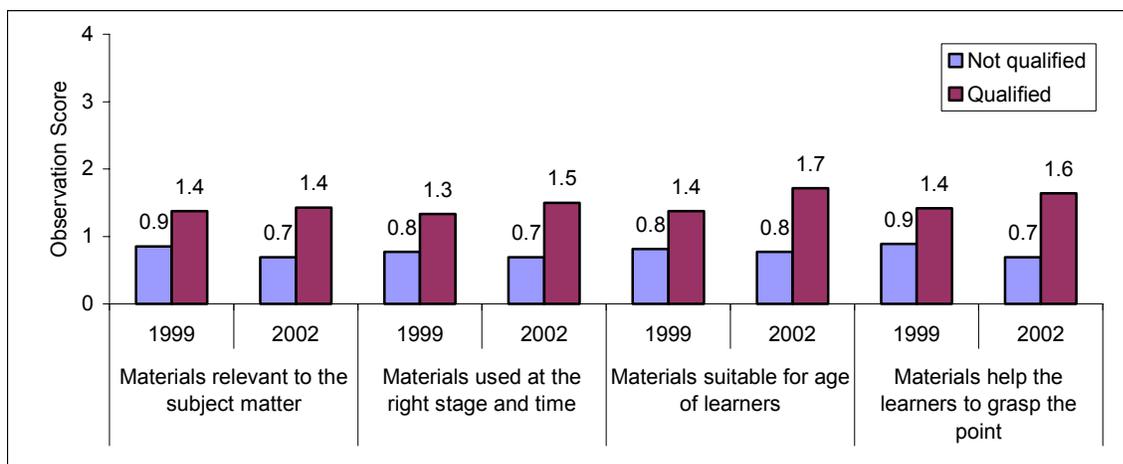
Sources: IEQ/Malawi Longitudinal Study and 2002 Gain Score Study, Pupil Assessments

QUALIFICATIONS, PRACTICES, RESOURCES, AND LEARNING

The analyses thus far in this chapter explain trends in teacher qualifications, classroom practices and resources, and pupil learning. The next step is to examine the extent to which these concepts conform to the model of teaching and learning. In other words, to what extent do teacher qualifications affect classroom practices and resources? Similarly, to what extent do qualifications, practices, and resources affect pupil learning? Findings from various analyses indicate that that answer is “not in most instances.”

On the one hand, Figure 4.9 demonstrates that qualified teachers used teaching and learning resources in the classroom more effectively than not qualified teachers in February 1999 and October 2002.

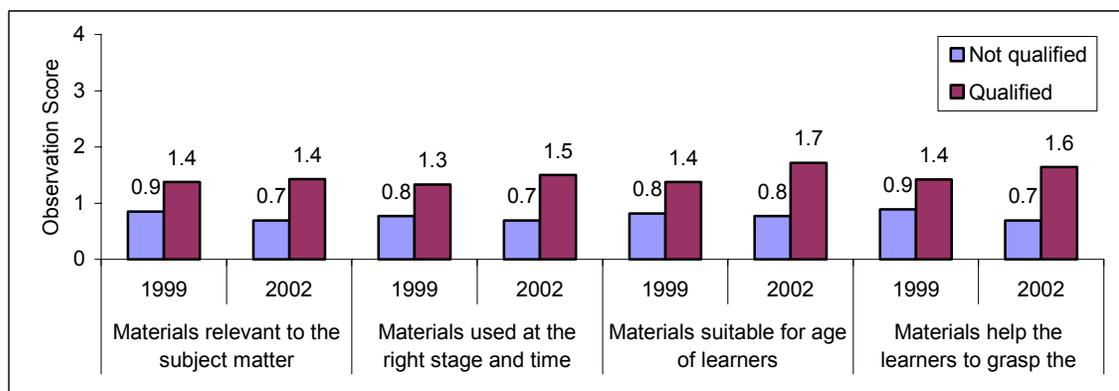
**Figure 4.9: Qualified and Not qualified Teachers’ Use of Teaching and Learning Materials across Subjects, February 1999 & October 2002**



Sources: IEQ/Malawi Longitudinal Study, Teacher Survey and Classroom Observations

Figure 4.10, however, illustrates that non-qualified teachers surpass their qualified colleagues in the use of Chichewa, English, and maths textbooks over time. In February 1999, qualified teachers used textbooks more aptly in their instruction than did non-qualified teachers. By the end of the following academic year, however, non-qualified teachers were using textbooks more effectively than qualified teachers.

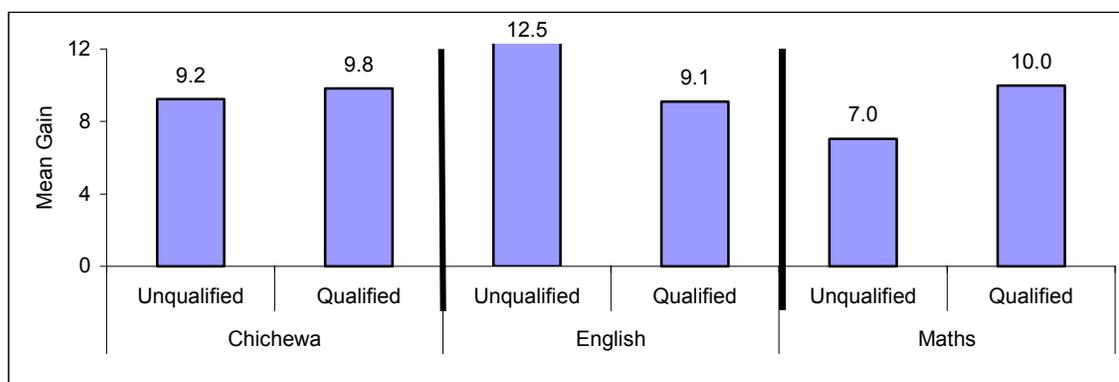
**Figure 4.10: Qualified and Non-Qualified Teachers' Use of Textbooks across Subjects, February 1999 & October 2000**



Sources: IEQ/Malawi Longitudinal Study, Teacher Survey and Classroom Observations

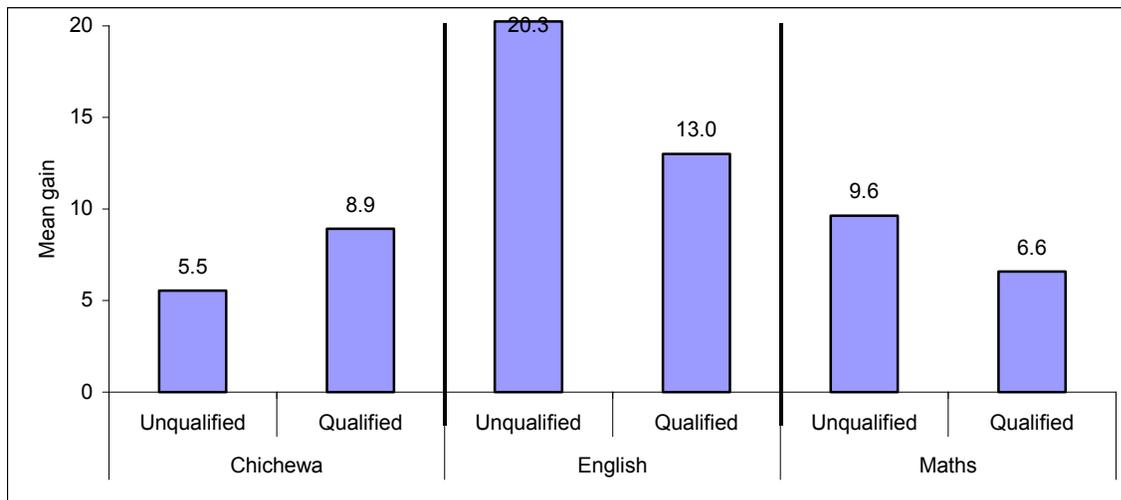
The relationship between teacher qualification and pupil learning is also mixed. Figures 4.11 and 4.12 summarize changes in standard-three pupil performance on Chichewa, English, and maths assessments during the 1999 and 2002 academic years respectively. The first bar in Figure 4.11, for example, indicates that pupils taught by unqualified teachers gained an average of 9.2 points between February and October 1999 on the Chichewa assessment. This is slightly less than gains made by pupils taught by qualified teachers, which was 9.8 points. Pupils taught by qualified teachers achieved higher gains on Chichewa assessments in both the 1999 and 2002 academic year. They also achieved higher gains on the maths assessment in 1999. However, pupils taught by unqualified teachers achieved higher maths gains in 2002 as well as substantially higher English gains in both academic years.

**Figure 4.11: Gains in Standard Three Pupil Achievement between February and October 1999, by Teacher Qualification Status**



Source: IEQ/Malawi Longitudinal Study, Teacher Survey and Pupil Assessments

**Figure 4.12: Gains in Standard Three Pupil Achievement between February and October 2002, by Teacher Qualification Status**



Source: IEQ/Malawi Longitudinal Study, Teacher Survey and Pupil Assessments

Numerous other analyses were conducted using 1999 achievement gains to determine the extent to which qualifications, practices, and resources had an effect on pupil learning.<sup>5</sup> The decision was made to use 1999 data because the previous analyses in this chapter indicated that teachers were more educated and had more formal teacher training experience than teachers in 2002. In addition, findings of greater improvements in classroom practices and more access to teaching materials in 1999 led to an expectation of stronger associations between these variables and pupil learning during 1999 than 2002.

Findings indicate no statistically significant associations<sup>6</sup> between teacher education and 1999 pupil learning gains. In addition, no statistically significant differences were found in pupil achievement between teachers with JCE and MSCE academic qualifications or between teachers with various pre-service and in-service professional development experiences.

Meanwhile, numerous statistically significant associations between pupil outcomes and classroom practice and resource variables were found, but the associations were mixed: Findings indicate that

<sup>5</sup> First, overall October pupil achievement scores were regressed on various input variables (i.e., teacher education, classroom practice and classroom resource categories) and, as a control, February pupil achievement scores. Next, Student's t-tests were conducted to examine differences in pupil outcomes by teachers' academic qualifications, professional qualifications, and professional training. Multi-level statistical procedures were used, and, in the case of t-tests, a Bonferroni adjustment was included to account for the nested sampling frame of pupils in classrooms.

<sup>6</sup> Statistical significance is defined as a probability value of less than or equal to 0.05.

- Effective practices in Chichewa classes were associated with increased pupil achievement or gain scores in only four of 14 instances.
- Effective practices in English classes were associated with increased pupil achievement or gain scores in 13 of 24 instances.
- Effective practices in maths classes were associated with increased pupil achievement or gain scores in 25 of 37 instances.

Complete lists of statistically significant associations between February 1999 classroom practices and October 1999 learning outcomes, as well as between February 1999 practices and 1999 learning gains, are included in Appendix 5. These results indicate almost as many statistically significant negative associations between what was previously identified as “good” classroom practices and pupil learning.

## SUMMARY AND DISCUSSION

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The analyses in this chapter have indicated a variety of trends in teacher qualifications, classroom practices, classroom resources, and pupil learning in Mangochi and Balaka between 1999 and 2002. Some trends were consistent with initial hypotheses. For example, there was an expectation that academic and professional qualifications would increase over time. There was also an expectation that scores on pupil achievement would increase over time. This was at least true for pupil scores on most English assessment items.

Analyses demonstrated, however, that just as many trends were contrary to initial hypotheses. Between 1999 and 2002, for example, the average years of education decreased for teachers, fewer teachers had participated in traditional pre-service and in-service teacher training activities (e.g., MIITEP, MASTEP, and residential teacher training programs), and standard three pupils fared worse on maths assessments. In addition, other trends were observed that are contrary to initial hypotheses but not necessarily inconsistent with other trends in development. With respect to classroom practices and the use of classroom resources, for example, statistics reveal a year-one “spike” in improvements, followed by a decline and leveling out in later project years. Furthermore, analyses did not indicate consistent, statistically significant associations between pupil learning and teacher qualifications, classroom practices, or classroom resources. In many instances, negative associations were found.

The questions, then, are what insight these analyses give into the effects of recent reform efforts on education in Mangochi and Balaka schools and what the implications may be for future educational reform. To the extent that schools in these rural provinces are at least somewhat representative of schools across Malawi, trends suggest that there seems to be a loss of resources over time. This includes lower teacher credentials, fewer teaching aides and teaching guides. The education system is also overburdened with high pupil/teacher ratios and high teacher mobility, forcing teachers to sometimes manage more than one class.

Given the shortage of resources in Malawi, it is important to ensure teachers learn strategies, such as TALULAR and textbook tracking techniques, to maximize the resources available. As discussed, there was a decline in the availability of teaching guides, an important source of information for teachers, particularly the unqualified or under trained teacher. Therefore, unqualified teachers who also lack teachers' guides are especially disadvantaged and may be unnecessarily struggling with their teaching. However, teachers, regardless of qualifications appear to be strained in this environment.

Some of the lack of differences in the findings between unqualified and qualified teachers could possible be for alternate reasons. As mentioned, the IEQ Longitudinal Study was conducted largely in Mangochi, the same district where the QUEST intervention by SAVE the Children trained teachers. Therefore, the gap between qualified and unqualified teachers may be less than other districts. In addition, the impact of teacher training is difficult to measure when there is greater than 50 percent mobility of teachers in a school year. Alternatively, the lack of differences may indicate the new system in this resource strained environment is not producing high enough quality teachers and a return to investing in the conventional teacher training colleges may be needed. Even though the data do not follow the model of teaching and learning, it does not reflect on the value of the model. There may be other circumstances, aside from those mentioned, those make it difficult to measure, and were not accounted for in this study, such as external factors like HIV/AIDS.

## REFERENCES

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Stuart, J.S., & Kunje, D. (2000). Discussion paper 11: The Malawi Integrated In-Service Teacher Education Project: An analysis of the curriculum and its delivery in the colleges. Sussex, UK: University of Sussex, Institute of Education, Centre for International Education.

## Chapter Five: Pupil Characteristics Predict Learning

By Amy Jo Dowd

Longitudinal analyses of learning used data from pupils in all standards. Data was collected in February 1999, October 1999, October 2000, February 2002 and October 2002. The findings summarized here focus upon how pupil characteristics influenced pupil learning in Maths, Chichewa and English over that period of time.

### MATH LEARNING

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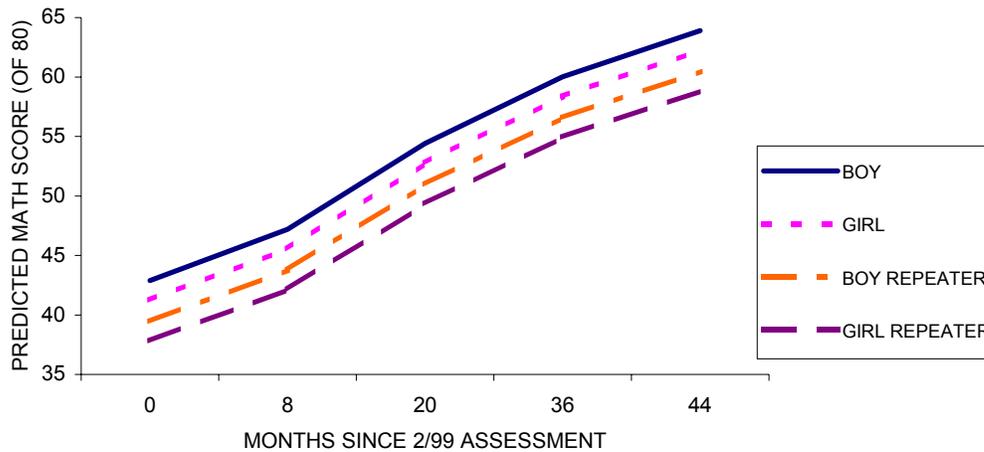
Math learning was measured using an 80 point curriculum-based instrument comprised of items grouped in 7 sections: beginning math concepts, numeration, addition, subtraction, multiplication and division, money and measurement. The following factors predict total math score controlling for all other significant effects:

- **Pupil sex:** There is a significant gender gap in math learning. A girl's predicted total math score is 1.64 points lower than a boy's predicted score.
- **Preliteracy skills:** For every concept about print that the pupil demonstrates mastery of, his/her predicted math score increases by 1.22 points. For every letter of the alphabet a pupil knows, his/her predicted math score increases by .32 points.
- **1999 Standard:** The predicted math score is raised 5.13 points for each year of the 1999 standard (i.e., in 1999, standard 2 predicted math score is 10.26, standard 3 is 15.39 and standard 4 is 20.52).
- **Repetition:** Repetition in 2000 reduces a pupil's predicted math score by 3.43 points.
- **Home language:** Speaking Chiyao at home reduces a pupil's predicted math score by 3.03 points.
- **Home language and preliteracy:** If a pupil speaks Chiyao at home, then the benefit to math learning of learning more letters is an increase of .38 points per letter (.07 points more per letter than for non-Yao classmates).

### FIGURES AND DISCUSSION

At all assessment points, boys outperformed girls by 1.64 points on average. These estimates are for boys and girls who have average literacy at each point in time, are not Yao and have progressed from standard 2 in 1999 to standard 3 in 2000. Of greater magnitude than the effect of pupil sex is the impact of repetition on math learning. A pupil repeating in 2000 the same standard he/she attended in 1999 has a predicted math score 3.43 points below that of a colleague who was promoted in 2000.

**PUPIL SEX AND REPETITION PREDICT MATH LEARNING 1999-2002**

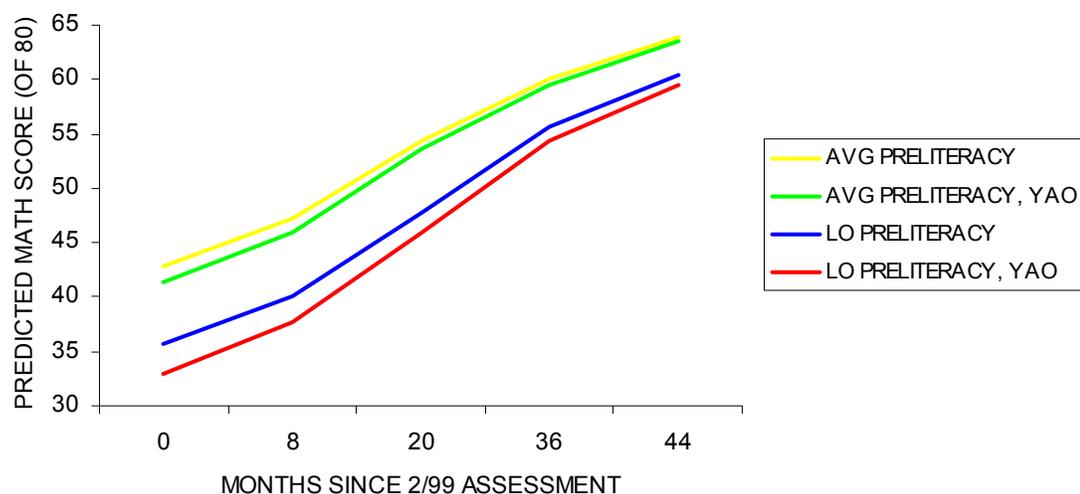


Preliteracy skills and home language also influence math learning. The two skills measured are “concepts about print<sup>7</sup>,” and knowledge of letters and sounds. Ten concepts about print included which way to open and hold a book, where to begin reading a line of text, where to go next after finishing that line, etc. Knowledge of letters was assessed by requesting recognition of all upper and lower case letters that are shared by both English and Chichewa, for a total of 52 possible points. The figure below presents the impact on predicted math score of low literacy (scores set at the 25th percentile for both concepts and letters for each assessment point) and high literacy (scores set at the 75th percentile for both concepts and letters for each assessment point) for Yao and non-Yao boys. Estimates for Yao and non-Yao, low and high literacy girls are 1.64 points below the curves for their male classmates of the same language and literacy status.

Low literacy pupils know only 5 letters and 5 of 10 concepts about print in February 1999. They demonstrate knowledge of 31 letters and 8 concepts about print in October 2002. This benefits their math learning. Between the first and last assessment points, the influence of their improved preliteracy skills closes the gap between their estimated math scores and those of their average literacy counterparts from 9.92 points to 4.36 points.

<sup>7</sup> Adapted from: Clay, M. M. (1979). *Reading: The patterning of complex behaviour*. London: Heinemann Educational Books.

### HOME LANGUAGE AND PRELITERACY PREDICT MATH LEARNING 1999-2002



Comparing the curves of the low literacy Yao and non-Yao classmates at the bottom of the figure, note that the benefit of literacy to math learning is greater for Yao pupils over time. The distance between the curves decreases from 2.69 points in February 1999 to .91 points in October 2002. Preliteracy skills benefit math learning and the negative effect of speaking an additional language at home is mediated by these abilities.

#### LEARNING TO WRITE CHICHEWA WORDS

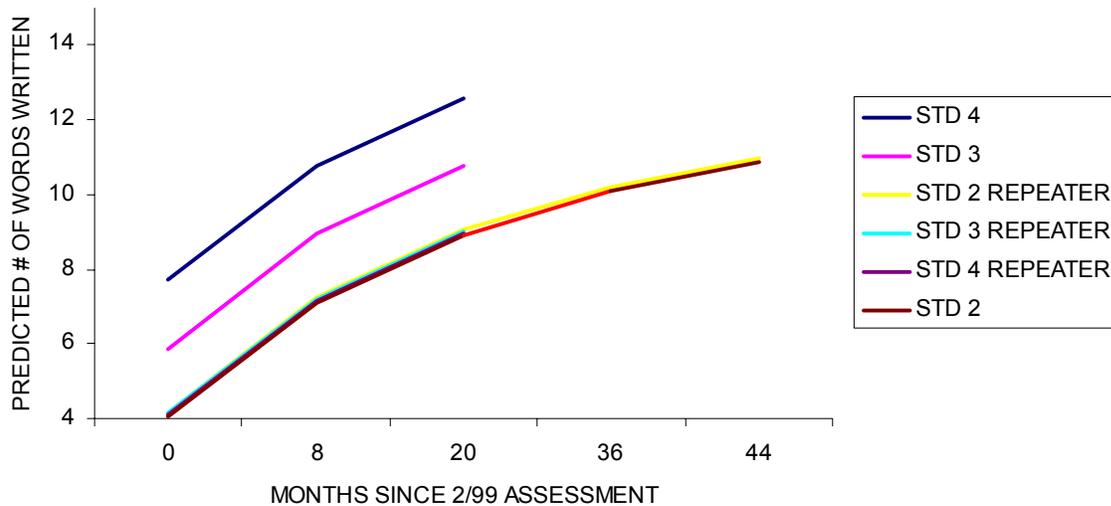
Pupils were asked to write Chichewa words and the total number written was recorded in February 1999, October 1999, October 2000, February 2002 and October 2002. The following factors predict the number of Chichewa words written controlling for all other significant effects:

- **Preliteracy skills:** For every concept about print that the pupil demonstrates mastery of, his/her predicted number of Chichewa words written increases by .28 points. For every letter of the alphabet a pupil knows, his/her predicted number of Chichewa words written increases by .20 points. Pupil A, who knows 5 more letters than Pupil B, can write one more Chichewa word.
- **1999 standard and repetition:** The predicted number of Chichewa words written by a pupil promoted normally between 1999 and 2000 is raised 1.83 points for each year of the 1999 standard (3.66 for standard 2, 5.49 for standard 3 and 7.32 for standard 4). Repetition alters these values to: 3.79 for standard 2 repeaters, 3.75 for standard 3 repeaters and 3.71 for standard 4 repeaters.

FIGURES AND DISCUSSION

The 1999 standard 4 girls promoted between 1999 and 2000 write the most Chichewa words on average. Note that the estimates for boys follow the same patterns according to standard and repetition, but are .33 points lower than these curves, a non-significant difference.

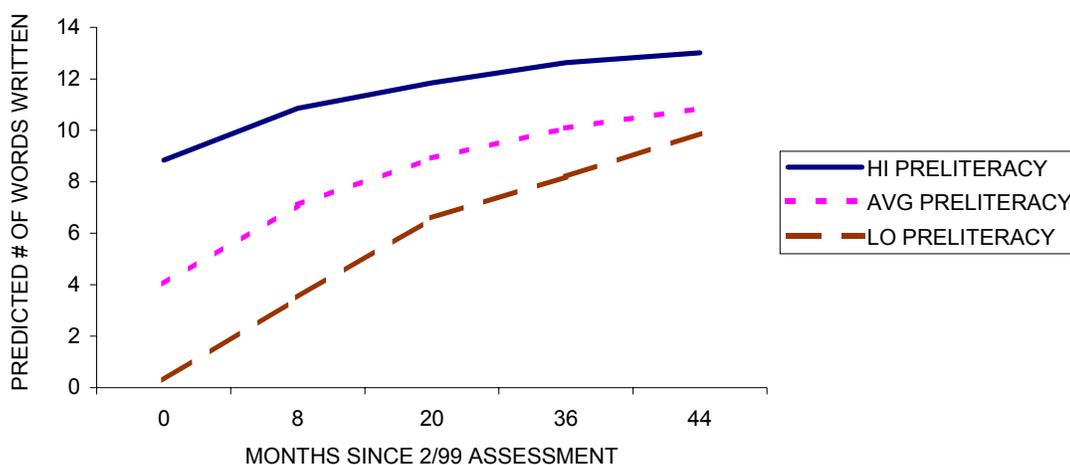
**1999 STANDARD AND REPETITION PREDICT NUMBER OF CHICHEWA WORDS WRITTEN**



The 1999 standard 3 girls write 1.83 words fewer on average than their standard 4 colleagues. Interestingly, the 1999 standard 2 girls and all of the girls who repeated any standard in 2000 have similar estimated numbers of Chichewa words written. They write 4 Chichewa words in February 1999 and nearly 11 in October 2002.

The 1999 standard 2 girls have an estimated number of Chichewa words written below that of all girls who repeated any standard in 2000, including standard 2. In fact, those who repeat standard 2 in 2000 slightly outperform (.13 words) those who progress to standard 3 in the same year. Standard 3 repeaters write 1.74 Chichewa words fewer on average than pupils promoted from standard 3 to 4 in 2000. Finally, standard 4 repeaters write 3.61 words fewer than their 1999 classmates who were promoted. This indicates that the negative effect of repetition on learning to write Chichewa words is absent in standard 2, but grows with each standard.

### PRELITERACY SKILLS PREDICT NUMBER OF CHICHEWA WORDS WRITTEN 1999-2002



Girls with high preliteracy skills in the figure above know 40 letters of the upper and lower case alphabet and all 10 of the concepts about print in February 1999. Their predicted number of Chichewa words written is the highest at the baseline (8.84 words), but as they have only 12 more letters to learn to boost their Chichewa writing skills, they have a flatter learning curve compared to their average preliteracy and low preliteracy counterparts. Low preliteracy girls know only 5 concepts about print and 5 letters of the alphabet in February 1999. As they strengthen their preliteracy skills, their predicted number of Chichewa words written increases sharply, decreasing the gap between themselves and high preliteracy colleagues from 8.54 in February 1999 to 3.13 in October 2002.

### LEARNING TO WRITE ENGLISH WORDS

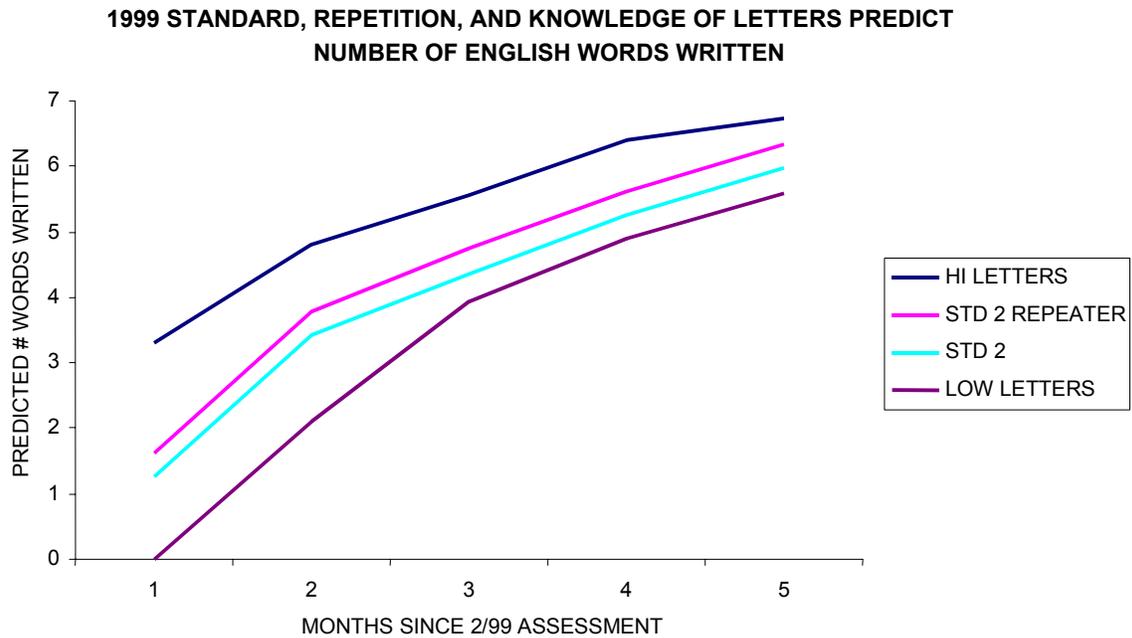
Pupils were asked to write English words and the total number written was recorded in February 1999, October 1999, October 2000, February 2002 and October 2002. The following factors predict the number of English words written controlling for all other significant effects:

- **Preliteracy skills:** For every letter of the alphabet a pupil knows, his/her predicted number of English words written increases by .11 points. Pupil A, who knows 10 more letters than Pupil B, is estimated to be able to write 1 more English word.
- **Home Language and 1999 standard:** The predicted number of English words written by a non-Yao pupil promoted normally between 1999 and 2000 is raised 2.25 points for each year of the 1999 standard: 4.50 for standard 2, 6.75 for standard 3 and 9.00 for standard 4. Speaking Chiyao at home alters these estimates to: 4.70 for standard 2, 5.84 for standard 3 and 6.98 for standard 4.
- **Home language and repetition:** For non-Yao pupils who repeated the 1999 standard in 2000, the predicted number of words written is raised based on the 1999 standard as follows: 5.07 words for standard 2 repeaters, 4.22 words for standard 3 repeaters and 3.37 words for standard 4

repeaters. Speaking Chiyao at home alters these estimates to: 3.79 words for standard 2 repeaters, 3.75 words for standard 3 repeaters and 3.71 total for standard 4 repeaters.

FIGURES AND DISCUSSION

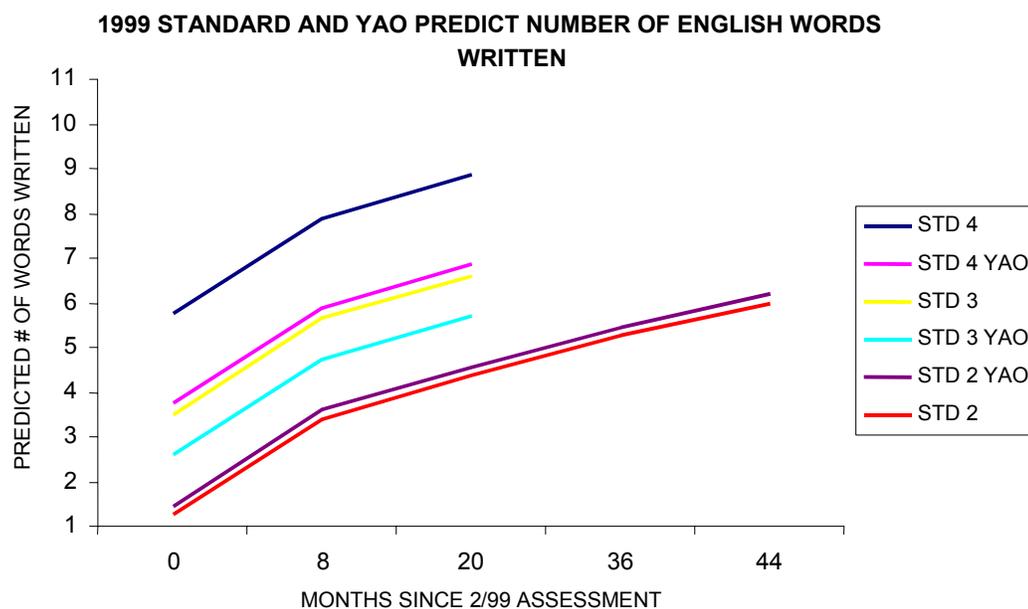
Similar to predicting number of Chichewa words written, 1999 standard and repetition predict the number of English words a pupil in Mangochi writes.



Standard 3 repeaters write 1.62 English words fewer on average than pupils promoted from standard 3 to 4 in 2000 and standard 4 repeaters write 3.61 words fewer than their 1999 classmates who were promoted. This indicates that the negative effect of repetition on learning to write English words is minimal in standard 2, but grows with each standard. Note that these estimates for boys are nearly identical to estimates for girls as the difference between their predicted words written is .04 words.

The boys who have the highest knowledge of letters write the most English words from baseline to October 2002, but improve the least writing only 3.41 more English words on average 44 months after the baseline. The standard 2 boys who know the fewest letters (5 letters) at baseline write no words in February 1999, but by October 2002 improve to writing 5.58 on average. This improvement reduces the gap between high and low letters learners from 3.31 words at baseline to 1.14 words in October 2002.

In the following figure, the 1999 standard 4 boys have the highest predicted number of English words written. This curve predicts the number of English words written by a non-Yao standard 4 boy, while the Yao classmate prediction is 2.02 points below it.



The difference between each pair of lines by standard decreases with the standard and is .91 words between Yao and non-Yao standard 3 boys and only .2 words between Yao and non-Yao standard 2 boys. While in standard 2 these pupils have similar English writing skills, the challenges faced by Yao speakers in mastering writing in a third language presents itself more clearly in later grades.

#### LEARNING TO READ CHICHEWA MOST USED WORDS CORRECTLY

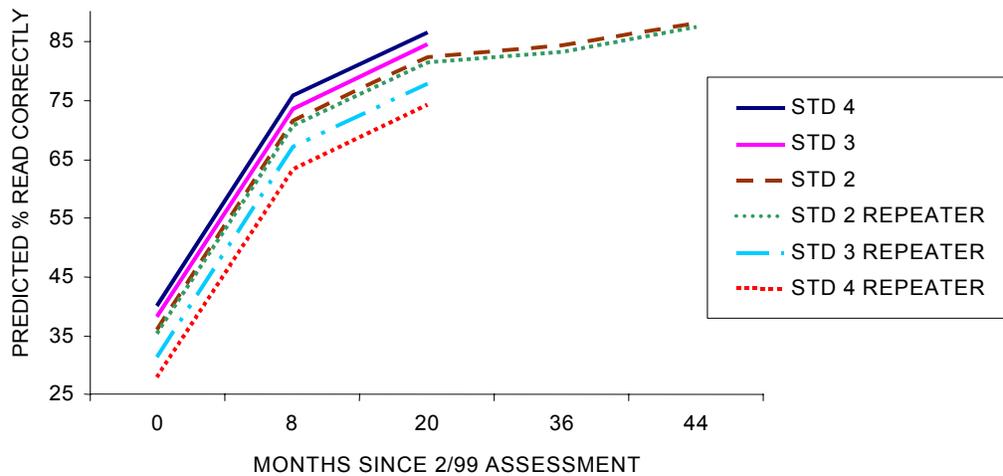
The words used most often in the Chichewa textbooks were organized into a list that the children in that standard were asked to read. This outcome reflects the percentage of most used words that the pupil read correctly for his/her standard in school. Thus, a standard 2 pupil and a standard 3 pupil are attempting to read different lists and the score reflects the percentage of words for his/her standard read correctly. At each assessment the pupil read the word list from textbooks for his/her current standard. The following factors predict the percentage of Chichewa most used words read correctly, controlling for all other significant effects:

- **Preliteracy skills:** For every letter that the pupil demonstrates knowledge of, his/her predicted percentage of most used Chichewa words read correctly increases by 1.76 points.
- **1999 standard and repetition:** The predicted percentage of Chichewa most used words read correctly by a pupil promoted normally between 1999 and 2000 is raised 2.11 percentage points for each year of the 1999 standard (4.22 for standard 2, 6.33 for standard 3 and 8.44 for standard 4). Repetition alters these values as follows: raised 3.39 percentage points for standard 2 repeaters, lowered .27 percentage points for standard 3 repeaters and lowered 3.39 percentage points for standard 4 repeaters. The pupils in these standards are not reading the same lists of most used words. The lists are more difficult in each successive standard, meaning that the deficit to reading skills represented by repeating in later standard is greater than in earlier standards.

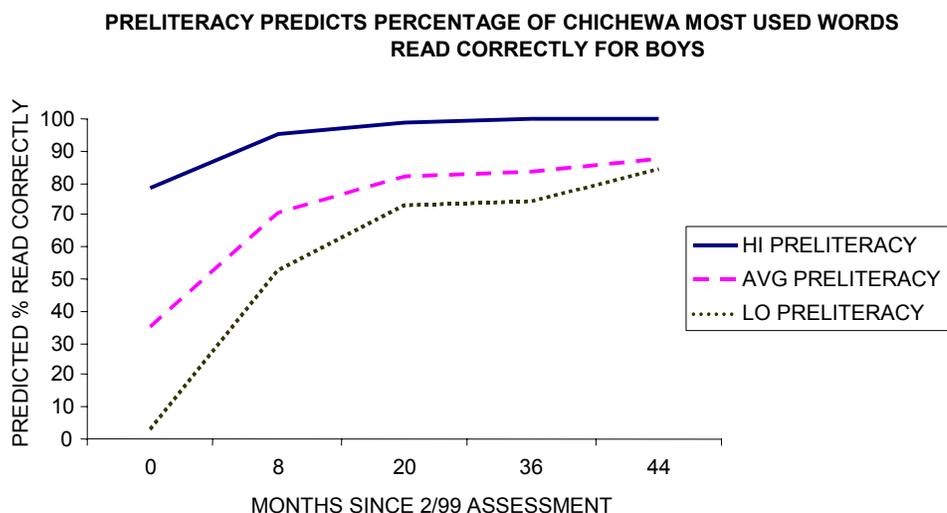
FIGURES AND DISCUSSION

Unlike the number of words written in Chichewa and English, reading skills improved dramatically between February 1999 and October 2002. The steep increase from the baseline to the end of the 1999 school year reflects the decision to focus the analysis upon factors that affect learning by dropping pupils not demonstrating any learning in reading.

**1999 STANDARD AND REPETITION PREDICT PERCENTAGE OF CHICHEWA MOST USED WORDS READ CORRECTLY FOR GIRLS**



Girls who repeated standard 2 in 2000 have estimated percentages of Chichewa most used words read correctly less than 1 percent below their non-repeating counterparts. Girls who repeated standard 3 in 2000 have an estimated percentage of Chichewa most used words read correctly 6.60 percentage points below their non-repeating counterparts. Finally, girls who repeated standard 4 in 2000 estimated percentage of Chichewa most used words read correctly 12.37 percentage points below their non-repeating 1999 standard 4 colleagues. While repeating a standard might have resulted in a benefit to the percentage of most used words read correctly via increased exposure to those words, this finding reveals that repetition in later standards has a greater negative impact on reading than repetition in earlier standards. Estimates presented are for girls, but those for boys follow the same pattern and are .48 percentage points lower, a difference that is not significant.



Boys with high preliteracy skills read nearly 80% of Chichewa most used words correctly in February 1999 and 100% by October 2002. Note again that while boys estimates are presented in the figure, the girls estimates mirror these patterns .48 percentage points above the boy's estimates. Boys with low preliteracy skills read 3.18 percent of Chichewa most used words correctly in February 1999. As their preliteracy skills improve over time, they learn to read greater and greater percentages of the Chichewa most used words for their standards. By October 2002, they have closed the gap between themselves and their hi preliteracy counterparts from 75.26 percentage points at baseline to 15.72 percentage points in October 2002.

#### LEARNING TO READ ENGLISH MOST USED WORDS CORRECTLY

The words used most often in the English textbooks were organized into a list that the pupils in that standard were asked to read. This outcome reflects the percentage of most used words that the pupil read correctly for his//her standard in school. Thus, a standard 2 pupil and a standard 3 pupil are attempting to read different lists and the score reflects the percentage of words for his/her standard read correctly. At each assessment the pupil read the word list from textbooks for his/her current standard. The following factors predict the percentage of English most used words read correctly, controlling for all other significant effects:

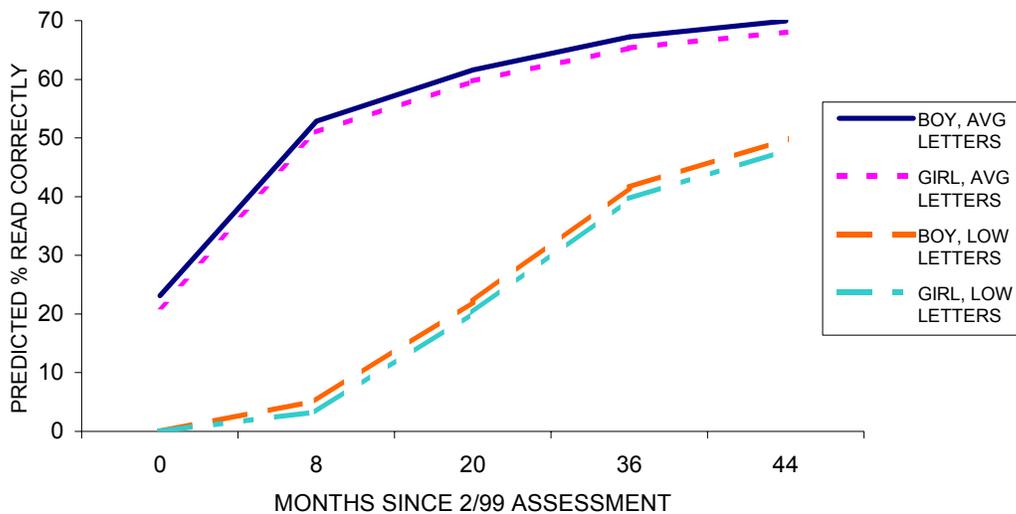
- **Pupil sex:** There is a gender gap in reading English most used words: a girl's predicted number of words read correctly is 1.91 words lower than a boy's predicted words read correctly.
- **Preliteracy skills:** For every letter of the alphabet a pupil knows, his/her predicted percentage of English most used words read correctly increases by 1.53 percentage points.
- **1999 standard and repetition:** The predicted percentage of English most used words read correctly by a pupil promoted normally between 1999 and 2000 is raised 7.13 percentage points for each year of the 1999 standard (14.26 for standard 2, 21.39 for standard 3 and 28.52 for standard 4). Repetition alters these values to: 17.07 for standard 2 repeaters, 13.04 for standard 3 repeaters

and 9.02 for standard 4 repeaters. The pupils in these standards are not reading the same lists of most used words. The lists are more difficult in each successive standard, meaning that the deficit to reading skills represented by repeating in later standard is greater than in earlier standards. Standard 2 repetition boosts the percentage of these familiar words read correctly.

FIGURES AND DISCUSSION

Standard 2 boys’ read 1.91 percentage points more English words correctly than standard 2 girls’ estimates. Standard 2 boys and girls with low knowledge of letters (5) read none of the English most used words correctly in February 1999. Those with average knowledge of letters (21) read over 20% correctly. As this preliteracy skill improves over time, pupils in both groups learn to read increasingly greater percentages of the English most used words for their standards. A steep increase in percentage read correctly occurs when the pupils know 20 letters: between 0 and 8 months for pupils with average knowledge of letters and between 20 and 36 months for pupils with low knowledge of letters.

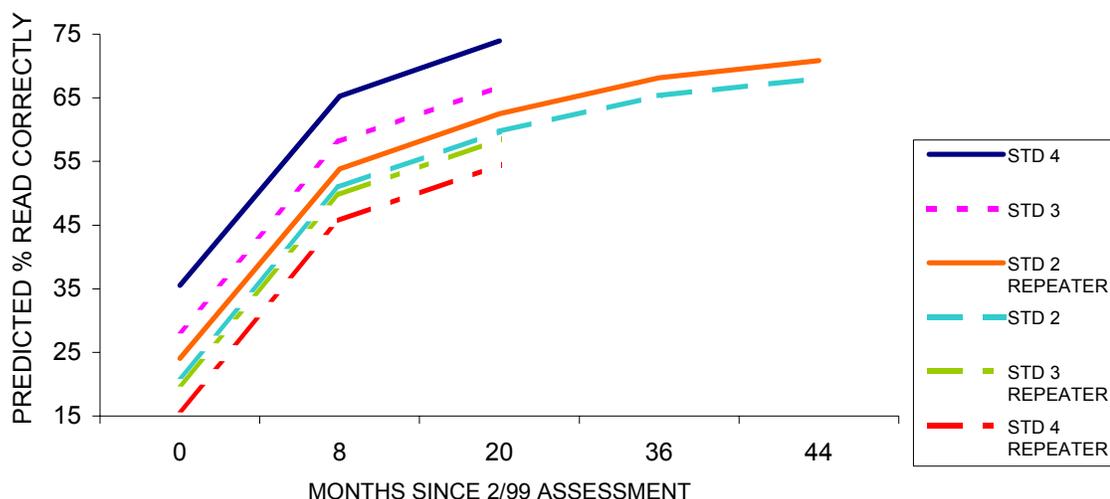
**PUPIL SEX AND NUMBER OF LETTERS KNOWN PREDICT PERCENTAGE OF ENGLISH WORDS READ CORRECTLY**



The 1999 standard 4 girls read the highest percentage of English most used words correctly, while their classmates who repeat standard 4 in 2000 read the lowest percent correctly. Similar to the trend in learning to read Chichewa most used words correctly, repetition in standard 4 reflects the greatest negative effect and a deficit of 19.51 percentage points. This is particularly troublesome when we recall that the standard 4 promoted pupils are reading a new list of most used words (standard 5 in 2000) and the standard 4 repeaters are assessed with the same list of English most used words at baseline, October 1999 and October 2000.

This same trend is apparent among standard 3 girls promoted and repeating. Unlike the finding with Chichewa reading, the standard 2 girls benefit from a second year of exposure to the English text and

### 1999 STANDARD AND REPETITION IN 2000 PREDICT PERCENTAGE OF ENGLISH MOST USED WORDS READ CORRECTLY



instruction in that standard. Their estimated percentage of English most used words read correctly is 2.81 percentage points higher than their standard 2 non-repeating counterparts.

#### IMPLICATIONS

Repetition and preliteracy are interrelated in their influence upon pupil learning. Pupils who repeated the 1999 standard in 2000 know 6.16 fewer letters and 1.34 fewer concepts about print. Promoting math learning and learning to read and write in Chichewa and English entails enhancing preliteracy skills and reducing repetition.

Preliteracy skills and literacy are keys to academic success. These skills influence learning in all academic areas. There is a gender gap in preliteracy skills, boys in Mangochi know 1.67 more letters and .35 more concepts about print on average than girls. It is imperative that pupils attain their preliteracy skills early. Attention should be given to enhance reading opportunities for both boys and girls in the classroom and in the home.

The gender gap still exists in mathematics performance. Teachers need to pay special attention to girls in mathematics teaching. When practical experience is needed, such as problems involving money, parents should give equal opportunity to girls, such as sending them to grocery shops to buy things.

Strategies at home and in the first years of school should include strengthening support for schooling and reading in particular at home, enhancing the amount and variety of literacy materials available in the environment, and promoting child-centered teaching in the earliest standards.



## Chapter Six: HIV/AIDS: Effects in the Classroom

By Abigail Harris and Jane Schubert

### INTRODUCTION

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The existence of the HIV/AIDS pandemic in Africa is real and frightening. It's real because there is no denying its presence and it's frightening because this presence permeates the core of life in every human being who lives in a society where HIV/AIDS has intruded. Malawi, like many of its African neighbors, has been hit hard by the AIDS epidemic. Prevalence rates amongst adults between the ages of 15 and 44 are estimated at 16% with higher prevalence rates for pregnant women from both urban (26.0%) and rural (18.2%) areas (Chesterfield & Enge, 2000). The Malawi National AIDS Control Programme (NACP; 2000) estimates that 46% of all new adult infections in 1998 occurred in youth aged 15-24 with young women suffering the greatest burden (60% of new infections). In Malawi, at least one teacher per day dies because of this and if one considers who is affected within the circle of that teacher – loss of teaching personnel; loss of a mother; loss of a wife; the strain on the family and the school (pupils and teachers) while the teacher suffered and eventually died; long-term loss of a contributor to national development and so on.

What follows are the findings of an attempt by IEQ/Malawi to explore how this pandemic is intruding into the classroom and the lives of teachers and children. The study did not include questions specifically about HIV/AIDS and yet the impact of the crisis began to emerge in response to other questions such as, “What are some reasons you miss school?” and “Are both of your parents living?” The nature of the IEQ approach permitted the flexibility to explore this change. In our first interview in February 1999, children were asked about who they live with and their activities outside of school. From our findings we moved on to questions the living status of parents and reasons for missing school. More recently, in October 2000, we again asked these questions of the same children. We also added questions about teacher stability and continuity of teaching. Below are some of the findings.

### PUPILS

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We examined the data by looking in the classroom – first at the lives of children attending school and secondly, at the classroom context for those able to attend school. Keep in mind that these are children who are in school. Our data do not permit us to address what is happening in the lives of children who were not in attendance when we visited the schools. We deconstruct the findings to explore possible relationships and identify potential opportunities to better meet the basic learning needs of children.

- Parental death: During the course of one year, the percentage of children in school who had lost one or both parents increased from 12% to 17%. Thus, children are surrounded by parental death and dying. Even children who come from healthy families are faced with the sadness and mourning of their peers who are dealing with parental death and dying.
- Caring for the sick: One-third of all the children in the study reported that they sometimes miss school to care for someone who is sick. This percentage is almost doubled for children who have lost both parents.
- Funeral activities: Six percent of the children reported that the main reason they miss school is funeral activities.
- Absenteeism: Children whose mothers were dead had a higher absenteeism than children whose parents were living or whose fathers were dead.
- Dropout: Children with both parents dead in October 1999 were twice as likely to dropout (17.1%) during the 2000 school year as children with one parent dead (9.1%) or both parents living (9.5%).
- Repetition: Repetition rates for children whose parent(s) were dead were 5-15% higher (depending on the cohort and standard) than for children whose parents were living. The average age for pupils with both parents dead was about 6 months older than the average age of their grade cohort.
- Achievement: Within a grade cohort, for children whose parents were alive or dead, the average performance in numeracy and literacy tasks was comparable. Also, the percent of achievement gain during the 2000 school year was comparable regardless of parental status. One possible explanation is that parental status is only one of the stressors affecting performance. Children whose parents are ill or who are affected by other stressors (economic, the loss of a teacher, family members or friends, etc.) are not identified by a question about parental mortality. Better control on the factors affecting a child's well-being may allow better prediction of achievement.
- Textbook use: Although there were no differences in reported use of textbooks during class, pupils whose parent(s) were dead were less likely than pupils of living parents to report taking textbooks home (particularly if both parents were dead). It is unclear if this is a consequence of a school factor (e.g., payment of school fees), a family support/supervision factor, or a student factor (e.g., motivation).

## CLASSROOMS AND TEACHERS

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In 1994, the government of Malawi introduced free primary education for all children (FPE) resulting in a sudden and dramatic rise in pupil enrollment and a concomitant severe teacher shortage. To reduce the shortfall, large numbers of untrained teachers were recruited. Recruits were given a brief orientation before being assigned to various schools where their services were needed. Posting was based on need rather than preference or language compatibility. Subsequently, substantial teacher attrition has compounded the problem resulting in the need to continue to recruit large numbers of new untrained teachers every year. Even without HIV/AIDS, the situation was dire; with the increasing impact of AIDS and the reported high morbidity amongst teachers, the situation is in crisis. Below are some of the findings from IEQ research in the 65 schools.

- **Class size:** Class enrollments were quite large in most of the 65 participating schools, particularly in the lower grade levels. The average class size for standard 2 classes in the study was 96 pupils (median=90). Class enrollments decreased progressively for standard 3 (mean=83; median=70) and standard 4 (mean=68; median=62). Since class enrollments are not always indicative of average daily attendance, teachers were asked, “Most days how many pupils (boys...girls...) come to your class? Generally the total number attending that was reported by teachers was about 70% of the total enrollment.
- **Age range:** The range of ages in most classrooms was quite large. As Table 1 suggests, while many pupils were fairly close in age to the median for each standard, sizable proportions of pupils were substantially younger or older. The average range in ages found in the 65 standard 2 classrooms was almost 6 years. In practical terms this means that the standard 2 teacher

**Table 1: Percentages of boys and girls by standard for selected age ranges.**

	N	Median	Ages 5-7	Ages 8-10	Ages 11-13	Age 14+
Standard 2						
Boys	497	9	19.9 %	44.9 %	28.1 %	7.0 %
Girls	486	9	23.4 %	48.4 %	24.6 %	3.5 %
Standard 3						
Boys	239	11	6.3 %	35.2 %	43.9 %	14.7 %
Girls	251	11	8.4 %	39.9 %	46.6 %	5.2 %
Standard 4						
Boys	223	12	2.2 %	21.5 %	53.3 %	22.8 %
Girls	247	12	-	26.3 %	55.9 %	17.8 %

NOTE: These data were drawn from a stratified random sample of 65 primary schools. Stratification was based on class size (reported in 1997 school census data; n=50) with the additional inclusion of a sampling of schools without 1997 data (new or non-reporting; n=15). Pupils (stratified by gender) were randomly selected from standards 2-4 classrooms with over-sampling in standard 2 (16 pupils per class in standard 2 and 8 pupils per class in standards 3 and 4).

has pupils as young as 5 or 6 in the same class with children 12 years and older. In standard 4 where the median age was 12, about 1/4<sup>th</sup> of the pupils were 10 or younger while about 1/5<sup>th</sup> were 14 or older. This suggests that teachers face wide disparities in pupil development and interests further complicating their choice of instructional approach.

- **Range of skills in a class:** One might imagine that the large age range in a class reflects an effort by teachers to compose groups that were more homogeneous as to academic skills (either through repetition or class placement). As expected, mean performance increased with each standard. However, this does not mean that pupils in the upper standards were uniformly more skilled than pupils in lower standards. On the contrary, the range of skills within a class tended to be rather large. It was common for teachers of standard 4 to begin the year with about 20-30% of their pupils who were illiterate in Chichewa (unable to read 30% of the words from a passage in their reading text and unable to write more than 5 Chichewa words). In the same classes, between 65-70% demonstrated mastery in reading Chichewa from their texts but only 16% were able to write correctly more than 15 Chichewa words.
- **Teacher training:** Untrained and under-trained teachers were the mode. Roughly three-fourths of the teachers had completed only 2 years of secondary school education and two-thirds were not qualified as teachers (i.e., lacked the required teacher training). More than one-third had been

teaching for 3 years or less and almost three-fourths of the teachers had fewer than 6 years of teaching experience.

- **Teacher Absenteeism:** During the interviews, teachers reported that they rarely missed school but when they were absent, the main reasons they gave were illness (50.0 %), funeral activities (10.1 %) and training activities (9.6%). Although AIDS was not discussed formally as part of the interview, the search by researchers for absent and missing teachers provided an entrée. Often the explanations provided by colleagues and headteachers were vague or inconsistent.

Some teachers with symptoms of declining health continued to teach. In one rural school in the study, the replacement teacher only lasted one term before falling ill and dying. Estimates of HIV/AIDS teacher infection rates in Malawi range from 13-40%. Teachers in the study were fairly young with two-thirds of the teachers between the ages of 20-30 years, which according to a recent strategic planning report in Malawi includes the age group most likely to be infected already (Malawi National Response to HIV/AIDS for 2000-2004, 2000).

- **Teacher Mobility:** During 1999, IEQ/Malawi researchers visited 188 classrooms in 65 schools in the at the beginning of the school year to collect baseline data. When researchers returned to the schools near the end of the school year, 50% of the teachers were no longer teaching the classes they began with in February. After discovering the pervasiveness of the pattern, researchers returned to the schools to look for explanations. Many different reasons were identified to justify the teacher mobility. In some instances the teachers had remained in the same school but had been reassigned to a different class or to cover several classes. In other instances, the teachers had left the school. Some had left permanently (e.g., through posting away or death) while others were gone temporarily through illness, training, and so on. In most schools headteachers were frustrated. They lamented the loss of a teacher for any reason because replacements were in short supply. They struggled to cover classes by whatever means possible, often shuffling teachers between positions or shifting teachers to different classes if they returned from training or illness.

#### SCHOOL CLIMATE

These are some of the findings. They hint at a school environment in which children are surrounded by constant change and often distressing events. Even children from healthy, intact families are surrounded by other children who have lost a parent or whose parents are dying. Children and teachers are absent because of their own illness or to attend funerals and to care for others who are sick. Often teachers with declining health continue to teach. While this reduces teacher shortage temporarily, other teachers and children are exposed to the dying process. As a Zambian student whose professor had AIDS reported, “The course really suffered, and we couldn’t blame him. We knew what was happening. He had lost a lot of weight and used to get infections, and he wasn’t motivated and it wasn’t really his fault. So the course that he was teaching really suffered because we were left to our own resources. A lot of times he wouldn’t come for lectures. We would feel sorry for him...it was depressing for us as well.” (Bollag, 2001, p. A45). While we know that some children appear resilient, the current stress is unrelenting. Teacher mobility and shortages reduce opportunities for children to establish lasting relationships with teachers.

#### INSTRUCTIONAL PROCESS

With high teacher and pupil absenteeism, instructional time is disrupted. Textbooks and guides were designed for a full school year of full-class instruction. No provision is made for individual learning

or for adjusting lessons to learner needs. Yet, repetition isn't the answer. With repetition, the age range of pupils within a class increases. As the age range in a class increases, so too does the risk for girls (Caillods, 2000). Recent studies in Africa show that teenage girls are 5 to 6 times more likely to be infected by the HIV virus than boys their age (UNAIDS, 1999, p. 15).

#### TEACHER PREPARATION

Teachers are not prepared to cope. What is clear from the emerging data is that in the next decade, there will be more classes with sick teachers, with over-stretched teachers, with untrained teachers and without teachers. While there may be access to a school building, the resources that were used in the past to create a learning environment will be scarce.

#### LINKAGE BETWEEN HIV/AIDS AND LEARNING

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The purpose for seeking this information was to begin to identify and describe the possible linkages between the events in children's lives—at home and at school—and their influences on pupils' participation in learning. The interview questions were not direct probes about the influence of AIDS. Local researchers felt that direct questions were likely to be perceived as insensitive and culturally inappropriate. Instead we've focused on potential symptoms or indicators of the crisis and their relationship to various ingredients of schooling. We've begun to glean some understanding about the relationships between participation in learning and the growing health crises that destabilize the family and classroom—whether HIV/AIDS, malaria or other chronic illness. The findings presented in this paper help form an image of the impact of HIV/AIDS within the context of teaching and learning. But the image is blurry and we need to probe further to sharpen the focus. As we examine and discuss these findings further, consider the following:

- The meaning of quality education in the area where the research is being conducted is guided by local and/or national issues (findings are discussed by non-educators & researchers and their “voice” is validated) as compared with an international “template” of the meaning of quality;
- The challenges of unqualified teachers, overcrowded classrooms, limited access to resources etc is a “pre-existing” condition to the onset of HIV/AIDS and with or without the presence of HIV/AIDS, will have to be addressed – fixing AIDS will not fix the system;
- The access of children to primary education remains the same – BUT quality is subject to change, within the context of national priorities, educational reform efforts and learning outcomes;
- Does HIV/AIDS obstruct attention to existing educational problems?

These very preliminary explorations suggest some ideas for improving the children's learning opportunities in the midst of this growing crisis.

- Promote continuity of instructional and emotional support by linking younger children with same sex older children for tutoring, support, and protection if needed.

- Provide instructional materials to support out-of-school learning that could be used by children who have to miss school.
- Support greater flexibility for pupils whose school participation and learning is disrupted. Rather than relying on repetition, support individualized learning by creating sequenced learning materials that can be used individually or in groups.
- Assume that teachers will be expected to teach classes they have never taught before with virtually no notice or training support. Provide teacher instructional support materials that are totally inclusive of what is required to present and support the lesson. The goal would be to build the knowledge and capacity of untrained teachers and under-trained teachers as they teach.
- Succession planning—assume that teachers and other educators will miss time from teaching due to illness and other causes. Anticipate and plan for these absences by setting up partnerships between teachers or generating contingency plans that take advantage of other resources in the school or community classroom

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## Epilogue

By Jane Schubert and IEQ/Malawi Team

*Quality is dynamic – a work in progress characterized by dialogue among policymakers and practitioners. IEQ offers a framework to stimulate dialogue and take action, as guided by classroom-anchored research. (Schubert 1993)*

June 2003 marked the conclusion of a four-year activity in Malawi, framed by a scope of work, plan of implementation and a litany of deliverable products and papers, all embedded within a formal contract supported by the United States Agency for International Development/Malawi. We are all very grateful to USAID for the opportunity to engage in such a fruitful, challenging and professionally rewarding activity. June 2003 also marked the beginning of new opportunities to use the knowledge gained working with local educators to learn more about ways to improve teaching and learning in Malawi schools and to apply the technical skills that were strengthened during the conduct of this research. The continued application of knowledge and skills in ways defined by the user to address a specific context is the highest form of sustainability. Sustainability is not measured by perpetuating a specific project, but in the ongoing application of project methodologies and experiences within new environments. Such outreach reflects a dynamic and organic process designed to improve the quality of education.

In Malawi, the findings from the IEQ/Malawi partnership between the Malawi Institute of Education and Save the Children reveal opportunities for accelerating the path to quality at several levels. Examples include:

**... for curriculum** Knowing about individual achievement of pupils in literacy and numeracy throughout four years of the primary cycle reveals what pupils can know and do over time – whether they can read passages at their standard or above/below; what numeric functions they can perform at what standard.

**... for teacher professional development** The data contain information about individual teacher education, proficiency in subject content; length of time in the system, and skills in teaching English, Chichewa and Maths. Linkages are also made between teacher characteristics and pupil outcomes.

**... for policy consideration** The data track pupil retention over time and reveal that the brightest males are dropping out of school; reveal that the link between higher teacher education and pupil achievement is not present; show that teacher attrition is higher than realized; and uncover that teachers are often unable to instruct in the mother tongue of the pupils because they can't speak it and materials may not be available in the mother tongue of either the pupils or the teacher.

In addition, opportunities to examine broader social implications emerge from the data from this longitudinal study. For example:

- what are the implications of not having one's own language used (validated) in the school? Does this have an impact on civic participation, employment opportunity, feeling of worth? Our study does not provide answers to such questions – this goes beyond our mandate -- but the data do illuminate some potentially provocative issues that may some may wish to explore;
- if the rate of single parent or orphaned children continues to rise, as revealed in our study, then how does the school and the community respond and where is the support for such a condition?
- there is a gender gap in preliteracy skills and literacy and they influence learning in other areas – how can this gap be reduced and how can opportunities outside the school be mobilized to close this gap?

During one of the last formal meetings of the IEQ/Malawi team, the members reflected on what they believed to be the five key accomplishments of their work together:

1. The creation of a database about skills, performance and environment that influence teaching and learning. This database of interviews, achievement measures, classroom observations is now available to a broader community and represents a unique contribution to knowledge about four years of a primary school cycle.
2. The production of a continuous assessment manual that is embedded in teacher development and not examinations is also one of the first of its type. The ideas and procedures in this manual reflect the collaborative effort of the IEQ team and teachers in the Ntcheu district of Malawi. This manual is also being considered by the Primary Curriculum & Assessment Reform committee for integration into the new primary school curriculum.
3. The exposure of the MIE's TALULAR (teaching and learning using locally developed resource) to hundreds of donors and other program developers in development education. The team produced the resource guide of activities developed and copyrighted by the MIE.
4. The new and enhanced skills in research and development among the team members and others in their respective institutions.
5. The integration of sharing findings from the research on an ongoing basis with both teachers and policymakers – particularly the teachers, who identify ways to use findings in their classrooms and to share with their colleagues.

Our work together has enriched us and forged new relationships and new ways to think about improving the learning opportunities and experiences for the children of Malawi. For this, we are truly grateful.

## Appendix 1: Example Research/Assessment Instrument Questions<sup>8</sup>

Task	Levels	What is Measures	Sample Questions	Scoring	Sample Findings Using the Instruments
<b>PRE-READING</b>					
Concepts about Print (adapted from Clay, 1979 <sup>9</sup> )	Same form all levels 2-5	Hands on exposure to print.	Questions asked in vernacular, e.g., "Turn to page 5."	# Correct	By the end of standard 3, 2/3 of the pupils demonstrated mastery of basic skills associated with using printed materials such as finding a page or turning to a specific unit.
Letter/Sound Recognition	Same task all levels 2-5	Alphabet recognition/discrimination	Upper and Lower case letters-Can be pronounced in Chichewa OR English	# Correct	At the beginning of standard 2 most pupils recognized very few letters. By the end of standard 3, most pupils recognized a majority of the letters.
<b>READING--CHICHEWA</b>					
Aided Reading	2-5	Pointing to words that are read.	same as below	% Correct	At the beginning of the school year, 60% of standard 2 pupils were unable to recognize any of the most commonly used words in their Chichewa textbook.
Reading Most Used Words	2-5	Reading of most commonly used words in the P2-P5 textbooks	Word lists with words such as and, the, for, one, they, etc.	% Correct	About 70% of the standard 4 pupils demonstrated that they were able to read all of the most commonly used words in their Chichewa textbook.

<sup>8</sup> For more information refer back to Chapter 1. This table was originally prepared by Abigail Harris for inclusion in the IEQ Research Tools website.

<sup>9</sup> Clay, M. M. (1979). Reading: The patterning of complex behavior. Exeter: NH: Heinemann Educational Books.

Task	Levels	What is Measures	Sample Questions	Scoring	Sample Findings Using the Instruments
Reading Passages from Textbook	2-5	Decoding accuracy	Passages selected from P2-P5 textbooks; pupils only read passages from their current standard and below.	Words % Correct	For 25% of the standard 4 pupils, the Chichewa textbook passages are too difficult and consequently pupils will likely become frustrated and the learning will be inefficient.
	2-5	Decoding speed	Speed in first minute of reading the above passages	Words/ Minute	Pupils in standard 3 average about 15 words per minute whereas standard 4 pupils are able to average about 32 words per minute.
Passage Comprehension	2-5	Reading Comprehension	Questions based on the above passages	% Correct	Reading quickly and accurately was associated with reading comprehension. Pupils who read slowly also had more difficulty with the comprehension questions.
<b>READING--ENGLISH</b>					
Aided Reading	2-5	Pointing to words that are read.	same as below	% Correct	Pupils in standard 4 were able to recognize about 18% more words when the words were read aloud than they could read aloud without assistance.
Reading Most Used Words	2-5	Reading of most commonly used words in the P2-P5 textbooks	Word lists with words such as and, the, for, one, they, etc.	% Correct	Only 25% of the standard 4 pupils demonstrated that they were able to read all of the most commonly used words in their English textbook.
Reading Passages from Textbook	2-5	Decoding accuracy	Passages selected from P2-P5 textbooks; pupils only read passages from their current standard and below.	Words % Correct	The English textbooks are too difficult for 95% of the Standard 2 pupils, 85% of the Standard 3 pupils, and 50% of the Standard 4 pupils.

Task	Levels	What is Measures	Sample Questions	Scoring	Sample Findings Using the Instruments
	2-5	Decoding speed	Speed in first minute of reading the above passages	Words/Minute	Pupils in standard 3 average 9 words per min.; standard 4 pupils average 26 words per min. The correlation between reading rate in Chichewa and English is .82.
Passage Comprehension	2-5	Reading Comprehension	Questions based on the above passages	% Correct	Reading quickly and accurately was associated with reading comprehension. Pupils who read slowly also had more difficulty with the comprehension questions.
<b>WRITING</b>					
Copying Letters	Same task all levels 2-5	Copying letters using a pencil and paper	Pupil is asked in vernacular to copy his/her name.	Pass/Fail	About 93% of all standard 2 pupils could copy letters by the end of the year.
Writing Name	Same task all levels 2-5	Writing name correctly without help	Pupil is asked in vernacular to write his/her name.	Pass/Fail	At the beginning of the school year, 47% of the standard 2 pupils could write their names.
<b>WRITING-CHICHEWA</b>					
Writing Words-Chichewa	Same task all levels 2-5	Writing vocabulary--Chichewa	Pupils are asked to write as many Chichewa words as they can within 10 minutes.	# of correctly spelled words	Most pupils in standard 2 and 3 experienced difficulty writing more than a few words whereas by standard 4 most pupils wrote more than 10 words.
Writing Composition-Chichewa (only administered to pupils who write 10+ words)		Fluency in written expression	Pupils are given a topic from Chichewa syllabus and asked to write a letter or story.	Words produced -# (spelling not considered)	When asked to write a letter to a friend, Lawrence wrote 54 Chichewa words in 5 minutes.
		Words spelled correctly in written expression	Exa: Children in Malawi know folk stories. Write a folk story or some other kind of story.	Words spelled correctly (#)	Of the 54 words that Lawrence wrote, 49 (91%) were spelled correctly.

Task	Levels	What is Measures	Sample Questions	Scoring	Sample Findings Using the Instruments
<b>WRITING-ENGLISH</b>					
Writing Words-English	Same task all levels 2-5	Writing vocabulary--English	Pupils are asked to write as many English words as they can within 10 minutes.	# of correctly spelled words	Most pupils in standard 2 and 3 were unable to write any English words whereas by standard 4, 48% of pupils could write between 1-5 words and 39% could write more than 5 words.
Writing Composition-English (only administered to pupils who write 10+ words)		Fluency in written expression	Pupils are given a topic from English syllabus and asked to write a letter or story.	Words produced -# (spelling not considered)	When asked to write a letter to a friend, Rosemary wrote 19 English words in 5 minutes.
		Words spelled correctly in written expression	Exa: A friend has moved away from your community. Write a letter to the friend. Tell the friend about your family or school.	Words spelled correctly (#)	Of the 19 words that Rosemary wrote, 10 (53%) were spelled correctly.
<b>MATHEMATICS</b>					
Counting	2-5	Beginning concepts of how many using objects and pictures	How many bottle caps are here? (asked in Chichewa)	# correct	57% of the standard 2 pupils responded correctly to all 12 of the counting and basic math questions.
Recognizing/writing numbers	2-5	Recognition and familiarity with numerical symbols.	Can you show me an eight?	# correct	At the end of the year, 39% of standard 3 pupils and 72% of standard 4 pupils can correctly read the number: 2,379
Coin recognition	2-5	as above with \$	Which is more? three 10 tambala coins or one 50 tambala coin? (with coins)	# correct	Using coins, 85% of standard 2 pupils can correctly identify, "Which is more?"
Sequencing/Ordering	2-5	Beginning concepts of number order	Can you count from 7 to 14?	# correct	At the beginning of standard 2, 84% of the pupils can count in sequence from single to double digits.

Task	Levels	What is Measures	Sample Questions	Scoring	Sample Findings Using the Instruments
<b>COMPUTATION (USING +, -, X, =)</b>					
Addition/ Subtraction	2-5	Mastery of addition and subtraction facts and algorithms without (standard 2) & with (standard 3+) regrouping	$2 + 6$ ; $12 + 29$	# correct	At the end of the school year, approximately half of standard 3 pupils demonstrate mastery of subtraction (with and without regrouping).
Multiplication/ Division	2-5	Mastery of multiplication and division facts and algorithms without (standard 2) & with (standard 3+) regrouping	Tell me what is three times four.	# correct	The majority of standard 4 pupils demonstrate only partial mastery of simple multiplication.
<b>PROBLEM SOLVING/REAL WORLD MATH</b>					
Oral word problems (using props)	2-5	Mastery of simple computation as used in daily situations	You have 6 fish to share with two friends. You each get the same number. How many does each get?	# correct	About 72% of standard 2 pupils can perform simple multiplication using bottle caps but only 35% can do the same problems using only numbers
Money	2-5	Mastery of computation in the marketplace.	You want to buy a mango for 12t and have a 20t coin. How much change do you get?	# correct	Over half of the standard 4 pupils can perform simple multiplication in problems involving money.
Measurement	2-5	Concepts of size	Which of these sticks is longer?	# correct	Almost all pupils (96%) in standards 2-4 can identify which object is longer.
<b>PUPIL INTERVIEW</b>					
		Socio-economic status	What type of roof and floor does your house have?		77% of the pupils interviewed reported that they lived in houses with a thatch roof.
		Home educational environment	Did you see your mother (father, sister, brother) reading last week?	categorical	Girls in school were significantly more likely than boys in school to report seeing their mothers reading.

Task	Levels	What is Measures	Sample Questions	Scoring	Sample Findings Using the Instruments
		Home language	What language do you speak at home?	categorical	42% of the pupils in participating schools speak the national language (Chichewa) at home whereas 56% of the pupils speak ChiYao at home
		Health	Height and weight (measured)		
<b>TEACHER INTERVIEW</b>					
	2-5	Teacher background	What languages do you speak and how well?	list, fluency self-rating	35% of the teachers report speaking "very good" or "excellent" English
	2-5	Education and training	What is your highest academic qualification?	categorical	70% of Mangochi teachers have only a JCE.
	2-5	Classroom environment	How many boys/girls are in your class today?	total by sex	While the average reported class size was over 80 pupils, teachers reported that average daily attendance was about 60 pupils.
	2-5	Pedagogical support	In the past three years, how many inservice trainings have you attended?	#, total hours	At the end of the year, 64% of the teachers reported attending SAVE in-service training sessions.
	2-5	Relationship with community	Have you ever involved community members in teaching?	yes/no and frequency	84% percent of participating teachers have worked with community members to improve the school; the majority of them do so more than once per term.

Task	Levels	What is Measures	Sample Questions	Scoring	Sample Findings Using the Instruments
<b>TEACHER SURVEY</b>					
	2-5	Teaching Efficacy (adapted from Gibson & Dembo, 1984 <sup>10</sup> )	When I really try, I can get through to most difficult students.	disagree/ agree (1-4)	30% of the teachers disagree that they would be able to accurately assess whether an assignment was at the correct level of difficulty for a student.
<b>TEACHER OBSERVATION</b>					
	2-5	Lesson Plan & Preparation	Content suitable for age group	0=not done to 4=outstanding	At years end, 40% percent of participating teachers have outstanding fit of content to age group in their lesson plans. (at baseline the figure was 25%)
	2-5	Lesson Delivery	Uses varied approaches to deliver subject matter	0=not done to 4=outstanding	During math, 1/3 of Yao pupils were in classrooms where the teacher did not use mother tongue to help the pupil grasp a point
<b>TEACHING AND LEARNING AIDS SURVEY</b>					
	2-5	Use of teacher made or locally available learning materials	Listing of aids seen in classroom, typology and use	total, % used	Early in the year, about 1/2 of the teachers used teaching and learning aids in their teaching whereas at years end, 3/4 were observed using aids.
<b>TEACHER SUBJECT KNOWLEDGE</b>					
Mathematics	2-5	Standard 8 mathematics skills	Express 5/8 as a decimal fraction.	# correct	MSCE qualified teachers performed significantly better in tests of Mathematics and English than JCE qualified teachers.

<sup>10</sup> Gibson, S., & Dembo, M. (1984). Teacher efficacy: A construct validation. *Journal of Educational Psychology*, 76, 569-582.

Task	Levels	What is Measured	Sample Questions	Scoring	Sample Findings Using the Instruments
English	2-4	Standard 8 English skills	The headmaster praised Mary ____ her hard work.	# correct	English knowledge was correlated significantly with observer ratings during English lessons of "Displays competence in subject matter."
<b>TEXTBOOK SURVEY</b>					
	2-5	Number and condition of available textbooks		count	In 20% of the classrooms, the ratio of Chichewa books to pupils in class was 1 book to 2 or more pupils.
<b>PUPIL TRACKING</b>					
	2-5	Enrollment, drop out, repetition	List of pupils checked over two years	total by sex	22% of girls who started standard 2 in Feb. 1999 were not available in Oct. 99. It was reported by teachers that 11% had dropped out.
<b>HEADTEACHER INTERVIEW</b>					
	School	School facilities, resources	Does the school have PTA?	yes/no	Initially, only 1/3 of the headteachers reported attending PTA meetings.
	School	Pedagogical support	In the past month, how many lessons have you observed?	total #	78% of headteachers reported observing teacher lessons in the past month.
	School	Community Relations	How many projects did you implement together with the community last year?	total #	43% of headteachers reported that the community was involved in maintaining the school buildings during this school year.
<b>TEACHER LISTING</b>					
	School	Qualifications, languages of school teaching force	Highest academic qualification		A large percentage of teachers changed classes within the school during the school year.

Task	Levels	What is Measures	Sample Questions	Scoring	Sample Findings Using the Instruments
<b>SCHOOL OBSERVATION</b>					
	School	Facilities, conditions	Do you see classes meeting outside due to lack of classroom space?	yes/no and number	60% of the schools have one or more classes meeting outdoors due to lack of space.
<b>COMMUNITY INTERVIEW</b>					
	School	Activities undertaken	Do you monitor pupil attendance?	# of activities	Half of the communities reported that they monitor pupil drop out but only 40% report following up with families of pupils who drop out.
	School	Opinion of School-community relations	Community members visit school, discuss issues with teachers openly and freely	agree/disagree	58% of Mangochi community groups agree that their members visits schools and speak openly with teachers.

## Appendix 2: Language Research Reference Guide<sup>11</sup>

Reference(s)	Country	Design	Results/Findings	Implications
Akinnaso (1993) Bamgbose (1991)	Nigeria (6 Year Primary Project; also known as Ife Project) 1970-1978	<ul style="list-style-type: none"> <li>• Pilot Exp (late exit) gr 1-6 LoI<sup>12</sup> Yoruba (n=62)</li> <li>• Pilot control (transitional bilingual) gr 1-3 LoI Yoruba; 4-6 LoI English (n=27)</li> <li>• Expansion Exp (late exit) (n=144)</li> <li>• Expansion Control (transitional bilingual but with revised curriculum) (n=94)</li> <li>• Traditional control (transitional bilingual) (n=112)</li> </ul>	"All the groups were systematically evaluated from 1976 to 1978. The results showed very clearly the superiority of the original experimental group in all areas- English, Yoruba, science, social and cultural studies, and mathematics-closely followed by the new experimental group. In all cases the traditional control group was the worst." (Bamgbose, 1991, p 86)	"The lesson to be learnt from the Six Year Primary Project is that where a dominant, mother tongue education involving the use of an indigenous language as a medium of instruction for the entire primary education can be achieved without sacrificing proficiency in a LWS, in this case English, which is taught as a subject throughout primary education. In order to achieve this result, attitudes toward both languages have to be positive." (Bamgbose, 1991, p. 86)
Bamgbose (1991)	Nigeria (Rivers Readers'Project) 1970-	<ol style="list-style-type: none"> <li>1. Introduce initial literacy in 20 local languages</li> <li>2. Replace practice of using Igbo (i.e., mother tongue directly to English without Igbo as lingua franca)</li> </ol>	No objective evaluation;  Problems with teacher training and materials distribution.	Materials in mother tongue can be made efficiently if using uniform formats and illustrations;  Community interest useful to success.

<sup>11</sup> For more information refer back to Chapter 3. This table was originally prepared by Abigail Harris as a background resource for research and policy planning discussions in Malawi.

<sup>12</sup> Key: LoI= Language or medium of Instruction; L1=First language; L2=Second language; L3=Third language

Reference(s)	Country	Design	Results/Findings	Implications
Eamgbose (1991, 2000)	Cameroon PROPELCA 1981-	Compared traditional approach (English in the West and French in the East) with transitional bilingual-mother tongue for initial literacy (70% medium of instruction in grade 1 to 30% by grade 3 to 5% by grade 5)	Initially implemented in 4 languages. Has moved from initial stage to "a generalization phase where over 12 languages are currently being used in education as the primary and in some cases secondary) school level. (2000, pp. 51-52)	Difficult to get documentation.
Modiano (1968) Reported in Engle (1975); Akinnao	Mexico Chiapas Indian	Compared initial literacy instruction in mother tongue (taught reading in preparatory grade using global method with oral Spanish drills then taught reading in Spanish in 2nd gr using phonics method vs Spanish for initial literacy and instruction (called "direct teaching" but Spanish was not learned to fluency before reading instruction; no systematic oral instruction in Spanish	Initial mother tongue literacy associated with better interaction with print and better reading results in Spanish than those who went directly to Spanish  Having an Indian teacher vs non-Indian was particularly important for girls participation and reading	
Okombo & Rubgumya (1996)	Mali	N (total) = 1601 from 26 schools	46.1% of experimental cohort made it to 6th grade without repeating vs only 7.5% of the French comparison	Methodological weaknesses
Okombo, Rubagumya, & Haloui (1996) Chap. 2	Mali 1985-	6 yr longitudinal study comparing 115 students with mother tongue instruction as the lang of instruction to 340 students in French-based schools		
ADEA (1999) (Biennale synthesis)	Mali Convergent pedagogy 1987-	To reduce repetition: traditional replaced by active pedagogy-more child centered and uses mother tongue instruction for grades 1-3; French is introduced in 2nd grade; becomes language of instruction in 4th grade	As of 1999, 39,000 pupils in these classes (4%)  Two evaluations have been conducted; don't allow strict comparisons but suggest positive impact on comprehension, oral and written expression, French and mathematics	
ADEA (1999) (Biennale synthesis)	Niger 1972-	Introduced experimental program using national languages and active pedagogy. Remained experimental until 1998 when it was extended. National languages used as language of instruction and French taught as subject until gr 4 when French becomes language of instruction	Four evaluations have demonstrated the effectiveness of the approach: Rates of success on French part of primary school leaving exams are 3X higher for exp. schools; repetition and drop out rates much lower; class sizes much smaller in exp.; comparing the 18 exp schools -impact greatest at gr 3	

Reference(s)	Country	Design	Results/Findings	Implications
Okombo, Rubagumya, & Haloui (1996) Chap. 2	South Africa Threshold project 1990-	Language of instruction shifted from mother tongue to English at 3rd grade;	Pupils could not explain in English what they already knew in 1 <sup>st</sup> lang; could not transfer into 1 <sup>st</sup> lang. what they learned in Eng;	Interpreted to mean that learners must reach CALP (threshold) before shift to 2 <sup>nd</sup> lang for language of instruction
Cleghorn, etal. (1989) (IDRC synopsis)	Kenya	Carried out in 3 schools, 2 yrs; assess the impact of language policy-English, Swahili, & science Sch 1-English/urban Sch 2 peri urban/Eng & Kiswahili; Sch 3 rural local vernacular was 3rd initial lang of instruction;	Sch 1 > sch 2 or 3 in science, English and Swahili; Sch 3 > sch 2 in all except Swahili	
Ramirez (1994) Collier (1992)	US	Observation of over 100 lessons English immersion with bilingual teachers trained in ESL Early Exit bilingual-home language <40 minutes per day and offered no more than 2-3 years Late exit bilingual LoI in home language 40-50% of day until student reached 4th gr.	The greater the amt of L1 instructional support, combined with L2 support, the higher the academic ach in L2 and in other subject areas, particularly after 3+ years	Important to note that teachers in all three groups were proficient in both languages
Wagner, Spratt, & Ezzaki (1989)	Morocco Berber (L1) Arabic (L2) French (L3) Vs Arabic (L1) French (L2)	Monolingual Berber children with direct approach - L2 Arabic medium of instruction and initial literacy Compared to Arabic L1 peers Then-second literacy in French for both groups	L2 for both medium and initial literacy not disadvantage by gr 5; For both groups, second literacy was substantially dependent on 1st literacy acquisition	Important because of focus on transfer from literacy in L2 to L3

Reference(s)	Country	Design	Results/Findings	Implications
Engle (1975)	Philippines Iloilo I 1948-	Exp: Gr 1-2 LoI and initial literacy in L1, Gr 3-6 LoI=L2; Teachers trained in teaching in vernacular (Early exit)  Control: English only Gr 1-6 (Immersion/Direct Approach)	Began with 758 Exp and 1,164 Controls;  By grade 6 232 Exp and 301 Controls but only 82 were matched;  Gr 6: Exp > controls in social studies and slightly in Math and Reading; Controls slightly > in language.	Methodological concerns but Engle concludes: "it does indicate clearly that experimental children were not hampered in achievement if they began reading in their own language in content areas. If, that is, they were able to stay in school for 6 years." (p. 8)
Engle (1975)	Philippines Rizal Study	Manipulated when English became LoI (either 1st, 3rd or 5th grade) and when literacy in English begins (1st or 2nd gr); all teacher training focused on teaching in English (not vernacular)	Findings:  Beginning English reading in 1st or 2nd gr made no difference;  Those who had vernacular the longest > on math tests (in Eng)  Those who had English LoI the longest > English language test	Neither study (Iloilo I or Rizal) indicates whether introducing reading in L1 has positive transfer effects; also, neither study indicates conclusively when and how the L2 should become the LoI
Chilora & Harris (2001)	Malawi IEQ	Investigated pupils in grades 2-4 whose home language is Yao;  naturalistic rather than experimental study	Pupils whose teachers home language is ChiYao performed better in English (gr 2-4) than pupils with non-ChiYao home language teachers.  Pupils whose teachers used ChiYao to support instruction performed better in English reading and comprehension (gr 4 only) and in math (grade 2 only)  Pupils whose teachers used Yao during Chichewa instruction performed less well than pupils whose teachers did not use ChiYao during Chichewa instruction	Chichewa findings may be confounded by teachers perceptions that ChiYao was or wasn't needed. (i.e., Teachers may use ChiYao more often with pupils who are weaker in Chichewa and likely to perform less well in Chichewa)

## Appendix 3: Analytical Tables<sup>11</sup>

**Table 4.1: Years of Schooling Completed, Sample Teachers, 1999 & 2002**

	Feb 99			Oct 02			Difference in Means
	Mean	SD	N	Mean	SD	N	
Average Years of Teacher Education	12.1	1.4	185	11.3	4.7	44	-0.8

Source: IEQ/Malawi Longitudinal Study, Teacher Survey

**Table 4.2: Academic Qualifications, Sample Teachers, 1999 & 2002**

	Feb 99		Oct 02		Difference in Percents
	Percent	N	Percent	N	
JCE	74.1	137	34.2	13	-39.8
MSCE	25.9	48	65.8	25	39.8
Total	100.0	185	100.0	38	

Source: IEQ/Malawi Longitudinal Study, Teacher Survey

**Table 4.3: Professional Qualifications, Sample Teachers, 1999 & 2002**

	Feb 99		Oct 02		Difference in Percents
	Percent	N	Percent	N	
Temporary Teacher	60.5	112	43.2	16	-17.3
T4	0.5	1	16.2	6	15.7
T3	18.9	35	16.2	6	-2.7
T2	20.0	37	24.3	9	4.3
Total	100	185	100	37	

Source: IEQ/Malawi Longitudinal Study, Teacher Survey

<sup>11</sup> For more information refer back to Chapter 4.

**Table 4.4: Professional Training, Sample Teachers, 1999 & 2002**

	Feb 99 Percent	N	Oct 02 Percent	N	Difference in Percents
MIITEP	66.5	123	38.5	15	-28.0
MASTEP	2.2	4			
1 Yr TTC	13.5	25	12.8	5	-0.7
2 Yrs TTC	16.2	30	15.4	6	-0.8
3 Yrs TTC	1.6	3			-1.6
Other			33.3	13	33.3
Total	100	185	100	39	

Source: IEQ/Malawi Longitudinal Study, Teacher Survey

Table 4.5a: Observed Classroom Practices, 1999 &amp; 2002

Activity Group	Observed Activity	Feb-99			Oct-99			99 Diff	Feb-02			Oct-02			02 Diff.
		Score	SD	N	Score	SD	N		Score	Score	SD	N	Score	SD	
Suitability, relevance, liveliness of introduction	Lively, including activities for learners	2.6	0.8	175	2.9	0.7	173	0.4	2.8	0.6	24	2.6	0.3	27	-0.1
	Relevant to new subject matter	2.6	0.8	176	3.0	0.8	174	0.4	2.7	0.8	24	2.6	0.7	27	-0.1
	Short enough (5 - 7 minutes)	2.5	0.8	175	3.0	0.7	174	0.5	2.7	0.9	24	2.2	0.6	27	-0.5
Ability to cope with individual differences	Handles responses of different pupils	2.6	0.8	174	3.0	0.7	173	0.4	2.9	0.6	24	2.3	1.2	27	-0.5
	Gives individual help during lessons	2.6	0.7	175	2.9	0.8	172	0.3	2.9	1.1	24	2.3	1.4	27	-0.6
	Utilizes pupils incorrectly/partially correct responses to improve learning	2.3	0.8	174	2.5	1.0	175	0.1	3.0	0.8	22	2.4	1.1	27	-0.5
	Uses situations/pupils experiences to motivate them to learn	2.1	0.9	174	1.9	1.2	174	-0.1	2.3	0.9	23	1.6	1.0	26	-0.7
Degree of pupils' participation	Individuals participate throughout the lesson	2.6	0.7	176	2.8	0.9	172	0.2	3.1	0.7	24	2.8	0.6	27	-0.3
	Pupils initiate interactions with the teacher	1.5	1.2	175	0.8	1.1	172	-0.8	0.8	1.2	24	0.5	0.8	27	-0.3
	Teacher promotes learning with minimal use of drilling and choral response	2.4	0.8	175	2.3	1.1	171	-0.1	2.8	1.0	24	1.7	1.4	27	-1.0
	Pupils given a variety of exercises to practice skills	2.6	0.7	173	2.7	0.8	168	0.1	2.8	0.6	23	2.6	0.7	25	-0.2
Appropriate use of language	Language at the level of pupils, ie simple and easily understood	3.1	0.6	176	3.4	0.5	175	0.3	3.4	0.4	24	3.1	0.6	27	-0.3

Activity Group	Observed Activity	Feb-99			Oct-99			99 Diff	Feb-02			Oct-02			02 Diff.
		Score	SD	N	Score	SD	N		Score	SD	N	Score	SD	N	
	Follows the language policy for instruction	2.9	0.7	176	3.5	0.5	174	0.5	3.6	0.5	24	3.2	0.8	27	-0.4
	Uses mother tongue to help the learner grasp a point being taught	2.1	1.1	174	1.5	1.3	174	-0.5	1.7	1.6	23	1.8	1.4	27	0.2
Effectiveness of questioning technique	Use of question - pause – name (look for all three)	2.7	0.8	175	3.1	1.0	173	0.4	3.0	0.9	24	2.6	0.8	27	-0.3
	Phrases questions clearly	2.8	0.6	175	3.0	0.8	172	0.3	3.2	0.6	23	2.8	0.6	27	-0.3
	Uses varied questions	2.5	0.7	175	2.7	0.8	167	0.2	2.9	0.6	24	2.5	0.5	26	-0.4
	Distribution of questions – random order	2.7	0.7	174	3.1	0.7	171	0.3	3.1	0.8	22	2.8	0.9	27	-0.3
	Adequacy of number of questions asked in the lesson	2.5	0.7	174	2.8	0.8	172	0.3	2.9	0.7	23	2.7	0.6	27	-0.3
Effectiveness of methods used	Uses pair work	0.6	0.8	174	0.4	0.7	173	-0.2	0.2	0.6	23	0.5	0.6	27	0.3
	Uses group work	0.8	1.0	175	1.0	1.1	175	0.2	1.0	1.3	23	0.7	0.9	27	-0.3
	Uses role play	0.3	0.5	173	0.2	0.6	174	-0.1	0.1	0.4	23	0.1	0.2	27	-0.1
	Uses song	0.6	0.8	172	0.3	0.7	173	-0.3	0.1	0.3	23	0.0	0.1	27	0.0
	Uses demonstration	2.1	1.1	176	2.2	1.4	174	0.1	2.7	1.1	23	2.0	1.4	27	-0.7
	Uses varied approaches to deliver the subject matter	2.0	0.8	175	2.3	1.0	171	0.3	2.1	0.8	23	1.7	1.0	27	-0.4
	Integrates other curriculum subjects into the lesson	1.3	1.0	173	1.4	1.2	172	0.1	0.9	1.1	22	0.3	0.9	27	-0.6
Use of textbooks	Relevant to the subject matter being delivered	2.4	1.0	176	2.7	1.2	175	0.4	2.8	1.1	24	3.2	0.8	27	0.5

Activity Group	Observed Activity	Feb-99			Oct-99			99 Diff	Feb-02			Oct-02			02 Diff.
		Score	SD	N	Score	SD	N		Score	Score	SD	N	Score	SD	
	Used at the right stage and time in the lesson	2.2	1.0	176	2.6	1.2	175	0.3	2.8	1.1	23	2.9	0.7	27	0.1
	Help the learners to grasp the point being taught	2.0	0.9	176	2.5	1.2	173	0.4	2.7	1.0	24	2.8	0.7	27	0.1
Use of locally available teaching and learning materials	Relevant to the subject matter being delivered	1.2	1.0	176	1.5	1.3	175	0.4	0.3	0.6	24	1.2	1.2	27	0.9
	Used at the right stage and time in the lesson	1.1	1.0	176	1.5	1.3	175	0.4	0.7	1.2	24	1.2	1.2	27	0.5
	Suitable for age group of learners	1.1	1.0	176	1.5	1.3	175	0.4	0.7	1.2	23	1.2	1.2	27	0.5
	Help the learners to grasp the point being taught	1.2	1.0	176	1.5	1.3	174	0.3	0.8	1.2	24	1.2	1.2	27	0.4
Logical development of the lesson	Presents the subject matter logically	2.6	0.7	175	3.1	0.8	174	0.5	2.9	0.8	24	2.4	1.1	27	-0.5
	Activity delivery responsive to the abilities of the learners	2.6	0.7	175	3.0	0.7	174	0.4	3.1	0.5	23	2.5	0.8	27	-0.6
	Specific objectives being achieved in a logical sequence	2.6	0.8	174	2.8	1.0	174	0.3	2.7	1.1	24	2.3	1.0	27	-0.4
Knowledge of subject matter	Displays competence in subject matter that is being taught	3.0	0.6	175	3.3	0.6	173	0.3	3.1	0.7	24	3.1	0.5	27	0.0
	Simplifies the content to the level of the learners	2.8	0.7	175	3.1	0.7	174	0.3	3.2	0.6	24	2.7	0.6	26	-0.4
Class control and organization for pupils activities	Uses seating plan-children sitting orderly in rows	2.7	1.0	175	3.5	0.7	173	0.8	3.1	1.1	23	3.0	1.2	27	-0.1
	Names pupils	2.3	1.0	174	3.1	1.0	173	0.8	2.7	1.0	24	2.8	1.1	27	0.1
	Girls and boys mixed in the classroom, interacting freely	1.8	1.2	176	2.6	1.4	175	0.8	2.2	1.4	24	2.8	0.9	27	0.6

Activity Group	Observed Activity	Feb-99			Oct-99			99 Diff	Feb-02			Oct-02			02 Diff.
		Score	SD	N	Score	SD	N		Score	SD	N	Score	SD	N	
	Uses monitors/rosters to involve pupils in classroom responsibilities	0.9	0.9	175	1.1	1.4	174	0.3	0.6	1.0	24	0.4	0.6	26	-0.2
	Uses proper system for pupils to do activities orderly and quickly	2.1	0.8	175	2.6	0.9	174	0.5	2.3	1.0	24	2.1	1.1	27	-0.2
	Uses proper system of marking pupils work and helping the weak ones	2.0	0.9	169	2.1	1.1	161	0.1	2.5	0.9	17	1.9	1.0	27	-0.6
	Corrects bad behaviors displayed by pupils and reinforces good ones	2.4	0.9	174	2.7	1.0	175	0.3	2.6	1.1	23	2.0	1.3	27	-0.6
	Pupils raise their hands when they want to answer questions	2.8	0.9	176	3.4	0.7	175	0.7	3.1	0.5	23	3.1	0.8	26	0.0
	Classroom displays – at appropriate height, clean, adequate, attractive	0.8	1.0	176	1.1	1.4	175	0.3	0.8	1.2	24	0.3	0.7	27	-0.5
Teacher - pupil relations	Mutual respect between teacher and pupils	2.7	0.7	176	3.3	0.6	175	0.6	3.2	0.7	24	3.1	0.9	27	-0.1
	Mutual respect between pupils	2.6	0.8	174	3.1	0.8	175	0.4	3.3	0.4	24	2.8	1.0	27	-0.5
	Pupils free to talk to each other	2.3	1.1	175	2.4	1.4	174	0.2	2.3	1.1	24	1.8	1.2	27	-0.5
	Pupils ask questions to the teacher	1.2	1.0	174	0.3	0.8	175	-0.9	0.5	0.7	24	0.2	0.5	27	-0.3

Activity Group	Observed Activity	Feb-99			Oct-99			99 Diff	Feb-02			Oct-02			02 Diff.
		Score	SD	N	Score	SD	N		Score	Score	SD	N	Score	SD	
	Teacher praises and corrects behavior in a friendly manner	2.4	0.8	173	3.0	0.9	172	0.6	3.0	0.6	24	2.3	1.2	27	-0.6
Effective use of time	Being conscious of time allocated to each learning activity	2.6	0.7	175	2.7	0.9	175	0.1	2.1	1.0	24	2.7	0.7	27	0.6
	Learners are given more time to do activities than listening to the teacher	2.6	0.6	175	2.8	0.7	174	0.1	3.0	0.5	24	2.8	0.7	27	-0.2
Appropriateness of closure	Summarizes main points of the lesson	2.4	0.9	174	2.5	1.2	168	0.1	2.6	1.2	20	1.8	1.2	27	-0.8
	Uses questions to enhance understanding of main points of lesson	2.5	0.8	173	2.4	1.1	166	-0.1	2.7	1.2	20	2.1	1.2	27	-0.6
Presentability and appropriateness of dress	Neat in dress and appearance	3.3	0.7	176	3.6	0.6	175	0.2	3.0	0.8	23	3.2	0.6	27	0.2
	Displays movement which does not distract attention of learners	3.4	0.6	176	3.4	0.6	175	0.1	3.2	0.5	23	3.2	0.6	27	0.0

Source: IEQ/Malawi Longitudinal Study, Classroom Observations

**Table 4.5b: Use of Teaching and Learning Resources**

Activity Group	Feb-99	Oct-99	99 Diff	Feb-02	Oct-02	02 Diff
Suitability, relevance, liveliness of introduction	3.5	4.0	0.4	2.7	2.5	-0.2
Ability to cope with individual differences	3.4	3.6	0.2	2.8	2.2	-0.6
Degree of pupils' participation	3.3	3.1	-0.1	2.4	1.9	-0.4
Appropriate use of language	3.7	3.8	0.1	2.9	2.7	-0.2
Effectiveness of questioning technique	3.6	4.0	0.3	3.0	2.7	-0.3
Effectiveness of methods used	2.1	2.1	0.0	1.0	0.8	-0.3
Use of textbooks	3.2	3.6	0.4	2.7	3.0	0.2

Use of locally available teaching and learning materials	2.2	2.5	0.3	0.6	1.2	0.6
Logical development of the lesson	3.6	4.0	0.4	2.9	2.4	-0.5
Knowledge of subject matter	3.9	4.2	0.3	3.1	2.9	-0.2
Class control and organization of pupils' activities	3.0	3.5	0.5	2.2	2.0	-0.2
Teacher - pupil relation	3.3	3.4	0.2	2.4	2.0	-0.4
Effective use of time	3.6	3.7	0.1	2.5	2.7	0.2
Appropriateness of closure	3.4	3.5	0.0	2.6	2.0	-0.7
Presentability and appropriateness of dress	4.4	4.5	0.1	3.1	3.2	0.1

Source: IEQ/Malawi Longitudinal Study, Classroom Observations

**Table 4.6: Use of Teaching Aids in the Classroom**

	Feb 99			Oct 99			99 Diff Score	Feb 02			Oct 02			02 Diff Score
	Score	SD	N	Score	SD	N		Score	SD	N	Score	SD	N	
# teaching aids in classroom	1.6	1.9	185	3.7	3.6	230	2.1	2.5	1.2	35	2.5	1.2	44	0.0
% used in three lessons	48.0	47.2	186	60.0	40.2	229	12.1							
% hand made	27.6	37.3	185	43.0	40.3	229	15.4							
% from recycled materials	20.6	32.8	184	16.4	29.1	229	-4.2							
% from natural materials	21.8	30.5	186	16.5	32.6	229	-5.3							
Relevant to the subject matter being delivered	1.2	1.0	176	1.5	1.3	175	0.4	0.3	0.6	24	1.2	1.2	27	0.9
Used at the right stage and time in the lesson	1.1	1.0	176	1.5	1.3	175	0.4	0.7	1.2	24	1.2	1.2	27	0.5
Suitable for age group of learners	1.1	1.0	176	1.5	1.3	175	0.4	0.7	1.2	23	1.2	1.2	27	0.5
Help the learners to grasp the point being taught	1.2	1.0	176	1.5	1.3	174	0.3	0.8	1.2	24	1.2	1.2	27	0.4

Source: IEQ/Malawi Longitudinal Study, Teacher Survey

**Table 4.7: Percent of Maths Items Correct among Standard Three Pupils, 1999 & 2002**

	Feb 99			Oct 02		
	Percent	SD	N	Percent	SD	N
Percent of maths items correct	57.4	12.8	499	54.0	7.7	713

Sources: IEQ/Malawi Longitudinal Study and 2002 Gain Score Study, Pupil Assessments

**Table 4.8: Standard Three Pupil Achievement on English Assessments, 1999 & 2002**

	Feb 99	SD	N	Oct 02	SD	N	Diff
Percent of maths items correct	57.4	12.8	499	54.0	7.7	713	-3.4
Number of English words written	1.5	3.2	494	2.5	3.2	707	1.0
Number of English words used (unaided)	21.4	29.4	494	23.5	30.7	711	2.1
Number of English words used (aided)	28.2	33.8	499	39.8	38.3	710	11.6
Number of English words read in one minute	3.8	11.1	499	6.5	13.9	709	2.7
Percent of English words read correctly in a passage	9.4	24.7	499	16.7	29.4	710	7.3
Percent of English comprehension questions correct	14.2	56.1	499	3.4	24.1	710	-10.8

Sources: IEQ/Malawi Longitudinal Study and 2002 Gain Score Study, Pupil Assessments

## Appendix 4: Classroom Observation Instrument<sup>12</sup>

Teacher's Name: \_\_\_\_\_

School Name: \_\_\_\_\_

Standard: \_\_\_\_\_ Teacher code: 19 \_\_ \_\_ \_\_ \_\_ 00

Sex: *Male/Female*

Topic: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

EVALUATION ITEM	0= not done	1= very poor	2= weak	3= good	4= out-standing
1. Suitability, relevance, liveliness of introduction.					
a. Lively, including activities for learners					
b. Relevant to new subject matter					
c. Short enough (5 - 7 minutes)					
2. Ability to cope with individual differences					
a. Handles responses of different pupils.					
b. Gives rewards for effort to answer.					
c. Gives individual help during lessons					
d. Utilizes pupils' incorrectly/partially correct responses to improve learning.					
e. Uses situations/pupils' experiences to motivate them to learn.					
3. Degree of pupils' participation					
a. Individuals participate throughout the lesson					
b. Pupils initiate interactions with the teacher.					
c. Teacher promotes learning with minimal use of drilling and choral response. (excessive drilling = 0)					
d. Pupils given a variety of exercises to practice					

<sup>12</sup> This instrument was adapted by IEQ researchers in 1999; it was based on a teacher feedback tool originally developed by Save the Children/Malawi.

EVALUATION ITEM	0= not done	1= very poor	2= weak	3= good	4= out- standing
skills.					
4. Appropriate use of language					
a. Language at the level of pupils, i.e. simple and easily understood					
b. Follows the language policy for instruction.					
c. Uses mother tongue to help the learner grasp a point being taught					
5. Effectiveness of questioning technique					
a. Use of question - pause – name (look for all three).					
b. Phrases questions clearly.					
c. Uses varied questions.					
d. Distribution of questions – random order.					
e. Adequacy of number of questions asked in the lesson					
6. Effectiveness of methods used					
a. Uses pair work					
b. Uses group work					
c. Uses role play					
d. Uses song					
e. Uses demonstration					
f. Uses varied approaches to deliver the subject matter					
g. Integrates other curriculum subjects into the lesson					
7. Use of textbooks					
a. Relevant to the subject matter being delivered.					
b. Used at the right stage and time in the lesson.					
c. Help the learners to grasp the point being taught.					
8. Use of locally available teaching and learning materials					
a. Relevant to the subject matter being					

EVALUATION ITEM	0= not done	1= very poor	2= weak	3= good	4= out- standing
delivered.					
b. Used at the right stage and time in the lesson.					
c. Suitable for age group of learners					
d. Help the learners to grasp the point being taught.					
9. Logical development of the lesson					
a. Presents the subject matter logically.					
b. Activity delivery responsive to the abilities of the learners					
c. Specific objectives being achieved in a logical sequence					
10. Knowledge of subject matter					
a. Displays competence in subject matter that is being taught.					
b. Simplifies the content to the level of the learners					
11. Class control and organization for pupils activities					
a. Uses seating plan- children sitting orderly in rows					
b. Names pupils.					
c. Girls and boys mixed in the classroom, interacting freely.					
d. Uses monitors/rosters to involve pupils in classroom responsibilities.					
e. Uses proper system for pupils to do activities orderly and quickly.					
f. Uses proper system of marking pupils' work and helping the weak ones.					
g. Corrects bad behaviors displayed by pupils and reinforces good ones.					
h. Pupils raise their hands when they want to answer questions.					
i. Classroom displays – at appropriate height, clean, adequate, attractive.					

EVALUATION ITEM	0= not done	1= very poor	2= weak	3= good	4= out- standing
12. Teacher - pupil relation					
a. Mutual respect between teacher and pupils					
b. Mutual respect between pupils					
c. Pupils free to talk to each other					
d. Pupils ask questions to the teacher.					
e. Teacher praises and corrects behavior in a friendly manner.					
13. Effective use of time					
a. Being conscious of time allocated to each learning activity.					
b. Learners are given more time to do activities than listening to the teacher.					
14. Appropriateness of closure					
a. Summarizes main points of the lesson					
b. Uses questions to enhance understanding of main points of lesson					
15. Presentability and appropriateness of dress.					
a. Neat in dress and appearance.					
b. Displays movement which does not distract attention of learners					
<b>CLASSROOM RECORDS</b>					
Availability of schemes of work					
Quality of schemes of work					
Upkeep of records of work					
Availability of lesson plans					
Availability & maintenance of other classroom records					
<b>TOTAL SCORES</b>					
<i>OVERALL AVERAGE (total across and divide by): _____</i>					

## **Appendix 5: Statistically Significant Associations between Classroom Practices in February 1999 and Pupil Learning Outcomes in October 1999 and 1999 Learning Gains<sup>13</sup>**

### CHICHEWA CLASSES

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- Greater suitability, relevance, and liveliness of introduction in February 1999 is associated with lower achievement scores for standard three and standard four pupils as well as lower achievement gains for standard four pupils;
- Greater pupil participation in February 1999 is associated with lower achievement scores for standard three pupils;
- More appropriate use of language in February 1999 is associated with lower achievement scores for standard three pupils;
- More appropriate use of textbooks in February 1999 is associated with lower achievement scores for standard three but higher achievement scores for standard four pupils; it is also associated with lower achievement gains for standard three pupils but higher gains for standard four pupils;
- Greater teacher knowledge of subject matter is associated with lower standard three pupil achievement scores;
- Greater class control and organization of pupil activities is associated with lower standard two pupil achievement scores;
- Greater teacher/pupil relations is associated with higher standard three pupil achievement scores as well as higher standard three pupil gains;
- More appropriate lesson closures is associated with lower standard three achievement scores; and
- More presentable and appropriate teacher dress is associated with lower standard four pupil achievement scores.

### ENGLISH CLASSES

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- Greater suitability, relevance, and liveliness of introduction is associated with higher achievement scores for standard three pupils but lower gain scores for standard two pupils;
- A greater ability to cope with individual pupil differences is associated with higher standard three pupil gain scores but lower standard four pupil achievement scores;
- Greater pupil participation in class is associated with lower standard four pupil achievement scores and lower standard three gain scores;

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<sup>13</sup> For more information refer back to Chapter 4.

- More appropriate use of language is associated with higher standard three and four pupil gain scores;
- More effective questioning techniques is associated with higher standard three pupil achievement scores and higher standard two and three pupil gain scores;
- More appropriate use of textbooks is associated with lower standard four pupil achievement scores and lower standard two pupil gain scores;
- More logical development of the class lesson is associated with higher standard three pupil gain scores;
- More logical development of the class lesson is associated with higher standard three pupil gain scores but lower standard four pupil achievement;
- Greater knowledge of subject matter is associated with higher standard three pupil gain scores;
- More class control and better organization of pupil activities is associated with lower standard three pupil achievement scores and lower standard four pupil gain scores;
- Better teacher/pupil relations is associated with higher standard four pupil achievement scores;
- More effective use of time is associated with higher standard two pupil gain scores but lower standard four pupil achievement scores;
- More appropriate closure of class lessons is associated with higher standard two pupil gain scores but lower standard four pupil achievement scores; and
- More presentable and appropriate a teacher's dress is associated with higher standard three pupil achievement scores.

#### MATHS CLASSES

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- Greater suitability, relevance, and liveliness of introduction is associated with higher achievement and gain scores for standard three pupils;
- A greater ability to cope with individual pupil differences is associated with higher standard two pupil achievement scores and standard two and three gain scores but lower standard four pupil achievement and gain scores;
- Greater pupil participation in class is associated with higher standard two pupil achievement scores and standard two and three gain scores but lower standard four pupil achievement and gain scores;
- More appropriate use of language is associated with higher standard three pupil gain scores;
- More effective questioning techniques is associated with higher standard two pupil achievement and gain scores but lower standard three achievement scores and lower standard four achievement and gain scores;
- Greater effectiveness of methods used is associated with lower standard three pupil achievement scores;
- More appropriate use of textbooks is associated with higher standard two achievement and gain scores;
- More appropriate use of locally available teaching and learning aids is associated with higher standard three pupil achievement scores and higher standard two and three gain scores;

- More logical development of the class lesson is associated with higher standard two achievement and gain scores but lower standard three pupil achievement scores;
- Greater knowledge of subject matter is associated with higher standard two pupil achievement and gain scores but lower standard four pupil achievement scores;
- More class control and better organization of pupil activities is associated with lower standard two and three pupil achievement scores;
- Better teacher/pupil relations is associated with higher standard two pupil achievement and gain scores;
- More effective use of time is associated with higher standard two pupil achievement scores; and
- More presentable and appropriate a teacher's dress is associated with higher standard two pupil achievement and gain scores.