Primary Education in Uganda

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Preface

Since the mid 1990s, development agencies, including the Netherlands, started to move from project aid towards sector and general budget support. These new aid modalities emerged because of the perception that the project approach was no longer efficient or effective, due to fragmentation and a lack of coordination, ownership and sustainability. It was felt that pooling funds would be more effective, and that cooperating with existing ministerial institutions would strengthen local capacity and thus make development more sustainable.

The education sector in Uganda is one of the sectors in which this approach has been applied. In 1996 the government of Uganda introduced Universal Primary Education (UPE) and abolished school fees. With two development plans, the Government of Uganda sought create the conditions for the expansion of primary education and to improve the quality of education. The investments made by the Ugandan government in the education sector were facilitated by the introduction of the Sector-Wide Approach (SWAp) and General Budget Support (GBS). SWAp and GBS resulted in the pooling of funds and created the conditions for a more focused, coordinated and efficient approach. This way, SWAp en GBS have contributed to the feasibility of free primary education and the large investment programmes needed to support the resulting increase in enrolment.

This evaluation is one of the first attempts of the Policy and Operations Evaluation Department (IOB) to analyse the *impact* of a contribution to a sector (or subsector) as a whole. The basic principle is that evaluation of support received by a sector should focus on the sector as a whole, rather than focusing on the contribution of one specific agency. The evaluation analyses the effectiveness of interventions to which the Netherlands contributed. The study is an impact evaluation in the sense that it analyses the effectiveness of interventions in the sector, taking into account various factors that may have influenced the outcome. As such, it deals with the attribution problem and selection effects.

The first three chapters introduce the study, describe the methodology and provide a brief overview of how education policy developed. The following chapter describes the development of investments, access and learning achievements. Chapter five analyses the effectiveness and impact of interventions and chapter six analyses the effectiveness of a specific project that focused on the improvement of school and district management. The final chapter focuses on the problem of teacher absenteeism.

The study concludes that the GoU and its development partners have achieved remarkable results. The report makes several recommendations for improving the quality of primary education.

The report is a joint effort of the Education Planning Department (EPD) of the Ministry of Education and Sports (MoES) in Uganda and the Policy and Operations Evaluation Department of the Netherlands Ministry of Foreign Affairs. The report was written by Antonie de Kemp (IOB) and Joseph Eilor (MoES/EPD). Prof. Erisa O. Ochieng of International Development Consultants (IDC) led the fieldwork and was involved in the analysis. Many other people have contributed to the report. They include:

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In addition, Prof. Jan Willem Gunning and Dr. Chris Elbers of the *Vrije Universiteit* (VU) in Amsterdam have advised on statistical an econometric matters. These researchers simultaneously contributed to a study on basic education in Zambia.

This study has been made possible thanks to the contributions of the MoES Education Planning Department, UNEB, UBOS, ESA and LCD. On September 10, a stakeholder workshop was held in Kampala to validate the findings of the study. The valuable comments of the stakeholders have been included in the report. The authors would like to thank George Kalibbala, education specialist of the Netherlands Embassy in Kampala, for his contribution to the evaluation.

An advisory group consisting of Henri Jorritsma, Deputy Director of IOB, Maarten Brouwer, Director of the Effectiveness and Quality Department (DEK), Corien Sips and Chris de Nie of the Cultural Cooperation, Education and Research Department (DCO), Eric Hilberink of the United Nations and International Financial Institutions Department (DVF) and former Head Development in Kampala and Babette Wils of the Education and Policy and Data Center (EPDC) commented and advised on this report.

IOB is responsible for the report's content.

Bram van Ojik
Director Policy and Operations Evaluation Department

Contents

Abbreviations

ABEK	Alternative Basic Education for Karamoja
ADEA	Association for the Development of Education in Africa
ANOVA	Analysis of Variances
BEUPA	Basic Education for Urban Poverty Areas
CCT	Coordinating Centre Tutors
CHANCE	Child-centred Alternative Non-formal Community-based Education
COPE	Complementary Opportunities to Primary Education
DEO	District Education Office
DFID	Department for International Development
DHS	Demographic and Health Survey
DTE	Diploma for primary Teacher Education
EdData	Education Data
EFAG	Education Funding Agencies Group
ELSE	Empowering Lifelong Skills Education in Masindi
EMIS	Education Management Information System
EPD	Education Planning Department
ESA	Education Standards Agency
ESAPR	Education Sector Annual Performance Report
ESIP	Education Strategic Investment Plan
ESR	Education sector Review
ESSP	Education Sector Strategic Plan
ESWG	Education Sector Working Group
GBS	General Budget Support
GEM	Girls' Education Movement
GLS	Generalized Least Squares
GoU	Government of Uganda
GTZ	German Technical Cooperation
HIPC	Heavily Indebted Poor Country
IDC	International Development Consultants

IOB	Policy and Operations Evaluation Department (the Netherlands)
IPS	Integrated Production Skills
ISO	Internal Security Organisation
LCD	Link Community Development
LRA	Lord's Resistance Army
MDEDP	Masindi District Education Development Project
MDG	Millennium Development Goal
MoES	Ministry of Education and Sports
MoFPED	Ministry of Finance, Planning and Economic Development
MTBF	Medium Term Budget Framework
MTEF	Medium Term Expenditure Framework
NAPE	National Assessment of Progress in Education
NBFP	National Budget Framework Paper
NDC	National Development Committee
NGO	Non-Governmental Organisation
NRM	National Resistance Movement
OED	Operations Evaluation Department
OLS	Ordinary Least Squares
PAF	Poverty Action Fund
PASEC	Programme d'appui au secteur éducation aux Comores
PCA	Principal Component Analysis
PCR	Pupil Classroom Ratio
PEAP	Poverty Education Action Plan
PGMs	Peer Group Meetings
PLE	Primary Leaving Exam
PTC	Primary Teachers' College
PTE	Primary Teacher Education
PTR	Pupil Teacher Ratio
SACMEQ	Southern and Eastern African Consortium for Monitoring Educational Quality
SFG	School Facility Grant
SST	Social Studies
SWAp	Sector-Wide Approach
TDMS	Teacher Development and Management System
UBOS	Uganda Bureau of Statistics
UDES	Uganda DHS EdData Survey
UNEB	Uganda National Examination Board

UNESCO	United Nations Educational, Scientific and Cultural Organisation
UPE	Universal Primary Education
Ush	Uganda Shilling
VCM	Voluntary Community Mobilisation
VU	Vrije Universiteit (Free University, Amsterdam)

Summary and conclusions

Introduction

Since the mid 1990s, development agencies have shifted from project aid towards sector and general budget support. These new aid modalities emerged in response to a perceived lack of efficiency and effectiveness of the project approach, which was caused by fragmentation and a lack of coordination, ownership and sustainability.

In Uganda, this shift coincided with the government's intention to revitalise the education sector. This sector had been neglected for years until the National Resistance Movement (NRM) took over in 1986. During the 1980s, education expenditure had fallen from more than 4% of GDP to 1.2%. In 1992, no more than two out of three children in the primary school age actually went to school. The quality of education was poor. In 1987, the new government established an Education Policy Review Commission, which reported in 1989. Three years later, in 1992, the GoU released the Government White Paper on Education. In that paper, the GoU formulated its goal to achieve Universal Primary Education (UPE) before 2000. In 1997, the GoU abolished school fees. As a result, the number of pupils in primary education tripled within several years. The GoU developed two ambitious development plans in order to redress the negative effects of this dramatic increase and improve the quality of education. The introduction of a Sector Wide Approach (SWAp), and later General Budget Support (GBS), contributed to the implementation of these plans. In the context of SWAp and GBS, funds were pooled and resources were allocated more effectively and efficiently to the education sector.

This study analyses the results of the interventions made in primary education since 2000. It evaluates the effectiveness of educational interventions in terms of incidence and educational results.

The following questions are central:

1) In what way have school attendance and learning achievement developed since 2000?
2) What were the main determinants of these developments?
3) Which interventions have the largest and most *cost-effective* impact on educational outputs?

Summary

Chapter 1 provides an introduction to the study and chapter 2 describes the research questions and method of analysis. The study is an *impact evaluation*: a quantitative evaluation of the effects of specific interventions on primary education. Chapter 2 shows the pitfalls of this kind of study and describes how these were overcome through statistical and econometric methods. The study is mainly based on existing data: data from the Education Management Information System (EMIS), information from test results (National Assessments on Primary Education) and examination results (Primary Leaving Examination), as well as information from the Demographic and Health Survey (DHS) and the Population and Housing Census. Apart from this, additional data were gathered at districts and schools and a survey was conducted among teachers.

Chapter 3 starts with a brief outline of the development of education in Uganda. The chapter shows how the GoU and its development partners have cooperated since the mid-1990s to improve access to primary education and later to improve the quality of education. In 1997, Uganda abolished tuition fees and this resulted in an exponential increase in enrolment. Both the introduction of Universal Primary Education (UPE) as well as demographic developments contributed to a dramatic expansion of enrolments, from 2.6 million in 1995 to 7.2 million in 2005 and 2006. Initially, this massive inflow had a negative effect on the quality of education: pupil teacher ratios and pupil classroom ratios skyrocketed. Pupils went to school but lacked learning materials. The government and its development partners sought to meet the needs created by this sharp increase by increasing their funding. The *Education Strategic Investment Plan* (ESIP) of 1997 and its successor, the *Education Sector Strategic Plan* (ESSP) were introduced to redress the negative effects of the increase in enrolment and to improve the quality of the education system. The introduction of UPE coincided with the moment development partners changed their policy from project to sector support and later to general budget support (GBS). The introduction of the Sector-Wide Approach (SWAp) and general budget support created the financial preconditions for universal primary education. The expenditure on education, financed by

external agencies for more than 50%, was increased to more than 5% of GDP. The idea for a Sector-Wide Approach to education in Uganda emerged in 1996 and was realised with ESIP in 1997. The initial group of support agencies was relatively small and included DFID, Ireland, the Netherlands, USAID, the European Commission and the World Bank. Later, other development partners joined. Within the framework of the sector-wide approach, 15 development partners created the *Education Funding Agencies Group* (EFAG) to coordinate budget support, project support and technical assistance.

For several years, policy priorities of GoU and donors coincided, but a perceived lack of results seems to have affected their relations. Within the education sector, this perceived lack of results is due to a lack of progress on specific targets related to the quality of education. It is generally acknowledged that Uganda has been successful in improving access, but it is felt that this was at the cost of the quality of education as measured by learning achievements.

So, what has been achieved since the introduction of UPE, SWAp and GBS? This question is addressed in chapters 4 and 5. Chapter 4 describes the development of important output and outcome indicators, mainly since 2000. Chapter 5 analyses the impact of various interventions on learning and learning achievement.

Chapter 4 shows how increased investments in the sector have led to improved access to all levels of education, mainly through the expansion of school facilities and the reduction of financial and social barriers to education. Chapter 5 analyses the impact (effectiveness) of specific interventions in primary education. This chapter presents a number of important findings. Investments in teachers and teacher training, in schools and classrooms, in school facilities and in books have been, and still are, important instruments for reducing dropout and repetition, for improving progression and completion rates and for improving the quality of education as measured by test and examination results. Pupils who live closer to school have higher attendance rates and better results than pupils who live at greater distance from school. High pupil teacher ratios lead to higher dropout rates and have a negative effect on learning achievement. Teacher education and teacher training have a significant positive effect. The analyses show that the head teacher's qualification has a highly significant and positive effect on test and examination results. Private schools perform better than public schools, even after correcting for differences in the number and quality of teachers, the number of books, etc. Both factors suggest that good management is very effective.

A comparison between examination results in Masindi and other districts (see chapter 6) confirms this image. In Masindi, the Regional District Office, the Education Standards Agency and the NGO Link Community Development (LCD) have worked since 2000 to improve district and school management. The training of district officers, management and teachers, as well as regular monitoring and inspections by the district office on the basis of a detailed format have resulted in significant improvements in the schools participating in the project. Examination results in these schools are approximately 50% higher than the results of comparable schools. Also, the analysis again shows the effectiveness of good management.

Management proves to be the key to reducing teacher absenteeism as well. In Uganda, more than in other countries, teacher absenteeism is a rampant problem. Chapter 7 shows that it is estimated at 20-30%. The problem seems to be greatest in the country's northern and eastern districts and more serious in rural areas than in urban areas. Teacher absenteeism has a highly negative impact on learning achievement: low attendance rates of teachers set a bad example for pupils and parents. Moreover, high absenteeism rates reduce effective contact time, whereas it is generally acknowledged that contact time is one of the main factors in improving the quality of education. Therefore, reducing the absence of teachers is essential to increasing effective contact time. Without such a reduction, it is hardly effective to increase the number of teachers. The results of this study show that the attendance of teachers is highly correlated with the school's management: schools with better management have lower absence rates. According to the results of a survey conducted for this study, the main causes of absenteeism (apart from illness) are: poor accommodation, distance to the school, low salary, late pay and low teacher morale.

Conclusions

1. *Uganda has made enormous progress in improving access to primary education.*

Since 1997, the GoU has succeeded in raising the access to primary education after years of underinvestment. Within several years, total enrolment in primary education tripled. Considerable numbers of new teachers were recruited and trained, almost doubling from 74,000 in 1995 to 150,000 in 2006 (including private and community schools). Notwithstanding this growth, the percentage of untrained teachers decreased in this period, from 28% to 11%. The number of schools increased from 12,500 in 2000 to 17,000 in 2006. The number of classrooms grew from 68,000 in 2000 to 100,000 in 2006. Over the same period, the number of books for the four main subjects increased from 6.6 million to 10.6 million. As a

result of these investments, the pupil teacher ratio decreased from 60:1 in 2000 to 48:1 in 2006 and the pupil classroom ratio from 108:1 to 71:1. In 2000, an average of four children had to share one book for each subject. In 2005, this ratio was reduced to 2.7:1. The official net enrolment rate increased to above 90%. The gender gap narrowed and in 2005 parity was achieved. The percentage of pupils who passed the primary leaving exam improved from 74% in 2001 to 82% in 2006. Average examination and test results are gradually improving.

2. *The Sector-Wide Approach, and later GBS, contributed to the successful implementation of two development plans and the introduction of Universal Primary Education.*

The example of Uganda shows that a sector-wide approach can be an effective strategy for enhancing education within a very short period. Within a few years, the GoU and its cooperating partners have shifted the education sector from a project approach to sector support. The pooling of funds created the means for a broad, holistic and integral approach to the basic education sector.

3. *The quality of primary education remains poor and absenteeism and dropout pose serious threats to the efficiency and effectiveness of primary education.*

Whereas Uganda is successful in improving access to education, quality remains low. Teaching methods are old-fashioned and books are not always used effectively. Moreover, high teacher and pupil absenteeism as well as high dropout rates undermine the effectiveness of investments in the education sector. Progression rates are low and even tend to fall as a result of increasing dropout rates. Low progression rates are especially a problem at primary 1 and primary 6 levels. On average, approximately 27% of the children are not in school. Second, the quality of education remains an enormous problem. Although there seems to be a slight improvement in learning achievement, the quality of education remains low. Examination and test results are gradually improving, but still far below satisfactory levels. Average scores on tests and primary leaving examinations are below 40%. In 2005, the average result of the primary leaving examination in mathematics was even below 30%. Many children leave school without having mastered literacy and numeracy. Moreover, regional disparities remain high. There are too many children in one classroom, they have to sit on the floor and lack basic learning materials. Extra attention is needed in poor and underdeveloped regions.

4. *Decreasing effectiveness of interventions poses a real threat to measures aimed at improving the quality of education.*

The analyses indicate that the effectiveness of interventions is decreasing. Computations show that most interventions were more effective at the beginning of the millennium than they are now. Interventions are generally effective, but in a large number of schools the effectiveness is low. In many schools the average effect of reducing the pupil teacher ratio is not nearly as significant as it might have been. Moreover, there is substantial misallocation of resources. Even though many schools have very high pupil teacher ratios, it seems to be common practice that there are two or even three teachers in one classroom at the same time. The main (related) reasons are management problems, lack of training and high absenteeism of teachers and pupils. The MoES needs to deal with these problems in order to reap the full benefits of the investments in primary education.

5. *A focus on agreed targets may lead to a neglect of underlying inequalities.*

Due to the focus on aggregated average figures, underlying inequalities tend to be disregarded. With an eye to the conditions attached to agreed and aggregated targets, the MoES has no incentive to invest in remote areas. Development partners see the need to invest in remote areas, but these investments are relatively expensive and could thus have a negative impact on the realisation of aggregated (average) targets. Moreover, the monitoring function still focuses too much on input and process indicators and aggregated MDGs. The scope of the monitoring and evaluation functions needs to be extended so that they become instruments for the improvement of the quality of education. Information of the annual school census should be linked to information from UNEB (NAPE and PLE) and ESA (inspection reports).

6. *It is important that the GoU and its development partners have realistic expectations of the possibility of improving both access and quality at the same time.*

SWAp and GBS were based on the assumption that the MoES and local governments have the capacity to implement the necessary measures effectively and efficiently and that these measures will have a significant effect within a number of years. In retrospect, expectations were too high. The consequences of a tripling of enrolment within only a few years have been underestimated. It takes more time to produce significant results. The substantial increase not only had an effect on pupil teacher ratios, pupil classroom ratios, etc., but it also meant that children of poor, less-educated parents living in remote areas gained access to primary education. This in itself had a negative effect on average results. It is well documented – and confirmed by this study – that children from poor and less-

educated parents do not perform as well as children from wealthier and better-educated parents. Second, the large increase in enrolment initially led to very high pupil teacher ratios and pupil classroom ratios which generally have a negative impact on the learning environment. Nevertheless, Uganda succeeded in improving pupil teacher ratios and pupil classroom ratios. The example of Uganda shows that is it possible to have a large growth of enrolments within a few years without large negative effects on the test and examination results of pupils.

Issues for future policy

Although Uganda has, together with its development partners, achieved remarkable results in primary education, massive investments will still be needed to realise a sustainable improvement of the quality of education.

1. *The analyses show that investments in teachers, classrooms and books are effective in raising the quality of education. These investments would be more effective, however, if the MoES succeeds in simultaneously raising the quality of school and district management.*

The evaluation shows that improving school and district management is the key to improving the quality of schools. The improvement of management proves to be the most cost-effective measure for improving learning and learning achievement. Merely increasing the number of teachers will not be particularly effective. In many cases, the quality of management is too low to reap the full benefits of the investments in schools, teachers and learning materials. Investments in books, classrooms, teachers and teacher training are much more effective if the school is well-managed and investing in the quality of management means training, establishing an effective support structure at the district level and an effective inspection apparatus. A good manager is a lever for other teachers and pupils. A head teacher with well-developed management skills creates a stimulating learning environment, holds teachers accountable and reduces teacher and pupil absenteeism. Teacher education and teacher training is effective. Schools with high percentages of teachers who have had training in the previous year perform better. Investments in teacher training lead to higher attendance rates (for teachers as well as pupils), lower dropout and better examination results. Nevertheless, teacher training must be improved in order to ensure effective teaching and effective use of books. The example of Masindi shows that technical assistance can be very effective in improving the quality of the school and the quality of learning achievements.

2. *Teacher absenteeism*

Absenteeism, dropout and repetition are significant problems in primary education in Uganda. Teacher absenteeism may be estimated at 20% - 30% and this is an important factor in the low quality of education in many schools. It is generally acknowledged that contact time is one of the key factors in the quality of education. Therefore, reducing teacher absenteeism may be a very cost-effective way to improve the quality of education. Currently, 20%-30% of the wage bill is spent on services that are not delivered. One of the main instruments to improve teacher attendance is to improve the quality of the school management, in addition to increasing the number of inspections and sanctions for unjustified absence. Well-managed schools have lower absence rates. This study confirms that well-managed schools have lower absenteeism rates and that children in these schools show better test and examination results. Apart from this, it is important to improve accommodations (teachers' houses) and working conditions, especially in rural areas.

3. *Pupil absenteeism, repetition and dropout*

The absence of pupils is highly correlated with the absence of teachers. The reduction of teacher absenteeism will reduce the absenteeism of pupils as well. Moreover, pupil absenteeism may lead to dropout. Apart from this, the main causes of dropout lie outside the direct influence of the school and education policy. The main solutions are found within the communities and households. Government and schools must sensitise parents on the importance of education. Within the school environment, distance to school and high pupil teacher ratios are important factors contributing to dropout. The analyses show that teacher training reduces dropout rates in a cost-effective way. Repetition is negatively correlated with dropout at the school level. Schools with high pupil teacher ratios tend to have relatively low repetition rates but high dropout. Repetition is expensive and leads to higher pupil teacher ratios. However, a policy that aims at reducing repetition must ensure that this will not lead to higher dropout rates. Repetition and dropout are especially high at primary 1. An important reason is that there are not enough facilities for pre primary education. Children do not have access to pre primary education, with the result that they do have a wrong start with primary education. The efficiency of the education system can be enhanced by improving access to pre primary education.

4. *High population growth creates enormous challenges for the education sector.*

The anticipated population growth, from 27 million people now to 127 million people in 2050, poses a tremendous challenge for the Ministry of Education and

Sports to maintain the accessibility of primary education, while at the same time improving its quality. If the predictions come true, the number of pupils will double within twenty years and double once again between 2025 and 2050. The major threat of high population growth has a tremendous effect on education planning. Even in the current situation, too many children have to sit on the floor in crowded classrooms, without books and in schools without adequate facilities (including water and electricity).

1 Introduction

At the 1990 *World Conference on Education for All* in Jomtien, delegates from 155 countries agreed to make primary education accessible to all children and to massively reduce illiteracy before the end of the decade. The *World Declaration on Education for All*, adopted at this conference, urged countries to intensify their efforts to meet the basic learning needs of all and to provide universal access to primary education by 2000. The Jomtien EFA targets were not achieved, but they were reaffirmed at the Dakar World Education Forum in April 2000 and at the Millennium Summit in September that year, when 189 nations adopted the Millennium Declaration, comprising eight specific goals known as the Millennium Development Goals (MDGs). One of these goals is to achieve universal primary education by 2015. That year, children everywhere, boys and girls alike, must be able to complete a full course of primary school.

The 1990 World Conference gave an important impetus to the education sector in developing countries. In Uganda, the government had already started a process of reforming and reconstructing the education system in 1986 to redress the problem of the declining quality of basic education. A real boost came with the abolishment of school fees and the introduction of Universal Primary Education (UPE) in 1996. Between 1996 and 1997, the number of pupils increased by 70% as a result of the abolition of primary school fees. By 2004, the number of pupils in primary education had increased to 7.4 million. This sharp increase led to overcrowded classrooms, insufficient learning materials and high pupil teacher ratios (IOB, 2003; Murphy, 2003). The *Education Strategic Investment Plan* (ESIP) of 1997 and its successor, the *Education Sector Strategic Plan* (ESSP) were introduced to redress the negative effects of this increase in enrolment and to improve the quality of the education system.

The investments made by the Ugandan government in the education sector were facilitated by the introduction of the Sector-Wide Approach (SWAp) and General Budget Support (GBS). SWAp and GBS resulted in the pooling of funds and

created the conditions for a more focused, coordinated and efficient approach. This way, SWAp en GBS have contributed to the feasibility of free primary education and the large investment programmes needed to support the resulting increase in enrolment.

Developments in Uganda show that government intervention in the education sector, supported by development partners, may have a great impact. Nevertheless, it is not yet certain whether these MDG targets on education can be realised by 2015. The GoU and development partners face the challenge of effectively and efficiently supporting the education sector to ensure free access to education and improve learning outcomes. If the GoU and development partners want to realise the MDGs on education, it is important that they know which interventions have the greatest impact and which interventions are most cost-effective. This insight seems to be missing. Of course, there is a general understanding of variables that are likely to have an impact on learning and learning achievement, but empirical evidence of the quantitative effects of these interventions is limited. There are several studies on (basic) education in Uganda (see Eilor, 2004 for an overview), but most are process oriented or solely directed at specific problems.

Therefore, the Policy and Operations Evaluation Department of the Netherlands Ministry of Foreign Affairs (IOB) and the Education Planning Department of the Uganda Ministry of Education and Sports (MoES/EPD) have conducted an evaluation of primary education in Uganda in cooperation with International Development Consultants (IDC). Its key questions are:

i) What factors affect learning and learning achievement?
ii) Which interventions are most cost-effective?

This report presents the results of this evaluation.

Chapter 2 of this study provides a brief outline of the method of analysis. Chapter 3 follows with a description of the context and educational interventions. Chapter 4 starts with a quantitative description of the development of education indicators (output and outcome) and chapter 5 gives an analysis of the impact of interventions. Chapter 6 analyses the results of a specific project in the Masindi district in western Uganda. Finally, chapter 7 presents the results of a survey on the problem of teacher absenteeism.

2 Research questions and method

2.1 Research questions

This study aims to analyse the effectiveness, or *impact*, of interventions in primary education in Uganda. Throughout this study, the word impact is used in a specific sense, in accordance with the definitions of the growing number of impact studies. Impact here refers to *effects* – positive or negative, intended or unintended – on individual households, institutions, and the environment caused by a given development activity, such as a programme or project (Baker, 2000; World Bank, 2005). The study evaluates the effectiveness of educational interventions in terms of incidence and educational results. The following questions are central:

1) In what way have school attendance and learning achievement developed since 2000?
2) What were the main determinants of these developments?
3) Which interventions have the largest and most cost-effective impact on educational outputs?

The evaluation focuses on the (cost-)effectiveness of educational interventions: policy measures and budgets contributing to the improvement of access, equity and learning achievement. These measures include building schools and classrooms, providing teaching materials and training teachers.

2.2 Measuring impact

The road to the measurement of impact of programmes is paved with methodological problems. Programmes may seem (in-)effective, but in fact, many factors apart from direct interventions may have determined the results. Take for instance drug testing: normally, researchers give control groups a placebo to

make sure that the beneficial effects are caused by the active components and not just by increased attention or the mere idea that the drug is effective.
In education, outcomes may be affected by many different variables other than (government) interventions. Pupils' social background, economic developments, conflict situations, etc. may have an impact as well.

For an adequate assessment of interventions, one needs to know what the outcome would have been without the intervention (treatment). Here, one touches upon the problem of the *counterfactual*: how would children have developed without the interventions? What would have happened in the absence of the intervention(s)?

Three related problems need to be addressed. First of all, there is the *attribution problem*. Which effects can be attributed to educational interventions? Many other factors interfere and may have an impact as well. An unbiased assessment of the effects of educational interventions on, for instance, enrolment must take into account the effects of the size, remoteness and poverty status of households, as these factors may also determine enrolment rates. For example, enrolment rates may improve as a result of an increase of incomes, lowering or abolition of school and exam fees, increased awareness of the importance of education among parents, etc. Moreover, there are also certain factors that have a negative impact on learning and learning achievement. Poor education outcomes may be due to the low quality of the schooling system (teachers, teaching methods, materials), to underfunding or to factors beyond the education policy. One of these factors is HIV/AIDS, which has a negative impact on school attendance and leads to teacher absenteeism (UNESCO, 2004).

The attribution problem is related to *selection effects*. Selection effects may occur when the characteristics of the intervention and control group(s) are different. For instance, school attendance is lower in poor and nomadic regions. In Uganda, several northern and eastern districts are affected by the internal conflict. Many people live in Internally Displaced Peoples' Camps. In the Karamoja region in the northeastern part of Uganda, pastoralists live in semi-arid plains. Livestock is their major source of income and the Karimojong (the native population of the Karamoja) see formal education as a too long investment compared to their own traditional forms of education. The fishing communities on the Kalangala islands in Lake Victoria have a unique way of life as well. Ignoring selection effects leads to biased estimates. Selection effects create differences between intervention group(s) and control group(s) that cause the estimates of the intervention to be biased (White, Sinha and Flannagan, 2006, pp. 3-4).

As long as selection is based on observable characteristics, these may be included in the analysis. However, not all characteristics are observed. This is the third problem: selection on unobservables. If the effects of one particular intervention are evaluated, it is not necessary to include all relevant factors in the model as long as these other factors are not correlated with the intervention. This is what causes the problem of unobservables and endogeneity. For instance, one may be interested in the effect of class size on learning achievement.[1] Class size may be endogenous or correlated with school management (see for instance Glewwe and Kremer, 2005). However, school management is seldom included in the analysis. Moreover, it is often assumed that the school choice of motivated (and probably well-educated) parents is correlated with class size, as these parents tend to send their children to schools with low pupil teacher ratios. Many studies have attempted to measure the impact of class size on learning achievement and many of these have come to the conclusion that there is no significant – or even no positive (!) – relationship between class size and learning achievement. The neglect of the endogeneity of class size – or other unobserved selection effects – is a likely explanation for these counterintuitive results.

In the case of Uganda – but not only Uganda! – the neglect of unobserved selection effects has led to unrealistically high expectations and subsequent disappointment about achievements and wrong policy conclusions, as the following two examples illustrate.

First of all, it is generally felt that although education outcomes have improved, it was not to the level anticipated (Ward, Penny and Read, 2006, p. xii). However, this study shows that Uganda has succeeded in improving the quality of education, even though the number of pupils tripled. One cannot overstate the impact of this enormous increase. It did not only have a severe impact on the education system and infrastructure, but it changed the school-going population as well. It is generally known from the literature that there is a high correlation between socio-economic background and school results. This study also confirms this correlation for Uganda. So, by abolishing school fees in 1997, Uganda offered poor, uneducated parents from remote areas the opportunity to send their children to school. As a result, the composition of the school-going population changed dramatically. A second example has to do with the supposed relation between repetition and examination results. Several studies find that repeaters score lower test and

1 In traditional usage, a variable is endogenous if it is determined within the context of a model. In econometrics, it is used to describe any situation where an explanatory variable is correlated with the disturbance term. Endogeneity arises as a result of omitted variables, measurement error or in situations where one of the explanatory variables is determined along with the dependent variable.

examination results than pupils who did not repeat. Many researchers thus conclude that repetition does not have a positive effect on school performance. However, this conclusion is a classic example of the neglect of unobserved selection effects: intelligent children with well-educated parents are more likely to perform well and will therefore not repeat. Poor and less intelligent children, on the other hand, will not achieve good results and are therefore more likely to repeat. Both groups of pupils (i.e. repeaters and non-repeaters) have different characteristics, which causes a selection effect. Pupils' learning abilities and household characteristics both have an impact on their learning achievement and (therefore) on repetition rates. The proper way to measure the effects of repetition would be to compare the results of repeaters with the results of non-repeaters who have the same characteristics or to compare the results of repeaters before and after repetition.

There are a number of standard techniques to solve the problems identified and there are excellent studies of the impact of projects. However, only a limited number of studies give insight into the impact and effectiveness at the sectoral level, although the sector is increasingly important for the realisation of the MDGs. An important reason for the lack of impact studies at the sectoral level is their complexity (see Elbers and Gunning, 2006). Rigorous methods for evaluating impact are designed for individual projects rather than sector aid or general budget support and at higher levels of aggregation, the interventions to be evaluated are more heterogeneous.[2] It is possible to use multivariate techniques to deal with this heterogeneity, but these require large samples.

The authors of this study have been aware of the many potential pitfalls in impact evaluation. Different methods were used to solve methodological problems. Basically, regression techniques were applied in this study to solve problems of (observed) confounding factors and selection effects. In addition, propensity score matching techniques were used to create (ex-post) control groups that are comparable with the intervention groups. The problem of selection on unobservables was dealt with by using data from many different sources, through triangulation and exploitation of natural restrictions. It is often assumed that the choice of motivated (and probably well-educated) parents is correlated with (for instance) class size, as these parents are expected to send their children to schools with low pupil teacher ratios. In that case, one may estimate the effects of class size for situations in which parents do not have a choice (i.e. in remote rural areas).

2 Heterogeneity in treatment is a precondition for an impact evaluation at the sectoral level.

2.3 The intervention logic

The evaluation focuses on the (cost-)effectiveness of educational interventions: policy measures and budgets that contribute to the improvement of access, equity and learning achievement. These measures include the building of schools and classrooms and the provision of teaching and learning materials. Figure 2.1 outlines the intervention logic.[3]

Interventions translate into action at the school level. In order to estimate the effects of each factor that has an impact on access and learning achievement (not only interventions but pupil, household and regional characteristics as well), all factors and outcome changes are measured at the school level.

In figure 2.1, access and achievement are the main *outcome* variables. These indicators are broadly similar to the indicators used by partner countries to monitor sector progress:

Access	- (gross and net) intake rates - (gross and net) enrolment ratios - attendance - absenteeism - dropout rates
Efficiency	- repetition rates - progression rates
Equity / gender	- access indicators for different groups (including male/female) - learning achievement indicators for different groups (including male/female)
Quality	- qualifications of primary school teachers - pupil teacher ratios - pupil textbook ratios

3 The model is based on the literature (for an overview, see Boissiere, 2004, Glewwe and Kremer, 2005 and Kingdon, 2005).

Learning achievement
- literacy, numeracy, science and social studies
- primary school leaving exams

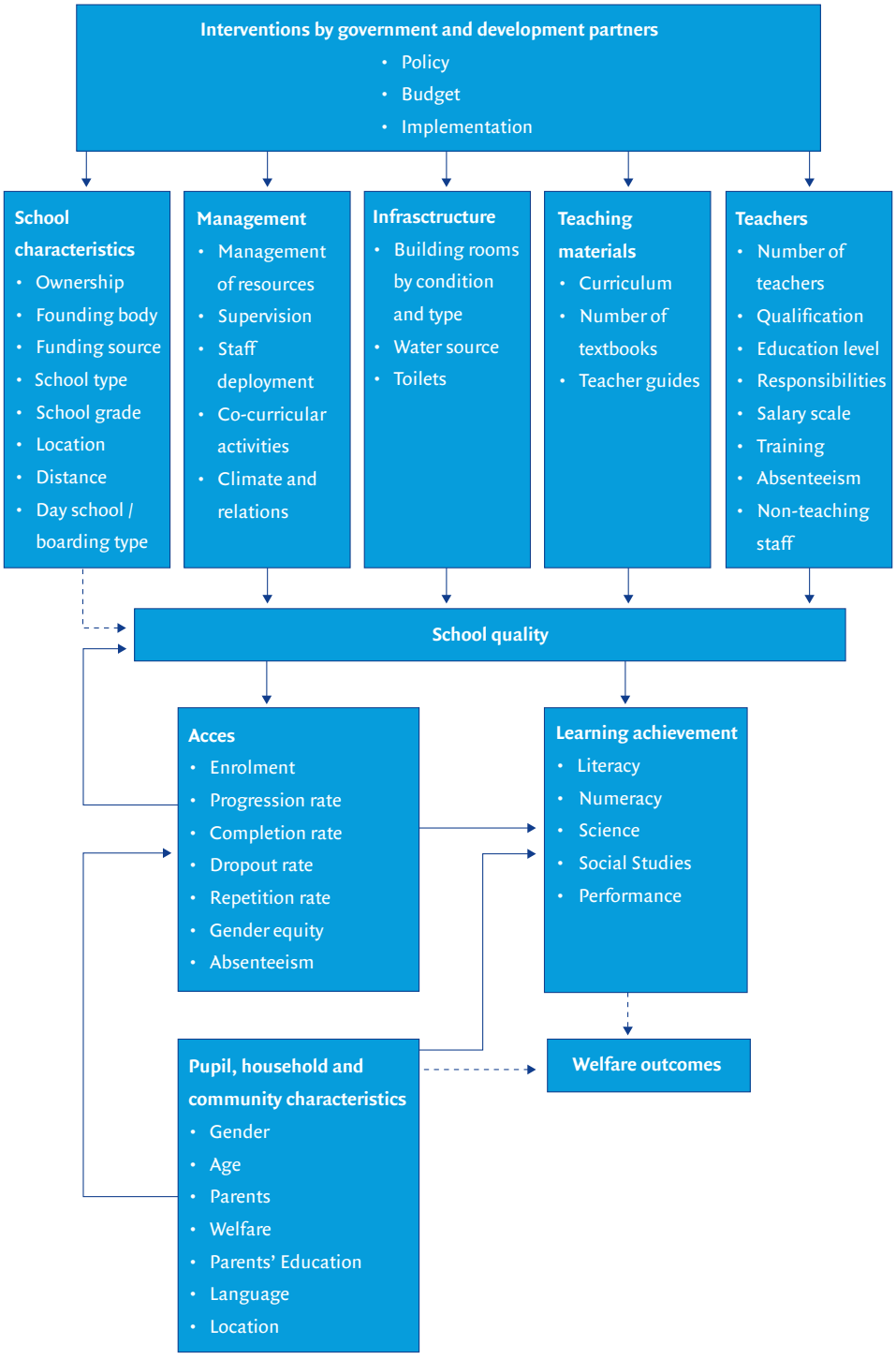
Many studies suggest a relation between access and learning achievement: a large increase in enrolment – without accompanying measures – has a negative impact upon the quality of education and (therefore) upon achievement. In several African countries, an increase in enrolment has led to pupil teacher ratios that are so high that they have a significant negative impact on quality (DFID, 2005). Many African countries have very high pupil teacher ratios (about 80:1 or 100:1). These high ratios, together with irregular pay, are a main cause of teacher absence (White, 2004). HIV/Aids also contributes to absenteeism and attrition. In several (African) countries, teacher absenteeism is a serious problem. It may not only have an impact on the quantity and quality of schooling, but also on pupils' attendance and dropout rates (DFID, 2005).

There is a trade-off between increasing access to and quality of education.[4] Increasing access to education must be accompanied by more schools, classrooms, teachers and textbooks. According to a World Bank study (White, 2004), the building of classrooms and the provision of school supplies (such as textbooks) are cost-effective instruments that contribute to higher enrolment and better learning outcomes. The provision of books is a cost-effective way to improve learning achievement (see Kingdon, 2005). This is especially the case in developing countries where teacher quality is often low and other facilities are scarce or of poor quality (Lewin and Stewart, 2003 and Ward, Penny and Read, 2006). Therefore, the quality of education depends on the supply of teachers, schools, etc.
Differences in the *distance* to the nearest school are used as a proxy for the (average) distance of pupils to their schools. This made it possible to analyse the impact of distance on enrolment and achievement.

Specific school characteristics may have an impact as well. Private schools seem more effective in imparting learning to students than public schools. In many developing (as well as developed) countries, private schools show better results. However, for a fair comparison, one needs to control for differences in the number (and quality) of teachers, regional differences and differences between parents and pupils. Several studies found that the observed differences in learning and learning achievement disappear after controlling for these other factors (Kingdon, 2005).

4 For a discussion, see Freeman and Dohoo Faure, 2003, pp. 45-49.

Figure 2.1 *Intervention logic*



In poor and rural areas, there are proportionally fewer schools and the quality of education is lower (DFID, 2005). Other household and community characteristics that may be of importance include welfare and education of parents. In Uganda, the costs of education in the form of uniforms, lunch and local examination fees are a major cause of dropout (MoES, 2005c). Acana (2005a) finds evidence that pupils with better-educated parents have better test results.

The mathematical model

This study analyses the effectiveness of interventions, taking into account specific characteristics of pupils and exogenous factors such as pupils' households. The study uses a regression-based approach, with school-level interventions or outputs as regressors and access and learning achievement as dependent variables. This approach is known as the 'estimation of education production functions' (see Glewwe and Kremer, 2005). Differences in access and learning achievements are explained by:

- characteristics of the pupils (gender, age, where they live, work at home);
- specific characteristics of households (such as welfare and education of parents, language);
- school-related factors (such as distance to school, availability of desks and books, qualifications of teachers, contact hours, teacher absenteeism).

The main unit of analysis is the school. It therefore seems appropriate to distinguish a number of specific school-related factors: school characteristics, infrastructure, learning materials, teachers and management. In a formal mathematical notation (see for instance Glewwe and Kremer, 2005 and Nannyonjo, 2007):

$$Outcome_i = a + b_i S_i + c_i M_i + d_i I_i + e_i L_i + f_i T_i + g_i P_i + h_i H_i + k_i R_i + \varepsilon_i$$

S, M, I, L, T, P, H and R denote vectors of observable characteristics, a denotes the estimated constant, b_i through k_i denote the estimated coefficients and residual ε indicates all unobserved characteristics. These are the characteristics included:

S = vector of specific school characteristics
M = vector of management characteristics
I = vector of infrastructural characteristics
L = vector of learning materials
T = vector of the number and quality of teachers
P = vector of pupil characteristics

H = vector of household characteristics
R = vector of regional characteristics.

2.4 Data

The study is based on available (existing) data. The main sources of information are:

- the *Annual School Census* for the years 2000-2005;
- the *National Assessment of Progress in Education* (NAPE) surveys of 2003, 2004 and 2005;
- examination data (P7) of the *Uganda National Examinations Board* for 2001-2005;
- the Uganda Demographic and Health Survey (DHS) for 2000/2001 (especially the *Uganda DHS EdData Survey 2001*);
- the *Uganda Population and Housing Census* of 2002;
- SACMEQ II data;
- a specific survey conducted for this study among 378 schools in 25 districts.

The heart of the analysis consisted of linking EMIS data (school census data in the Education Management Information System) with test and examination results at the school level. The (Uganda) study is based on data for the years 2000-2005. However, National Assessment of Progress in Education (NAPE) surveys are not panel-based and only a limited number of schools are sampled more than once. Still, the correlation between test and examination results (the primary leaving exam at the end of primary education) is very high (see chapter 5). Examination data of approximately 7,000-8,000 schools have been matched with EMIS data (which is more than 50% of the schools for each year). The three databases were complemented with an additional survey of 378 schools in 25 districts. These schools were sampled from the schools that were in the NAPE surveys in the years 2003-2005. The fieldwork included a survey among teachers on the reasons for (teacher) absenteeism.

Although the analysis is conducted at the school level, it is important to take into account household and community (or regional) characteristics. The impact evaluation uses two sources to take the differences between households and regions into account. The first is the DHS Education Survey of 2001. The data obtained from this survey make it possible to study the relation between pupil and household characteristics and school attendance. Another source is (a sample of) the Population and Housing census of 2002. Census information provides important explanations for socio-economic differences between regions. The study has linked the DHS with other data at the county level. Census data were linked at the

parish level.[5] Next, we were able to obtain information on the quality of management in two districts (approximately 125 schools).

The reliability of the data has been checked intensively through:

- triangulation (for instance by comparing the number of grade 7 pupils with the number of examination candidates);
- the analysis of changes over time;
- comparing census information with data from the field survey;
- analysing ratios (like pupil teacher ratios, pupil repeater ratios, pupil orphan ratios etc.).

Schools with improbable ratios have been deleted from the analysis. Even when these ratios are correct, then there is no point in adding such outliers that may have a disproportionate effect on the outcomes.

The analyses confirm that the reliability of the EMIS database is improving. In a similar study, the World Bank came to the same conclusion (see Winkler, 2007).

5 Uganda has an administrative structure covering 77 districts and 146 counties. Each county is divided in several subcounties and parishes.

3 Education policy

3.1 Introduction

Since 1999, the government of Uganda, aided by its cooperating partners, has mobilised resources to improve the quality of education in general and primary education in particular. Increased financing has enabled the sector to implement programmes such as Universal Primary Education (UPE), to build capacity in MoES as well at district level, and to establish strong partnerships between the public and private sector. The ministry developed two sector plans, the *Education Strategic Investment Plan* (ESIP 1998-2003) and the *Education Sector Strategic Plan* (ESSP 2004-2015) to improve access, quality, equity and efficiency in the delivery of sector services.

This chapter presents a brief description of the development of education policy in Uganda.[6] Section 3.2 sketches the demographic, political and economic contexts. Section 3.3 describes the development of education policy with an emphasis on the introduction and consequences of Universal Primary Education. Sections 3.4 shows how both the transition to the sector-wide approach as well as general budget support were in accordance with the education policy of the GoU. Section 3.5 provides a brief overview of the development of the education budget. The next section (3.6) gives a brief outline of Dutch support to the education sector in Uganda. Section 3.7 outlines several challenges facing the MoES and development partners. The chapter ends with a brief summary and a number of conclusions.

6 The focus of this study is not to describe the education policy, but the impact of interventions. The interested reader may wish to read Eilor, 2004, Ward, Penny and Read, 2006 or Leliveld, 2006.

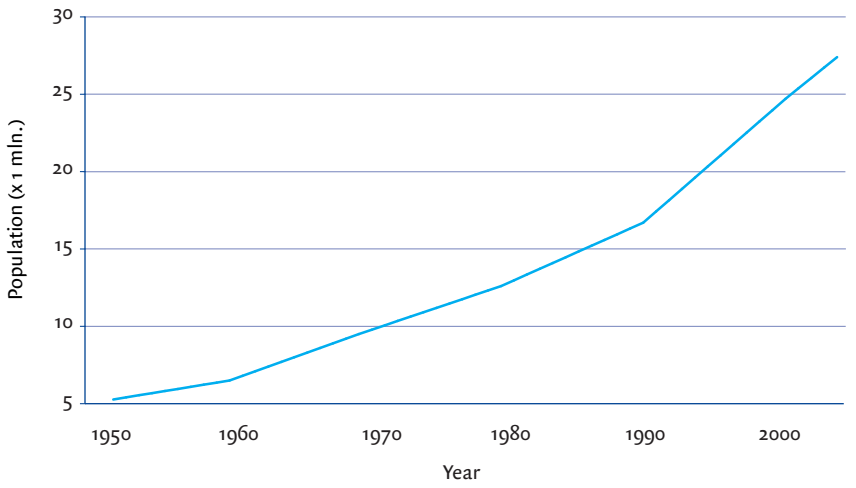
3.2 The context of educational development

3.2.1 Demographic context

The restructuring of the Ugandan education system took place in the context of a fast-growing population. Uganda's population increased nearly fivefold from approximately five million in 1950 to 27 million in 2006 (see figure 3.1). Between January 1991 and September 2002 alone, there was an increase of eight million persons, which represented the highest increment ever recorded. The current population growth rate of 3.2% per annum is largely attributed to a high fertility rate of approximately seven children per woman, a relatively high birth rate and declining infant mortality and crude death rates. According to recent projections, the total population of Uganda will reach a total of 127 million by 2050. This development has enormous consequences for the education system in Uganda.

Presently, the central region has the largest share of the population (27%) whereas the western, eastern and northern regions have a share of 26%, 25% and 22%, respectively.

Figure 3.1 *Development of the population (1950-2006)*



Source: UBOS.

3.2.2 Political context

The foundations of Uganda as a national state were laid in 1886, when it became a British Colony. In that period, all policies were developed and approved in London. In October 1962, Uganda gained political independence. Milton Obote, the leader of the Uganda People's Congress (UPC) became prime minister of a coalition government. The country retained a unitary system of government and Kampala became its capital. The districts had only limited power to initiate their own policies or programmes. Obote gradually imposed control over both his own party and his coalition partners. In 1966, he arrested five of his ministers, suspended the constitution, deposed the President, and transferred all executive powers to himself. Between 1971 and 1979, Uganda was under the military dictatorship of Idi Amin. During this period, constitutionalism was suspended and the country was plunged into civil unrest, which culminated in economic collapse.

After Amin's removal, the Uganda National Liberation Front formed an interim government with a ministerial system of administration and a quasi-parliamentary organ known as the National Consultative Commission (NCC). In 1980, the military regained power and in December of that year, elections brought Obote back to power. Under Obote, Uganda had one of the world's worst human rights records. In 1985, Obote fled into exile and in 1986 the current NRM government came to power and restored both economic and political order throughout the country. The new government subsequently embarked on an ambitious political and economic reform programme that included empowering local government through decentralisation. The decentralisation policy was later enshrined in the new constitution promulgated in 1995 and legalised by the Local Government's Act of 1997. The Act established district, municipality and sub-county/ division/ town councils as corporate bodies of Local Governments and delegated to them powers and responsibilities in such areas as finance, legislation, planning and personnel matters.[7] During the 1990s, parliament was reinstated. Individual members were elected again, without formal party affiliations.

3.2.3 Economic context

Uganda's economy is primarily agrarian. The main agricultural products are coffee, tea, cotton, tobacco and cassava. Uganda's main exports are coffee, tea, fish, electrical products, iron, steel, gold and flowers and horticultural products Exports go to Kenya, Belgium, the Netherlands, France and Germany.

7 Uganda Government. The Local Government Act, 1997.

The civil strife between 1971 and 1985 resulted in fiscal and monetary mismanagement and a general lack of budgetary discipline for many years. This led to total breakdown of the physical infrastructure and social services. When Museveni came to power in 1986, GDP was approximately 40% lower than in 1971. Corruption was high, the exchange rate was overvalued and inflation was rampant (Leliveld, 2006, p. 3). These factors adversely affected economic and social development.

After 1986, the new government and its development partners began implementing structural adjustment policy packages that involved trade liberalisation, privatisation and divestiture of public enterprise, foreign exchange liberalisation, reorganisation of tax revenue collection, civil service reform, reduction in the size of the army, decentralisation, streamlining of investment policy and rehabilitation of the socio-economic infrastructure. In 1987, the GoU launched an *Economic Recovery Programme* (ERP). In 1992, the Ministries of Finance and Planning and Economic Development merged into the new Ministry of Finance, Planning and Economic Development (MFPED). As a result of these structural adjustments and the liberalisation of markets, the economy boomed during the 1990s, with an average growth of 7% per year.

In addition, the government reoriented its development programmes towards poverty eradication and improvement in the delivery of social services. In 1997, the government developed a policy framework for fighting poverty known as the Poverty Eradication Action Plan (PEAP). This plan may be seen as Uganda's overarching national planning document that signals poverty eradication as the government's ultimate goal. It was accepted as Uganda's Poverty Reduction Strategy Paper (PRSP). PEAP provides a framework for the development of detailed sector plans and investment programmes, districts plans and the general budget process. PEAP has identified five priority areas: economic growth, basic education, basic health services, rural sanitation and rural roads. By the end of the 1990s, government and development partners adopted Sector-Wide Approaches (SWAps) to address sector-specific constraints within the framework of the Poverty Eradication Action Plan. Uganda became one of the main beneficiaries of development support and was among the first sub-Saharan countries to qualify for debt relief under the Highly Indebted Poor Countries (HIPC) initiative in April 1998. Relief savings and additional donor funds have been channelled through the Poverty Action Fund (PAF) to sustain the social services sector, including primary education and health.

The stabilisation of Uganda's economy and monetary sector was achieved through a complementary application of policies strictly limiting expenditure to the available

resource envelope. In that regard, the three-year rolling Medium Term Expenditure Framework (MTEF) is the government's master expenditure planning tool. It is regularly reviewed and implemented on the basis of the Annual Budget. Both the MTEF and the Annual Budget are products of an increasingly consultative and participatory process. On the basis of the MTEF, the line ministries prepare a Medium Term Budget Framework (MTBF). Sector/district plans are implemented within an overall MTEF.

3.3 Restructuring of the education system

3.3.1 Introduction

Between 1971 and 1985, Uganda's education system was severely disrupted. Prior to the introduction of Universal Primary Education (UPE), the status of the primary education sub-sector in Uganda was extremely poor. Budgetary allocations to the education sector declined from 3.4% to 1.4% between 1971 and 1985 and most of the burden of financing education was borne by parents. The physical infrastructure had deteriorated or was completely destroyed and the teachers' take-home pay had fallen far below the minimum living wage. In addition, there were glaring regional and gender disparities in the distribution of basic educational opportunities. Above all, the management and planning of education service was inadequate at all levels and the curriculum and related assessment system were obsolete. Still, the gross enrolment ratio for children between 6 and 12 years old was 69% in 1990. Cohort survival rates were very low, especially for girls. Approximately 40% of primary teachers were untrained and even those who were recognised as 'trained' lacked basic skills. The physical school infrastructure was in a state of disrepair and there was an acute shortage of instructional materials.

3.3.2 Universal Primary Education

In 1986, the government introduced initiatives and innovations to initiate an education reform and reconstruction process and to improve the quality of basic education in Uganda. This process resulted in the government *White Paper on Education* of 1992. Upon his election to the presidency in 1996, Museveni announced free primary education for the first four children per family. Difficulties in establishing eligibility criteria forced the government to abandon the 'four children ceiling' and extend free education to all school-age children.

The overall objective of this policy of Universal Primary Education (UPE) was to increase access, equity and quality of primary education in Uganda with a view to eradicate illiteracy and subsequently transform society. The specific objectives of UPE include:

a) establishing, providing and maintaining quality education as the basis for promoting necessary human resource development;
b) transforming society in a fundamental and positive way;
c) providing the minimum facilities and resources needed to enable every child to enter and remain in school until the primary cycle of education is complete;
d) making basic education accessible to the learner and relevant to his or her needs as well as meeting national goals;
e) making education equitable in order to eliminate disparities and inequalities;
f) ensuring that education is affordable by the majority of Ugandans;
g) fulfilling the government's mission to eradicate illiteracy and equip each individual with the basic skills and knowledge to exploit their environment for both self and national development.

Since 1997, the government took over the responsibility of paying tuition fees for all children enrolled in government-aided primary schools, regardless of their family background. This was Ush 5,000 per pupil per annum for pupils at primary 1-3 and Ush 8,100 for pupils at primary 4-7. Later, this grant was replaced by a threshold amount of Ush 900,000 per school and a variable grant of Ush 3,464 per P1-P7 pupil per annum.

At the inception of the UPE programme, parents continued to shoulder the payment of PLE fees. Although the figure of Ush 6,100 (USD 4) was deemed affordable, the reality was that a considerable number of parents, particularly in rural areas, could not afford it. Consequently, school dropout rates increased. In 2000, government assumed full responsibility for the payment of PLE fees for all 'UPE children'. Currently, the fee is Ush 10,000.

3.3.3 Structure of the education system

Uganda's education system is based on a four-tier model: primary education, secondary education, BTVET and tertiary education. This model has existed since the early 1960s. The education system consists of seven years of primary education for pupils aged 6-12, followed by four years of lower (ordinary) and two years of upper (advanced) secondary education. At the end of primary seven, children sit the primary leaving examination (PLE). Graded pupils obtain a Primary Leaving Certificate and those with the highest marks are admitted to secondary education. (UNEB uses a 1-4 grade system). Primary school completers can also follow a three-year crafts course at a technical school. After secondary education, students may go to university, to teacher colleges or to business, technical or vocational educational institutions.

3.3.4 Education of disadvantaged children

UPE was initially developed to benefit all school-going age children (6-12 years old). However, it did not succeed in reaching all of them due to social exclusion. Social exclusion is caused by a number of limiting factors, including disability, geographical location, culture, ethnicity, language and conflict. Geographical factors have direct implications for the education of children. The ragged terrain of areas such as Karamoja in the northeast, Sebei in the east and Kisoro and Kabale in western Uganda impairs accessibility to education facilities (Byamugisha and Ssenabulya, 2005, p. 1). The 20-year old conflict with the Lord's Resistance Army (LRA) in the northern and northeastern districts has had a devastating impact on (primary) education. The LRA has forced many children to become armed fighters.

These factors have created groups of disadvantaged children such as refugees, physically and mentally handicapped children, children of nomadic societies and those in urban poor areas. Several initiatives have been undertaken to provide these groups of out-of-school children with education through alternative delivery modalities. These include:

i) *Alternative Basic Education for Karamoja (ABEK)*

In 1997, the MoES launched ABEK with support from Redd Barna, a Norwegian NGO. It was specifically designed to reach the pastoral, semi-nomadic communities of Karamoja in northeast Uganda (six parishes in the Kotido and Moroto districts) to overcome their cultural resistance against the formal school system. ABEK mainly targets children aged 6-18 years. Teaching is done at homesteads in the morning before the children take the animals out to graze and in the evening after supper. In 2006, the programme had an enrolment of 15,000 pupils in 128 learning centres.

ii) *Basic Education for Urban Poverty Areas (BEUPA)*

BEUPA is a non-formal basic education programme supported by GTZ in cooperation with the MoES and the Kampala city council. The programme targets out-of-school children and those who did not have the opportunity to attend school at the appropriate age in the country's main urban areas. The project is implemented in the capital city, Kampala.

iii) *Complementary Opportunities to Primary Education (COPE)*

COPE is a non-formal education programme designed for children aged 10-16 years who have never attended school, or who enrolled but dropped out before having acquired basic skills and literacy. The programme targets disadvantaged children

in ten districts: Arua, Bushenyi, Kamuli, Kisoro, Masaka, Mbarara, Mubende, Nebbi, Sembabule and Kalangala. UNICEF provides technical and financial support.

iv) Child-centred Alternative Non-formal Community-based Education (CHANCE)

This programme was established for nomadic pastoral children who are out of school and were unable to access UPE in Nakasongola district. It has been extended to Luwero and Wakiso districts.

v) Empowering Lifelong Skills Education in Masindi (ELSE)

ELSE was introduced in 2002 on behalf of children in Masindi district who were unable to access formal education.

vi) Special Needs Education

The education of children with special learning needs has been prioritised and therefore a separate MoES department was created to promote the interests of children suffering from hearing impairment, visual impairment, mental retardation, etc. The education of children with physical impairment has been integrated into the country's regular basic education system.

vii) Affirmative Action in Support of the Girl Child

In order to promote gender equity in basic education, the Ugandan government has initiated a series of grass-root campaigns to increase the number of girls in primary school. In addition, Uganda embraced the Girls' Education Movement (GEM), which is an Africa-wide popular movement launched in 2001 to promote quality education for girls. It focuses on enhancing girls' enrolment rates, development of their leadership and technical skills, assisting girls with special needs and mobilising communities to support the education of the girl child.

3.3.5 Revision of the primary school curriculum

In the 1990s, the GoU started to review the primary school curriculum of 1990 in order to make basic education relevant to the needs of individuals by equipping every individual with basic skills. It was to focus on functional literacy and numeracy, effective communication skills in local languages, appreciation of diversity in cultural practices, traditions and social organisations and acceptance of differences in social beliefs and values. The government set up a taskforce and subject panels to take the process forward, which resulted in a new two-volume curriculum in 1998/1999. The first volume of the primary school curriculum contains four core subjects (English Language, Integrated Science, Mathematics

and Social Studies). The second volume contains Integrated Production Skills (IPS), Kiswahili and Mother Tongue, Music, Dance and Drama, Physical Education and Religious Education.

As early as 1999, concerns were raised over the new curriculum. The main concerns were (see Ward, Penny and Read, 2006, pp. 40-41):

- teachers and other stakeholders complained that there were too many subjects and too much content;
- development partners considered a ten-subject curriculum too expensive and were not willing to fund the textbook implications;
- there were concerns over the cost implications of subjects like Integrated Production Skills (IPS);
- the lack of attention to literacy issues was seen as a mistake;
- there were disputes over the language of instruction and the viability of Kiswahili as a compulsory subject.

Apart from these concerns, the lack of detailed planning and the absence of a budget created serious implementation problems. Teachers received their textbooks years too late and for some compulsory subjects (Kishawili and IPS), they did not receive teaching materials at all. Furthermore, the teacher training curriculum was not adjusted to the new primary curriculum.

In 2003, the MoES installed a taskforce to review the primary curriculum. In June 2004, the review concluded that the overall performance of primary school pupils had not significantly improved over the previous five years and that literacy levels in English and in local languages were low. It was concluded that because students failed to develop early literacy, they performed poorly in all curriculum subjects (Ward, Penny and Read, 2006, p. 42). On the basis of the review's conclusions, the ministry initiated a reform in 2005, which resulted in the introduction of a new 'thematic curriculum' in 2007. This curriculum is designed to meet the needs of the Ugandan child in primary 1-3. The content and skills taught are arranged around a number of different themes rather than subjects. The thematic curriculum focuses on Literacy (reading and writing) in local language or English, Numeracy and Life Skills Education.

The introduction of the new thematic curriculum may be accompanied by the same problems as in 1998/1999: the training budget was inadequate, teachers only received one week of training, schools did not receive their books in time and

the introduction period was short. Consequently, it is to be expected that the new curriculum will not be very effective in the first year(s).

3.3.6 Planning framework

The introduction of free primary education necessitated large investments in the education sector. The *Education Sector Investment Plan* (ESIP) for the period 1997-2003 formed the basis for these investments. The basic principles of the sector plan were dictated by the government *White Paper on Education* of 1992 and the *Poverty Eradication Action Plan* of 1997. The ESIP's broad policy priorities were (see Byamugisha and Ssenabulya, 2005, pp. 8-9):

1) *Expanding access*
   - achieving universal enrolment of primary school-aged children by the year 2003;
   - ensuring that post-primary vocational opportunities are in place for primary school leavers;
   - achieving and maintaining high transition rates from primary to secondary schools.
2) *Enhancing the quality* and relevance of instruction through procurement of relevant instructional materials and training of teachers.
3) *Increasing equity*
   - continuing the shift in public expenditure allocation in favour of broader access to basic educational opportunities;
   - directing special incentives to disadvantaged groups to attract them to school.
4) *Public-private sector partnership:* creating a financial framework for sustained and equitable educational provision with appropriate levels of contribution from public sector, private sector and household community partnerships especially at post-primary level.
5) *Strengthening the capacity* of central government to formulate sectoral policy and broadly direct financial resources in response to evolving priorities and needs.
6) *Enhancing the capacity of districts and local governments* and promoting greater participation and responsibility of local authorities andcommunities in the development of education at all levels.

The *Education management Information System* (EMIS) was introduced to improve the management and planning procedures of the education sector by providing accurate information and building staff capacity in the education sector through trainings.

The main objective of this sub-component is to strengthen the administrative sector. In order to achieve this objective, top and middle-level management is to be trained on the principles of management and the use of new administrative systems. This in turn would result in an improved capacity for planning, managing and implementing various education programmes. Additionally, new information systems are required in order to solve the problem of record keeping. Making data readily available would substantially improve planning, management, and budgeting procedures.

In 2005, the MoES adopted the *Education Sector Strategic Plan 2004-2015* (ESSP) as a follow-up to the *Education Strategic Investment Plan* of 1998-2003. With regard to the primary education sector, this plan prioritised shifting the focus from access to quality of education. The main goal of the first plan was to get all children into primary school. Later, the MoES recognised that children were not learning basic skills and that is was necessary to invest more in the quality of education. In order to realise this objective, the ministry proposed to:

1) introduce a new curriculum;
2) adopt effective methods of instruction and train teachers in their use;
3) increase instructional time;
4) examine pupils only in reading, writing and math.

3.4 Sector-wide approach and general budget support

The GoU's increased attention for the education sector coincided with the decision made by donors to shift from projects to sector and budget support. It was felt that too often development assistance was based on un-coordinated projects, led by agents that did not receive adequate support at the national level. As a result, the sustainability of a large number of projects was questionable. Moreover, project support could contribute to institutional fragmentation and incoherence in policy execution (Eilor, 2004). In the early 1990s, twelve donor countries, four UN agencies, three major multilateral financial institutions and a large number of NGOs provided assistance in the education sector in the form of more than 100 different projects (Ward, Penny and Read, 2006, p. 9). In 1997, the MoES received over thirty separate missions. The idea for a Sector-Wide Approach on education in Uganda emerged in 1996 and was realised with the establishment of ESIP in 1997. The initial group of supporting agencies was relatively small and included DFID, Ireland, the Netherlands, USAID, the European Commission and the World Bank (Berry et al., 2003, p. 14). Their objectives were (see Eilor 2004, p. 79-80):

a) increased national ownership;
b) improved service delivery;
c) improved institutional and financial sustainability;
d) reduced dependence on aid;
e) an effective framework for policy dialogue and performance monitoring;
f) improved coherence between macro-economic management, public sector reform, sector policies and development programmes;
g) reduced transaction costs and
h) enhanced stakeholder participation.

Within the framework of the sector-wide approach, the development partners created the *Education Funding Agencies Group* (EFAG). EFAG's common aim is to coordinate budget support, project support and technical assistance.

Cooperation between GoU and development partners was based on a draft Memorandum of Understanding (MoU). In this MoU, the GoU and the 15 EFAG partners agreed on the modalities of the cooperation. The MoU appreciated the willingness of EFAG members to plan, budget and mobilise their support in line with the Ugandan government's planning and budgeting cycle by means of a three-stage process:

- multi-annual planning, with indicative commitments for at least three years;
- annual confirmation of contributions to the education budget and
- half-yearly releases of funds.

The draft also stipulated that trigger performance indicators were to cover critical progress in the sector and process issues affecting the implementation of education sector priority activities. The draft MoU was never signed, mainly because the MOFPED and MoES failed to agree on who was to sign it on behalf of the GoU (Eilor 2004, p. 116). Therefore, all contracts still need to be signed on a bilateral basis (Leliveld, 2006, p. 35).

EFAG members meet every month and its representatives meet the top management of the ministry every two months, within the *Education Sector Consultative Committee* (ESCC). ESCC members are MoES heads of department, representatives of donors, NGOs, relevant line ministries and semi-autonomous bodies under MoES, as well as secretaries of departments and cross-cutting working groups. All stakeholders take part in bi-annual *Education Sector Reviews* to discuss progress in the education sector. EFAG participates in planning, reviewing documents and preparing the

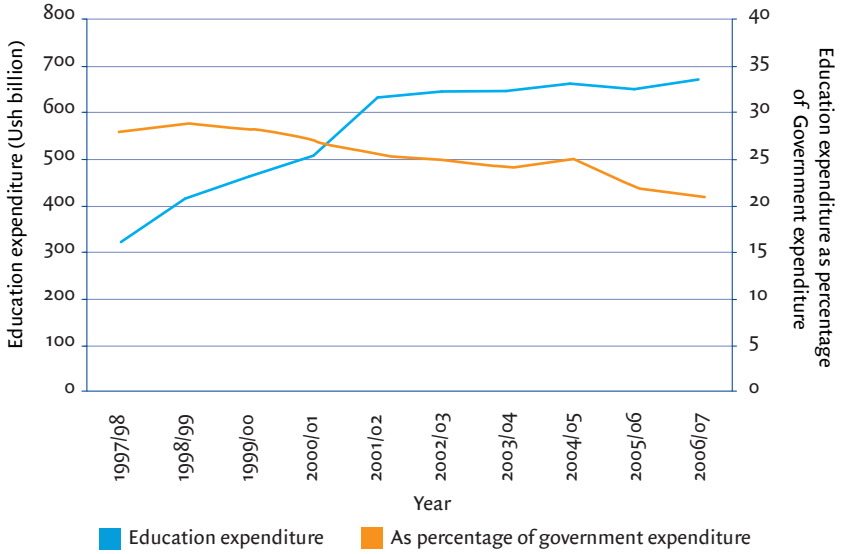
Aide-Memoire. Technical assistance is pooled within EFAG and managed through a consolidated fund.

Development partners and the government have increasingly focused their dialogue on ownership, capacity building within the education sector and critical outcomes such as pupil teacher ratios and pupil classroom ratios. For the evaluation of progress on education, MoES and EFAG define critical and process undertakings. These undertakings are evaluated and negotiated during Joint Education Sector Reviews (JESR). The EFAG donors release their budgets on the basis of these undertakings. *Critical undertakings* include targeted performance indicators to be monitored at each sector review. The focus is on financial commitment, public expenditure management and quality enhancement. *Process undertakings* focus on strategic areas where support in needed in order to achieve the sector priorities. These process undertakings are monitored through the ESCC.

3.5 Budget

Increased financing enabled the sector to undertake programmes such as Universal Primary Education (UPE), build capacity in MoES as well as at district level and forge stronger partnerships between the public and private sector. Between 1998 and 2002, external support has funded between 54% and 61% of the recurrent costs of primary education (Berry et al., 2003, p. 19). General budget support has made it possible for the GoU to spend approximately 5% of the national income on education. Between 1997 and 2001, expenditure on education doubled. Nevertheless, the expenditure on education is decreasing as a percentage of total government expenditure.

Figure 3.2 *Education expenditure 1997/1998 – 2006/2007 (constant prices 2007; excluding interest payments)*



Source: Lister et al (2006) / Ministry of Finance, Planning and Economic Development / computation IOB.

Approximately 30% of the *recurrent* budget goes to education, with primary education as the main beneficiary. The ESIP target for the period 1998/99-2003/04 was fixed at 31% of the total government recurrent budget, whereas 68.5% of the education budget was earmarked for primary education.

Table 3.1 *Share of education sub-sectors in the total expenditure on education*

	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	2006/ 2007
Primary	72.0	69.2	66.9	68.4	66.0	67.1	59.7
Secondary	12.5	13.8	15.0	14.9	17.0	16.1	22.2
BTVET	3.5	4.3	4.3	3.8	4.0	3.9	3.8
Tertiary	3.5	3.3	3.5	9.9	10.0	11.1	11.7
Other	3.5	3.3	3.5	3.0	3.0	1.1	2.3

Source: MoES / computation IOB for 2006/2007.

The primary education budget includes wages, non-wage recurrent expenditure and development expenditure. The main part of non-wage recurrent expenditure is for the UPE capitation grant, PTC capitation grants and instructional material.

Kamurasi primary school, Masindi.

The largest part of the development budget is for the School Facilities Grant (SFG), school furniture and the development of PTCs.

In 2005, there were approximately 6.6 million pupils in public schools for primary education. Expenditures per pupil amounted to approximately Ush 60,000 (EUR26). Figure 3.3 shows the increase in the share of wages in the total expenditure for education. In the fiscal year 2001/2002, approximately 56% of primary sector expenditure was spent on wages; by 2005/2006 this had increased to 70%. As a result of the growing number of teachers, non-wage expenditure gradually declined. Moreover, the 2006 salary increase, from Ush 150,000 to Ush 200,000, further reduced the proportion of non-wage expenditures.

Figure 3.3 *Expenditure on primary education 2001/2002 - 2005/2006*

Source: MoE / computation IOB.

Budgeting takes place within the framework of the *Medium Term Budget Framework* (MTBF), in accordance with the central *Medium Term Expenditure Framework* (MTEF). The Education Sector Working Group (ESWG) within the MoES prepares the Medium Term Budget Framework (MTBF). ESWG consists of central government representatives, education sub-sectoral representatives, EFAG, NGOs and other stakeholders. It is the ESWG, in concert with the MoES top management, which:

- allocates MTEF resources in accordance with ESIP priorities, recommendations of the Education Sector Reviews (ESRs) and the budgetary ceilings defined by the MoFPED;
- produces the Budget Framework paper for onward submission to the MoFPED and subsequent incorporation into the National Budget Framework Paper (NBFP);
- initiates the process of appraising new educational programmes before they are forwarded to the MoFPED for final evaluation by the National Development Committee (NDC).

3.6 Dutch support to the education sector

Until the early 1990s, Dutch contributions in the sphere of education targeted higher and vocational education. The World Conference at Jomtien (1990) marked a change in policy. In accordance with the agreements at Jomtien, the

Netherlands started to devote more attention to basic education. In 1992, the Dutch government recognised that its support of basic education was not in line with the problems and needs of developing countries. At that moment, several computations showed that a tenfold increase of international support would be required in order to realise the EFA goals. Already then, the Netherlands had concluded that donors would have to collaborate more effectively and adjust their policies to national priorities. While still mainly implementing its own projects, the Ministry of Foreign Affairs gradually moved in the direction of sector support.

The main shift occurred in 1998, when the new minister for Development Cooperation announced the introduction of the Sector Wide-Approach as the main organising principle for bilateral aid (IOB, 2006). In accordance with this new policy, the ministry formulated its policy principles in the document *Education: a basic human right, development cooperation and basic education: policy, practice and implementation* (Netherlands Ministry of Foreign Affairs, 2000). Dutch policy on basic education aimed at the sustainable improvement of high-quality education systems in developing countries, which are accessible to all and contribute to a more democratic and equitable society.
Dutch policy objectives included:

- improvement of the quality and relevance of basic education;
- equal opportunities for people from disadvantaged groups;
- reduction of gender disparities.

This shift in policy was in line with the sector-wide approach (SWAp). Cooperation within the framework of the SWAp was conditional on:

- the priority given to education and within the education sector to basic education;
- a gradual increase in the budget for basic education;
- a national action plan specifying how the EFA goals were to be realised.

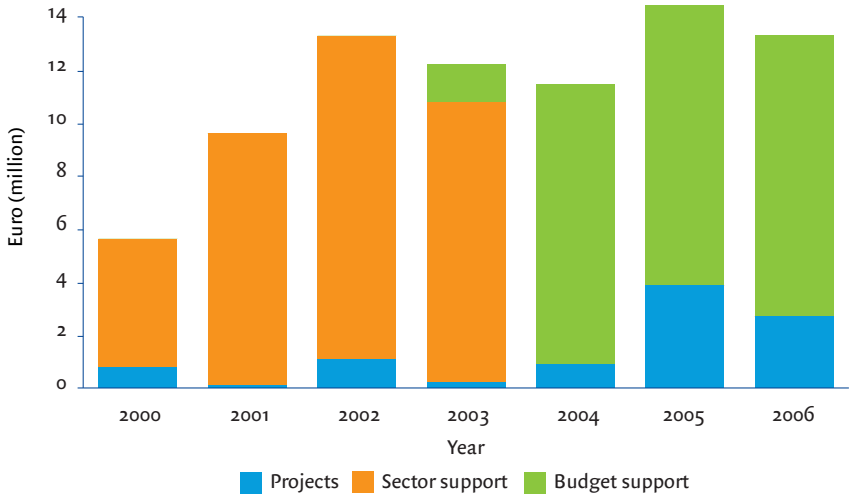
Now, in 2007, 15% of the development budget goes to basic education.

In the 1980s, Dutch bilateral aid to Uganda was relatively low (on average USD 5 million). It took off from 1991 onwards, when Uganda regained its special status as a 'concentration country' (Leliveld, 2006, p. 12). During the 1990s, Dutch aid to the education sector in Uganda increased as well (from USD 0.8 million in 1996 to USD 5.5 million in 1999). Interventions in the education sector included a variety

of projects and activities including women empowerment, classroom construction and furniture provision, the provision of teaching and training materials and procurement of instructional materials.

Figure 3.4 is a graphic presentation of Dutch support from 2000 to 2006. The graph illustrates the move from sector support to general budget support. Part of the general budget support is 'notionally' earmarked. The continuation of this support depends on 'satisfactory progress' on education. If the outcomes of sector reviews are negative on specified indicators, the Netherlands may postpone or stop its releases (Leliveld, 2006, p. 24).

Figure 3.4 *Dutch contribution to education in Uganda (2000-2006)*



Source: Netherlands Ministry of Foreign Affairs.

Through EFAG, a representative of the Netherlands Embassy, together with other stakeholders, is involved in policy dialogues at all key stages of the process. The Netherlands contributed to the curriculum review and participates in several working groups (such as the Working Group for the Sector Budget, the Control and Evaluation Working Group and the Taskforce for the Curriculum Review). In 2004, the Netherlands financed a project to provide furniture for primary schools in rural areas. As a result, approximately 80,000 pieces of furniture were distributed to rural areas. Presently, the Royal Netherlands Embassy is about to start implementing a bursary scheme for the northern region in order to promote reconciliation and ensure meaningful engagement of beneficiaries in development activities.

In January 2006, the Netherlands agreed on a new *Joint Assistance Strategy for the Republic of Uganda* (UJAS) for the years 2005-2009 with seven other development partners.[8] This strategy paper outlines developments within Uganda, opportunities and risks, the strategic principles of the eight partners, financing scenarios and a results-based monitoring and evaluation framework.

3.7 Challenges

The sector-wide approach and general budget support are based on the assumption that the ministries and local government units in Uganda have the capacity to implement PEAP and its related SWAps effectively and efficiently. However, several recent studies point to a weak institutional capacity at central and local levels (Leliveld, 2006, p. 7). As early as 2002, the head of the MoES planning department noted that the ministry faced numerous problems (Malinga, 2002):

- ministerial restructuring revealed various inadequacies related to the increased volume and complexity of work and the shortage of personnel;
- staff did not possess the required skills;
- procedures and machinery for coordinating government-wide undertakings were not fully developed.

A number of studies reveal that capacity building at all levels, especially at decentralised levels, still constitutes a major challenge (see, for instance, Eilor, 2004, Smith, 2004 and Ward, Penny and Read, 2006). In many cases, technical assistance is poorly structured and prepared. Frequently, knowledge and capacity were not transferred effectively to local counterparts (EFAG, 2002). Moreover, there is a potential flaw in the transition to sector support and general budget support. Several countries reduced their technical assistance when they shifted to sector support and budget support, but it appears this reduction was rather premature. Public sector reform in Uganda had resulted in the downsizing of MoES headquarters, but at the expense of transaction costs at the district level (Eilor, 2004). This situation created enormous management problems for district officers.

Another point of concern is the relations between headquarters and district offices. The linkage between the MoES and the districts is weak. Moreover, there is no linkage between the districts and the sub-county level. Officials within the MoES in Kampala feel that districts are not doing enough to combat teacher

8 Together with the African Development Bank, Austria, Germany, Norway, Sweden, DFID and the World Bank.

absenteeism and the misuse of funds. Districts, on the other hand, have the idea that headquarters are silently recentralising. They feel that they do not get enough support from the headquarters. Districts and schools complain of decreasing and inadequate budgets. The central government has abolished local taxes, but it has not increased the school facilities grant. According to one of the district officers, the SFG is barely enough to build ten classrooms. UPE grants come too late and many schools have debts. Inspectors lack the means to visit schools regularly. The current division of tasks between the MoES and the Ministry of Local Governments (MoLG) has not improved service delivery.

These problems are related to the problems of corruption and the abuse of funds. A study carried out in 1996 established that in the period 1991-1995 only 13% of the funds allocated for non-wage spending actually reached schools (Reinikka and Svensson, 2004). The bulk of school grants was captured by local officials and politicians. A simultaneous cleanup of the teacher payroll revealed that in 1993, 20% of the salaries were paid to non-existing 'ghost-teachers' (Reinikka, 2001). In reaction to these results, the GoU developed a mechanism in which non-wage funds are transferred directly to school accounts and the moment of allocation is publicly announced. These measures led to a significant improvement in the proportion of resources that reach the schools. In 2001 and 2002, tracking surveys reported that 60% and 80% of the funds, respectively, reached the schools (Eilor 2004, p. 100). For 2001, Reinikka and Svensson (2003) report a capture of less than 20% (compared to 80% in 1995). The authors conclude that 'public access to information' is a powerful deterrent to capture at the local level. Recent tracking studies reveal that over 90% of the released funds reach the primary schools (Ward, Penny and Read, 2006, p. 13). However, there are still many problems. Inspections report ghost teachers and ghost pupils. The government inspectorate, district inspectors and the Education Standards Agency are understaffed and/or have a weak mandate. Another problem is that many members of school management committees (SMC) demand attendance allowances, reducing the school's actual budgets. A major concern of development partners is that in a political context with personal and vertical links between patrons and clients, rational and transparent decision-making cannot be guaranteed (Ward, Penny and Read, 2006, p. xii).

Heavy reliance on foreign aid raises discussions on ownership (Leliveld, 2006, p. 42): 'While the external agencies are convinced that they have put the government of Uganda in control, this perception is not fully shared by the Ugandan officials' (Eilor 2004, p. 23). There is a tension between ownership and the priorities of

development partners. According to development partners, the MoES and the GoU have tended to take decisions without regard for their pedagogical or financial implications (Ward, Penny and Read, 2006, p. 3). Examples are the 2006 presidential directive to increase primary teacher salaries and the recent abolishment of school fees for secondary education. Moreover, SWAp and general budget support reduce the visibility of results achieved through contributions of development partners. Development partners within EFAG focus on agreed targets and the continuation of their support is conditional on the attainment of these targets. But several problems arise in this respect.

First of all, there is an inherent tension between accountability to external partners and domestic accountability and ownership. Development partners have the feeling that the whole process is too politicised and that too many decisions are based on patronage and personal relations. They find it difficult to take action within the structure of SWAp and general budget support to improve performance in specific delivery areas such as classroom construction and the procurement of textbooks (Ward, Penny and Read, 2006, p. 27).

Second, several cooperating partners feel that the MoES does not respond adequately to several major challenges in the sector:

- the low quality of education;
- low completion rates: when the first UPE graduates came out of school in 2003, it was discovered that a substantial percentage of pupils had not completed the primary school cycle;
- high pupil teacher ratios and high absenteeism of teachers;
- the transition from primary to secondary school: at the moment, only 40% of primary school leavers go to a secondary school;
- the retention of education, which is at the heart of the strategy to eradicate poverty;
- improvement of the budgeting and monitoring processes.

Third, the conditionality of continuous support for the realisation of agreed targets is not an incentive for the MoES to set ambitious targets. Due to a focus on aggregated average figures, underlying inequalities tend to be disregarded.

Finally, the monitoring function still focuses too much on input and process indicators (Adam and Gunning, 2002, Eilor 2004) and aggregated MDGs. The scope of monitoring and evaluation functions must be expanded to become

Primary school in Northern Uganda. Photo Alice Ibale.

instruments for the improvement of the quality of education. Information of the annual school census needs to be combined with information obtained from UNEB (NAPE and PLE) and ESA (inspection reports).

3.8 Summary and conclusions

This chapter outlined the development of education policy since the mid-1990s. Uganda became famous as one of the first African countries to abolish school fees at one stroke. The abolishment in 1996 was promoted in the context of an election campaign, but it was also in accordance with the principles of Jomtien, the national Poverty Eradication Action Plan and national education policy.

As a direct follow-up to the implementation of Universal Primary Education (UPE), the government launched its first investment plan for the education sector for the period 1998-2003. This plan focused on access to primary education and consequently to 'education for all'. The introduction of UPE coincided with the moment development partners shifted from project to sector support and later to budget support. It is fair to conclude that the fact that several donors made the transition to sector support created the financial preconditions for universal primary education.

For several years, policy priorities of GoU and donors had coincided, but in recent years, GoU and donors have faced a number of challenges. First, the heavy reliance on foreign aid raises questions on the ownership. Whereas development partners feel they must put the GoU in control, many MoES officials have a different perception. Some see conditional targets as a form of chequebook diplomacy. Whereas lack of ownership is a problem inherent in the project approach, SWAp and GBS create other tensions.

The perceived lack of results also created new tensions. SWAp and GBS are based on the assumption that the MoES and local government units have the capacity to implement the necessary measures effectively and efficiently and that these measures will have significant effects in the near future. In retrospect, expectations were too high. The MoES still faces capacity problems, at the central level as well as the local level. Moreover, these problems create tensions between the Kampala headquarters and the district offices. According to the headquarters, several districts fail to effectively combat the problems of pupil and teacher absenteeism and the abuse of funds. Districts and schools, on the other hand, complain of decreasing and inadequate budgets.

4 Education indicators 2000-2006

4.1 Introduction

Chapter 3 presented a brief overview of the development of primary education policy in Uganda. Mainly as a result of the political and economic developments before 1986, the education sector was in a dismal state at the beginning of the 1990s. Low enrolment and low quality necessitated substantial investments in the schooling and training of teachers, infrastructure and provision of instructional materials. The introduction of free primary education gave an enormous boost to enrolment and this necessitated new investments. It was essential that the number of teachers, classrooms and books kept pace with this growth in enrolment.

This chapter outlines the results of these investments, (mainly) for the years 2000-2006. Section 4.2 focuses on investments in teachers, teaching materials and school infrastructure. Apart from developments over time, the chapter also provides insight in a number of regional differences. Sections 4.3 and 4.4 describe the development of enrolment and learning achievement. Section 4.5 ends with a brief summary and a few conclusions.

4.2 Output: teachers, classrooms and instruction materials

4.2.1 Teachers

The recruitment and training of large numbers of new teachers necessitated intensive training programmes and expansion of training capacity. One of the main instruments in this regard was the *Teacher Development and Management System* (TDMS). TDMS was launched in 1994 as a World Bank project and was co-financed by USAID (Ward, Penny and Read, 2006, p. 75). After the introduction of UPE, it became part of the Primary Education Reform Programme (PERP). Since 1998, the TDMS system has been funded by the GoU, with support from the EU, Irish Aid, USAID and the Netherlands.

TDMS aimed to improve the quality and equity of primary education in Uganda through improved teacher training, development and professional support. TDMS is a training system staffed by teacher educators and has the appropriate training and resources to provide a wide variety of support services to schools and teachers, based on national and local educational needs. It provided pre-service training for untrained and under-trained teachers and in-service training and professional support for all serving teachers, head teachers, education managers and community mobilisers. Head teachers take a special one-year certificate course in basic management skills and other teachers participate in refresher courses. TDMS provided:

i) *Training.* Training helps to reduce the number of untrained teachers and also provides continuous support to all serving teachers.
ii) *Curriculum review*. The upgrading and strengthening of the relevance of the PTE curriculum was accomplished through the establishment of a curriculum review task force, appointment of subject panels and production of self-study materials.
iii) *Provision of Instructional Materials*. In order to maximise the supply and utilisation of instructional materials, emphasis was put on the selective procurement and distribution of core textbooks, teacher guides, teaching equipment (e.g. blackboards, slates, video vignettes, etc.) to core PTCs, CCs and selected outreach schools.
iv) *Infrastructure Provision and Equipment Supply*. A phased construction of new infrastructure was initiated at (23) core PTCs (Phases I and II), at classrooms in outreach schools (Phases I-III) as well as resource centres in all CCs (phases I-VI). In addition, the government decided to rehabilitate and/or expand the infrastructure in all core PTCs (phases III- VI) and to provide core PTCs, CCs, and selected outreach schools with the necessary equipment.

TDMS introduced a range of innovations, particularly in relation to training and empowerment of teachers, head teachers, tutors, education managers at various levels and the general community. These innovations include:

- new modalities for pre-service and in-service teacher training;
- Outreach Tutor Training;
- Voluntary Community Mobilisation (VCM);
- clustering schools to provide professional support.

Pre-service was developed to upgrade the skills of untrained and under-trained teachers, based on a revision of the Primary Teacher Education (PTE) course curriculum. It is an on-the-job training arrangement. The duration of the course is

three years and it leads to the award of a PTE Grade III Certificate, the minimum requirement for teaching in primary schools in Uganda. In-service training targets all serving teachers (trained, under-trained and untrained), head teachers, outreach tutors, community mobilisers and education managers at all levels. Head teachers take part in a special one-year certificate course in Basic Management skills, whereas other teachers participate in refresher courses to inculcate professionalism, introduce educational innovations and provide opportunities for continuous professional development for teachers. Both delivery approaches employ distance-learning techniques supported by self-study modules and interspersed with short face-to-face sessions and Peer Group Meetings (PGMs).

Outreach Tutor Training is aimed at tutors providing outreach services at Coordinating Centres. Most graduates from this programme become Coordinating Centre Tutors (CCTs). The programme only accepts Grade III teachers who have the potential to reach grade V and become tutors. The training curriculum is based on the Diploma for primary Teacher Education (DTE) course.

Training courses for voluntary mobilisers were developed to solicit community support for primary education programmes, including contributing to classroom construction, monitoring school finances and facilitating children with learning materials, uniforms and meals. Per school, two volunteers are trained who in turn sensitise their respective communities.

All government-aided primary schools are now clustered and linked to Coordinating Centres. These are under the stewardship of a CCT who resides in the centre. This enables him/her to adequately provide teacher support services, immediately respond to issues raised by teachers and promote pupil-friendly behaviours and practices among parents, community leaders and head teachers.

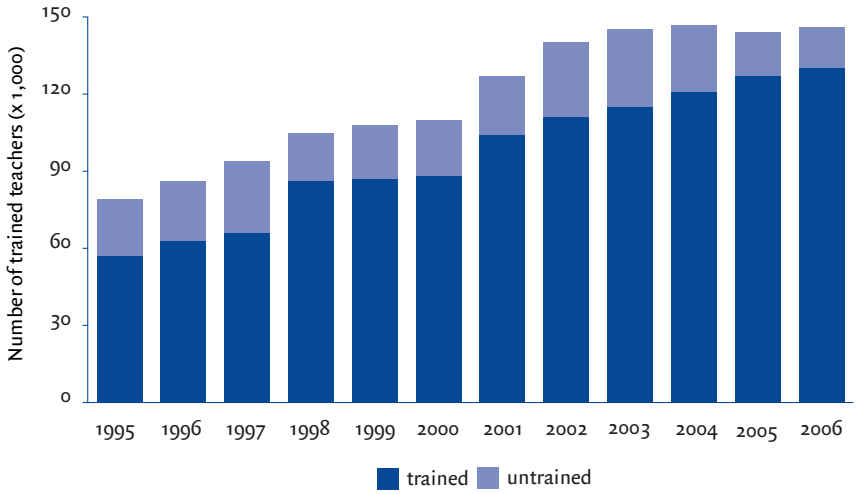
TDMS was succeeded by the Primary Teacher Development and Management Plan (PTDMP). PTDMP faces the challenge of improving the quality of pre-service and in-service training.

As a result of the recruitment and training of new teachers, the total number of teachers almost doubled between 1995 and 2006, in spite of high attrition rates (see figure 4.1). Moreover, the introduction of distance learning modules made it possible to educate teachers as quickly as possible and at less cost to both the learner and the government. Consequently, the proportion of untrained teachers significantly decreased between 2003 and 2006. In 2003, approximately 20% of

Mr. Jonathan Businge, Head teacher Walyoba primary school, Masindi.

the teachers were untrained; in 2006, this figure was reduced to approximately 11%. Due to continuous support for serving teachers and a reform of training mechanisms, the teaching methodologies applied in schools have recently improved. Nevertheless, many teachers tend to continue their old-fashioned practices, including rote learning.

Figure 4.1 *Number of trained and untrained teachers 1995-2006*

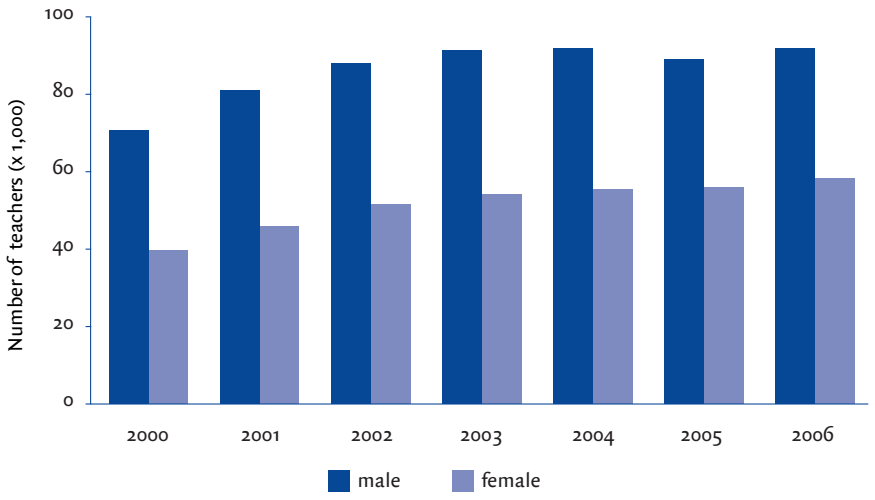


Source: MoES.

The educators responsible for inducting teachers into the profession have been retrained themselves to be adequately equipped with pedagogical skills. This has made the training of teachers more effective and improved the output of core Primary Teachers' Colleges (PTCs). Schools now follow work plans, and most teachers prepare their own schemes. Moreover, the average education level has improved as well. In 2000, nearly 50% of the teachers had no education beyond the ordinary level (O-level). Between 2000 and 2006, this percentage declined to about a third.

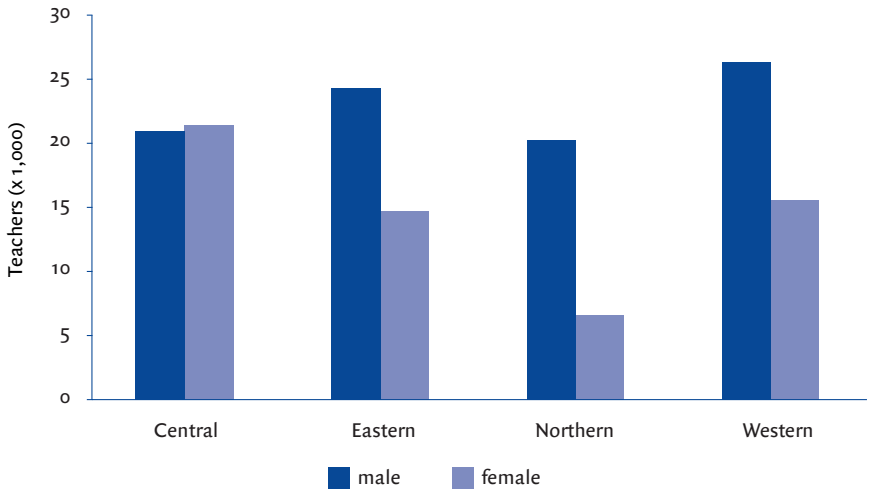
The pressing need for more teachers also meant that considerable numbers of female teachers were recruited, which slightly narrowed the gap between the number of male and female teachers. In 2000, approximately 36% of the teachers were female; by 2006 this figure had reached 39% (see figure 4.2). The low percentage of female teachers is in striking contrast with the achievement of gender parity of pupils in primary education. At the current trend, it will take 20 years before Uganda will reach gender parity among teachers. Moreover, regional disparities are high (see figure 4.3). In the central districts there are slightly more female teachers than male teachers, but in the other districts the gap remains large. Especially in the northern districts, teachers are predominantly male as a results of the conflict situation.

Figure 4.2 *Number of teachers by gender (2000-2006)*



Source: EMIS.

Figure 4.3 *Number of teachers by region and gender (2006)*



Source: EMIS.

4.2.2 Infrastructure

The increase in enrolment and the number of teachers also required large investments in infrastructure. Many new classrooms, pit latrines and teachers' houses were needed. In 2000, 10% of all pupils did not have a seat and 25% had no desk (Byammugisha and Ssenabulya, 2005, p. 117). The ministry set targets for classrooms, latrines and teacher houses in the context of the education sector investment plan. The target for the number of classrooms was determined by the classroom pupil ratio and is based on a maximum of 54 pupils in one classroom. Each new classroom built is furnished with eighteen three-seater desks.[9] The target for the number of latrines is set by the latrine pupil ratio and cannot be higher than 40 pupils per latrine. The target for teachers' houses is set at four per school.

The government established a conditional grant (the School Facilities Grant) to finance the infrastructure expansion. This grant was created to assist the neediest communities in acquiring school furniture and building new classrooms, latrines and teachers houses. SFG funding is channelled through the districts/ municipalities and utilised strictly in accordance with the Poverty Action Fund.

9 Unfortunately, the Annual School Census does not include information about the number of desks at the school level.

Classrooms

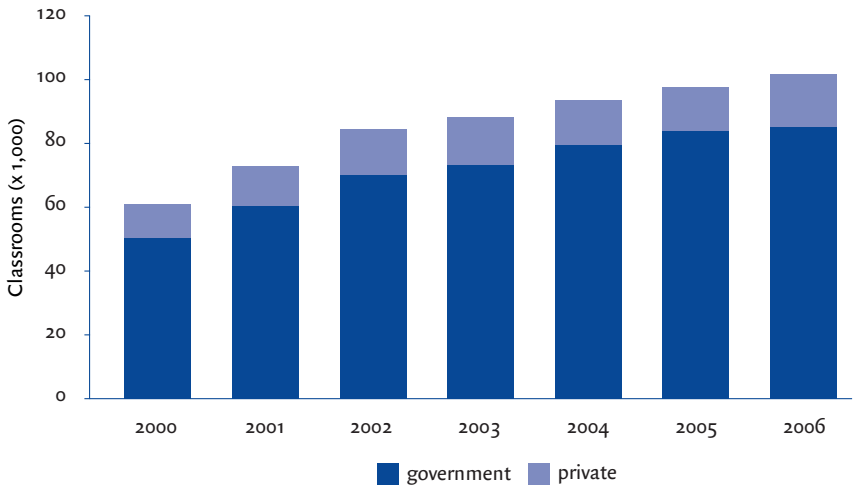
Between 2000 and 2005, the total number of classrooms increased by 60% as a result of the continued construction of classrooms under the School Facilities Grant (SFG). Figure 4.4 illustrates this development. Approximately 80% of the classrooms are built under the SFG. Between July 1999 and July 2005, the MoES built approximately 33,000 classrooms. Their quality also improved.

Teachers' Houses

National averages on the number of teachers' houses per school remained consistent during the years 2001-2005. Considering the target of four teacher houses, a slight improvement is observed at the individual school level. In 2001, 31% of the urban schools and 18% of the rural schools met the minimum target. In 2005, these percentages had increased to 34% and 20%, respectively.

In 2005, approximately 25,000 teachers' houses were available for 124,000 teachers at government schools (including 6,300 houses that were under construction). According to the annual school census, the total demand was approximately 86,000 and an additional 61,000 houses were therefore needed. Table 4.1 provides information on the availability of, and need for, teachers' houses at government (primary) schools in 2005.

Figure 4.4 *Classrooms 2000-2006*



Source: EMIS.

Table 4.1 *Availability of and need for teachers' houses (2005)*

	Existing teachers' houses / total number of teachers	Additional teachers' houses needed / total number of teachers	Total demand for teachers' houses/ total number of teachers
Urban			
Central	20%	29%	49%
Eastern	16%	44%	60%
Northern	22%	58%	80%
Western	20%	34%	55%
Total urban	**19%**	**42%**	**61%**
Peri-urban			
Central	27%	40%	66%
Eastern	18%	49%	67%
Northern	34%	48%	82%
Western	14%	49%	63%
Total peri-urban	**23%**	**46%**	**69%**
Rural			
Central	15%	48%	64%
Eastern	16%	54%	70%
Northern	40%	46%	86%
Western	12%	51%	63%
Total rural	19%	50%	69%
Uganda	**20%**	**49%**	**69%**

Source: MoES / EMIS 2005.

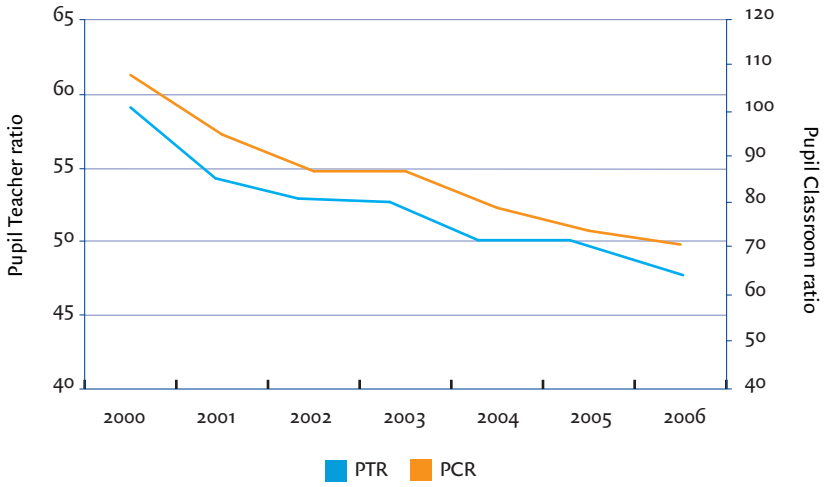
According to the school census data, almost 70% of the teachers need a teachers' house. Not surprisingly, this percentage is higher in rural areas, where shortages are most acute. In the central and western districts, there are relatively more teachers' houses in the urban areas than in the rural areas. Only the northern districts have relatively large numbers of teachers' houses.

4.2.3 Pupil teacher ratios and pupil classroom ratios

Recruitment of new teachers and building of new classrooms were not only necessary to cope with the increase in enrolments, but also aimed at reducing high pupil teacher ratios. Evidence suggests that this policy has been successful.

Figure 4.5 shows that both ratios have improved steadily through the years. The pupil teacher ratio (PTR) declined from 60:1 in 2000 to 48:1 in 2006. In the same period, the pupil classroom ratio (PCR) declined from 110:1 to 71:1.

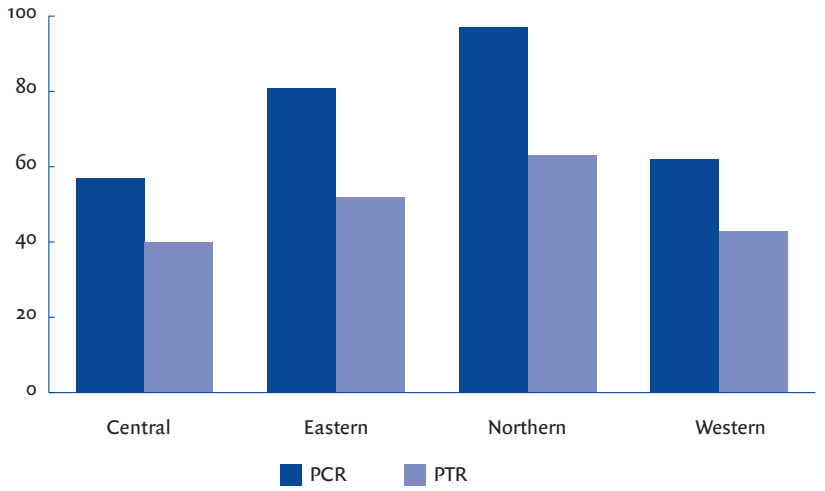
Figure 4.5 *Pupil teacher ratios en pupil classroom ratios (2000-2006)*



Source: EMIS.

However, there are large differences between regions (see figure 4.6). In rural areas the average pupil teacher ratio is much higher (53:1) than in urban (38:1) or peri-urban areas (40:1). An explanation for the relatively low pupil teacher ratio in the central districts is the number of private schools located there. Private schools have a lower pupil teacher ratio (26:1) than public schools (60:1) and community schools (46:1). Likewise, the pupil classroom ratio in private schools is much lower than in public schools (37:1 and 79:1, respectively, and 65:1 for community schools; figures 2005).

Figure 4.6 *Pupil teacher ratios and pupil classroom ratios by region (2006)*



Source: EMIS.

Average figures can be misleading, however. They do not show the differences between schools within the same region. Do all schools have a pupil teacher ratio of approximately 50 pupils per teacher, or are there large differences? Let us take a look at the figures:

Table 4.2 *Differences in pupil teacher ratios by region (2005)*

Region	Pupil teacher ratio				
	<30	30-50	50-60	60-80	>80
Urban	45%	35%	10%	7%	3%
Peri-urban	36%	39%	14%	8%	3%
Rural	9%	37%	22%	19%	13%
Central	26%	43%	16%	10%	5%
Eastern	8%	27%	27%	26%	12%
Northern	4%	21%	19%	27%	28%
Western	15%	47%	20%	13%	5%
Uganda	**15%**	**37%**	**20%**	**18%**	**11%**

Source: EMIS.

Almost 30% of all the schools have pupil teacher ratios above 60:1. Disparities between regions are substantial. Schools in the central and western districts show significantly lower pupil teacher ratios than schools in the northern and eastern

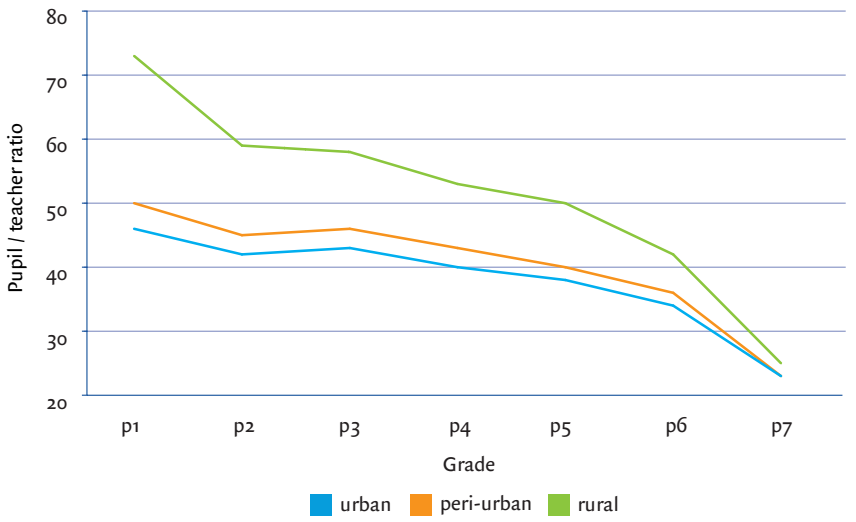
regions. In the northern region, more than 50% of the schools have pupil teacher ratios above 60:1. Moreover, in rural areas the number of schools with very high pupil teacher ratios is considerably larger than in urban areas. A World Bank study confirms that per pupil wage expenditures are significantly higher in districts with relatively low poverty rates (Winkler, 2007). In the districts with the lowest poverty levels, the wage bill per pupil is approximately 40% higher than in the districts with the lowest poverty levels. This finding suggests that the education system is regressive and not progressive.[10]

This finding is partially explained by the fact that teachers rather work in urban, relatively prosperous, central areas than in remote backward regions. It is much more difficult to recruit teachers in the rural areas and to keep them there. The MoES has established an incentive scheme to encourage teachers to settle in remote areas that they have hitherto avoided. These include areas with harsh climatic conditions, poor and unreliable transport and communication networks, difficult terrain, nomadic populations, insecure and hostile communities and areas lacking basic social amenities.

Differences are significant, not only between regions and schools, but also within schools. In general, pupil teacher ratios are considerably higher in the lower grades. The contrast between higher and lower grades is more marked in rural than in urban or in peri-urban areas.

10 Winkler et al suggest that Uganda is an exception as a country where the allocation of teachers is regressive. However, the researchers of this impact evaluation have found the same results for Zambia.

Figure 4.7 *Pupil teacher ratios by grade (2005)*



Source: EMIS.

The extreme size of classes in the lower grades is a phenomenon that is not unique to Uganda. It indicates that pupils who are closer to passing their examinations at primary 7 are prioritised. However, this prioritisation does not reflect the fact that smaller classes form a much more favourable learning environment for younger children. Pedagogically, it is a more effective strategy to reduce pupil teacher ratios in lower grades. MoES could choose to gradually increase the pupil teacher ratios in higher grades, as older children are better able to work independently.

The MoES has established an incentive scheme to encourage teachers to seek employment in remote areas that they have hitherto avoided. These include areas with harsh climatic conditions, poor and unreliable transport and communication networks, difficult terrain, nomadic populations, insecure and hostile communities and areas lacking basic social amenities.

Instruments to reduce high pupil teacher ratios and high pupil classroom ratios are multi-grade teaching and the use of double shifts. Multi-grade teaching is an instrument designed to support under-enrolled and understaffed schools in sparsely populated areas. It implies that more than one grade is taught in a single classroom by one teacher. The use of double shifts is a cost-saving mechanism that enables two separate groups of pupils to use the same school facilities (one in the morning and one in the afternoon).

High pupil class ratios at Kigumba primary school, Masindi.

Several schools have double shifts, but the Annual School Census does not contain information on this particular matter. Internationally, there is wide disagreement on the effectiveness of double shifts. Double shifts reduce contact time, whereas contact time is very important for the learning achievement of pupils (see, for instance, UNESCO, 2004; Michaelowa and Wechtler, 2005). The literature indicates that a multi-grade teaching system is more effective than a double-shift system, but multi-grade teaching does not solve the problem of high pupil teacher ratios.

4.2.4 Distance

Between 2000 and 2006, the number of (primary) schools increased from 12,500 to 17,000, while the total number of government schools increased from 8,000 to 12,000. The increase in the number of schools reduced the average distance pupils had to walk to school. School census data do not contain information on the average distance to the school, but the distance between schools seems to be an adequate proxy. Table 4.3 shows the development of the average distance between schools between 2001 and 2005. According to these figures, the average distance has decreased by approximately 8-9% (northern) to 13-14% (eastern).

Table 4.3 *Distances between schools by region (2001-2005)*

		< 1 km	1-2 km	2-3 km	3-4 km	4-5 km	> 5 km
Central	2001	24%	29%	16%	12%	9%	10%
	2005	32%	29%	15%	10%	7%	7%
Eastern	2001	11%	25%	24%	19%	11%	10%
	2005	15%	31%	24%	16%	9%	5%
Northern	2001	7%	18%	21%	21%	16%	18%
	2005	10%	20%	21%	20%	15%	13%
Western	2001	9%	26%	20%	16%	14%	16%
	2005	14%	29%	22%	14%	10%	11%

Source: EMIS.

DHS EdData for 2001 contain information on distances to school. In urban areas, 84% of the children had to travel less than one kilometre, whereas 56% of the children in rural areas had to travel more than one kilometre. In 2001, the mean walking time to school was approximately 35 minutes in rural areas and 14 minutes in urban areas. In urban areas approximately 24% of the children had to walk for more than an hour before they reached school. There are also large regional differences. In the central and eastern regions, the mean walking time was less than 30 minutes, whereas in the northern and western regions children had to walk for approximately 40 minutes. In the northern and western regions large numbers of children walk for more than one hour before they arrive at school: 32% in the northern region and 29% in the western region. Partly as a result of these distances, many children are over age when they start primary 1. In the northern region this was 27%, in the west 18%, east 15% and central 12%. In rural areas, 22% of the parents reported that distance to the school was an important reason for them to send their children to school at an age older than six.

4.2.5 Instructional materials

The high increase in enrolment necessitated new instructional materials for primary schools and Primary Teachers' Colleges (PTCs). These instructional materials included textbooks, teachers' guides, supplementary reading and curriculum support materials, essential reference books (*atlases and dictionaries*), teachers' pedagogical support materials and teaching and learning aids (*non-textbook materials*). A proportion of UPE capitation grants (35%) is set aside for schools to purchase supplementary materials (mainly supplementary readers, teacher reference books, wall charts, chalk, blackboards, etc.) in line with

established UPE capitation grant expenditure guidelines. Apart from these grants, resources are made available through the government recurrent budget for bulk purchases of these materials. The Instructional Materials Unit (IMU) coordinates these purchases.

The price of textbooks was a problem in Uganda. Textbook publishing, printing and distribution was a (poorly performing) state monopoly (Ward, Penny and Read, 2006, p. 57). In 2000, the government of Uganda implemented the Instructional Materials Reform Programme, resulting in more user-friendly and cost-effective methods of procuring and delivering the necessary instructional materials. The printing and publishing industry was liberalised and most instructional materials are now locally published and printed. Schools are actively involved in decision-making at various stages of the textbook procurement process. The participatory approach has allowed better utilisation of instructional resources.

The development of the number of textbooks is calculated on the basis of the EMIS database and MoES publications. This calculation has been limited to the four main subjects (English, mathematics, science and social studies), because no data on the other subjects were available for 2000-2002. Between 2000 and 2005, the number of textbooks for these four subjects increased almost 60%, from 6.6 million to 10.3 million. This has resulted in pupils' improved access to textbooks. The number of teacher guides on these subjects increased proportional to the number of teachers, from 640,000 to 820,000.

Table 4.4 *Textbooks for four subjects (2000-2005; millions)*

	2000	2001	2002	2003	2004	2005
English	2.0	2.3	2.4	2.6	2.7	2.8
Mathematics	1.7	1.9	2.2	2.3	2.7	2.7
Science	1.7	1.9	2.1	2.1	2.5	2.5
Social studies	1.2	1.4	1.6	1.9	2.1	2.2
Total	**6.6**	**7.5**	**8.2**	**8.9**	**10.0**	**10.3**

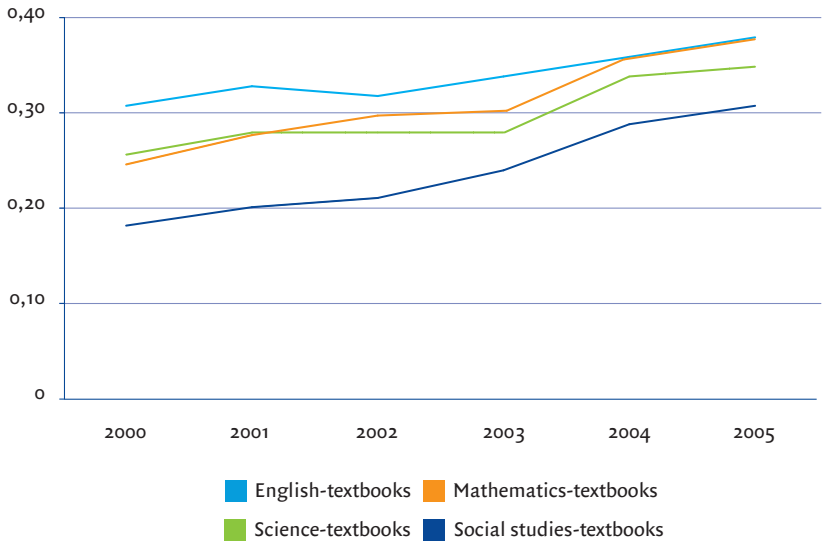
Source: EMIS / MoES / computation IOB.

Book Pupil Ratios

The increase in the number of books led to a slight improvement in the book pupil ratios for the four main subjects. However, book pupil ratios remain far too low. On average, three pupils share one book for each subject. In fact, this conclusion

is based on the assumption that there is only one title for each subject. Taking into account the fact that schools may have several different titles, the book pupil ratio is even lower.

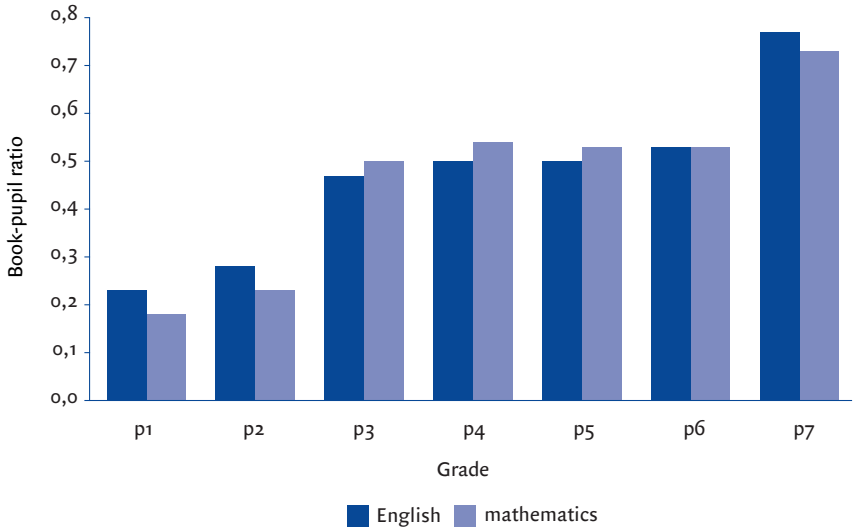
Figure 4.8 *Book Pupil Ratios (2000-2005)*



Source: EMIS.

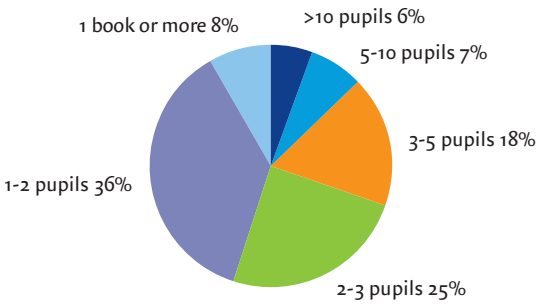
Moreover, there are large disparities between both schools and children. First of all, ratios are different for each grade. The book pupil ratio for children at primary 7 is better than for children at primary 1. Figure 4.9 illustrates the distribution of books for English and mathematics in different grades. The figure shows that the book pupil ratio is lowest at primary 1 and 2 and highest at primary 7. For children at primary 3-6, this ratio is relatively constant at an average level of one book for two pupils.

Figure 4.9 *Average book pupil ratios for Primary 1-7 (2005)*



This figure suggests that at primary 7, almost every pupil has one book. This is not necessarily true, as some children may have more than one title for a specific subject. The distribution of books is very uneven. Figures 4.10 and 4.11 show the distribution of English and mathematics books for primary 3-7. The analysis refers to the school level, but is weighted with the number of pupils in the school. So, for instance, if figure 4.11 indicates that 6% of the pupils share their English textbook with 10 or more other children, this means that 6 out of 100 children are in schools where the number of pupils in primary 3-7 is (more than)10 times higher than the number of English textbooks. The figure shows that almost one third of the pupils (6% + 7% + 18%) share their English textbooks with two or more other children. Only 8% of the pupils do not need to share their English textbook or have more than one book.

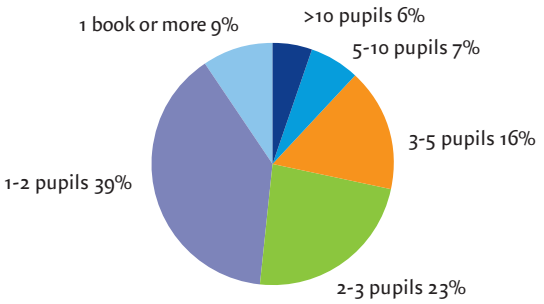
Figure 4.10 *Distribution of English textbooks (2005)*



Source: EMIS, 2005.

Figure 4.11 shows the distribution for mathematics, which is broadly similar as for English.

Figure 4.11



Source: EMIS, 2005.

According to EMIS data, differences between the regions are minor, although book pupil ratios are lower in the northern region and higher in the western region.

Table 4.5 *Book pupil ratios for English and mathematics by region (2005)*

	Urban	Peri-urban	Rural
English			
Central	0.54	0.47	0.48
Eastern	0.59	0.54	0.55
Northern	0.40	0.47	0.46
Western	0.56	0.58	0.59
Total	**0.52**	**0.51**	**0.52**
Mathematics			
Central	0.51	0.45	0.50
Eastern	0.65	0.56	0.57
Northern	0.41	0.52	0.51
Western	0.61	0.63	0.61
Total	**0.53**	**0.52**	**0.55**

Source: EMIS 2005 / computation IOB.

4.3 Outcomes: access

4.3.1 Introduction

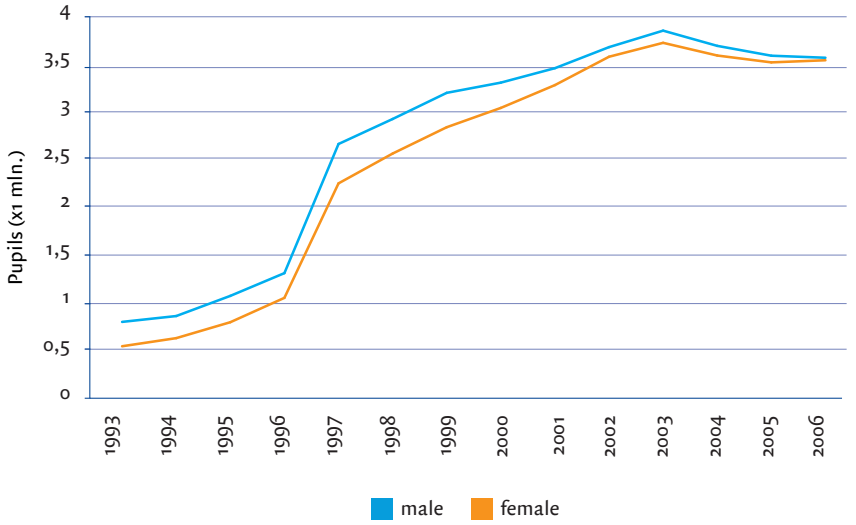
The previous section focused on investments in teachers, classrooms and instructional materials between 2000 and 2006. This and the following section evaluate the various results in terms of outcomes: the effects on access and learning achievement. This section focuses on enrolment (4.3.2), new entrants (4.3.3), enrolment rates (4.3.4), attendance (4.3.5), retention (4.3.6), progression (4.3.7), dropout (4.3.8) and completion (4.3.9).

4.3.2 Enrolment

By abolishing school fees, the Ugandan government gave a major boost to primary education. Enrolment doubled between 1995 and 1997 (from 2.6 million to 5.3 million). After 1997, enrolment continued to rise steadily and reached a level of 7.6 million in 2003 (see figure 4.12). Within eight years, the number of pupils enrolled in primary education had tripled, which is an enormous achievement. Since 2003, the temporary effects of this one-time increase have phased out and now most new entrants are aged six or seven. As a result, there is a slight decline in total enrolment, amounting to a total of 7.2 million in 2005 and 2006. This decline is consistent with the large increase seven years earlier.
Figure 4.12 also shows the declining difference between male and female enrolment.

The proportion of females in the total enrolment has increased from 45.4% in 1995 to 49.8% in 2006. Evidence suggests that UPE, together with government measures to further the education of girls, has achieved gender parity in primary education.

Figure 4.12 *Male and female enrolment 1993-2006*

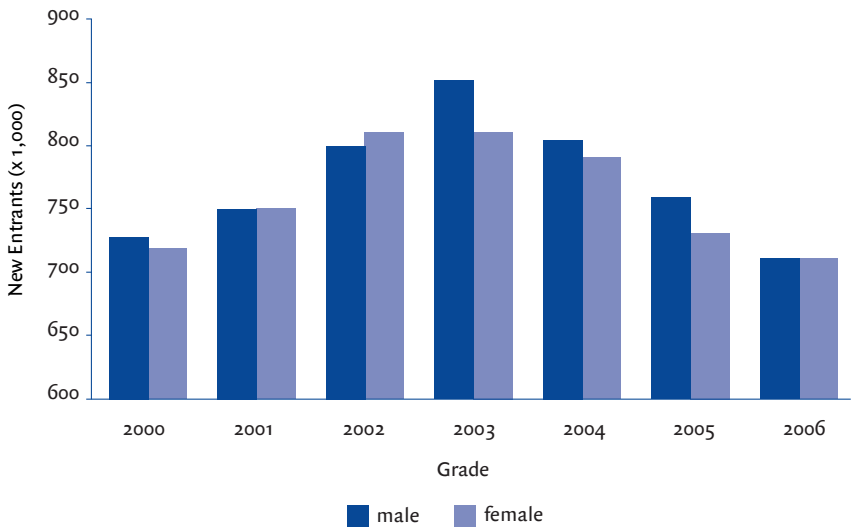


Source: EMIS.

4.3.3 New entrants

Large numbers of new pupils entered primary education as a result of UPE and the population growth. This inflow was not only high in 1997, but it remained high until after the turn of the century. Between 2000 and 2003, the number of entrants increased by 13% as a result of the population growth and increased opportunities for children to attend school. After 2003, enrolments began to drop, mainly as a result of a drop in new entrants at age five. One of the explaining factors for this trend is that at the beginning of the 2005 academic year, the Ministry of Education and Sports directed all schools not to admit underage pupils. The reason behind this decision is the high repetition rates for this age group. In compliance with this directive the proportion of underage children fell from almost 15% to 4% between 2004 and 2005.

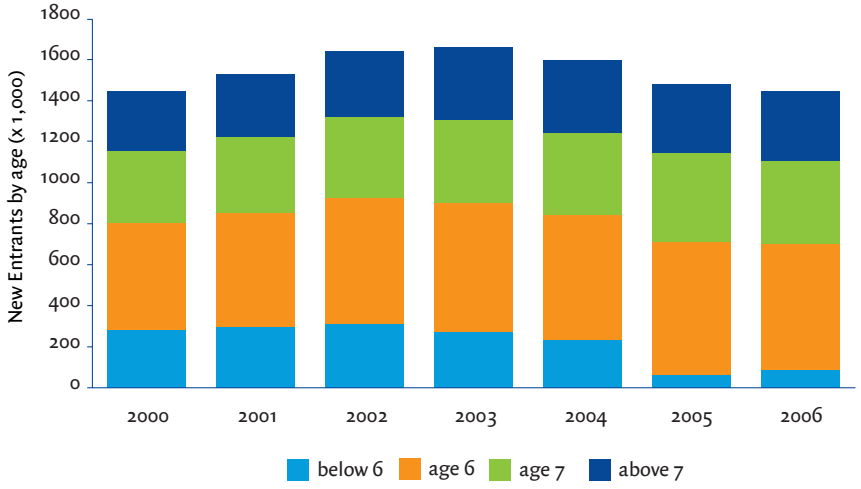
Figure 4.13 *New entrants 2000-2006*



Source: EMIS database 2000-2006.

Almost half of the pupils entering primary education each year are older than six. In most years, there is a large proportion of underage pupils in primary 1 due to the unavailability of pre-primary education. Many of these children spend at least two years in primary 1. This grade commonly functions as a 'waiting room'.

Figure 4.14 *New entrants to primary 1 by age*



Source: EMIS database 2000-2006.

4.3.4 Enrolment rates

The interested reader who wants to obtain information on enrolment rates in African countries may refer to UNESCO's *Global Monitoring Reports*. However, information on net enrolment rates for Uganda are unavailable. Apparently, it is difficult to calculate reliable (net) enrolment rates. This calculation is hampered by several factors:

1) Enrolment rates can only be based on reliable estimates of the population between 6 and 12 years of age.
2) School census data must be inclusive and accurate. In practice, disaggregated enrolment figures may be biased as a result of over- and underreporting. At the national level, these two opposite factors may neutralise each other, but this may not be the case at a local level. For instance, in the Kampala district, enrolment rates seem to be underestimated as a result of underreporting due to non-response by private schools.
3) The computation of net enrolment rates is based on the assumption that schools accurately report the age of their pupils. This assumption is not necessarily correct (see Annex 6).
4) Changes in the administrative structure (the formation of new districts) hamper the comparison of figures between years (at the district level).

Based on the Annual School Census, it is possible to calculate a gross enrolment rate for Uganda of approximately 108% in 2005 and a net enrolment rate of approximately 93%. These figures reflect the success of UPE. However, there seem to be complications:

1) In 2005, 14% of the primary schools failed to participate in the school census. Especially the response by private schools in Kampala was low. As a result, gross and net enrolment rates in Kampala appeared much lower than in other districts, even though they were most likely higher.
2) For several districts, calculated gross enrolment rates are above 125%, or even above 140%. For half of the districts, the net enrolment rate is above 100% and in one district it is even above 150%.

UBOS (2006) presents somewhat lower enrolment rates on the basis of national Household Surveys. Moreover, these figures suggest a decreasing trend.

Table 4.6 *Primary school net enrolment rates (1999-2006)*

Survey year	Male	Female	Total
UBOS			
1999/2000	85	84	84
2001 (DHS)	87	87	87
2002/2003	85	86	86
2005/2006	84	85	84
EMIS			
2003	101	100	101
2004	90	88	89
2005	94	92	93
2006	90	93	92

Source: UBOS (2006) / EMIS (2003-2006).

According to the UBOS figures, the net enrolment rate is significantly lower than the rate calculated on the basis of EMIS data. The fact that EMIS data show a 10% 'drop' between 2003 and 2004 is the result of new population estimates in 2004 (see Annex 6). This drop illustrates the drawback of computing net enrolment rates using school census data and population estimates: changes in net enrolment rates are likely to reflect changes in population estimates, more than anything else.

On the basis of DHS Education surveys, UBOS has calculated a net enrolment ratio of 87% for 2001. The high net enrolment rate for the Eastern provinces is remarkable. These very high enrolment figures point to the phenomenon of 'ghost pupils'. The fact that the number of enrolled pupils determines the education grant may be a reason for schools to inflate it. According to the Internal Security Organisation (ISO) there are more than 60,000 ghost pupils.[11] Over 60,000 ghost pupils are still on the Universal Primary Education (UPE) registers countrywide, even though they do not go to school. ISO discovered that several head teachers deliberately inflated their registers to continue to receive capitation grants for those pupils. Large numbers of pupils remained on the register even long after they had abandoned school. Ghost pupils were discovered in each district across the country, but figures were highest in Karamoja, the north and West Nile. It must be noted that this probably has to do with the security situation in these regions.

11 Source: New Vision, April 2007.

Table 4.7 is copied from the 2001 DHS EdData Survey. The table shows differences in enrolment rates by residence, asset index and parents' education.[12] Enrolment rates are highest for the wealthier quintiles and for pupils with parents with secondary education or higher.

Table 4.7 *Net enrolment rates in 2001 (DHS)*

	Male (%)	Female (%)	Total (%)	Number of children (x 1000)
Residence				
Urban	89	89	89	687
Rural	87	87	87	6,281
Region				
Central	84	86	85	2,366
Eastern	94	93	94	1,921
Northern	84	81	82	995
Western	87	85	86	1,685
Asset Index				
Lowest quintile	82	79	81	1,305
Second quintile	89	87	88	1,341
Middle quintile	87	87	87	1,442
Fourth quintile	89	90	89	1,537
Highest quintile	89	91	90	1,341
Mother's education				
No schooling	84	81	83	1,512
Primary	88	88	88	2,863
Secondary or higher	92	92	92	529
Mother not in household	88	89	89	1,992
Father's education				
No schooling	82	79	81	513
Primary	87	87	87	2,614
Secondary or higher	92	90	91	1,087
Father not in household	87	87	87	2,632
Total	**87**	**87**	**87**	**6,967**

Source: UBOS/DHS EdData Survey 2001.

12 For the DHS, UBOS uses the term 'attendance rate'. This term is equivalent to (net) enrolment rate but differs from the term 'attendances rate' used in this study.

In addition, table 4.8, copied from the Uganda National Household Survey 2005/2006 (UBOS, 2006, p. 20), shows the main reasons why children do not attend school. The main reason (53%) is that parents consider their child to be too young. This reason suggests that these children will start attending school at an older age. Other reasons for not attending school include: 'the child has to help at home' (10%), 'indifference to education' (9%), 'the costs' (8%) and 'distance to the school' (7%).

Table 4.8 *Reasons for not attending school for children aged 6-12 year by sex (2005/2006; %)*

Reason for never attending	Male	Female	Total
Too expensive	8.5	7.4	7.9
Child considered too young	54.2	52.2	53.2
School too far away	5.6	8.2	6.8
Child has to help at home/ family/ business	8.3	11.2	9.6
Indifference to education	9.5	8.7	9.0
Orphaned	0.7	0.4	0.6
Disabled	6.6	5.6	6.1
Other reasons	6.6	6.3	6.8
Total	**100.0**	**100.0**	**100.0**

Source: UBOS, Uganda National Household Survey 2005/2006.

The qualitative module report of the Uganda National Household Survey 2005/2006 provides a more qualitative insight in the reasons why children do not attend school.[13] First of all, there are economic barriers. Not all parents can afford to pay for school requirements. 'I do not have the Ush 5,500 which is for food, registration and exam fees for my child' a widow in Adjumani explained. Especially orphans may be forced to leave school. Social and cultural factors may also prevent school attendance. Not all parents value education. This is especially a problem in (semi-)nomadic regions, but also in other rural areas many parents (often farmers) do not value education. On the Kalangala islands in Lake Victoria, most parents do not value education. Children must take care of the homes while their parents go fishing. Moreover, children have to trek through dense forests harbouring criminals. As a result, most children in the district begin primary one while they older than

13 This section includes information obtained during a field trip to Masindi and from reports by district officers and head teachers, presented at the Joint Annual Review (2006).

Lack of desks: Kigumba primary school, Masindi.

the official entry age of 6 years.[14] In the Karamoja subregion (including the districts Kotido, Moroto and Nakapiripirit) the pastoralist population lives in semi-arid plains. The Karimojong resent formal education because they believe that formal education is a too long-term investment compared to their own traditional forms of education.[15] Moreover, children play an important role in the household economy. Boys herd the cattle and girls do all home chores. There is a gender bias that works against the school attendance of girls. The practice of early marriage – especially in the northern, eastern and western regions – limits girls' opportunities to attend school (Byamugisha an Ssenabulya, 2005, p. 49). And finally, violence in the region may prevent children from going to school. As a result, net enrolment rates are very low in these districts. Insecurity and conflict are important reasons for non-attendance in the north and northeast of Uganda as well.[16] In those regions, 20 years of armed conflict have had a devastating impact on (primary) education. Armed conflict has led to the abduction, killing, sexual abuse, displacement and psychosocial and physical victimisation of children and communities.[17] The LRA has forced children to become armed fighters. Estimates range from 30,000 to 60,000 child soldiers, who constitute almost 90% of the LRA's soldiers. Recruits are inducted

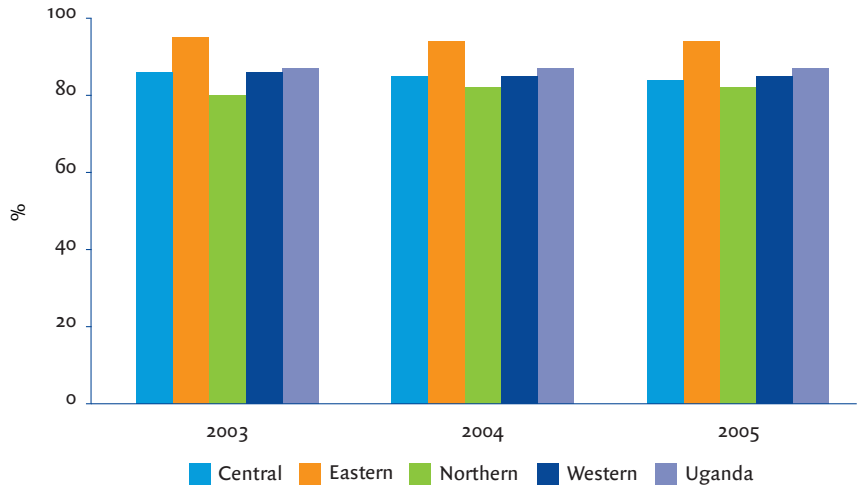
14 Adapted from a presentation by Mrs. Florence Bbosa, District Education Officer Kalangala.
15 Adapted from a paper presented by Paul Abdul, DEO in Moroto, for the 2006 Education Sector Review.
16 The most affected districts are Gulu, Pader, Kitrgum, Lira, Apac, Soroti and Katakwe. Adjumani, Nakapiripirit, Moy, Kotido and Moroto are affected as well.
17 Christopher Wimon Okecho, Assistant Commissioner Special Needs Education in a presentation for the 2006 Education Sector Review.

through raids on villages and some are as young as eight. People seek security in Internally Displaced Peoples' Camps. Approximately 1.6 million Ugandans – half of them children – have fled to these squalid and overcrowded camps.

So, apart from economic barriers, there are also political barriers (conflict) and physical barriers (distance, impassable roads). Insecurity, long distances and rough terrain, in combination with a lack of money, are the main reasons why many children do not enrol until they are 8, 9 or even 10 years old. There are several other reasons why there are many 'over-age' children in the classes. One is (or rather, was) the abolishment of school fees in 1997. As a result, children who had dropped out of school earlier because they were unable to pay the school fees, returned to school (Byamugisha an Ssenabulya, 2005, p. 48). A second reason is high repetition rates.

Figure 4.15 gives an estimate of net enrolment rates by region, calculated for this study. Annex 6 presents a brief outline of the method used to calculate these figures. According to these figures, net enrolment rates are approximately 87%, a percentage that is more or less consistent with the UBOS estimates. Estimates for the eastern districts seem very high, but are consistent with the UBOS estimates. Nevertheless, one would expect figures to be highest for the central region.

Figure 4.15 *Estimated net enrolment rates by region (2003-2005)*



Source: EMIS / computation IOB.

4.3.5 Attendance

Non-attendance of pupils is one of the main problems in primary education in Uganda. Enrolment rates appear to be high, but *actual* attendance is significantly lower. In this study, we define attendance rate as the percentage of pupils *actually* in school, divided by the total number of pupils enrolled.

Figures on pupil attendance are not included in the annual census; however, these figures are generally available at the schools. Information on pupil attendance for the years 2001-2006 was gathered by means of a survey of 379 schools in 25 districts. It became clear that not all schools keep attendance figures. Information on attendance rates was obtained from 319 schools, covering an average period of 4.8 years (out of six years). The total figure is based on 1,519 observations. Table 4.9 presents results that are weighted (by the number of pupils in each school) to avoid that small schools have a disproportionate effect on the outcomes. Results indicate that pupil attendance has been stable over the years and over all classes, at a level of approximately 73%. So, on average, one out of four enrolled children is not in school. Attendance rates at primary 7 seem to have improved only slightly over the last two years.

Table 4.9 *Pupil attendance by grade (2001-2006; percentages)*

	2001	2002	2003	2004	2005	2006
P1	73	73	73	72	73	73
P2	72	73	73	73	73	74
P3	73	73	73	73	73	73
P4	72	72	73	73	73	72
P5	72	72	73	73	73	73
P6	73	73	73	73	74	74
P7	74	74	74	73	76	77

Source: IDC Survey.

Table 4.10 provides the figures by region, also based on the data for 2001-2006. According to these figures, pupil attendance is lowest in the eastern districts. In the preceding section, it was demonstrated that enrolment rates in the eastern region were very high compared to the other regions. Now it appears that *actual* school attendance is much lower. In fact, there is a negative correlation (r= -0.32) between net enrolment rates and pupil attendance at the district level: the districts with the highest enrolment rates have the lowest attendance rates. The western region shows low figures as well, but these rise at primary 6 and primary 7.

Table 4.10 *Pupil attendance by region and grade (percentages)*

	Central	Eastern	Northern	Western
Primary 1	75	68	77	71
Primary 2	76	69	76	71
Primary 3	76	68	77	72
Primary 4	76	67	77	71
Primary 5	77	67	76	72
Primary 6	78	66	76	74
Primary 7	80	66	77	78

Source: IDC Survey.

A breakdown by location shows that attendance rates are higher in urban regions than in rural regions.[18] An important reason is long distances. There is a significant correlation between distance and pupil attendance.

Table 4.11 *Pupil attendance by location and grade (percentages)*

	Urban	Peri-Urban	Rural
Primary 1	78	75	72
Primary 2	80	74	72
Primary 3	80	77	72
Primary 4	81	76	72
Primary 5	81	77	72
Primary 6	81	76	72
Primary 7	77	76	74

Source: IDC Survey.

And finally, attendance rates are higher in private schools than in public schools. Of course, one must be careful with this conclusion, as there are (almost) no private schools in rural areas. The impact analysis takes this fact into account. Community schools are not included in the results, because the sample only contained a small number of them.

18 This analysis is based on figures for the years 2003-2005, because for these years data from the annual school census have been linked to the survey data. Of course, it would not be difficult to add location information to the other records, but because differences between years are insignificant, this would not provide any extra information. The total number of cases is 756.

Table 4.12 *Pupil attendance by school type and grade (percentages)*

	Government	Private
Primary 1	73	80
Primary 2	73	83
Primary 3	73	79
Primary 4	73	80
Primary 5	73	82
Primary 6	73	81
Primary 7	75	78
Number of observations	700	53
Number of schools	263	21

Source: IDC Survey.

The main causes of absence mentioned by teachers are:[19]

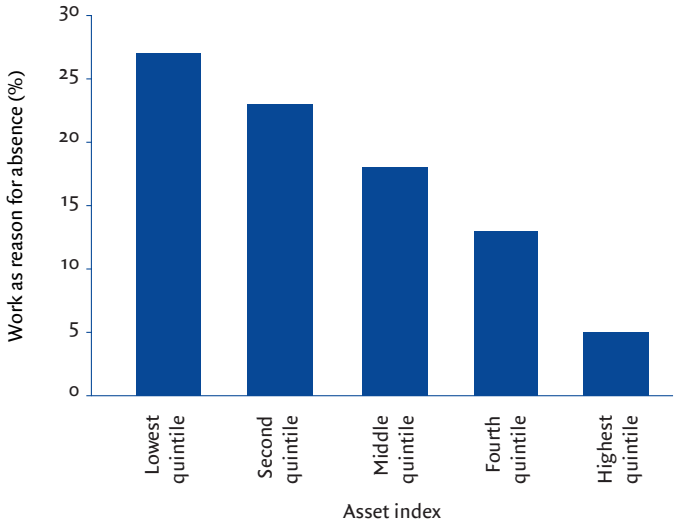
- rampant disease, including malaria, cough and HIV/Aids;
- resettlement in conflict areas;
- the country's high poverty levels;
- negative attitude towards education by both teachers and pupils;
- lack of mid-day meals;
- long distances to school;
- sexual harassment by both teachers and pupils;
- poor and inadequate teaching methods;
- inadequate instruction materials;
- lack of facilities, i.e. no separate latrines for boys and girls.

In the DHS survey of 2001, about 80% of the parents reported that their child had missed one or more days in the preceding school year. The average number of days reported was 13. Main reasons were funerals or illness (65%), weddings (19%), no money for school fees (19%) or work (13%). An analysis by UBOS shows that absence due to work is highly correlated with parents' income (see figure 4.16).

A more reliable indicator for absence seems to be the question whether the child had been absent during the last week. Approximately 21% of the parents reported that their child had been absent for one or more days during the previous school week (schools that were closed were not included). This figure was higher for the lowest wealth quintiles (around 25%) and for the northern region (28%).

19 Mentioned in the Stakeholder Workshop.

Figure 4.16 *Work as reason for pupil absence by wealth (2000)*



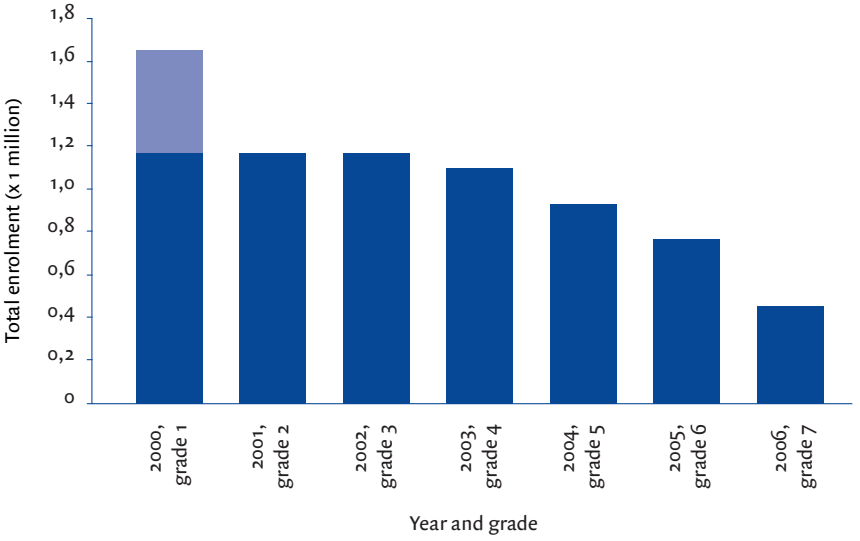
Source: UBOS / DHS, 2001.

4.3.6 Retention

Uganda has been very successful in increasing entrance and enrolment, but it appears difficult to keep children in school and to enable them to pass their exams within seven years: dropout and repetition rates are high. Figure 4.17 illustrates this problem. It shows the total enrolment for the years 2000-2006 in consecutive grades.
In 2000, 1.64 million pupils were enrolled at primary 1. Six years later, total enrolment at primary 7 was 452,000. What happened to the other 1.2 million pupils? An important explanation is the fickle nature of enrolment at primary 1. In the past, many children enrolled in primary 1 at an age below six. However, in primary six, many children repeat or drop out and enter the school again one year later. As a result, the congestion in primary 1 is very high, with many repeating pupils. This explains the large difference between enrolment at primary 1 and enrolment at primary 2. The high repetition and dropout rates at primary 1 are the result of a lack of pre primary schools. Many children go directly to primary schools, with repetition and dropout as a result. Better access to pre primary education is needed to improve the efficiency of primary education. For the higher grades, repetition cannot explain the reduction in enrolment, because repeaters from previous years are integrated in the enrolment figures. Dropout becomes problematic after primary 3 and especially after primary 4. The total dropout appears to be 700,000 (or 60% of the pupils).

Construction of new classrooms at Kiryandongo BCS, Masindi.

Figure 4.17 *Total enrolment in grades 1-7 (2000-2006)*



Source: Albert Byamugisha (2006).

The retention or survival rate refers to the proportion of pupils enrolled in one grade, expressed as a percentage of primary 1 enrolment. A cohort analysis shows how cohorts that enrol at primary 1 pass through the seven grades of primary education. MoES has conducted a cohort analysis of three cohorts: 1997, 1998 and

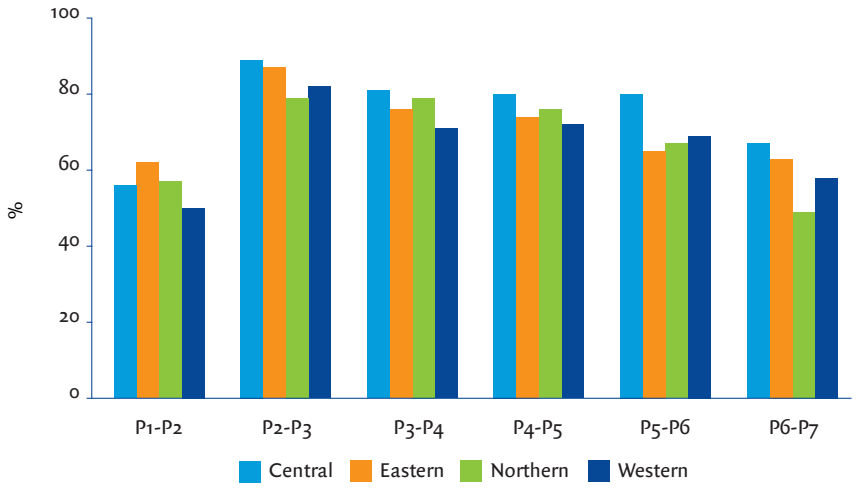
2000 (see Byamugisha, 2006). This analysis shows that no more than 22% (1997 cohort) to 30% (1999 and 2000 cohorts) reached grade 7 within six years. However, the 1999 and 2000 cohorts show significantly better results than the 1997 cohort. Only 40% of the 1997 cohort got promoted to primary 2 in 1998. The 1999 and 2000 cohorts showed figures that were about 10% higher. However, these cohorts were significantly reduced in primary 6 and primary 7. These extraordinarily low figures, especially for the 1997 cohort, partly explain why the large increase in examinations that was expected from 2004 onwards has not materialised so far.

4.3.7 Progression

Table 4.13 shows the development of progression rates, repetition rates and dropout rates for the period 2000-2005. The *progression rate* is defined as the percentage of a cohort of pupils enrolled in one grade who move to the next grade. Children who do not reach the next grade either repeat or drop out. Dropout rates have been calculated on the basis of progression and repetition rates:
dropout rate= 100% – (progression rate + repetition rate).

Progression rates were highest in the years 2001 and 2002, declined in 2004 and then slightly increased again in 2005. The table shows that dropout rates are especially high at the transition between P1 and P2 and between P6 and P7. Highest progression rates are found in P3, and from then they progressively decline until P7. This decline is most pronounced in the northern region. Progression rates are highest in the central region (see figure 4.18).

Figure 4.18 *Progression rates by region (2005)*



Source: EMIS.

Table 4.13 *Progression rates, repetition rates and dropout rates (2000-2005)*

	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005
P1-P2					
Progression	64%	64%	59%	55%	56%
Repetition	12%	14%	16%	15%	14%
Dropout	24%	22%	25%	30%	30%
P2-P3					
Progression	88%	90%	85%	80%	85%
Repetition	9%	10%	12%	12%	12%
Dropout	3%	0%	3%	8%	3%
P3-P4					
Progression	83%	85%	82%	77%	77%
Repetition	9%	11%	13%	13%	13%
Dropout	8%	4%	5%	10%	10%
P4-P5					
Progression	80%	81%	78%	73%	75%
Repetition	9%	11%	13%	13%	13%
Dropout	11%	8%	9%	14%	12%
P5-P6					
Progression	79%	76%	73%	67%	70%
Repetition	9%	11%	14%	13%	14%
Dropout	12%	13%	13%	20%	16%
P6-P7					
Progression	69%	67%	62%	56%	57%
Repetition	10%	11%	14%	14%	15%
Dropout	21%	22%	24%	30%	28%

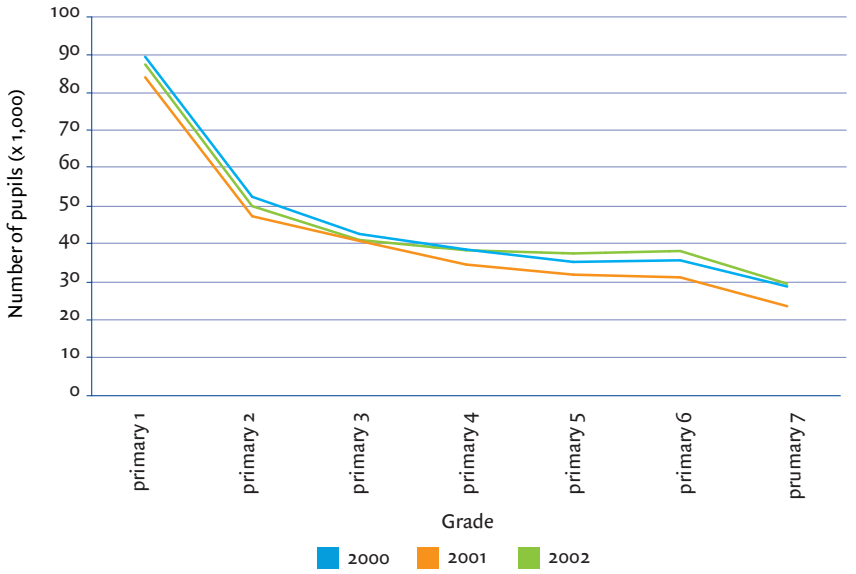
Source: EMIS.

4.3.8 Dropout

One of the main factors explaining the low retention rates is the high dropout level, which seems to constitute one of the major problems in primary education in Uganda. Until 2003, the annual census provided information on dropout and

its causes. After 2003, questions regarding dropout were no longer included in the census.[20] Figure 4.19 represents the total dropout by year for the years 2000-2003.

Figure 4.19 *Total dropout (2000-2003)*

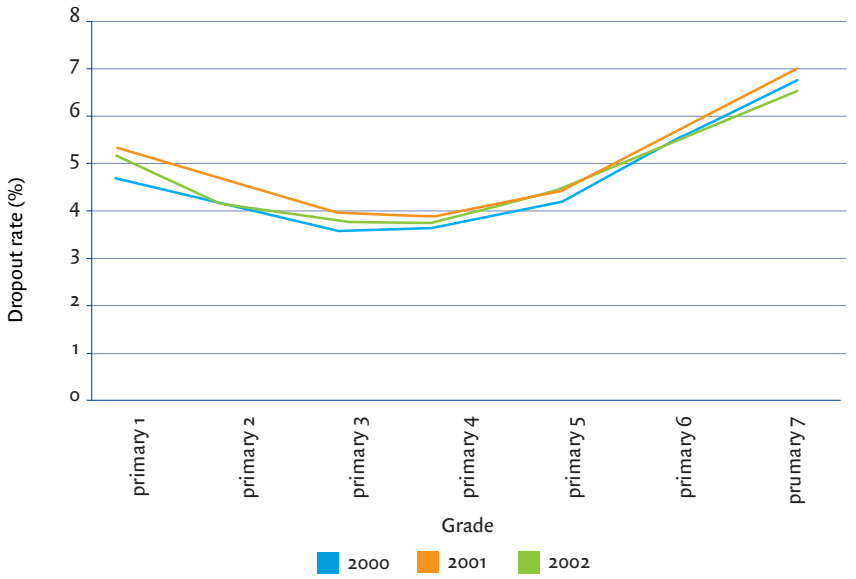


Source: EMIS.

The pattern is similar for each of the three years: dropout is highest at primary 1 and then decreases after primary 1. Note, again, that 'dropout' at primary 1 is normally only temporary. Many pupils who drop out at primary 1, go back to school the next year. Moreover, the figures are misleading as they do not represent the total number of pupils. As a result of dropout, the total number is lower at each following grade. As figure 4.20 shows, the dropout rate follows a u-shape, with an increasing dropout rate after grade 4.

20 Yet, it is still possible to calculate dropout rates based on EMIS data, because repeaters are included in the database. Pupils in one grade either move up to the next grade, repeat or drop out. Therefore, pupils at one grade higher in the following year either moved up or repeated. Deducting the repeaters from the total number of pupils in one grade gives the number of pupils who moved up. So, dropout in the year before equals the number of pupils in one particular grade minus the pupils who moved up and minus those who repeated that grade.
In formula: Dx, t= Px, t – Px+1, t+1 – Rx+1, t+1 – Rx, t+1
Where Dx, t = total dropout in grade x in year t, Px, t = total number of pupils in grade x in year t, Rx, t = total number of repeaters in grade x in year t.
An example: say you have 100 pupils in primary 1 in 2000 and 80 pupils in primary 2 in 2001. The figure of 80 includes the repeaters in primary 2 (say 10), which you deduct from the total number. Some pupils in primary 1 in 2000 are repeaters as well (say 18). So, dropout amounts to: 100 – (80-10) – 18 = 12. The figures in table 4.13 were calculated this way.

Figure 4.20 *Dropout rates (2000-2003)*



Source: EMIS.

The Uganda National Household Survey of 2005/2006 (UBOS, 2006) mentions several reasons why pupils drop out of (primary) school. Costs are the main reason (39%). The cost factor appears to be a more important for girls than for boys. Moreover, for girls domestic duties are a much more important reason for dropping out than for boys. For boys, indifference to education (31%) is a major reason. Of course, these reasons may be correlated: if parents do not value education and they cannot afford it, their children are more likely to drop out.

The qualitative answers to the Uganda National Household survey 2005/2006 underscore the fact that poverty is the primary factor: 'When I defaulted on my rent, my landlord advised me to allow my ten-year-old daughter to go and start sorting maize grain to enable me to support the family with food and also pay the rent', according to a widow in Gulu whose husband had been killed by the LRA.

Table 4.14 *Reasons for dropping out of primary school (%)*

Reason for dropping out of school	Male	Female	Total
School is too expensive	35	43	39
Completed desired level	4	1	3
Work at home	1	7	5
Indifference to education	31	15	21
Poor progress	2	4	3
Sickness or calamity	14	13	13
Other reasons	14	17	16
Total	**100**	**100**	**100**

Source: UBOS, Uganda National Household Survey 2005/2006.

4.3.9 Completion

It is common to define completion rates as the total number of pupils completing the final year of primary education as a percentage of those who are of the official age for completing primary education. This definition presupposes:

- that the estimated number of children at the age of 12 is reliable;
- that most children pass their primary leaving exam (PLE) at the age of 12.

However, UNEB figures show that many pupils pass their exam at a higher age, while it is well possible that population estimates are not accurate at the local level due to migration. As a result of these problems, the way completion rates are usually computed does not necessarily produce correct figures at the district or local level.

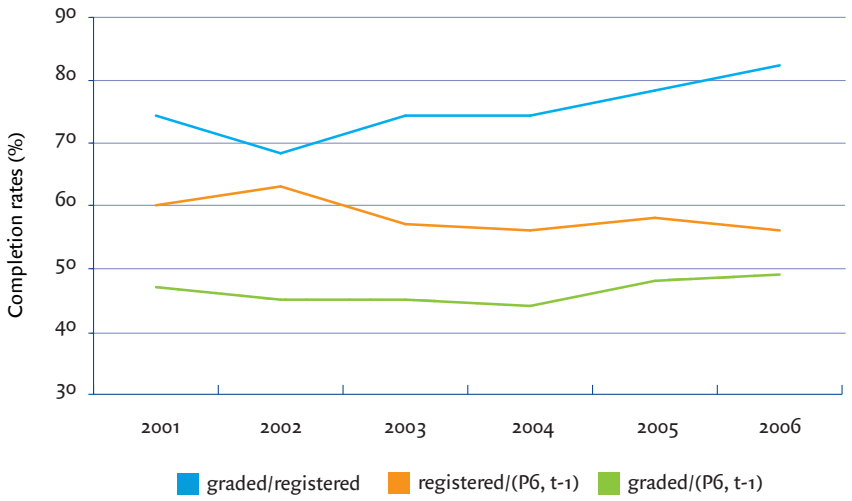
For this study, completion rates were calculated in a different way. The most reliable estimate is the number of pupils who pass the primary leaving exam as a percentage of the pupils registered for the exam. A second estimate involves a comparison of the number of pupils who passed the exam in year t with the number of pupils in primary 6 in year t-1. This method is in line with the method that MoES has used in its 2006 *Facts Report*.[21] Figure 4.21 shows both estimates. The

21 It can, of course, be argued that among the examination candidates are a number of pupils who repeated primary 7, which means that the computation is biased. However, pupils in primary 6 in year t-1 who do not register for the examination in year t or who do not pass the exam may repeat in primary 7 and take the exam the next year. Therefore, the chosen method gives a good estimate of completion rates.

figure also includes the number of pupils registered for the PLE as a percentage of the number of pupils in P6 in year t-1.

The figure shows that the percentage of registered pupils who pass the examination has increases since 2002. In 2002, 68% of the registered candidates passed the exam; by 2006 this percentage had increased to 82%. Second, there appears to be a negative correlation between the percentage of pupils who are registered and the percentage of registered pupils who pass the exam. Approximately 64% of the pupils enrolled in P6 in 2001 registered for the exam in 2002. That year the pass rate (the percentage of registered candidates who passed the exam) was relatively low (68%).

Figure 4.21 *Completion rates 2001-2005*



Source: EMIS / UNEB.

The lowest curve in the graph shows the combination of the two other indicators. It represents the number of pupils who passed their exam in a particular year, divided by the number of pupils in primary 6 the year before. This figure decreased between 2001 and 2004 (from 45% to 42%), but has shown an upward trend since 2005. Approximately 47% of the pupils enrolled in primary 6 in 2005 passed their exams in 2006. The overall conclusion is that completion rates declined between 2001 and 2004, but have improved since 2005.

4.4 Outcomes: learning achievements

This section describes the developments in learning achievement, as reflected by the results achieved by primary 7 pupils in the Primary Leaving Examinations (PLE) as well as the results of primary 3 and primary 6 pupils in the tests of the National Assessment of Progress Education (NAPE). On the whole, NAPE results correlate highly with exam results. This means that schools that perform well at primary 7, also perform well at primary 3 and primary 6.

PLE is an examination taken at the end of the primary school cycle. It consists of four compulsory papers: English (Literacy), Mathematics, Science and Social Studies (SST). Each paper is graded on a nine-point scale: 1 to 9, where 1 is the best grade and 9 the worst. The grades for each subject are then averaged to obtain the overall grade referred to as Division 1 to 4, in which Division 1 is the best. The Division awarded to a candidate is determined by the average examination result as well as the result for each individual subject. A candidate who fails to satisfy the conditions for the award of Division 4 is considered 'ungraded'.

NAPE tests consist of two papers for each class: one literacy and one numeracy test. The two subjects are graded separately by determining:

i) the average (mean) score, and
ii) the percentage of pupils who reach the required competency level.

The average scores are used for purposes of this study.

Table 4.15 shows the development of PLE results between 2000 and 2006. In 2001, 350,000 pupils were registered for the primary leaving exam. In 2005, this number had increased to 445,000 (an increase of 27%). The table shows that increasingly more pupils achieve Division 4 or higher: 79% in 2001 against 88% in 2006. However, requirements for Division 4 are low. A more encouraging result is that increasingly more pupils achieve Division 1 or 2 (45% in 2001 and 55% in 2006).

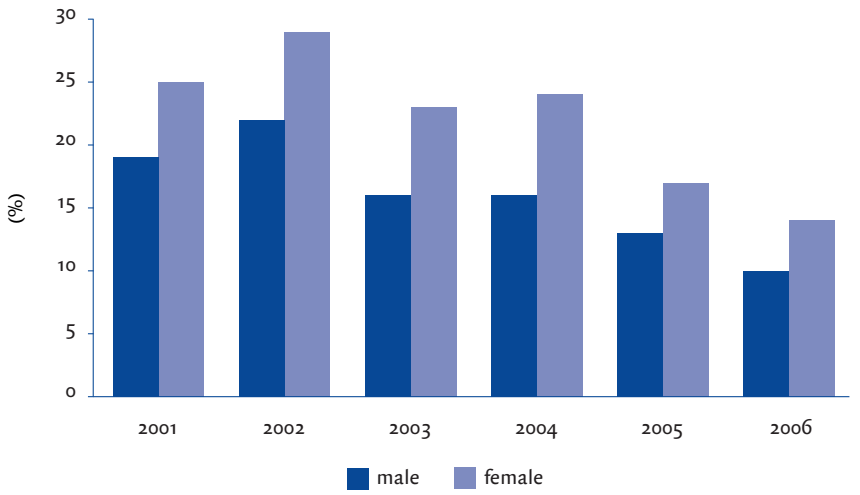
Table 4.15 *Primary Leaving Examination results by division (x 1,000; 2001-2006)*

	2001	2002	2003	2004	2005	2006
Division 1	27	33	41	30	21	32
Division 2	121	124	139	151	164	191
Division 3	63	71	73	72	106	86
Division 4	47	46	49	68	58	48
Ungraded	69	93	72	81	63	48
Total	**327**	**367**	**374**	**402**	**411**	**405**
Absent	22	35	32	31	34	29

Source: UNEB.

Figure 4.22 shows the variation in the percentage of ungraded pupils between 2001 and 2005.[22] Apparently, boys achieve better than girls. However, the gap has narrowed since 2003. Moreover, the percentage of pupils who do not pass their exam decreases every year.

Figure 4.22 *Percentage of male and female students ungraded in PLE 2001-2006*



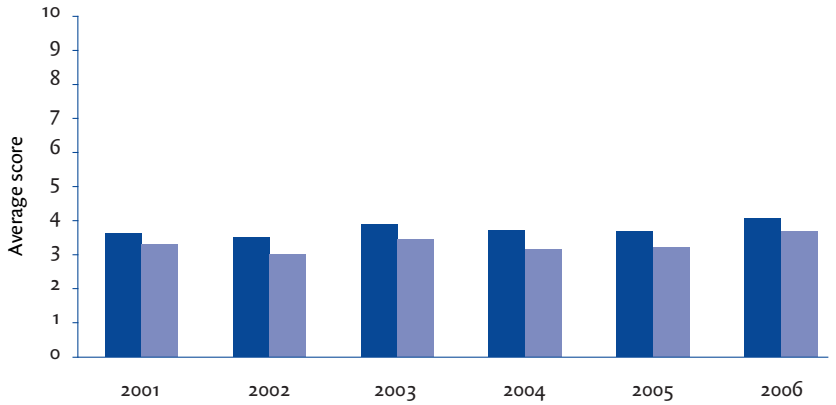
Source: UNEB.

22 Figures relate 'ungraded' pupils to all pupils who participated in the examination. Registered candidates who did not participate are not included.

On the whole, the percentage of both male and female pupils in the ungraded category declined between 2001 and 2006. In 2001, the percentage of ungraded boys was 19% and it dropped to 10% in 2006. For girls, the percentages changed from 25% to 14% in the same period. The real decrease in the proportions of ungraded boys and girls started to occur after 2002.

The reduction in the percentage of pupils in the ungraded category implies that more pupils are achieving better grades. This is an indicator of improved performance. This improvement, however, is not reflected in the average figures. Figure 4.23 presents the average examination scores for male and female pupils for the years 2001-2006. The results were recalculated to a 10-point scale (10 being the best score). While average examination results remain low, the figure shows a slightly improving trend, with relatively good figures for 2006. That year, the average scores were 12% higher than in 2000 (for boys and girls alike).

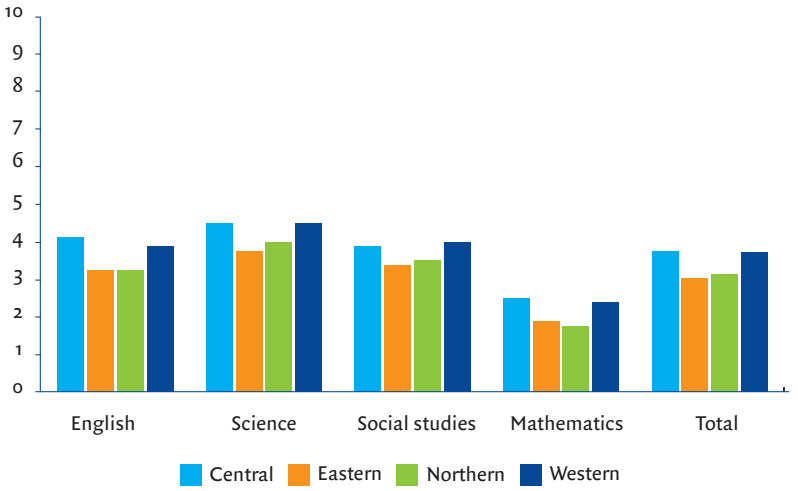
Figure 4.23 *Average test and examination results for boys and girls (2001-2006)*



Source: UNEB / computation IOB.

Figure 4.24 shows the regional differences in average exam results for 2005. The central and western districts perform better than the eastern and northern districts. Further disaggregation (table 4.16) shows that average results are significantly better in Kampala than in other parts of Uganda.

Figure 4.24 *Average PLE results by subject and region (2005)*



Source: UNEB / computation IOB.

Table 4.16 *Average PLE results by region and zone (2005)*

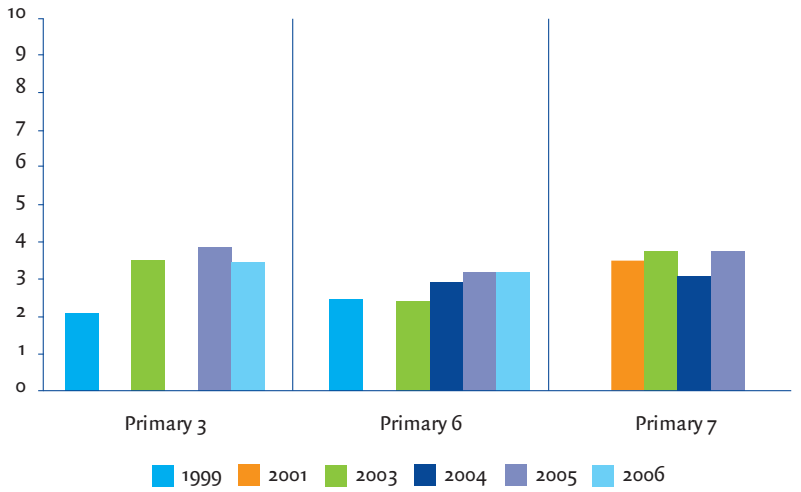
		English	Science	Social studies	Mathematics	Total (average)
Central	Central I	4.1	4.4	4.0	2.3	3.7
	Central II	3.2	3.8	3.0	2.0	3.0
	Central III	3.6	4.1	3.3	2.2	3.3
	Kampala	6.2	6.2	5.7	3.4	5.4
Eastern	Far East	3.3	3.8	3.5	1.6	3.1
	Mid East	3.3	3.7	3.2	1.7	3.0
	Near East	3.2	3.7	3.3	1.9	3.1
Northern	Mid North	3.1	3.9	3.4	1.7	3.0
	North East	4.2	4.5	4.4	1.7	3.7
	West Nile	3.3	3.9	3.5	1.6	3.1
Western	Far West	4.0	4.5	4.1	2.4	3.8
	Mid West	3.6	4.3	3.7	2.2	3.4
	North West	4.2	4.8	4.4	2.3	3.9
	South West	4.0	4.6	4.1	2.7	3.9

Source: UNEB, PLE Results 2005 / computation IOB.

4.4.1 Achievement in Literacy (English)

This section compares the developments in literacy performance at the primary 3, primary 6 and primary 7 level. NAPE tests (National Assessment of Progress in Education) are the reference point in this section to assess changes in the achievement levels of primary schools, at primary 3 and primary 6. At primary 3, the maximum test score is 50; at primary 6 this is 100. This difference in score reflects the difference in the number of questions. In order to be able to compare the test results with the PLE results, all figures are recalculated to a 10-point scale.

Figure 4.25 *Examination and test results for Literacy (1999-2006)*



Source: UNEB / computation IOB.

The Literacy achievements of pupils in both lower and upper primary have improved in all regions of the country. Pupils' mean NAPE Literacy test scores increased in all regions, although they were highest in the central and lowest in northern region. Examination figures for English appear to be stable, with relatively low figures in 2004.

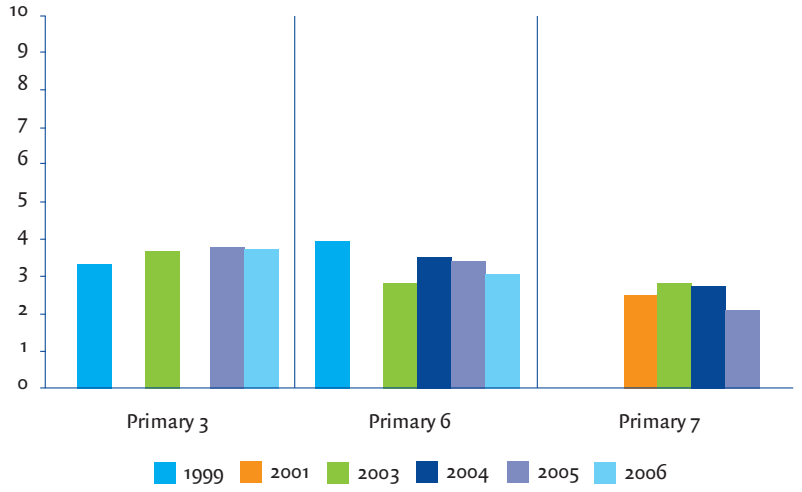
4.4.2 Achievement in Numeracy

This section examines pupils' achievements in Numeracy. The Numeracy achievements of primary 3 pupils from central and western districts improved, although the improvement was not as significant as in Literacy. In the northern region, results declined between 1999 and 2003 and then began to rise again in 2005, whereas in the east, the mean score was higher in 2003 than in 1999, but it

Pupils at the St. Livingstone primary school, Masindi.

had not risen further in 2005. At primary 6, mean scores slightly decreased between 1999 and 2005, although means were significantly lower in 2003. In 2005, the average PLE score for mathematics was very low.

Figure 4.26 *Examination and test results for Numeracy (1999-2006)*



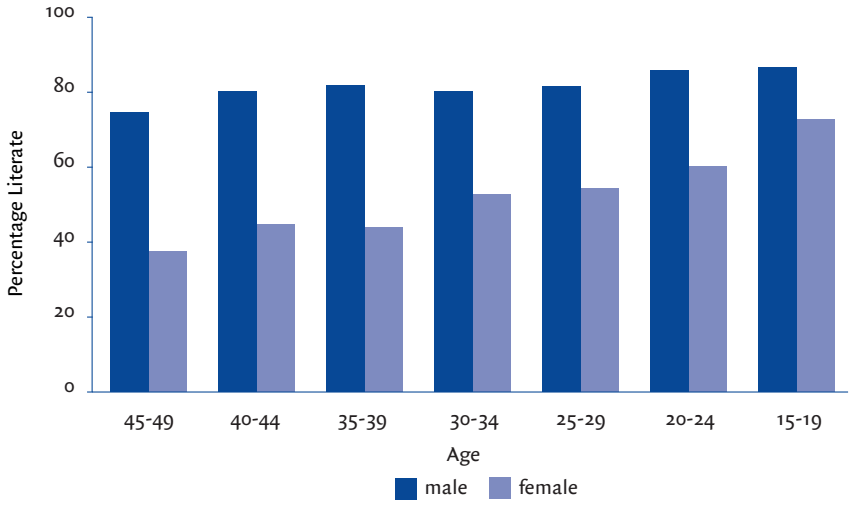
Source: UNEB / computation IOB.

4.5 Literacy and educational attainment

The development of literacy rates is an indicator for the general development of primary education in Uganda. In 1999/2000, approximately 65% of the population (aged 10 years and above) was literate; in 2005/2006 this percentage has increased to 69%. In the rural areas, literacy increased from 62% to 66%, whereas in urban areas, the literacy rate has remained constant since 1999/2000 (86%). Especially the literacy of women in rural areas has increased, from 54% to 58% (Uganda National Household Survey, 2005/2006). Literacy rates are lowest in the eastern (64%) and northern (59%) regions and highest in Kampala (91%).

Figure 4.27 shows the development by age group (male and female). The figure indicates that in Uganda literacy levels have improved over the past 40 years. In the age group of 45-49, 75% of the men can read whereas for boys between 15 and 19 this percentage is 87%. For women, the improvement is even more significant: approximately 38% of the women aged 45-49 can read, whereas 73% of the girls between 15 and 19 can read. The dramatic improvement shown by the youngest female age group reflects the effectiveness of recent policy measures.

Figure 4.27 *Literacy among males and females by age (2006)*

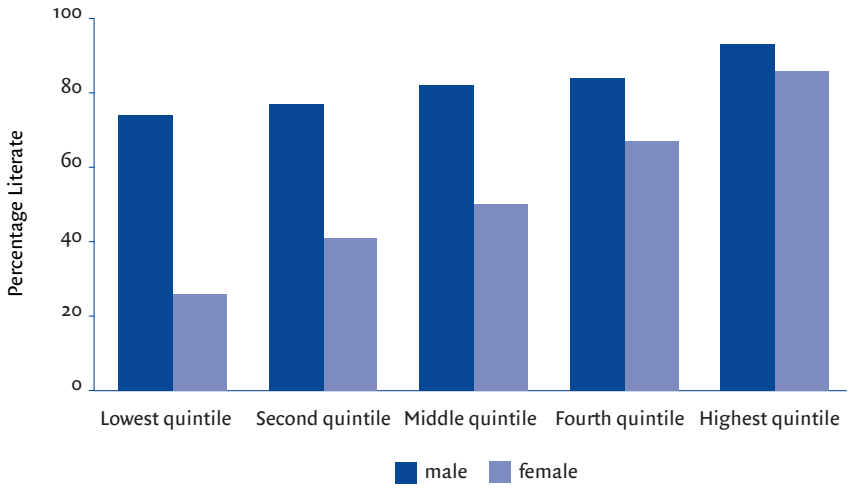


Source: UBOS / DHS 2006.

Apart from differences between age groups, literacy rates differ between wealth groups as well: in the highest quintile, literacy rates are substantially higher than

in the lowest quintile. These differences are especially large for women: literacy rates of women in the poorest households are very low.

Figure 4.28 *Literacy rates by wealth quintile (population 18 years and above, %)*

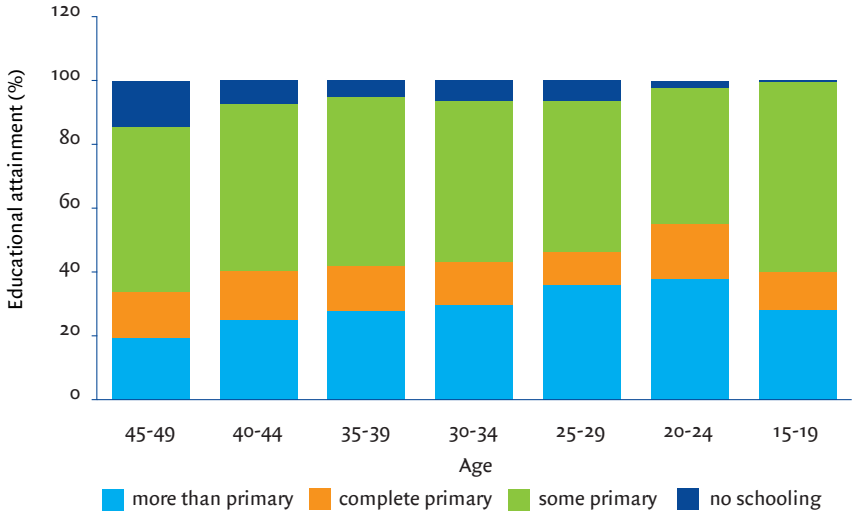


Source: UBOS / DHS 2006.

Figures on educational attainment by age show another way of looking at the effects of educational policy measures. Figure 4.29 shows a large increase in the percentage of males with at least (completed) primary education. For the oldest male age group, this percentage amounts to about 34% and for the age group 20-24 55%. For the youngest age group (15-19) this percentage is lower (40%). This relatively low figure reflects a high repetition rate as well as a high dropout rate.

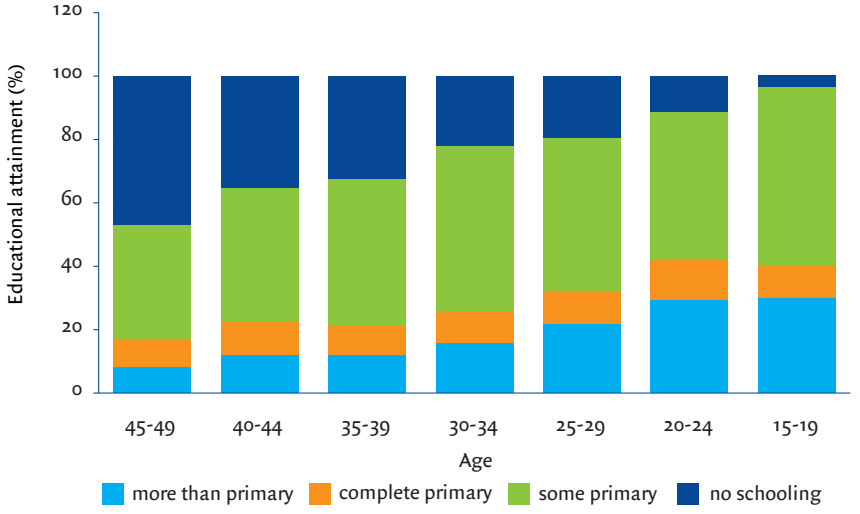
For the oldest female age group, this percentage amounts to about 17% and for the youngest age group 40%, the same percentage as for boys at the same age. While these low figures for the youngest age groups may partly be explained by the fact the UPE was introduced ten years ago and that in that year many boys and girls of this age group were already older than 6, the low figures for the group aged 15-19 are worrisome.

Figure 4.29 *Educational attainment by age (male, 2006)*



Source: UBOS / DHS 2006.

Figure 4.30 *Educational attainment by age (female, 2006)*



Source: UBOS / DHS 2006.

4.6 Summary and conclusions

The introduction of free primary education and the abolishment of school fees, together with the fast growth of the population, have contributed to an enormous expansion of enrolment in primary education. In 1995, 2.6 million children were enrolled in primary education and by 2005, this figure had increased to 7.2 million. At first, this massive inflow had a negative effect on the quality of education: pupil teacher ratios and pupil classroom ratios skyrocketed. Pupils went to school, but they had to sit on the floor in overcrowded classrooms and lacked learning materials.

Increased investments in the sector have led to improved access to all levels of education, mainly through expansion of school facilities and the reduction of financial and social barriers to education. As a result, a significant proportion of previously disadvantaged social groups (including girls, children of the poor and other disadvantaged groups) have gained access to education at all levels.

By increasing their funding and developing two investment plans (the *Education Strategic Investment Plan* of 1997-2003 and the *Education Sector Strategic Plan* 2004-2015) the government and donors sought to meet the needs created by this sharp increase. The first plan focused on access, whereas the second was developed to increase the quality of education. Large numbers of new teachers were recruited and trained. Their number doubled from 74,000 in 1995 to 150,000 in 2006. Notwithstanding this growth, the percentage of untrained teachers decreased from 28% to 11%. The number of schools increased from 12,500 in 2000 to 17,000 in 2006. The number of classrooms showed a growth from 68,000 in 2000 to 100,000 in 2006. In this period, the number of books for the four main subjects increased from 6.6 million to 10.6 million in 2005.

As a result of the large-scale investments, the pupil teacher ratio decreased from 60:1 in 2000 to 48:1 in 2006 and the pupil classroom ratio from 108:1 to 71:1. In 2000, an average of four children had to share one book for each subject. In 2005, this ratio was reduced to 2.7:1. The official net enrolment rate increased to above 90%. The gender gap narrowed and parity was achieved in 2005. The percentage of pupils who passed the primary leaving exam improved from 74% in 2001 to 82% in 2006. Average examination and test results improve gradually.

Uganda still faces many problems. First of all, although net enrolment rates seem high, pupil attendance rates are low. On average, approximately 27% of the children are actually not in school. Dropout (around 10%-15%) and repetition (about 14%)

are high, resulting in low progression rates and low completion rates. High repetition and dropout rates at primary 1 are the result of a lack of access to pre primary education. Better access to pre primary education would lower repetition and dropout and therefore would add efficiency to the learning process.

Although learning achievements seems to be slightly improving, the quality of education remains low. Average test and primary leaving examination scores are below 40%. In 2005, the average primary leaving examination result for mathematics was even below 30%. The only reason why most children pass the primary leaving examination is that demands are low. Pupils who answer 60% of the questions wrong may still receive a certificate for Division 2. Pupils still qualify for a Division 4 certificate if 90% of their answers were wrong. Even though this policy prevents repetition, many children leave school without having mastered literacy and numeracy (Leliveld, 2006, p. 58).

Moreover, regional disparities remain high. Pupil classroom ratios and pupil teacher ratios are much higher in northern and eastern districts than in the central and western districts. Children in rural areas have to walk much longer distances to school than children in urban areas. Differences in book pupil ratios are significant.

5 Impact

5.1 Introduction

The preceding chapter showed that Uganda has been successful in increasing entrance and enrolment, but it appears to be a problem to keep the children in school and to enable them to pass their exams within seven years: dropout and repetition rates are high. Moreover, the quality of education, as measured by assessments and primary leaving examination results, remains low. This chapter analyses the effectiveness of educational interventions based on a statistical (econometric) approach. Section 5.2 starts with a brief explanation of the analysis. Section 5.3 follows with an analysis of progression, dropout and repetition rates. Sections 5.4 and 5.5 assess the impact of interventions on overall learning achievements. Based on the results of these analyses, section 5.6 provides an estimate of the cost-effectiveness of interventions. Section 5.7 ends with a summary and a number of conclusions. The reader who is less interested in statistical analysis may wish to go directly to section 5.7.

5.2 Measuring impact

The purpose of an impact analysis is to combine all relevant factors that have an impact on learning achievement. Examples are the number of teachers, classrooms and books. It is impossible to analyse these factors in isolation, as explained in chapter 2. Various other interventions or exogenous factors may also have an impact on access and learning. Therefore, the focus of analysis in this chapter is not the intervention itself, but its effect on access and learning. This chapter analyses the effectiveness of different interventions, also taking the effects of other factors into account. The chapter focuses on the effects of (changes in):

- pupil teacher ratio
- classroom availability
- availability of toilets

- teacher education
- teacher training
- head teacher qualifications
- distance to the nearest primary school.

The analyses also include the effects of (differences in):
- school type (public, private, community)
- location (urban, peri-urban, rural)
- region
- socio-economic differences
- percentage girls
- percentage orphans

The final section will, on the basis of the preceding analyses, draw some conclusions on the effectiveness of the different interventions.

Class size

Class size is one of the central variables in the model. But what defines class size? The pupil classroom ratio is not necessarily the best indicator of class size. There are large differences in the quality of classrooms and therefore schools may use different definitions. Moreover, a lack of classrooms is not the same as large classes. In some schools, teachers may teach outside, under a tree. Other schools have erected temporary timber huts with thatched roofs. For this study, the pupil teacher ratio was chosen as the main indicator of class size. Moreover, it is generally acknowledged that the man or woman in front of the classroom is the most important factor in education.

A teacher classroom ratio of 1:1 is the best allocation of resources, but in practice there are many variations as a result of a lack of classrooms or teachers. Including the pupil teacher ratio and the pupil classroom ratio in the analysis creates a statistical problem. Both variables are highly correlated: in most cases, a class consists of a classroom and one teacher. This correlation hinders a reliable estimation of the coefficients for the pupil teacher ratio (PTR) and pupil classroom ratio (PCR).[23] An indicator for the availability of classrooms was used instead of the pupil classroom ratio. This indicator is calculated as follows:

23 The inclusion of both variables in one regression creates a multicollinearity problem. Multicollinearity refers to a linear relationship between a number of explanatory variables in a regression model. In the presence of multicollinearity, the estimate of one variable's impact on y while controlling for the other(s) may be biased.

existing classrooms

(existing classrooms + classrooms under construction+ additional classrooms needed)

The interpretation of this ratio is straightforward: a figure of 1 indicates that the school has enough classrooms and a figure of (almost) 0 indicates that the availability of classrooms is a large problem. A figure of 0.5 indicates that the school has half of the total classrooms required.

Socio-economic background

The EMIS database does not contain data on household characteristics. This creates the risk that important variables are omitted. As a result, estimates may be biased (see chapter 2). Therefore, a variable should be included that forms an indicator for the background and wealth of the parents. For this goal, the researchers have created a socio-economic indicator at the parish level, based on information from the Population and Housing Census of 2002 (see Annex 7).

The Population and Housing Census does not contain information about households' income or expenditures. However, several variables were used to construct an indicator for the *socio-economic position* of the households in the sample:

- percentage of paid employees in a parish (r=0.78)
- percentage who went to school in a parish (r=0.84)
- average job level in a parish (r=0.70)
- average education level in a parish (r=0.95)
- average literacy level in a parish (r=0.88).

The analysis is conducted at the parish level. A high score on the newly constructed variable means that most heads of households in the parish have a good job and a good educational background; a low score is an indication that fewer people have good jobs and a good educational background. Annex 7 explains the methodology.

5.3 Progression, repetition and dropout

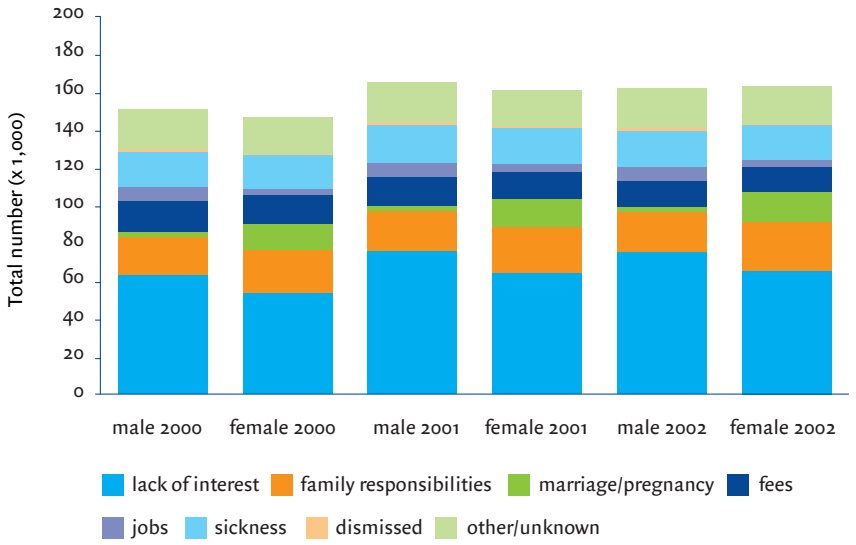
5.3.1 Dropout

Chapter 4 already noted that high dropout rates are among the main problems in primary education in Uganda. It is therefore unfortunate that since 2002, the annual school census no longer includes information on dropout rates. However,

these rates can still be calculated on the basis of enrolment and repetition figures (see chapter 4). This method makes it possible to analyse the effects of interventions on dropout.

Interestingly enough, school census data for 2000-2002 not only give information on dropout figures, but on the reasons for dropout as well. The main reason for dropout, from the schools' perspective, is pupils' lack of interest (see figure 5.1). This figure is higher for boys (approximately 45%) than for girls (40%). For girls, pregnancy and marriage are significant reasons. Other important reasons are sickness and family responsibilities.

Figure 5.1 *Reasons for dropout (2000-2002)*

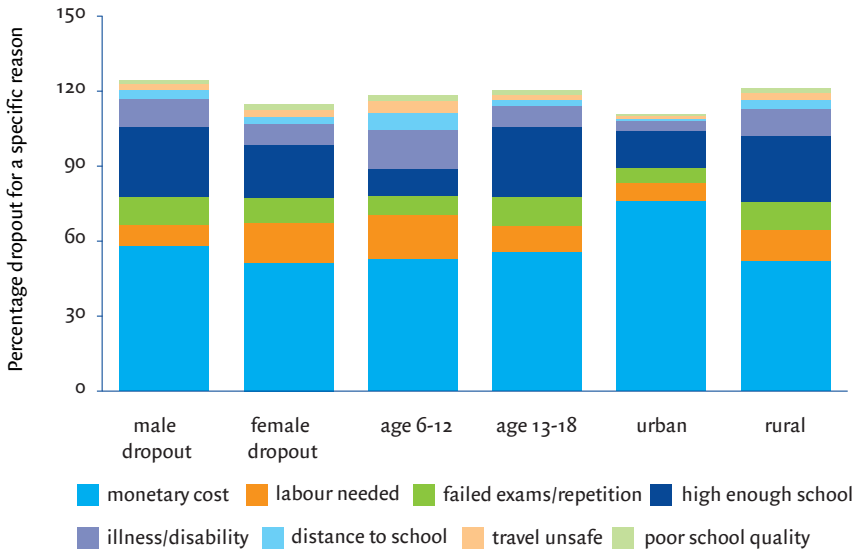


Source: EMIS.

The reasons stated in the annual school census may be biased, as they are given by the school, and not by the pupils or their parents. The DHS EdData survey of 2002 contains some information on the reasons for dropout for several groups of children (see figure 5.2). In the DHS, these reasons are given by the children's parents. Reasons can be stated more than once, so the total figure may be higher than 100%. The principal reason is lack of money (see section 4.3.7). This reason was mentioned by an average of 55% of the respondents. This reason appears to be more important in urban areas (76%) than in rural areas (52%). In rural areas, the argument that the child has learnt enough is more important (26%) than in

urban areas (15%). The two reasons are most likely correlated and correlated with lack of interest, as perceived by the teacher, as well. Head teachers in Masindi, interviewed in the context of this study, mentioned that lack of interest among parents was the main reason for dropout. According to them, people do not value education. They try to sensitise parents on this issue, but this is a slow process. An effective policy that aims to reduce the number of dropouts must start with the main causes: child labour, pregnancies, early marriages, etc. Government policy on dropout is top down instead of bottom up. The policy does not start with the main causes: child labour, pregnancies, early marriages, etc. Most parents are farmers and they need their children to work on the land or to take care of the cattle. School-related factors are important mainly for pupils aged 6-12. The main reasons are distance (7%) and unsafe roads (5%). In the northern region, 12% of the parents mentioned this factor as a reason for dropout of their children between 6 and 12.

Figure 5.2 *Specific reasons for dropout (UDES, 2001)*



Source: UBOS / DHS, 2001.

The EMIS data make it possible to analyse differences in dropout rates between schools.[24] One problem is that these data do not always seem consistent: for instance, sometimes repetition figures are higher than the total number of pupils

24 See section 4.3.7 for an explanation of the computation method.

in one grade. Therefore, potentially unreliable figures are excluded from the analysis. This reduces the total sample, but it increases the reliability of results.[25] The analysis is based on calculated dropout figures for the years 2003-2005. One year (2005) could not be analysed due to the method of calculation used. Table 5.1 represents the results.

Table 5.1 *Variables explaining dropout rates (2003-2004; percentages; GLS)*

Variable	Coefficient	Standard error	z-score	
Pupil teacher ratio	0.10	0.01	17.5	**
Education level teachers	- 1.11	0.28	- 4.0	**
Teacher training	- 0.37	0.44	- 0.8	
Head teacher qualification	- 0.34	0.07	- 4.8	**
Percentage female	0.01	0.02	0.4	
Percentage orphans	- 0.04	0.01	- 5.6	**
Percentage repeaters	- 0.15	0.01	- 15,5	**
Private schools	1.76	0.51	3.5	**
Community schools	1.09	0.53	2.1	*
Distance to the nearest school	0.38	0.07	5.5	**
Urban	1.03	0.56	1.8	
Rural	1.06	0.36	3.0	**
North	- 1.44	0.35	- 4.1	**
East	- 1.04	0.31	- 3.3	**
West	0.83	0.28	2.9	**
Socio-economic status	- 1.78	0.15	- 11.7	**
Dummy 2004	- 0.76	0.17	- 4.4	**
Constant	13.43	1.29	10.4	**

N = 18,000
R^2 = 0.08
Wald Chi^2 = 1,391
* significant at p<0.05; ** significant at p<0.01.
Source: EMIS 2003-2005.

25 A second problem is that the calculation method used is more reliable at the aggregate national level than at the individual school level. Dropout rates have been calculated based on enrolment and repetition figures. However, when pupils move from one school to another school, this is calculated as 'dropout' as well.

First of all, the total explained variance is rather low (R^2 adj= 0.08). This may be explained first of all by a relatively large measurement error. Second, it indicates that, as suggested by the above-mentioned explanations, pupil and household-related factors are much more important than school-related factors. This is consistent with the results from the DHS and Uganda National Household Surveys, which concluded that the main reasons for dropping out are costs and indifference to further education.

High pupil teacher ratios and a large distance to the school lead to higher dropout rates. For instance, a reduction of the PTR from 100:1 to 50:1 would reduce the dropout ratio (measured in percentages) by 0.1 x 50 = 5 points (which is approximately 30%). Second, there is a significant effect of teacher education: dropout is lower in schools with well educated teachers. The effects of teacher training are probably underestimated, because only training received in the previous year is taken into account. Third, taking into account the other factors in the model, dropout rates are lower in the north and east higher in the western region (for the western region about 5% higher). Taking all other factors into account, the 2004 dropout rate was in 2005 higher than in 2004. 'Socio-economic status' is also significant: in parishes with better-educated parents and wealthier households, the dropout rate is lower. This conclusion is consistent with the major reasons for dropout: the costs of schooling and child labour.

The figure for orphans seems remarkable: schools with large numbers of orphans have a lower dropout rate than schools with fewer orphans. Repetition rates appear to be an important factor explaining differences in dropout rates: schools with high repetition rates show lower dropout rates than schools with low repetition rates. This conclusion has relevance for education policy: repetition may prevent dropout. On the other hand, it is expensive, increases pupil teacher ratios, etc. Nevertheless, dropout is much more expensive: pupils who complete primary education are likely to become an asset for the country, whereas pupils who do not may become a liability. However, repetition is very costly, especially with the high repetition rates Uganda faces. Therefore, the country faces the challenge of lowering repetition rates without at the same time increasing dropout figures.

5.3.2 Repetition

One may expect that certain factors related to high dropout rates, such as a high pupil teacher ratio or a large distance to school, are related to high repetition rates as well. However, there may also be differences. For example, teachers may choose to allow repetition just in order to prevent dropout. A fieldtrip to schools in Masindi

confirmed this hypothesis: teachers do not support the automatic promotion system and defend repetition by claiming that there is no point in promoting a child if it lacks the knowledge to function effectively at the next grade level. According to them, repetition is likely to prevent dropout. They claim that repeaters receive extra attention (for instance, after official school hours).

Table 5.2 *Variables explaining repetition rates (2003-2004; percentages; GLS)*

Variable	Coefficient	Standard error	z- score	
Pupil teacher ratio	- 0.05	0.004	- 11.0	**
Education level teachers	0.63	0.22	2.8	**
Teacher training	0.33	0.34	1.0	
Head teacher qualification	0.08	0.06	1.4	
Percentage female	0.01	0.01	0.8	
Percentage orphans	0.05	0.006	8.4	**
Private schools	- 4.13	0.41	- 10.0	**
Community schools	- 2.08	0.42	- 5.0	**
Distance to the nearest school	- 0.23	0.06	- 4.0	**
Urban	- 1.60	0.45	- 3.5	**
Rural	0.77	0.29	2.65	**
North	6.79	0.29	23.2	**
East	6.58	0.26	25.3	**
West	5.02	0.24	21.0	**
Socio-economic status	- 0.14	0.13	- 1.1	
Dummy 2004	0.27	0.11	2.4	*
Constant	8.97	0.90	9.9	**

N = 18,000
R^2 = 0.08
Wald chi^2 = 1,321
* significant at p<0.05; ** significant at p<0.01.
Source: EMIS 2003-2005.

Table 5.2 shows the results of the regression analysis. The coefficient for the pupil teacher ratio has a negative sign. This indicates that schools with a large pupil teacher ratio have fewer repeaters. The probable explanation is that schools with larger classes cannot afford to increase their pupil teacher ratios and therefore tend to prevent repetition. Eventually, this could increase the chance of dropout (see table 5.2). There is no significant relation between distance and repetition. However, in the northern, eastern and western districts, repetition rates are

(considerably) higher than in the central districts. Schools with a high percentage of orphans have higher repetition rates as well. Finally, community schools and, especially, private schools have lower repetition rates than public schools.

So, repetition rates are high in schools in the north, east and west that have relatively low pupil teacher rates and relatively large numbers of orphans. If schools in these regions have high pupil teacher ratios, they cannot afford repetition and this may lead to increased dropout in the following years. A high number of repeaters in primary 6 suggest that a major reason for repetition is that it helps pupils to perform better at the PLE.

5.3.3 Progression

Uganda faces the challenge of improving progression rates (i.e. lowering repetition rates without increasing dropout figures as a result). The progression rate refers to the proportion of pupils who were promoted from one grade to the next. Which schools are most effective in realising this goal? The regression analysis of table 5.3 aims at shedding some light on this question.

The total explained variance is rather low although all coefficients do have the expected sign and most of them are significant. Regional characteristics show significant differences and the coefficient of socio-economic characteristics differs significantly from zero. This confirms the relevance of pupil and household characteristics.

However, a number of conclusions are relevant to educational policy. Low pupil teacher ratios and shorter distances to schools help increase progression rates. If teacher education and teacher training are more effectively directed at the problems of dropout and repetition, their impact is likely to increase.

Table 5.3 *Progression rates (2003-2004; percentages; GLS)*

Variable	Coefficient	Standard error	z- score	
Pupil teacher ratio	- 0.07	0.006	- 11.8	**
Education level teachers	0.51	0.31	1.6	
Teacher training	0.78	0.49	1.6	
Head teacher qualification	0.31	0.08	4.0	**
Percentage female	- 0.004	0.02	- 0.2	
Percentage orphans	0.03	0.01	3.4	**
Private schools	1.85	0.57	3.3	**
Community schools	0.78	0.59	1.3	
Distance to the nearest school	- 0.32	0.08	- 4.1	**
Urban	0.57	0.63	0.9	
Rural	- 1.63	0.40	- 4.1	**
North	- 4.43	0.39	- 11.4	**
East	- 4.34	0.35	- 12.5	**
West	- 4.90	0.32	- 15.5	**
Socio-economic status	1.68	0.17	9.7	**
Dummy 2004	0.49	0.18	2.8	**
Constant	78.23	1.25	62.7	**

N = 18,000
R^2 = 0.09
Wald Chi^2 = 1,545
* significant at p<0.05; ** significant at p<0.01.
Source: EMIS 2003-2005.

5.4 Learning achievements

5.4.1 Introduction

The preceding sections analysed the factors explaining dropout, repetition and progression. The following analysis is conducted to measure the impact of different interventions on learning achievement, as measured by examination and test results. As in the preceding chapter, examination and test results have been rescaled (from 0 to 10, with 10 as the best score). The analysis is based on different datasets in order to improve accuracy.

Table 5.4 shows the high correlation between test results (for the National Assessment) and examination results for 2005. The correlation between test results and examination results is very high; the lowest correlation (0.41) is the

Pupils at Walyoba primary school, Masindi.

correlation between the test results for mathematics (numeracy) at primary 3 and the examination results for social studies.

Table 5.4 *Correlations between test results (NAPE) and examination results (2005)*

	P3 Literacy	P3 Math	P6 Literacy	P6 Math	PLE Literacy	PLE Science	PLE Social Studies	PLE Math	Total PLE
P3 Literacy	1.00								
P3 Math	0.93	1.00							
P6 Literacy	0.75	0.70	1.00						
P6 Math	0.67	0.67	0.88	1.00					
PLE Literacy	0.55	0.48	0.75	0.63	1.00				
PLE Science	0.52	0.45	0.70	0.61	0.90	1.00			
PLE Social Studies	0.47	0.41	0.67	0.59	0.91	0.89	1.00		
PLE Mathematics	0.53	0.49	0.64	0.61	0.83	0.81	0.78	1.00	
Total PLE	**0.55**	**0.48**	**0.73**	**0.64**	**0.97**	**0.96**	**0.96**	**0.89**	**1.00**

N= 250; all correlations are significant at the 0.01 level (two-tailed).

The results show that schools with good test results at primary 3 and 6 have good examination results as well: they are simply good schools. The correlation between test results and examination results may seem exactly what you would expect, but other countries show different experiences. Rivkin, Hanushek and Kain (2005) did not find high correlations for schools in the United States. For Zambia, we did not find high correlations between test results at grade 5 and examination results at grade 7, either. But the findings for Uganda are encouraging: it helps to invest in schools and results do not solely depend on the teacher's qualities.

5.4.2 Class size and learning achievement

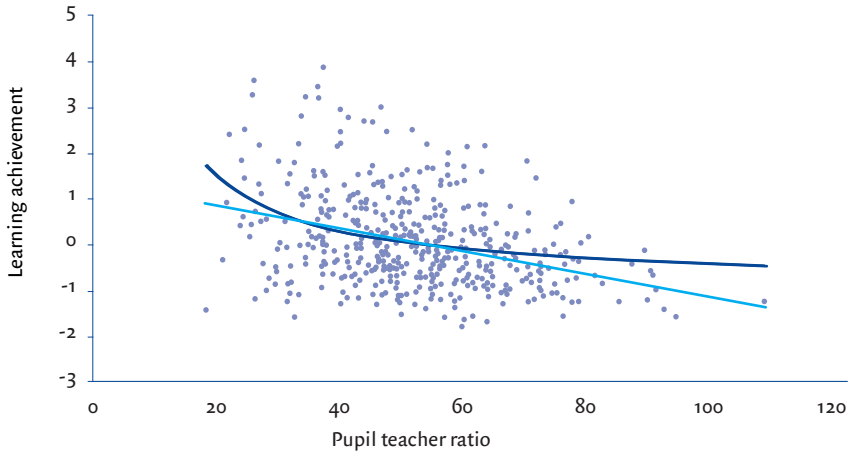
In the literature, there has been a long debate about the relation between class size and learning achievement. This debate is mainly based on evidence in industrialised countries and seems inconclusive.[26] For Uganda, Walugembe (2003) analysed the effects of class size on examination results. He used logit and probit specifications to analyse factors affecting pass rates in primary education between 1992 and 2000. He concluded that lower pupil teacher ratios, pupil classroom ratios, pupil book ratios and higher per-pupil expenditure do not necessarily mean higher pass rates in education.

Walugembe analysed the effect of interventions in the 1990s, which is the period before and after the introduction of free primary education. Since then, the MoES has invested heavily in primary education and interventions may have become more effective. Figure 5.3 is a graphic presentation of more recent figures. The figure shows the relation between pupil teacher ratio (on the horizontal axis) and learning achievement (on the vertical axis). For learning achievement, we have calculated one variable, using the PLE results and the (NAPE) test results at P3 and P6 for the years 2003-2005.[27] The method used shows the deviation from the zero mean (with a standard deviation of one).

26 See for instance Katharina Michaelowa, *Determinants of Primary Education Quality: What can we learn from PASEC for francophone Sub-Saharan Africa?* ADEA, 2003.

27 With the method of Principal Components Analysis (PCA). For 2004, we have used the NAPE results at P4.

Figure 5.3 *Pupil teacher ratio and learning achievement*



Source: EMIS/UNEB.

The relation between the number of pupils per teacher and learning achievement is not straightforward. A low pupil teacher ratio (PTR) is no guarantee for good results. However, the best-performing schools have a PTR below 50:1, whereas the results of most schools with a PTR above 60:1 are below average.

Second, the relation between pupil teacher ratio and learning achievements is not linear, but rather curve-linear. Michaelowa (2001) used a quadratic specification to explain the relation between class size and education quality. According to this specification, additional students only have an (increasingly) negative effect on learning beyond a threshold of approximately 60 pupils.[28] Figure 5.3 suggests an inverse relation, supporting the hypothesis of a linear relation between teacher pupil ratio and learning achievements.

5.4.3 Pupil and household characteristics

This section explores the effects of pupil and household characteristics. The analysis links examination data (for 2001) with the *DHS EdData Survey* of 2001 and with data from the *Population and Housing Census* of 2002.

The 2001 Uganda DHS EdData Survey is a national representative survey covering 4,217 households and 11,610 children. It is the first education survey of its kind in Uganda and is linked to the 2000-2001 Uganda *Demographic and Health Survey*. The

28 A disadvantage of this specification is that results may suggest, as they do in Michaelowa's model, that education quality would decrease below a certain threshold, but this is just an artefact of the specification.

survey contains information on adult educational attainment and literacy, children's school attendance, pupil absenteeism, household expenditures on schooling and parents' perceptions of schooling (including the perceived quality of schooling). The standard database of the DHS EdData survey contains a number of the DHS variables.

The present analysis is conducted at the school level and links data from 5,212 schools with the examination results (PLE) of 2001. The exam results have been rescaled to a 0-10 scale. Ten is the perfect score. Likewise, 0 means that a candidate had no correct answers. Extreme pupil teacher ratios were deleted from the analysis. Because the number of books for each different subject is correlated, only the number of books (per pupil) for mathematics (numeracy) was included. A weighted least squares regression was used, with the number of pupils in a school as weight. Table 5.5 summarises the results.

For most variables, the results are significant at the 1% level. However, effects are not necessarily large. The constant 1.6 is the average figure for a public school for boys in the central rural region, without orphans. The effects of the variables included in the model need to be added to this figure. The coefficient for the teacher pupil ratio (0.34) indicates that if a school has a ratio of 50 pupils for each teacher (a pupil teacher ratio of 50:1 or a teacher pupil ratio of 2:100), this will add 0.34 x 2 = 0.68 to the average exam figure. If the pupil teacher ratio is 1:25, this figure is 0.34 x 4 = 1.24. This does not seem a substantial figure. However, as the average figure for Uganda in 2005 was 3.5, the addition to this figure is approximately 16% ((1.24-0.68)/3.5).

An adequate number of classrooms also has a positive effect. It raises the average exam score by 0.49. Raising the book pupil ratio has the same effect, however – surprisingly – the availability of toilets does not have a significant effect on examination results. It has been suggested that toilets are very important for girls' school attendance. According to the Ugandan Health Minister Dr. Crispus Kiyonga, lack of (separate) latrines for girls is a major factor forcing girls out of school (cited in World Bank, 2004). A UNICEF study suggested that adequate water and sanitation facilities may increase girls' attendance by 15%. One may expect that increased attendance has an impact on learning achievement. However, a significant effect was not found. The analysis was repeated for girls alone, but this has not changed the conclusion. We do find, however, that the average examination results of schools with a high percentage of girls are not as good as the results of schools with a low percentage of girls. The percentage of orphans has no effect.

Table 5.5 *Variables explaining differences in average examination results (2001)*

Variable	Coefficient	Standard error	t- value	
Teacher pupil ratio (100:1)	0.34	0.04	8.1	**
Education level teachers	0.15	0.06	2.6	**
Teacher training	0.30	0.11	2.8	**
Head teacher qualification	0.15	0.02	9.5	**
Availability of classrooms	0.49	0.10	4.9	**
Availability of toilets	0.11	0.08	1.4	
Book pupil ratio Mathematics	0.48	0.04	11.0	**
Percentage female	-0.49	0.17	-2.9	**
Percentage orphans	-0.36	0.22	-1.6	
Private schools	0.74	0.10	7.8	**
Community schools	0.20	0.13	1.5	
Distance to the nearest school	-0.05	0.01	-3.8	**
Urban	1.85	0.08	23.5	**
Peri-urban	0.86	0.06	13.8	**
North	-0.36	0.08	-4.7	**
East	-0.74	0.06	-12.0	**
West	-0.04	0.06	-0.6	
Constant	1.6	0.17	9.7	**

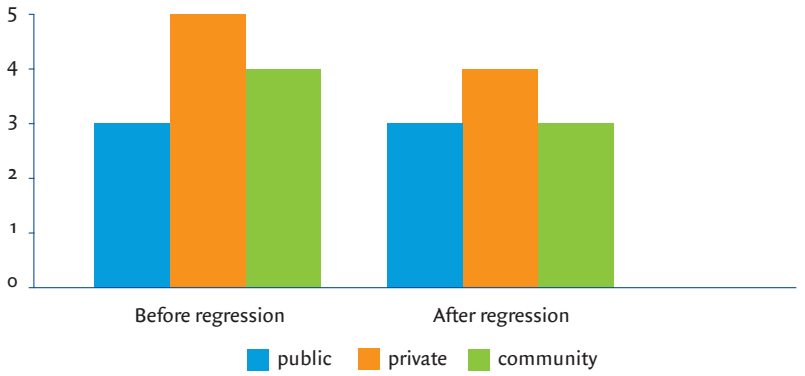
N = 5,212
R^2 adj = 0.31
F = 137
* significant at p<0.05; ** significant at p<0.01.
Source: EMIS / UNEB / UBOS.

We did find significant effects for teacher education, teacher training and qualification of the head teacher. The first two effects show that it is important that teachers are well educated and well trained. The latter effect seems to be an indicator for the importance of good management, as the head teacher is responsible for the school's management:

> *'The school head is, perhaps, the most important single factor influencing school performance. Within a few years, a school head can transform a school by attracting and retaining a well-qualified and highly motivated staff and by providing strong instructional leadership. The reverse is true: a poor school head can quickly turn an otherwise good school into a bad one.'*
> (Byamugisha and Ssenabulya, 2005, p. 118).

There is another indicator for the importance of good management: private schools perform better than public schools and community schools, even if the effects of differences in pupil teacher ratio, pupil classroom ratio, books, the quality of teachers, etc. are taken into account. This *could be* an indication of better management. Nevertheless, the analysis also shows that differences between public and private schools are much smaller if one corrects for a number of differences between these types of schools, such as the number and quality of teachers, the availability of classrooms, the number of books and regional differences (see figure 5.4). Private schools achieve better than public schools, but mainly as a result of their lower pupil teacher ratios, lower pupil classroom ratios, higher book pupil ratios and the fact that most private schools are situated in urban regions (especially Kampala).

Figure 5.4 *Average exam results for public, private and community schools (2001)*



Source: EMIS / UNEB (2001).

On average, examination results in urban areas are much better than in rural areas, even if differences in distance, pupil teacher ratio, pupil classroom ratio, book pupil ratios, etc. are taken into account. The difference between urban and rural areas is almost two points (with urban schools averaging 1.8 points higher than rural schools and peri-urban schools 0.9 points higher than rural schools). Similarly, regional differences are significant, with the northern and eastern regions performing not as well as the central region.

These differences may be related to differences in pupils' socio-economic background and specific characteristics. The DHS EdData survey offers the opportunity to analyse these differences. Table 5.6 shows the results. The variables teacher education and teacher training have been excluded because of their correlation with (perceived) teacher performance.

Table 5.6 *Variables explaining differences in average examination results (2001): inclusion of socio-economic variables*

Variable	Coefficient	Standard error	t- value	
Head teacher qualification	0.18	0.05	3.4	**
Availability of classrooms	0.52	0.34	1.5	
Availability of toilets	0.04	0.25	0.2	
Book pupil ratio Mathematics	0.58	0.14	4.1	**
Percentage female	0.13	0.53	0.2	
Private schools	0.90	0.26	3.5	**
Community schools	0.07	0.42	0.2	
Distance to the nearest school	-0.12	0.05	-2.4	*
Urban	1.75	0.21	8.5	**
Peri-urban	0.65	0.19	3.5	**
North	-0.27	0.25	-1.1	
East	-0.29	0.19	-1.5	
West	0.37	0.21	1.8	
Homework	0.09	0.03	3.0	**
Number of days missed last year	0.012	0.006	2.0	*
(Perceived) problems with teacher performance	0.19	0.09	2.1	*
Percentage female	0.14	0.59	0.2	
Availability of toilets	0.05	0.28	0.2	
Availability of classrooms	0.52	0.34	1.5	
Factor score (education, expenditures, pupil teacher ratio)	0.60	0.13	4.7	**
Constant	1.5	0.58	2.5	*

N = 439
R^2 adj = 0.54
F = 31
* significant at p<0.05; ** significant at p<0.01.
Source: EMIS / UNEB / UBOS.

The results are not completely in line with the previous table. Several variables that first showed a significant effect are no longer significant. There are two reasons. First, the sample is much smaller. Second, DHS data were linked with census data at the school level. However, the sample drawn from the DHS EdData was small, so that for many schools no more than two or three pupils were added to the school data. Therefore, error margins may be large. However, there are significant effects

for homework and the number of days missed during the previous year. The latter may be an indicator of pupil absenteeism at the school level. The effect of homework has been calculated as the (standardised) deviation from the mean figure for each grade. The reason for this is easy to see: children at primary 7 have a lot more homework than children at primary 1.

The constructed variable (factor score) is also significant: children of better-educated parents who can afford to pay more for the schooling of their children and send their children to schools with smaller classes, show better results than other children. The difference between the 10% schools with the highest score on this variable and the 10% schools with the lowest value is approximately 1.7 points (out of 10). This may not seem very much, but again, these are differences between school averages and not between individual pupils. Moreover, if one includes differences in the number of books, differences in distance, urban rural differences, etc., the effects become much more significant.

5.4.4 Including population census data

The attractiveness of DHS EdData is that the survey provides detailed information about the education of children at the household and pupil level. A disadvantage is that the sample is actually not extensive enough for the purpose of this study. A (10%) sample of the Population and Housing Census of 2002 has been used to make it possible to include household data in a larger survey. Census data have been used to include socio-economic indicators at the parish level. These indicators (percentage of paid employees, percentage of persons who went to school, average job level, average education level and average literacy level) have been combined to form one variable (see section 5.2). Table 5.7 shows the results.
The analysis refers to the school level.

The coefficients of most variables do not change considerably. One exception is the effect of teacher pupil ratio. The coefficient for this variable has become lower as a result of the inclusion of the variable 'socio-economic status'. Second, the effects of regional variables decrease with the exception of the western region. The analysis shows a small but significant positive effect (at the 5% level) for this region. So, schools in the central region perform better than schools in the western region, but if socio-economic differences are taken into account, schools in the western region are performing slightly better.

Table 5.7 *Variables explaining differences in examination results (2001): inclusion of socio-economic variables from the population and housing census (2002)*

Variable	Coefficient	Standard error	t- value	
Teacher pupil ratio (100:1)	0.26	0.04	6.3	**
Education level teachers	0.14	0.06	2.4	*
Teacher training	0.29	0.11	2.7	**
Head teacher qualification	0.13	0.02	8.1	**
Availability of classrooms	0.37	0.10	3,7	**
Availability of toilets	0.06	0.08	0.8	
Book pupil ratio Mathematics	0.48	0.04	11.1	**
Percentage female	-0.76	0.17	-4.5	**
Private schools	0.69	0.09	7.4	**
Community schools	0.15	0.13	1.1	
Distance to the nearest school	-0.04	0.01	-2.9	**
Urban	1.23	0.10	12.9	**
Peri-urban	0.62	0.07	9.6	**
North	-0.23	0.08	-3.0	**
East	-0.56	0.06	-9.1	**
West	0.14	0.06	2.2	*
Socio-economic status	0.36	0.03	11.6	**
Constant	1.88	0.17	11.3	**

N = 5, 188
R^2 adj = 0.33
F = 148
* significant at p<0.05; ** significant at p<0.01.
Source: EMIS / UNEB / UBOS.

The exploitation of natural restrictions

The preceding section dealt with possible bias caused by unobserved selection effects resulting from socio-economic differences. And indeed, this 'socio-economic status' variable is an important predictor for average examination results. Moreover, the estimated effect of the teacher pupil ratio decreased after this variable was included (see tables 5.5 and 5.7).

Another way of dealing with the problem of unobserved selection effects is to exploit natural restrictions. The assumption was that better-educated parents with

a higher income send their children to schools with relatively small classrooms and high teacher pupil ratios. This presupposes that parents have a choice. In rural areas, parents generally do not have that choice: they can only send their children to the nearest school. Therefore, we may introduce a natural restriction by eliminating schools in urban and peri-urban areas. Moreover, we have deleted all schools at a distance of less than 1 kilometre from the next school. As a result, the sample decreased with 27% (see table 5.8).

Table 5.8 *Variables explaining examination results in rural areas (2001)*

Variable	Coefficient	Standard error	t- value	
Teacher pupil ratio (100:1)	0.17	0.05	3.1	**
Education level teachers	0.34	0.07	5.2	**
Teacher training	0.18	0.12	1.5	
Head teacher qualification	0.09	0.02	5.3	**
Availability of classrooms	0.25	0.11	2.3	*
Availability of toilets	-0.01	0.09	-0.1	
Book pupil ratio Mathematics	0.40	0.05	8.2	**
Percentage female	-0.77	0.21	-3.7	**
Private schools	0.27	0.13	2.1	*
Community schools	- 0.19	0.17	-1.1	
Distance to the nearest school	-0.04	0.02	-2.0	*
North	-0.32	0.09	-3.6	**
East	-0.76	0.07	-10.9	**
West	0.12	0.07	1.7	
Socio-economic status	0.07	0.05	1.4	
Constant	2.4	0.20	12.1	**

N = 3,808
R^2 adj = 0.11
F = 31
* significant at p<0.05; ** significant at p<0.01.
Source: EMIS / UNEB / UBOS.

Table 5.8 provides several new insights. First of all, the deletion of schools in (peri-) urban areas has resulted in a large reduction of the explained variance: the new model explains no more than 11% of the differences in examination results between schools. Second, the coefficient of the socio-economic status variable is no longer significant. Third, the estimated coefficients of most variables are slightly lower.

For example, the effect of teacher pupil ratio has decreased from 0.26 to 0.17. It is interesting to note that the effect of the education level of teachers appears to be much higher (with an increase from 0.14 to 0.34). It appears that in rural areas the effect of educational background is higher than in (peri-)urban areas. This effect is not very large, however. In (rural) schools where all teachers attained at least (ordinary) O-level secondary education supplemented with specific certificates or diplomas, the average examination result is only 0.34 higher than in schools where none of the teachers have completed more than the O-level. Taking the average figure of 2.9 into account, this implies a 12% increase.

5.5 Analysis 2003-2005

5.5.1 Overall results

The results so far form the basis for an analysis of more recent figures. This analysis is based on the schools we could link with the PLE results in 2005. Most (but not all) schools are included in the databases for 2003 and 2004. Extreme pupil teacher ratios (below 10 and above 120) were deleted from the analysis. Because different years were included, the method of generalised least squares (GLS) was applied (with random coefficients). Table 5.9 summarises the results.

Most effects are significant (at a 1% level) and in line with expectations. First of all, as expected, book pupil and teacher pupil ratios are significant: it pays to invest in books and teachers. Given a choice, the distribution of mathematics books is more important than books for English. Second, high pupil teacher ratios have a negative effect on learning achievement. Teacher education and teacher training have a significant effect on test and examination results. Schools with high percentages of teachers who received training in the previous year perform better.

Table 5.9 *Variables explaining examination results (2003-2005; GLS)*

Variable	Coefficient	Standard error	z-score	
Book pupil ratio (English/Math)	0.13	0.01	17.5	**
Teacher pupil ratio	8.39	1.36	6.2	**
Education level teachers	0.13	0.02	5.3	**
Teacher training	0.08	0.04	2.2	*
Head teacher qualification	0.07	0.01	11.3	**
Availability of classrooms	0.21	0.03	6.6	**
Availability of toilets	0.07	0.03	2.8	**
Community schools	0.49	0.09	5.5	**
Private schools	1.55	0.07	21.8	**
Distance to the nearest school	-0.06	0.01	-7.5	**
Urban	0.72	0.05	13.3	**
Peri-urban	0.58	0.03	15.8	**
North	0.34	0.04	7.7	**
East	0.18	0.04	4.6	**
West	0.55	0.04	14.5	**
Masindi	1.49	0.10	15.0	**
Socio-economic differences	0.50	0.02	25.9	**
Proportion female	-0.43	0.07	-6.6	**
Proportion orphans	0.17	0.10	1.7	
2003	0.30	0.01	20.8	**
2004	0.03	0.01	2.0	*
Constant	1.83	0.08	24.4	**

N = 17,560
R^2 = 0.36
Wald Chi^2 = 5,478
* significant at p<0.05; ** significant at p<0.01.
Source: EMIS / UNEB / UBOS.

Head teacher qualification proves highly significant. This points to the effectiveness of good management. The difference between private schools and public schools points to the same conclusion. Even if all other variables in the equation are taken into account, private schools perform better than public schools (and community schools). The head teachers have a considerable influence on the school. This is why it is important to establish proper procedures for appointing head teachers and providing them with management skills. It is also important to recognise the

Kigumba primary school, Masindi.

valuable role of Parent Teacher Associations (PTA) in the management of schools. If parents have a role to play in the education of their children, this will encourage them to take responsibility and send their children to school. The districts and inspectorate also have an important role to play in the strengthening of school management. At the moment, adequate supervision of primary schools is lacking as a results of poor facilities and poor management by the districts. The ministry should improve the way it provides resources to districts and develop a better strategy for reaching out to schools. Uniform qualification requirements should be laid down and districts should be compelled to implement ESA programmes. Socio-economic differences are an important determinant of differences in test and examination results. This implies that extra attention is needed in poor and underdeveloped regions. Distance to the nearest school has a significant negative relation with average examination results. This suggests that pupils who live close to school achieve better results than pupils who live further away from school. As expected, schools in urban areas perform better than rural schools, even if certain differences are taken into account, such as pupil teacher ratio, the number of books or the distance to school. Also, several differences between regions and districts remain even after all these factors have been taken in to account. Taking into account the differences between schools, western and northern districts perform relatively well.

Nevertheless, most effects are not considerable. Especially the estimated effect for the pupil teacher ratio appears low. This is counter-intuitive, but consistent with

various other empirical studies. A relatively low effectiveness of teachers may be explained by high teacher absence. This hypothesis is tested in the last chapter. Moreover, a comparison between tables 5.8 and 5.9 suggests that the effectiveness of reducing the pupil teacher ratio gradually decreases. This observation is consistent with the *decreasing correlation* between the pupil teacher ratio and examination results over time.

Second, many observers (within the MoES and EFAG) are disappointed about the limited effects of TDMS and tend to ascribe the low quality of education to low quality of teacher training. But this needs to be put into perspective: generally, the impact of pre-service teacher training (in the developing world as well as in the developed world) is limited and it is unrealistic to expect too much too soon in Uganda (Ward, Perry and Read, 2006, p. 81).

Third, several factors may hinder the full utilisation of instructional materials. Ward et al. (2006, p. 67-68) mention several problems related to the use of school books in Uganda:

- books may be stored instead of being used;
- there is no significant evidence of the existence and widespread use of effective class sets of individual textbooks;
- there is evidence of poor textbook usage with continuing emphasis on learning by rote, even if books are available;
- there is often an observable non-use of available texts, with teachers using only a single book;
- the is no effective use of teachers' guides;
- book pupil ratios are often so poor that the perceived benefits of textbooks are rarely achieved;
- good classroom management of textbook use is severely impaired by the lack of an adequate number of copies;
- there are relatively few supplementary reading materials in schools.

A remarkable result is that exam scores in the Masindi district are relatively high. If all the other factors included in the analysis are taken into account, schools in the Masindi district show mean PLE results that are approximately 1.0 - 1.5 (out of 10) points higher than the schools in the central districts. This is a striking difference, given the average examination result of around 3.5. A specific project in this district has contributed to a large improvement in the quality of education (see chapter 6).

Primary school in northern Uganda, Photo Alice Ibale.

5.5.2 Separate estimates for English and mathematics

So far, analyses were directed at total examination results. Exams cover four subjects: English, mathematics, science, social studies and mathematics. This section investigates (possible) differences in effects for English and mathematics. Table 5.10 summarises the findings. For reasons of readability, Z-scores are not included in the table. The analysis is based on the approach followed in table 5.9.

The results of the (separate) analyses for English and mathematics are comparatively similar to the overall analysis. On average, scores for English are higher than for mathematics (see figure 5.5). Mathematics books have a higher impact on the overall results than books for English.[29] Nevertheless, the total explained variance is higher for English than for mathematics. This finding is consistent with other studies (see for instance White, 2004 for Ghana and Das et al 2004 and IOB 2008 for Zambia).

29 A separate analysis of overall examination results shows that the effect for math books (0.23) is slightly higher than the effect for English books (0.20). This analysis is not included in the report.

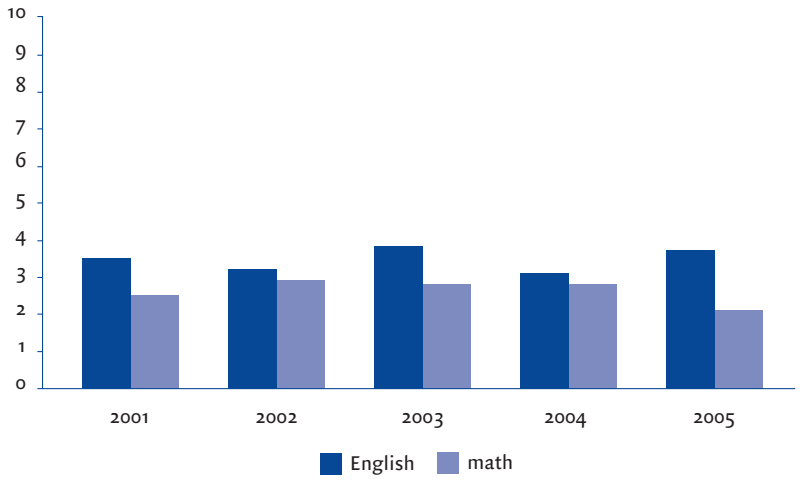
Table 5.10 *Variables explaining examination results for English and mathematics (2003-2005; GLS)*

Variable	English			Mathematics		
	Coefficient	St. error		Coefficient	St. error	
Book pupil ratio English	0.22	0.01	**			
Book pupil ratio Mathematics				0.16	0.01	**
Teacher pupil ratio	9.60	1.48	**	6.44	1.31	**
Education level teachers	0.10	0.03	**	0.14	0.02	**
Teacher training	0.12	0.04	**	0.08	0.04	**
Head teacher qualification	0.08	0.01	**	0.07	0.01	**
Availability of classrooms	0.27	0.04	**	0.17	0.03	**
Availability of toilets	0.07	0.03	**	0.08	0.03	**
Community schools	0.59	0.10	**	0.39	0.09	**
Private schools	1.68	0.08	**	1.48	0.07	**
Distance to the nearest school	-0.06	0.01	**	-0.04	0.01	**
Urban	0.87	0.06	**	0.55	0.05	**
Peri-urban	0.69	0.04	**	0.40	0.03	**
North	0.33	0.05	**	-0.08	0.04	**
East	0.29	0.04	**	-0.02	0.03	
West	0.52	0.04	**	0.46	0.03	**
Masindi	1.61	0.11	**	0.80	0.09	**
Socio-economic differences	0.61	0.02	**	0.33	0.02	**
Proportion female	-0.04	0.07		-0.27	0.06	**
Proportion orphans	0.11	0.04	**	0.10	0.10	
2003	0.11	0.02	**	0.69	0.01	**
2004	-0.68	0.01	**	0.68	0.01	**
Constant	1.88	0.08	**	0.92	0.07	**
N=	17,560			17,560		
R^2 =	0.42			0.32		
Wald Chi^2=	9,442			7,060		

* significant at p<0.05; ** significant at p<0.01.
Source: EMIS / UNEB / UBOS / computation IOB.

There are a number of striking differences between the two subjects. First of all, boys do not achieve better examination results for English but they do perform better in mathematics. Second, socio-economic differences have a greater effect on the results for English than on the results for mathematics. And finally, there are several regional differences. The northern and eastern districts perform relatively well on English examinations, but not on math examinations.

Figure 5.5 *Average examination scores for English and mathematics (2001-2005)*

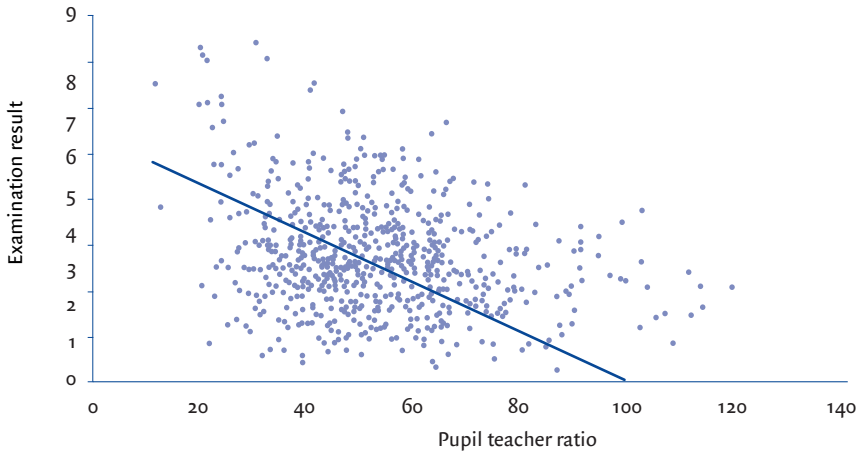


5.5.3 A more detailed analysis of pupil teacher ratios

Figure 5.3 already suggested that there is no optimal relation between the number of teachers and examination results in many schools. As could be expected, results are poor in schools with a high pupil teacher ratio. And a relatively large number of schools with a low pupil teacher ratio perform well. But a low pupil teacher ratio is not a guarantee for good results. Many schools achieve poor results despite their low pupil teacher ratio. An improvement in the pupil teacher ratio does not automatically lead to better results. Figure 5.6 shows this relation again for 2005. For sake of clarity, the figure shows a random 10% sample. What is striking is the slope of schools at the frontier, which are the schools achieving the best results given their specific pupil teacher ratio.[30] This relation suggests the *possible* effect of an improved pupil teacher ratio.

30 The figure points to heteroscedasticity, or non-constant variance. Heteroscedasticity may be induced by unobserved variables and lead to biased significance tests (in OLS). There are several ways to deal with this problem. The best way is to identify the variable(s) responsible for the problem. We have reduced the heteroscedasticity by the splitting the sample into two groups. Other solutions involve a log transformation and the use of GLS. For our estimations, we use GLS.

Figure 5.6 *Pupil teacher ratio and examination results (2005)*



In order to get a better idea of the possible relation instead of the *average* relation, the regression analysis was repeated with separate estimates for two groups of schools: schools above the line in figure 5.5 and schools below that line.[31] Although this way the relation is clearly induced, this has not been done arbitrarily, but on the basis of the slope of the schools at the frontier. Therefore, the method is likely to give a valid indication of the possible relation between pupil teacher ratio and examination results. The split does not produce the real average effect, but it gives a much better insight into the effects that might be realised. For policy makers, the challenge lies in identifying the factors that contribute to the realisation of this effect. This may prove to be a very cost-effective approach: if policy makers succeed in creating a relationship according to this model, school results will dramatically improve.

The schools above the line in figure 5.6 are different from the schools below the line. Table 5.11 summarises a number of these differences. The schools above the line perform approximately 100% better than the excluded schools. The latter group is primarily found in rural areas and in poorer regions where parents are less educated. On average, these schools are smaller than those above the line, but they have a lower pupil teacher ratio and a lower pupil classroom ratio. There appear to be no large differences in the education of the teachers, though head teachers in schools with better examination results are better qualified.

31 The line in the figure is defined by the equation Y=6-0.06*ptr. All schools with a figure of (average examination result + 0.06*ptr)>6 are above the line.

Table 5.11 *Differences between groups of schools (2003-2005)*

	Schools with relatively good results	Schools with poor results
Number of schools (2005)	2,891	3,382
Percentage rural	78%	92%
Average socio-economic score	0.23	-0.02
Percentage government schools	94%	98%
Average number of pupils	786	554
Pupil teacher ratio	58:1	47:1
Pupil classroom ratio	96:1	83:1
Education level teachers	0.66	0.63
Teacher training	0.20	0.19
Qualification level head teacher	5.5	5.2
Average result English	3.9	1.9
Average result Science	4.6	2.5
Average result social studies	4.6	2.5
Average result mathematics	2.9	1.5
Average total result	4.0	2.1

Table 5.12 illustrates the results of the regression, with separate estimates for the teacher pupil ratio for both the schools with relatively good results (high) and schools with poor results (low). The analysis includes one new variable. In several of schools, the total number of examination candidates is higher than the total number of pupils at primary 7. A reason may be that the school functions as an examination centre for other schools. As a consequence, average results may be pushed down by poor results of candidates from other schools. It is to be expected that schools without an examination centre are generally not the best schools. Therefore, the fact that a school is an examination centre for other schools may depress its examination results.

As expected, the estimated coefficient for the relatively good schools (77) is considerably higher than the estimated average effect, which is 8.4 (see table 5.10). Most other intervention variables do not change considerably. Splitting the sample into two groups (with relatively good and relatively poor results) has a depressing effect on the estimated coefficients of several variables, especially the regional variables and the ownership of the school. Almost all private schools fall within the group of relatively good schools and therefore the effect of the variable 'private' is much lower. The differences between regions and the effects of socio-economic

conditions are much smaller. Moreover, the total explained variation is substantially higher (64% vs. 35%).

The analysis suggests that simply increasing the number of teachers will not be very effective. It is only effective in an environment which includes a good management structure at the school and district level and qualified teachers.

Table 5.12 *Variables explaining examination results (2003-2005; GLS)*

Variable	Coefficient	Standard error	z-score	
Book pupil ratio (English/Math)	0.09	0.01	14.0	**
Teacher pupil ratio (high)	77	1.34	57.7	**
Teacher pupil ratio (low)	12	1.12	10.8	**
Education level teachers	0.10	0.02	4.7	**
Teacher training	0.09	0.03	2.8	**
Head teacher qualification	0.06	0.005	11.3	**
Availability of classrooms	0.15	0.03	5.7	**
Availability of toilets	0.04	0.02	1.7	
Community schools	0.28	0.07	3.8	**
Private schools	0.49	0.06	8.8	**
Distance to the nearest school	-0.04	0.01	-7.4	**
Urban	0.56	0.04	12.9	**
Peri-urban	0.41	0.03	13.9	**
North	0.17	0.03	5.1	**
East	0.05	0.03	1.7	
West	0.34	0.03	12.6	**
Masindi	1.04	0.07	12.6	**
Socio-economic differences	0.29	0.01	20.2	**
Proportion female	-0.24	0.05	-4.7	**
Proportion orphans	0.16	0.08	1.9	**
Proportion from other schools	-0.15	0.05	-3.2	**
2003	0.22	0.01	17.6	**
2004	0.04	0.01	3.2	**
Constant	1.43	0.06	23.0	**

N = 17,560
R^2 = 0.64
Wald Chi^2 = 19,247
* significant at p<0.05; ** significant at p<0.01.
Source: EMIS / UNEB / UBOS.

5.6 Estimation of cost-effectiveness of interventions

It is possible to estimate the cost-effectiveness of the different interventions by using the coefficients of the regression analyses. These analyses showed the relation between (for instance) pupil teacher ratio and learning achievement. The computed coefficients represent the estimate of this relation. Table 5.12 indicates that the coefficient for the teacher pupil ratio is 77, which implies that an improvement of this ratio from 1 teacher to 100 pupils to 2 teachers for 100 pupils means an improvement of the average examination result of 77 * (0.02-0.01) = 0.77. Given the average exam score of 3.5, this is an improvement of about 21%. The computation of cost-effectiveness is only possible if the costs of the interventions are known.

This section aims at providing a *rough* estimate of the cost-effectiveness of interventions. It is not possible to give very accurate estimates, as these estimates depend on the underlying assumptions. Moreover, actual effects will always depend on the exact combination of instruments at the school level. If a school has no teachers, building many new classrooms or buying hundreds of books will have no effect. Nevertheless, marked variations between different interventions allow us to make a rough estimate of their cost-effectiveness. Amounts are given in Uganda Shilling (Ush) and Euro (EUR).

5.6.1 Assumptions

For the computation of the cost-effectiveness of interventions, several assumptions had to be made about costs. Most of these are derived from the *Education Sector Strategic Plan* 2004-2015 (MoES, 2005).

1) *Salaries*: The ESSP estimates the average annual salary level of a grade III teacher at 1,320,000 Ush. However, in 2006, salaries were raised by 33%. Therefore, we use an estimate of Ush 1,800,000 (or EUR 800).
2) *Teacher education*: On the basis of the average cost per student at tertiary level, we have calculated an average cost of Ush 7,500,000, or EUR 3,300 (for three years of education). It is assumed that the average career of a teacher lasts 20 years, with yearly costs of Ush 90,000 (EUR 40).[32] Moreover, it is assumed that this education will have a salary effect of Ush 300,000 (EUR 132) compared to a grade III teacher.

32 Given the uncertainties in the estimates there seems to be no point in making annuity computations to account for interest or inflation rates.

3) *Teacher training*: The ESSP estimates teacher training costs at Ush 680,000 (EUR 300) per teacher trained. It is assumed that this training will have an effect for five years and that it will result in a salary increase of Ush 300,000 (EUR 132).
4) *Qualification level head teacher*: In order to compute cost-effectiveness, it was estimated what the effect would be of replacing a grade V head teacher with a head teacher who only has a diploma for primary education. It was assumed that this would involve two years of (additional) education (Ush 5,000,000; EUR 2,200) and a salary effect of Ush 600,000 (EUR 264). Moreover, it was assumed that he/she will be a head teacher for at least ten years.
5) *Classrooms*: the cost of constructing a classroom is estimated at Ush 9,500,000 (EUR 4,200). Moreover, it is assumed that a classroom can be used for 15 years.
6) *Toilets*: the cost of constructing a toilet is estimated at Ush 1,000,000 (EUR 440). Moreover, it is assumed that a toilet can be used for 15 years.
7) *Reducing distance*: Reducing the average distance to school would require new schools to be built. The cost of building a new school is estimated at Ush 100,000,000 (EUR 44,000). Moreover, it would require an additional head teacher (Ush 5,000,000; EUR 2,200). However, it would also reduce the pupil classroom ratio.
8) *Books*: Based on the LCD survey and Ward et al. (2006), the cost of a book is estimated at Ush 6,000 (EUR 2.65).

5.6.2 Results

Because it is difficult to definitively establish the cost-effectiveness of different interventions, we have chosen to provide a graphic presentation. Figure 5.7 illustrates the estimated *average* effects based on the results of the regression analyses in this chapter.

The picture 5.7 shows the average effect of an equal investment in teachers, buildings or instructional materials. Note that this is an *average* effect. If in a particular school the quality of the head teacher (management) is good and there are enough and good teachers, there is no point in investing in teachers. Moreover, if a school has an adequate number of books, investing in books will not lead to better results. Figure 5.8 gives an indication of the uncertainties of the estimates. These uncertainties are calculated using the standard errors of the estimated coefficients. The upper and lower limits are two standard errors above and below the estimated effects. The picture shows large uncertainties in the estimates for teacher training and school facilities.

TOP P.L.E CANDIDATES 1998 - 2005

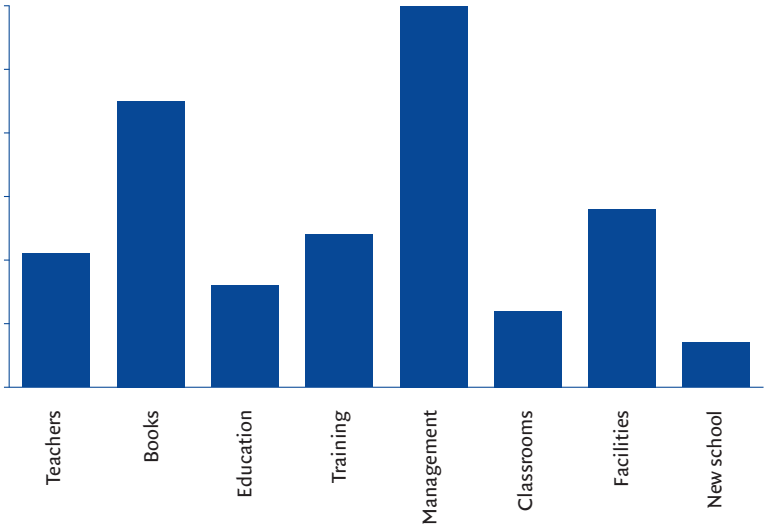
YEAR	NAME	SEX	AGG
1998	KATUSIIME JOYCE	F	13
1999	AKUGIZIBWE PATRICK	M	12
2000	WAROM MOSES OBIMA	M	10
2001	SENTEZA LAWRENCE	M	9
2002	TABAN ABDU SALAM	M	8
2003	LOKIO ROBERT	M	7
2004	WAROM DENIS	M	7
2005	AUMA JESCA	F	5
2006	TYAN DENIS	M	7
	ORURU EMMANUEL	M	7

TOTAL M F
33 18
4 22
34 16
31 16
36 10
5 25
8 42
3 41
37

A list of the best examination candidates in a school (4 is the best result and 36 is the lowest result).

The image shows, first of all, that for most schools, investing in the quality of the school management (through education and training) is the most effective way to improve results. This conclusion is consistent with the established relation between pupil teacher ratio and learning achievements and with the analysis of the schools in Masindi district (see the next chapter). Well-managed schools perform better and investing in the quality of management is a relatively cheap way to improve results. A better school management leads to higher pupil and teacher attendance, better-motivated teachers, better management of resources and a better school climate. As a result, pupils perform better.

Figure 5.7 *Estimated average cost-effectiveness of interventions*

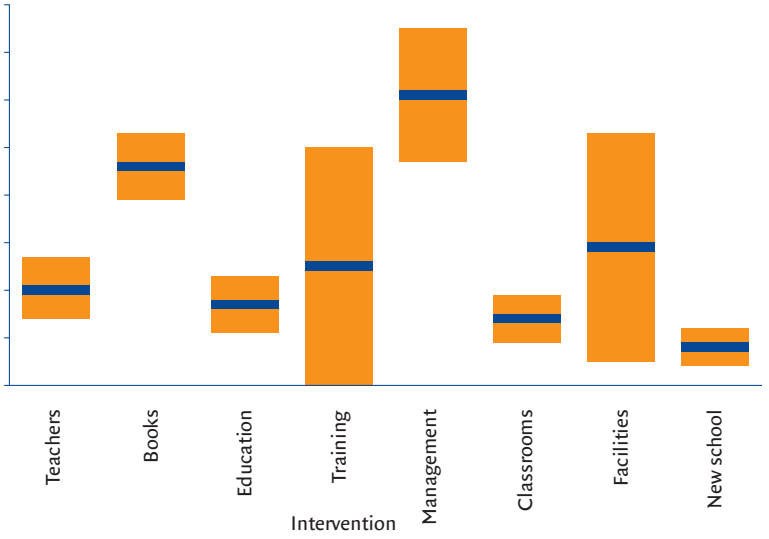


Second, investing in books is very cost-effective. The estimated coefficients are not very high, but the cost of books is low in comparison with the other instruments. Investing in books leads to better results. It has been suggested that investments in books are not effective because many of these books are not used and locked in classroom cupboards or in the head teacher's office. However, in these instances, books are locked away because there is scarcity and there are not enough copies. Next, the effectiveness of books will increase if teachers are trained to use them and the school management supervises their effective use. Moreover, the analysis suggests that in the present situation, investing in math books is more effective than investing in English books.

Third, investing *in* school facilities *is* likely to be very cost-effective. A good learning environment has a large impact on school attendance and learning outcomes. In the analyses, only the number of toilets was included. The availability of toilets proved to have a significant effect on school attendance and learning outcomes. Raising the number of toilets is clearly a relatively cheap way to improve the attendance of girls. However, it cannot be expected that building toilets will significantly raise learning achievements. It is more likely that the availability of toilets is an indicator of the quality of the school's total infrastructure. In figure 5.7, this assumption has been taken into account by (arbitrarily) raising the price of toilets by a factor 3. In other words, it is assumed that if a school has good toilet facilities, the quality of other facilities are also

likely to be good and that the costs of these other facilities are twice the cost of toilets. An analysis on the basis of SACMEQ II data (see Annex 8) shows that the provision of meals is a very effective way of raising pupils' results. Hungry children are unable to concentrate and are therefore unlikely to do well in school.

Figure 5.8 *Estimated upper and lower limits of the estimated cost-effectiveness of interventions*



Fourth, investment in the number and quality of *teachers* seem to be not as cost-effective as investment in books. However, one must be very careful with this conclusion. First of all, there are no schools that have both high pupil teacher ratios as well as good results (see figure 5.6). It pays to have a pupil teacher ratio that does not exceed 50:1 or even lower. Second, the analysis only showed that within the present structure, simply raising the number of teachers would not have a significant effect on the learning outcomes of many schools. High teacher absenteeism is one explanation. However, if the quality of school management is raised simultaneously, teachers would become considerably more (cost-)effective. With good management, the (cost-)effectiveness of an additional teacher would be much higher. And naturally, well-trained teachers would also raise the cost-effectiveness of books. What would be better, investing in more teachers or investing in the quality of teachers? It is hard to answer this question on the basis of this study. In the end, Uganda has no choice: the only way to go forward is to invest in both. An efficient way to proceed would be to take measures that reduce teacher absence. Investments in the building of new *classrooms* are more expensive. This does not mean,

however, that they are not cost-effective. The reduction of the pupil teacher ratio is highly correlated with the building of new classrooms. Several schools have more than one teacher in one classroom (even three teachers at the same time). This is not an efficient way of dealing with scarce resources. Therefore, building new classrooms is important. Uganda should find ways to increase its building capacity. In the meantime, schools should be more creative as well. In several schools, teachers give lessons outside, under a tree. This seems to be more efficient than putting 90 children together in one classroom, with one teacher just sitting at the back. One rural school that was visited showed more imagination. Together with the community, the school had constructed a temporary wooden classroom with a thatched roof.

Finally, it is no surprise that building new schools would be the most expensive investment. However, one way or another, the problem of distance needs to be dealt with: if children have to walk long distances, attendance rates will be low, resulting in high dropout, high repetition and poor learning achievement. There is a disproportionate emphasis on the addition of classrooms to existing schools, instead of establishing new schools (Eilor, 2004). This means that in some cases, schools grow very large, but many children still need to walk long distances to reach them. This is not conducive to access.

5.7 Summary and conclusions

This chapter has analysed the effectiveness of interventions in the enrolment and learning achievement of pupils. The main instruments are: raising the number of teachers, schools, classrooms and books, educating and training more teachers and improving the quality of school management. The quantitative analysis shows that each of these factors has an impact on learning and learning achievement.

High pupil teacher ratios and large distance to the school lead to higher dropout rates. There appears to be a trade-off between repetition and dropout: schools with high repetition rates have a lower dropout rate than schools with low repetition rates. This conclusion is relevant to education policy: the reduction of repetition must not lead to a higher dropout. A policy that aims to reduce repetition must at the same time avoid the possible negative effects on dropout. Nevertheless, it should be possible to reduce both repetition and dropout at the same time.
A second conclusion is that the main causes of dropout lie outside the direct influence of the school and education policy. Pupil and household factors are far more important than school-related factors. The main solutions to the problem have to be found within the communities and households. Government and

schools must sensitise parents on the importance of education. High absence rates of teachers are not helpful in this respect.

If it comes to learning achievement, book pupil and teacher pupil ratios are significant, as expected: it pays to invest in books and teachers. However, the former curriculum focused on literacy as the basic requirement for all other subjects. Now it appears that this focus has resulted in a bias towards literacy at the expense of other subjects. Chapter four showed that literacy results have improved, but that mathematics remains a problem. In 2005 and 2006, the PLE results for mathematics were very poor.

High pupil teacher ratios have a negative effect on learning achievement. Teacher education and teacher training have a significant effect. Schools with high percentages of teachers who have received training in the previous year perform better. However, without denying the importance of teacher education and teacher training, it must be added that one should not have unrealistic expectations about short-term effects. Teacher training is highly effective, but may take years to produce visible results: it is unrealistic to expect too much too soon in Uganda.

Head teacher qualification proves to be highly significant. This points to the effectiveness of good management. Simply increasing the number of teachers will not be very effective. This kind of measure can only be effective in an environment within a good management structure at the school and district level and with qualified teachers. The MoES should develop a proper procedure for appointing head teachers and providing them with management skills. PTAs, districts and the inspectorate also have a valuable role in the strengthening the management of schools. The ministry should improve the way it provides resources to districts and develop a better strategy for reaching out to schools. Uniform qualification requirements should be laid down and districts should be compelled to implement ESA programmes. Apart from this, extra attention is needed in poor and underdeveloped regions. Distance to the nearest school has a significant negative relation with average examination results. Pupils living close to their school have better results than pupils who live further away from school.

The chapter also gave an estimate of the cost-effectiveness of interventions. Please note that there are no general rules: cost-effectiveness will always depend on the specific situation. Nevertheless, based on the analysis, it is possible to present a number of general findings.
First of all, interventions (investments) are considerably more effective if the

school is well-managed (see chapter 6 as well). Therefore, the main conclusion of this study is that it is important to invest in the quality of management. If the quality of management improves, the effectiveness of other interventions will increase as well. Investing in management quality means providing training, establishing an effective support structure at the district level and an effective inspection apparatus.

Second, it pays to invest in books. Books are a cost-effective instrument for raising pupils' learning achievements. In order to make sure that books will be used, it is important that schools receive enough copies. Moreover, the effectiveness of books will increase if teachers are trained in how to use them.

Third, teacher training is a cost-effective way to improve results. Well-trained teachers seem to feel more responsible and show lower absence rates; schools with well-trained teachers show better results. Reducing the pupil teacher ratio is effective as well, especially in schools that are well-managed. In schools that are not, the effects of lowering the pupil teacher ratio may be disappointing. A cost-effective way to improve results is to take measures to reduce teacher absenteeism (see chapter 7).

6 Masindi

6.1 Introduction

The results reported for the Masindi district are a reason to take a closer look at (the project in) this district. If we want to improve the results for more rural regions, the developments in the Masindi project may offer some interesting starting points.

Masindi District is situated in the midwestern part of Uganda, 200 km northwest of Kampala. The district borders Gulu in the north, Apac in the east, Nakasongola in the southeast, Kiboga in the south, Hoima in the southwest and the Democratic Republic of Congo in the west. The district is divided into four counties and 13 subcounties, it has one Town Council and 43 parishes. Masindi has a population of 470,000, divided over 56 distinct large and small ethnic groups. The most dominant tribes are Banyoro/Bagungu, who form 60% of the district population, Alur/Jon/Aringa form over 5% and Baruli almost 5% of the total district population. The district also harbours large numbers of people from across international boundaries, who have permanently settled there. These include Rwandese who predominantly live in the Kimengo subcounty, Kenyans in Kiryadongo, Sudanese and Zaireans in the Mutunda subcounty and people of Somali origin in Kigumba subcounty.

In many ways, Masindi is typical of rural areas in Uganda. The main economic activities for most of the population are subsistence agriculture and fishing on Lake Albert. The only large-scale commercial activity is performed by the Kinyara sugar plantation and refinery. A high proportion of the pupils in this area (approximately 10,000) are Internally Displaced Persons (IDPs) who have relocated in the district from Gulu and other war-affected districts immediately to the north. The district has a combined total of approximately 137,000 pupils. There are 201 government primary schools in Masindi, and a total of approximately 2,400 teachers. The Masindi district office, located in Masindi Town has eight full-time education officials. There are also 13 Coordinating Centre Tutors (CCTs) providing full-time support to educators. Like all rural districts in Uganda, Masindi is struggling with

the twin challenges of implementing Universal Primary Education (UPE) and administrative decentralisation.

One of the components of this study was a field trip to several schools in Masindi. Although these schools show good results due to good school management, motivated teachers and adequate monitoring (by the district inspectors), they also face several problems. First, all schools face problems related to dropout. There is a large discrepancy between the number of pupils at the lower grades and the number of pupils in primary 7. Child labour, moving of parents, early marriages and pregnancies are among the immediate causes but, according to the head teachers, the main reason is parents' lack of interest in education. Head teachers make efforts to sensitise parents on the importance of education, but this is a slow process. Second, all schools have a level of repetition. The head teachers do not support the automatic promotion system and defend repetition by claiming that there is no point in promoting children if they lack the knowledge required to function effectively at the next grade. According to them, repetition may prevent dropout. They claim that repeaters receive extra attention (for instance after official school hours). The high number of repeaters in primary 6 suggests that repetition is a means to improve pupils' performance at the primary leaving examination the following year.

One of the main problems is the lack of facilities: most schools do not have enough classrooms, desks and books and they have water problems and no electricity. Many pupils (especially at primary 1) sit on the floor. Classrooms are crowded and in a poor state. Several schools have high pupil classroom ratios with classes of 90 pupils and even more. The schools need more classrooms as a result of fast-growing enrolment, but there is a lack of funding for planned building activities. The School Facilities Grant (SFG) is inadequate. According to the district education officer, it covers the costs of building about 10 classrooms. The government has abolished local taxes (such as the education tax), but it has not increased the SFG. Grants decline every year. SFG Budgets (UPE grants) come too late. Many schools are in debt. The district does not have adequate transport to visit schools. Vehicles are old (10 years) and need replacement.

Pupil teacher ratios have improved significantly, though there seems to be an imbalance in the distribution of teachers within schools. In some schools there were two or even three teachers at the same time and in one instance there were more teachers for the 92 pupils at primary 7 than for the 375 pupils at primary 4. Teachers being present in a classroom without actively participating do not seem

to improve the situation. Moreover, it is difficult to find teachers who are willing to work in the rural areas. The district tries to recruit teachers who are from these areas and to train them on the job.

6.2 The Masindi District Education Development Project (MDEDP)

The MDEDP has operated as a partnership between the Masindi District Education Office and Link Community Development (LCD). The project began work in June 2000. The objectives of the MDEDP are (Ark Consult, 2005, p. 5):

a) improving learner outcomes in primary schools;
b) improving access to learning opportunities;
c) improving the quality of the teaching process;
d) improving the effectiveness of management and governance in schools;
e) improving the effectiveness and responsiveness of educational management;
f) promoting meaningful parental and community participation;
g) disseminating lessons to positively influence the decentralisation policy in Uganda and beyond.

The project has mainly focused its activities on enhancing the quality of education management at both school and district level. Since September 2000 MDEDP has carried out the following activities:

- delivery of school management training to all head teachers, including courses on leadership, managing school improvement, financial management and curriculum management;
- the provision of a limited grant to schools with a School development Plan (ranging from 70,000 Ush to 230,000 Ush (EUR 30 - EUR 100));
- training and support in school inspection procedures;
- supporting district planning and management interventions;
- providing budgetary support necessary to keep district vehicles and other equipment functional;
- developing information management systems at district level.

Between 2001 and 2005, 95 schools in Masindi hosted experienced UK teachers from the Global Teachers Programme (GTP) for a period of five weeks. These teachers focused on developing school management skills and helped teachers to develop child-centred strategies for teaching literacy and numeracy.

A central characteristic of the project is the close cooperation with the Education Standards Agency (ESA) and the MoES district office in Masindi. District and LCD focus on the improvement of school-level and district-level management. The approach includes active monitoring of schools by the district. For this purpose, district officers make effective use of the Education Standards Agency's Handbook for School-inspectors. The inspection results are computerised and used for further monitoring purposes.

An external evaluation of the project conducted by Ark Consult in August 2006[33] found that MDEDP:

- succeeded in addressing the objective of improved learner outcomes;
- registered significant achievement in addressing the objective of improving the effectiveness of management and governance of primary schools;
- registered significant achievement in improving the effectiveness of educational management at district level.

These findings support the assertion that capacity building in education management presents a cost-effective investment or 'lever' in educational improvement. Up to now, the project has visited 430 schools in Masindi, Buliisa, Katakwi and Soroti.

6.3 A comparison of schools

Since 2000, LCD and the MoES have gradually increased the number of schools covered by the project. The project started with approximately 45 schools. By now, more than one hundred schools in Masindi take part in the project. In order to assess the joint efforts of the DEO and LCD, the first 45 project schools have been compared with other schools in the district and with a control group of schools outside Masindi that have the same characteristics. The technique of *propensity score matching* was used for this comparison. To properly determine the effectiveness of the project schools, a comparison needs to be made with other schools that have similar characteristics. There is no point in comparing schools with children from totally different backgrounds, schools in rural areas with schools in urban areas, schools with large differences in size, etc. Forming pairs of schools seems enormously difficult, but the statistical theory is helpful in this regard. The method of *propensity score matching* forms pairs by matching on the *probability* that

33 Masindi District Education Development Project: Evaluation Report, Ark Consult, August 2005.

Temporary classroom of the rural St. Livingstone primary school, Masindi.

schools participate in the project. The method uses all information available in order to construct a control group (for an explanation, see Wooldridge 2002, chapter 18). In 1983, Rosenbaum and Rubin showed that this method made it possible to create a control group ex post with characteristics that are similar to the kind of intervention and control groups that would have been created had they been selected randomly before the beginning of the project.

The control group was selected on the basis of following characteristics:

- the school's size (total number of pupils);
- the school's ownership (government, private, community);
- the school's location (urban, peri-urban, rural);
- the school's distance to the next school;
- type of school (day school, full boarding, partly boarding);
- pupil teacher ratio;
- availability of classrooms (total number of existing classrooms divided by the total number of schools needed);
- socio-economic characteristics of the region (at parish level);
- percentage of girls in the school;
- percentage of orphans in the school (having lost one or both parents).

On most variables, the 45 schools in Masindi are somewhat different from the other schools. However, differences with the control group are not significant.

Table 6.1 *Comparison between project schools in Masindi and other schools (2003)*

	Project schools	Other schools in Masindi	Control group	Other schools
Number of schools	45	94	168	9,052
Average number of pupils	917	623	799	697
Percentage female	40%	37%	42%	45%
Percentage orphan	26%	23%	26%	24%
Pupil teacher ratio	52:1	54:1	54:1	57:1
Distance to the next school	2 km	3 km	2-3 km	2-3 km
Urban	13%	5%	5%	6%
Peri-urban	20%	3%	12%	11%
Rural	67%	92%	83%	83%
Government	98%	93%	98%	93%
Private	2%	5%	2%	6%
Community	0%	2%	0%	2%
Day school	96%	99%	99%	94%
Partly boarding	2%	1%	1%	5%
Full boarding	2%	0%	0%	1%
Availability of classrooms	57%	53%	53%	44%
Socio-economic status[34]	0.30	0.18	0.17	0.09

Source: EMIS / computation IOB.

Table 6.2 shows the differences in examination results. The last column indicates the t-value, which represents the significance of the difference between the project schools and the control group.[35] These differences are significant (at 1% level).

The results for project schools and the control group show striking and significant differences. These differences tend to diminish slightly, but remain highly significant. In 2003, the average examination figures of the pupils in the project schools were approximately 56% better than those of the pupils in the control group. In 2005, the difference had slightly diminished, but still averaged approximately 52%. The differences within Masindi are smaller and diminish at a faster rate. This is a result

34 Socio-economic status was constructed at the Parish level (see Annex V). At that level, the variable has a mean of 0 and a standard deviation of 1. In the school sample, the variable has a mean of 0.13 and a standard of 0.87.

35 The t-test assesses whether the means of two groups are *statistically* different from each other. The t-value is computed on the basis of the means and the variances of the two groups. The probability of a t-value higher than 2.58 is smaller than 1 percent.

of the fact that more schools are included in the project and that district policy is becoming more effective. The results of the analysis are consistent with the regression analyses.

Table 6.2 *Comparison of the examination results of Masindi project schools and other schools*

		Project schools in Masindi	Control group	Other schools in Masindi	Other schools outside Masindi	t-value*
English	2001	3.9	3.1	2.9	3.1	2.7
	2002	4.7	2.8	3.3	2.8	6.4
	2003	5.5	3.4	4.1	3.3	7.6
	2004	4.6	2.8	3.4	2.6	6.4
	2005	5.1	3.5	4.3	3.3	8.1
Mathematics	2001	2.1	2.3	1.6	2.4	-0.9
	2002	3.7	2.6	2.7	2.6	4.9
	2003	3.8	2.5	2.8	2.5	5.9
	2004	3.8	2.6	2.9	2.5	5.7
	2005	3.0	1.9	2.3	1.9	7.1
Science	2001	3.9	3.5	3.0	3.6	1.1
	2002	5.1	3.2	4.0	3.2	6.2
	2003	5.6	3.5	4.3	3.5	7.2
	2004	5.3	3.6	4.4	3.5	6.0
	2005	5.8	3.9	5.0	3.9	9.8
Social Studies	2001	5.0	3.7	3.9	3.8	4.4
	2002	5.4	3.2	4.0	3.2	7.5
	2003	6.2	4.1	5.1	3.9	7.8
	2004	5.9	4.0	4.8	3.7	6.6
	2005	5.5	3.5	4.5	3.4	10.4
Total	2001	3.7	3.1	2.8	3.2	2.2
	2002	4.7	3.0	3.5	2.9	6.7
	2003	5.3	3.4	4.1	3.3	7.6
	2004	4.9	3.3	3.9	3.1	6.6
	2005	4.9	3.2	4.0	3.1	8.1

* Based on a t-test for the significance of the difference between project group and control group.
Source: EMIS / UNEB / LCD / computation IOB.

Already in 2001 the 45 project schools had on average better results than the schools in the control group. This may already be an effect of the project. Unfortunately, data for 2000 were not available to test this hypothesis, although the evaluation of Ark Consult (2005) confirms that the results of the project schools were already in 2001 much better than in 2000.
Nevertheless, even when the differences between the two groups in 2001 are not an effect of the project, the differences in more recent years remain impressive. The effect may be calculated using a *double difference* approach:
$(\text{Project}_{2005} - \text{Project}_{2001}) - (\text{Controlgroup}_{2005} - \text{Controlgroup}_{2001}) =$
$(4.9 - 3.7) - (3.2 - 3.1) = 1.1.$
The total effect in 2005 would be about 35% (1.1/3.1).

Assuming that there was already a marked effect in 2001, as the evaluation of Ark Consult confirms, the estimated effect of the project is about 45%-55%.

The (relatively) high achievements are a result of good school management, motivated teachers and adequate monitoring (by district inspectors). The inspectorate in the district received budget support and technical advise in the form of the attachment of two experienced inspectors from the Voluntary Services Overseas (VSO). Head teachers were requested to produce school development plans and schools with a good school development plan received a small grant as an incentive. Head teachers were trained on better timetabling and the distribution of teacher workload. Previously, the best teachers were deployed to the higher classes. Under MDEDP schools paid more attention to the lower classes (Ark Consult 2005, p. 18). The project succeeded in improving teacher and pupil attendance and improving the access to learning by children with special needs (handicapped children and orphans). The quality of the teaching process was improved through training, head teacher class room supervision, CCT follow up activities and inspections.

Costs

In 2004 and 2005 the project supported about 110 - 130 schools in Masindi. The total project costs in 2004 amounted to Ush 160 million in 2004 (EUR 70,000) and Ush 230 million in 2005 (EUR 100,000) (excluding administrative expenses of LCD). The large difference between 2004 and 2005 can be explained by the costs for the construction of a district education building. Including administrative expenses of LCD the total expenditure was Ush 365 million in 2004 (EUR 160,000) and Ush 505 million in 2005 (EUR 220,000).

6.4 Masindi School Performance Data

LCD has worked together with the Education Standards Agency (ESA) of the Ministry of Education and Sports to develop 16 quality indicators for school performance and the instrumentation to monitor these indicators during school inspection. ESA was established in 2001 to improve the monitoring of educational quality and to strengthen inspection partnerships. It is a semi-autonomous body of the Ministry of Education and Sports, with four regional offices headed by a Principal Inspector. Each region has 10-12 specialised inspectors. In addition to the ESA inspectors, each district has its own division of school inspectors. These are employed by local government and report directly to a District Inspector of Schools, who in turn reports to the District Education Officer and the chief Administration Officer. In order to facilitate and to standardise inspections, ESA has developed a handbook for school inspectors. The 16 quality indicators now form the basis of nationally agreed school inspection procedures[36]. These indicators are:

Teaching and Learning

1) Quality of Teacher's Planning
2) Quality of use of Resources and of the Classroom environment
3) Quality of the Teaching and Learning Process
4) Assessment and Record Keeping
5) Teacher Knowledge
6) Pupils' Understanding and Attainment

School Management

1) Leadership
2) Financial Management
3) Management of Resources
4) Supervision of Teaching and Learning
5) Staff Deployment and Development
6) Management of Co-Curricular Activities
7) Access and Equity
8) Climate and Relationships within the School

36 Handbook for School Inspectors (MoES ESA), 2005.

Mr. Alex Anyeki, Head teacher of St. Livingstone primary school, Masindi.

Governance

1) School Governance
2) Community Relations

In March and April 2006, 80 schools in Masindi District were inspected with reference to these indicators. In each case, the inspection team consisted of three trained persons. Each inspection resulted in a school inspection report to inform school improvement planning. All data were consolidated in a district performance report to inform planning at district level[37].
The data of the Masindi district have been combined with another district (Katakwi). The analysis is based on 112 schools (69 in Masindi and 43 in Katakwi).[38] In this sample, the schools in Masindi show significantly better results than the (sampled) schools in Katakwi:

37 Schools in Masindi and Buliisa Districts: Progress in Teaching, Learning, Management and Governance (LCD) June 2006.

38 No examination data was available for the other schools. There may be three reasons why these data are missing: 1) the school has no pupils at P7, 2) the school is not an examination centre or 3) the data could not be linked.

	Masindi	Katakwi
Average teaching and learning score (sum)	14.0	12.0
Average management score (sum)	24.0	20.6
Average PLE result	4.3	3.4

Table 6.3 shows the correlation of the indicators with the examination results. The variables 'teaching and learning' and 'management' have been created by a principal components analysis of the indicators for these variables (i.e. the six indicators for teaching and learning and the 10 indicators for management).

Table 6.3 *Correlation of teaching and management indicators with examination scores*

	Indicator	Correlation	
	Teaching and learning	0.39	**
1	Quality of teachers planning	0.33	**
2	Quality of use of resources and classroom	0.34	**
3	Quality of the teaching and learning process	0.20	**
4	Assessment and record keeping	0.22	**
5	Teacher knowledge	0.37	**
6	Learners understanding and attainment	0.35	**
	Management	0.52	**
7	Leadership	0.31	**
8	Financial management	0.32	**
9	Management of resources	0.35	**
10	Supervision of teaching and learning	0.35	**
11	Staff deployment and development	0.37	**
12	Co-curricular activities	0.33	**
13	Access and equity	0.25	**
14	Climate and relationships	0.39	**
15	School governance	0.33	**
16	Community relations	0.47	**

* significant at p<0.05; ** significant at p<0.01.

All teaching and management indicators appear to be highly (and positively) correlated with examination results. The correlation of the management variable

with examination results is higher than the correlation of the teaching and learning variables. An explanation may be that the conclusions of inspectors on teaching and learning do not necessarily relate to primary 7, whereas management indicators are directed at the school level and therefore also at primary 7.

Because of the correlation between variables and the high number of variables compared to the relatively small sample (N=112), principal components analysis was used to combine both the indicators for teaching and for management.[39] Table 6.4 shows the results of the regression analysis. This makes it easier to compare the two variables in the model.

Table 6.4 *Regression examination results 2005*

Variable	Coefficient	Standard error	t- value	
Teaching and learning	0.22	0.10	2.2	*
Management	0.47	0.09	5.0	**
Distance to the nearest school	-0.16	0.06	-2.8	**
Constant	4.3	0.20	3.9	**

N = 11
R^2 adj = 0.36
F = 21.4
* significant at p<0.05; ** significant at p<0.01.

The analysis shows the importance of (good) management, especially if a school performs well on all management indicators. Of the three variables in the model, management seems to have the greatest impact on learning achievement.

The correlation between the teaching and learning variable and the management variable may be a problem in the analysis. The estimated coefficients may be biased as a result, although they seem to be in line with the correlations between these variables and examination scores. Combining the two variables into one factor score leads to a correlation of 0.55 with the examination scores and a regression coefficient of 0.60 (t=6.7).

39 One case got lost in the analysis because of missing data for the distance to the nearest school.

6.5 Summary and conclusions

In 2000, the NGO Link Community Development, the Ministry of Education and Sports and the Education Standards Agency started a project in Masindi District in the midwestern part of Uganda. The project aimed at enhancing the quality of education management at both school and district level. It was argued that the basic institutional functionality of both schools and districts was the main factor limiting educational performance. The project started at a limited number of schools. Currently, the organisation supports more than 100 schools in the district and the project has been extended to 430 schools in Masindi, Buliisa, Katakwi and Soroti.

The project focused its activities on enhancing the quality of education management at both school and district level through the training of school management and teachers, training and support in school inspection procedures, supporting district planning and management interventions, budgetary support necessary to keep district vehicles and other equipment functional and developing information management systems at district level.

The project proves to be highly successful. The project succeeded in improving teacher and pupil attendance and improving the access to learning by children with special needs (handicapped children and orphans). The quality of the teaching process was improved through training, head teacher class room supervision, district activities and inspections. Project schools perform approximately 45%-55% better than comparable schools. Key elements of the project's success are the training of district officers and school management and the regular monitoring and inspection of schools based on a detailed format.

The findings are supported by an analysis of differences in the quality of school management, based on inspection report in two districts. This analysis shows that good management contributes significantly to better learning achievements.

7 Teacher absenteeism

7.1 Introduction

Like low pupil attendance rates, teacher absenteeism is a rampant problem in Uganda. Nevertheless, reliable data are practically unavailable. This chapter presents a number of estimates based on the information available. Several sources were used. First, SACMEQ II data (see Annex 8), which provides information on the problem of teacher absence in 2000, as perceived by head teachers. Second, an international study conducted by Chaudhury et al. (2005) presenting quantitative information on absence rates. The World Bank recently analysed the problem of teacher absenteeism in Uganda (Winkler, 2007). Third, the present study has used data from districts offices gathered by International Development Consultants for the years 2001-2006. IDC has combined its field work with a survey among teachers. Fourth, inspection reports of two districts for 2006, which were also of value to this study.

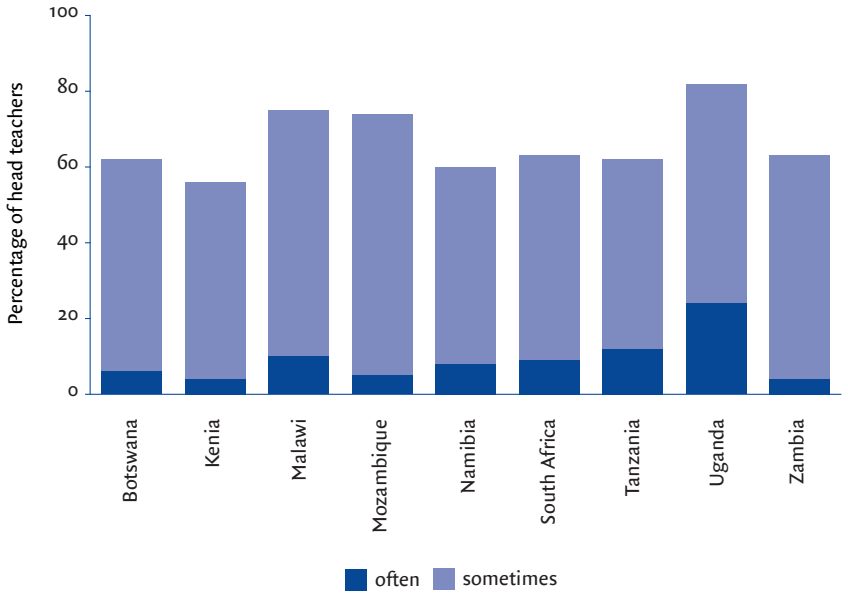
Section 7.2 summarises the results of the SACMEQ II survey and the Chaudhury study and section 7.3 presents an analysis based on the inspection reports of two districts. Section 7.4 presents the findings of the survey conducted for this study. The chapter ends with a brief summary and a number of conclusions.

7.2 Results of other studies

In 2000, head teachers in several schools in southern Africa were asked how often they were confronted with unjustified absence of teachers. The results of this survey revealed that this occurred more often in Uganda than in any other country (see figure 7.1). In Uganda, 24% of the head teachers were frequently confronted with unjustified absence of teachers, which is significantly more than in any other country. In addition, according to 58% of the head teachers, unjustified absence was an occasional a problem.

There is also a high correlation with pupil absenteeism.[40] According to SACMEQ figures, Uganda is among the countries with the highest pupil absence rates. 45% of the head teachers are frequently confronted with pupil absenteeism.

Figure 7.1 *Head teachers having to deal with unjustified absence of teachers (2000)*



Source: SACMEQ II.

In the context of this study, International Development Consultants (IDC) has contacted district offices to gather teacher absenteeism data covering 401 schools in 24 districts. According to this survey, in 2001 the districts only had access to information on teacher attendance for 28% of the schools. In 2006, this figure had increased to 49%. The figures suggest a slow decrease in absence rates (from 25% in 2001 to 21% in 2006). Rates seem to be highest in the eastern districts (28% in 2005).

40 Within Uganda, the correlation is high (r=0.40) and significant at a 1% level.

Table 7.1 *Teacher absenteeism by year and region*

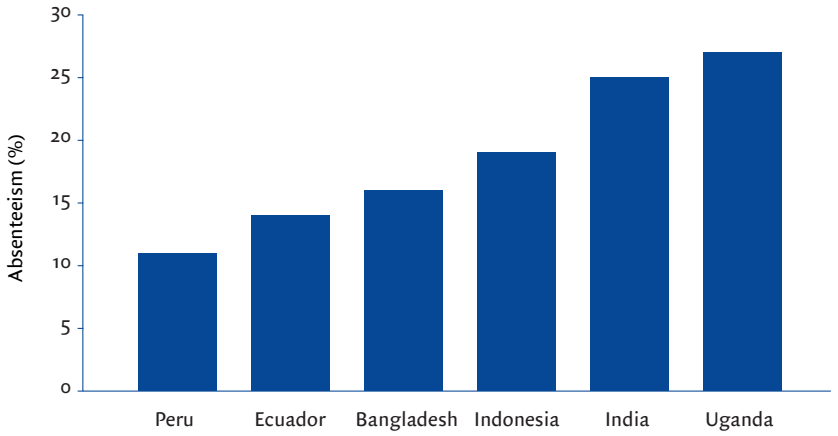
Year / Region	Percentage of schools with information on teacher attendance*	Teacher absenteeism (percentage)**	Number of schools
Year			
2001	28	25	401
2002	27	23	401
2003	27	22	401
2004	30	22	401
2005	34	21	401
2006	49	21	401
Region (2006)			
Central	36	18	129
Eastern	43	28	112
Northern	51	17	73
Western	74	21	87

* Information available at the district office.
** Weighted figures (weighted by the number of teachers).
Source: Survey IDC.

These figures need to be interpreted with care. They are reported by the schools to the district offices. In many cases, information is missing. It is therefore probable that the figures are an underestimation of the real problem.

Chaudhury et al. (2005) investigated the absence of teachers and health workers in six countries. To collect data, enumerators made unannounced visits to primary schools and health clinics between October 2002 and April 2003. Their results show that teacher absenteeism was highest in Uganda (see figure 7.2).

Figure 7.2 *Teacher absenteeism in primary education in six countries (2002-2003)*



Source: Chaudhury et al. (2005).

The researchers found that head teachers, better-educated teachers and older teachers are more likely to be absent. Moreover, the attendance of male teachers is lower than that of female teachers. Local teachers are less likely to be absent than teachers born in other districts. Socio-economic environment plays a role a well: absence is lower in areas with higher literacy rates. Finally, teachers in private schools are absent less frequently than teachers in public schools. In 2006, the World Bank conducted a study on teacher absenteeism in Uganda (Winkler, 2007 and Habyarimana, 2007).[41] According to this study, unauthorized absenteeism of teachers is slightly decreasing. Nearly 20% of the teachers were not at the school at the time of the enumerator visit; head teachers actually produced the highest absence rates. Schools with (relatively) more functional teachers' houses produce lower absence rates. High parental involvement is correlated with low teacher absenteeism.

Reducing teacher absence is very important for achieving universal primary education and improving the quality of education. Based on data for Zambia, Das et al. (2004) estimated that the effect of one day's absence per month leads to examination scores that are about 10% lower.

41 The study of Habyarimana on teacher absenteeism in Uganda is part of the study of Winkler (2007)

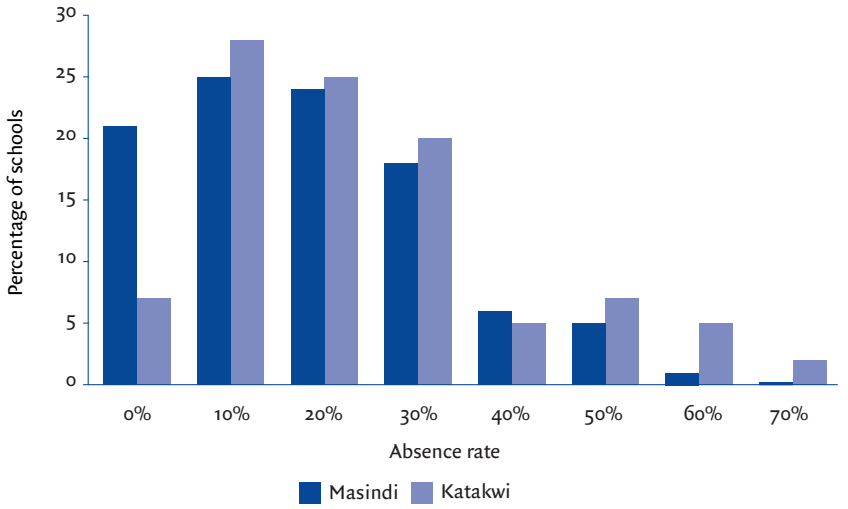
Teacher and pupils at Kamurasi primary school, Masindi.

7.3 Inspection reports

Inspection reports from two districts also provide information on teacher absenteeism. The inspectors report higher attendance rates than the above-mentioned survey by Chaudhury et al. (2005). The average absence rate for Katakwi is 24% (for 67 schools) and 18% for Masindi (for 80 schools). The average figure for the two districts is 21%.

Figure 7.3 shows the distribution of teacher absence in the two districts. Figures are weighted by the number of teachers in a school. The percentages on the horizontal axis represent the average absence rate. So, an absence of 10% means that absence ranges between 5% and 15%. The figure shows that most schools have a teacher absence rate lower than 25%. In Masindi, absence was less than 5% in one in five schools. In Katakwi, only one in fourteen schools showed such low absence figures.

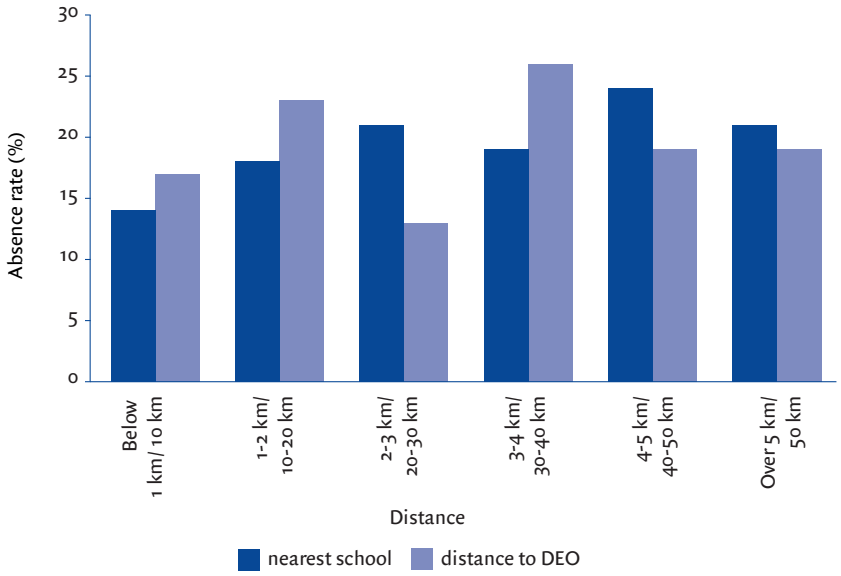
Figure 7.3 *Distribution of teacher absence (in Masindi and Katakwi; 2006)*



Source: ESA / EMIS.

Chaudhury et al. (2005) found a positive correlation between the quality of a school's infrastructure and teachers' attendance. Teachers may be more tempted to skip lessons because of their school's lack of accommodation (Byamugisha and Ssenabulya, 2005, p. 79). One of the contributory factors is the distance teachers must travel to get to school. The availability of teachers' houses, particularly houses of good quality and in good condition, is therefore a strong motivational factor. However, this study did not establish a relation between lack of teacher houses and absence rates (r=0.11 and not significant). Moreover, we did not find a relation between the distance to the next school (as a proxy for the distance teachers travel to school) and the absence rate. Schools located closer to the DEO may have a higher chance of being inspected since they are easier to reach. It can therefore be expected that the closer a school is to the DEO, the lower the teacher absence level. However, there appear to be no relation (see figure 7.4).

Figure 7.4 *Relation between teacher absence and distance to the nearest primary school*



Source: ESA / EMIS.

Teacher absence may be related to the education level and qualifications of the head teacher. Better-educated and qualified head teachers are expected to be better able to motivate their colleagues to be present. On the other hand, the results of the research conducted by Chaudhury et al. suggest that head teachers, better-educated teachers and older teachers are more likely to be absent.

Our database shows that the head teacher's education level does make a slight difference in teacher absence. Up to ordinary level, average teacher absence is 20%. At education levels higher than ordinary level, average teacher absence drops to 17%. The same results are found for the qualifications of head teachers. Schools with grade III head teachers show an average teacher absence level of 21%. And the higher the head teacher's qualification level, the lower the teacher absence level (see table 7.2).

Table 7.2 *Relation between teacher absence and the head teacher's qualification level*

Qualification Head Teacher	Average Teacher Absence Rate
Grade III	21%
Grade IV + V	20%
Diploma in Primary Education	17%
Graduate	17%

Source: ESA / EMIS.

The inspection reports from two districts enabled to analyse the relation between attendance and school performance. School performance is measured through the 16 quality indicators which are monitoring instruments during school inspections. These quality indicators were developed in cooperation with MoES and now form the basis of nationally agreed school inspection procedures[42]. Table 7.3 shows the correlation of these 16 school performance indicators with teacher absence.

First of all, a significant positive correlation between teaching indicators and attendance rate (r=0.29) was established. The most important indicators are teacher planning and teacher knowledge. In schools in which teachers properly plan their lessons and effectively share their knowledge, absence rates are lower than in schools which score lower on these variables. Of course, one must be careful interpreting this correlation. Good planning does not directly lead to higher attendance rates, but motivated teachers plan their lessons more effectively and have low absence rates. The correlation with the management variable is even higher, which confirms the importance of good management in the combat against teacher absenteeism. Not surprisingly, the correlation is highest for the 'staff deployment and development' indicator. However, it should be noted that teacher attendance is one of the indicators of good management. The inspectors' assessment of staff deployment is also based on teacher attendance. Other important indicators are 'leadership' and 'access and equity'. A head teacher who shows leadership and is accessible and fair will have a positive effect on absence rates. Surprisingly, the sample did not show a correlation between teacher attendance and examination results.

42 Handbook for School Inspectors (MoES ESA) 2005. See also section 6.4.

Table 7.3 *Correlation of teaching and management indicators with teachers' attendance rates*

	Correlation with teachers' attendance rates	Correlation	
	Teaching and learning	0.29	**
1	Quality of teachers planning	0.30	**
2	Quality of use of resources and classroom	0.24	**
3	Quality of the teaching and learning process	0.16	
4	Assessment and record keeping	0.12	
5	Teacher knowledge	0.28	**
6	Learners understanding and attainment	0.23	**
	Management	0.36	**
7	Leadership	0.29	**
8	Financial management	0.26	**
9	Management of resources	0.12	
10	Supervision of teaching and learning	0.20	*
11	Staff deployment and development	0.34	**
12	Co-curricular activities	0.17	*
13	Access and equity	0.29	**
14	Climate and relationships	0.16	
15	School governance	0.26	**
16	Community relations	0.23	**
	All management variables	0.38	**

* significant at p<0.05; ** significant at p<0.01.
Source: Inspection reports Masindi and Katakwi (2006).

7.4 Survey among teachers

In order to obtain a better insight into the reasons for teacher absenteeism, IOB and the MoES have conducted a survey among 1,508 teachers from 486 schools in 25 districts. IDC has carried out the fieldwork in cooperation with MoES officials. The results indicate that 55% of the teachers see teacher absenteeism as a problem in their district. Approximately 24% do not consider it a problem and 21% have no opinion. Not surprisingly, only 45% of the teachers felt that teacher absenteeism is a problem at their own school (whereas 53% does not and 2% has no opinion). Tables 7.4 and 7.5 show the results by (UNEB) zone (see Annex 4 for the districts in each zone).

In the eastern and northern regions, as well as in the far west (including Kabale and Rukungiri) the most teachers consider teacher absenteeism to be a problem. The problem appears to be lowest in Kampala and in the central I and central II zones. Teachers in rural areas (50%) regard absenteeism at their own school as a more serious problem than teachers in urban areas (33%) or peri-urban areas (39%). These differences are statistically significant.

Table 7.4 *Teacher absenteeism perceived as a problem in different districts (%)*

Zone	Teacher absenteeism is a problem in the district (%)			Number of answers
	Yes	No	Don't know	
Kampala	30	57	13	87
Central I	41	24	35	156
Central II	33	34	33	102
Central III	55	20	25	117
Near East	66	12	22	156
Mid East	66	16	18	164
Far East	64	17	19	84
Mid North	56	29	15	174
North East	89	7	4	28
West Nile	66	13	21	91
North West	54	19	27	59
Mid West	57	25	18	95
Far West	75	10	15	61
South West	51	36	13	141
Uganda	**55**	**24**	**21**	**1,515**

χ^2= 170; p=0.00.
Source: survey IDC.

Table 7.5 *Teacher absenteeism perceived as a problem in their own school (%)*

Zone	Teacher absenteeism perceived as a problem in their own school (%)		Number of answers
	Yes	No	
Kampala	22	63	85
Central I	15	85	151
Central II	15	85	102
Central III	39	61	115
Near East	62	38	155
Mid East	62	38	162
Far East	57	43	84
Mid North	49	51	172
North East	86	14	28
West Nile	72	28	89
North West	38	62	58
Mid West	51	49	94
Far West	67	33	61
South West	36	64	140
Uganda	**46**	**54**	**1,495**

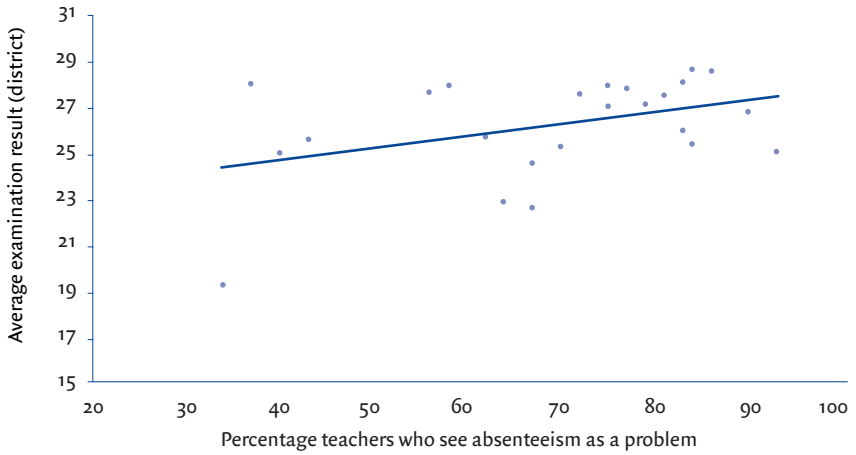
χ^2= 214; p=0.00.
Source: survey IDC.

The school management (teacher and deputy head teacher) perceives it a more serious problem than senior and class teachers. There is also a slight negative correlation with age and seniority, indicating that young teachers see it as a more serious problem than older teachers. There are no differences between male and female teachers.

An indication of the negative effects of absenteeism on pupils' results is the correlation between the perceptions of teachers and examination results (2005) at the school level (r=0.26) and at the district level (r=0.41). Figure 7.5 presents this relation at the district level. In Kampala, the percentage of teachers indicating that absenteeism is a problem is lowest,[43] and average examination results are far better than in other districts.

43 The results for Rukungiri have been excluded because of the low number of teachers who responded to the question. If Rukungiri is included, the correlation increases to r=0.52. Without Rukungiri and Kampala, the correlation reduces to r=0.18.

Figure 7.5 *Teachers perceiving teacher absenteeism as a problem*



Source: survey IDC.

Table 7.6 shows what teachers themselves consider to be the main causes of teacher absenteeism. Apart from illness, the main reasons appear to be inadequate accommodation, poor working conditions, distance to the school, low salary, teachers not receiving their salaries in time and low teacher morale. The number of pupils per classroom is not an important reason.

Low teacher morale may be caused by:

- salary delays. These not only demotivate teachers, but may force them to look for alternatives to sustain their families;
- a lack of incentives for well-performing teachers;
- inadequate accommodation and long distances;
- inadequate supervision.

As a result, teachers have no incentive to be innovative and creative in their work.

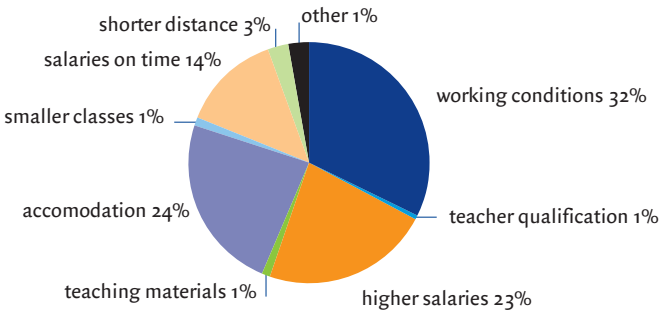
Table 7.6 *Perceived causes of teacher absenteeism*

Main causes of teacher absenteeism	%	No. of cases
Illness	67	1013
Poor working conditions	36	543
No accommodation/bad accommodation	52	783
Bad/insufficient teaching materials	9	134
Too many pupils per classroom	12	187
Distance to school	39	591
Low teacher morale	24	364
Unqualified teachers	2	34
Low salary	34	517
Teachers not receiving their salaries in time	30	466
Regional conflict	6	92
Other	7	111

Source: survey IDC.

Suggestions to improve teacher attendance form the mirror image of the causes of absenteeism. Most frequently mentioned solutions include: improvement of working conditions, accommodation, salaries and timeliness of payment.

Figure 7.6 *Suggestions to improve teacher attendance*

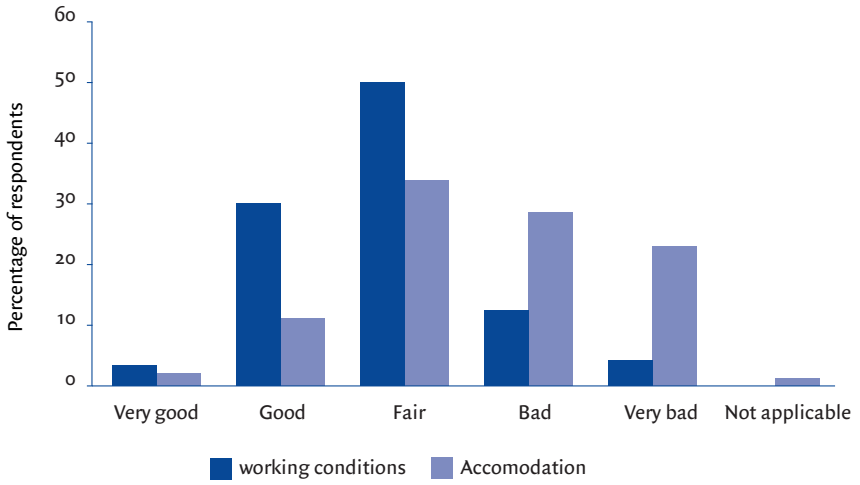


Source: survey IDC.

And what about teacher morale? 97% of teachers said that they enjoyed being a teacher and 90% intended to continue to be a teacher. No more than 17% of the teachers thought their working conditions were (very) poor. In general, teachers are more satisfied with their working conditions than with the accommodation (see figure 7.7). Nevertheless, improvement of working conditions appears to be

important. Another problem is that 57% of the teachers responded that they seldom or never received their salaries in time.

Figure 7.7 *Perception of working conditions and accommodation*



Source: survey IDC.

In order to analyse differences between regions and between urban and rural areas, the working conditions and accommodation variables were rescaled, with 1 for very good conditions/accommodation and 0 for very bad (working conditions) or not applicable (accommodation). Table 7.7 presents the results. Differences are adjusted for the effects of the other variable in the model. Teachers in the north complain most about their working conditions and teachers in the east and north complain most about the accommodation. Differences between urban and rural areas are small, with the exception of accommodation. On average, accommodations in rural areas are not as good as in the urban and semi-urban areas.

Teacher house at Kamurasi primary school, Masindi.

Table 7.7 *Perception of working conditions and accommodation*

	Working conditions	Accommodation
Central	0.55	0.52
East	0.54	0.46
North	0.47	0.45
West	0.58	0.48
Urban area	0.53	0.53
Peri-urban area	0.53	0.51
Rural area	0.54	0.47

Source: survey IDC.

7.5 Summary and conclusions

It is generally acknowledged that teacher absenteeism is an enormous problem in Uganda. There are only few reliable estimates, but most figures range between 20% and 30%. According to an international survey conducted in 2000, 24% of the head teachers in Uganda were frequently confronted with the unjustified absence of teachers. Another 58% indicated that it was an occasional problem. Another study (with figures from 2002/2003) established an absence rate of 27%,

which is higher than any other of the six countries in the survey. Recent figures of the World Bank suggest an (unauthorized) absence rate of almost 20%. Within the country, absenteeism seems to be most problematic in the northern and eastern districts and more problematic in rural areas than in urban areas.

Teachers' absenteeism is an important factor in the low quality of education in many schools. It is generally acknowledged that contact time is one of the key factors in the quality of education (see for instance UNESCO, 2004). Therefore, reducing teacher absenteeism may be a very cost-effective way to improve the quality of education. Currently, 20-30% of the wage bill is spent on services that are not delivered.

According to the results of a survey conducted for this study, the main causes of absenteeism (apart from illness) are: poor accommodation, distance to the school, low salary, late pay and low teacher morale. One of the main instruments to improve teacher attendance is to improve the quality of the school management, in addition to increasing the number of inspections and sanctions for unjustified absence. Results from two districts show that teachers' attendance is highly correlated with the school's management: well-managed schools have lower absence rates. This study confirms that well-managed schools have lower absenteeism rates and that children in these schools show better test and examination results. Apart from this, it is important to improve accommodations (teachers' houses) and working conditions, especially in rural areas.

Annex 1 About IOB

Objectives

The objective of the Policy and Operations Evaluation Department (IOB) is to increase insight into the implementation and effects of Dutch foreign policy. IOB meets the need for independent evaluation of policy and operations in all policy fields falling under the Homogenous Budget for International Cooperation (HGIS). IOB also advises on the planning and implementation of the evaluations for which policy departments and embassies are responsible.

Its evaluations enable the ministers to account to parliament for policy and the allocation of resources. In addition, the evaluations aim to derive lessons for the future. Efforts are accordingly made to incorporate the findings of evaluations into the Ministry of Foreign Affairs' policy cycle. Evaluation reports are used to provide targeted feedback, with a view to improving both policy intentions and implementation. Insight into the outcome of implemented policy allows policymakers to devise measures that are more effective and focused.

Approach and methodology

IOB has a staff of experienced evaluators and its own budget. When carrying out evaluations, it calls on the assistance of external experts with specialised knowledge of the topic under investigation. To monitor its own quality, it sets up a reference group for each evaluation, which includes not only external experts but also interested parties from within the Ministry.

Programme

IOB evaluations form part of the Ministry's evaluation programme (set annually by the Senior Management Board) that appears in the Explanatory Memorandum to the Ministry of Foreign Affairs' budget.

An organisation in development

Since IOB's establishment in 1977, major shifts have taken place in its approach, areas of focus and responsibilities. In its early years, its activities took the form of separate project evaluations for the Minister for Development Cooperation. Around 1985, evaluations became more comprehensive, taking in sectors, themes and countries. Moreover, IOB's reports were submitted to parliament, thus entering the public domain.

1996 saw a review of foreign policy and a reorganisation of the Ministry of Foreign Affairs. As a result, IOB's mandate was extended to the Dutch government's entire foreign policy. In recent years, it has extended its partnerships with similar departments in other countries, for instance through joint evaluations.

Finally, IOB also aims to expand its methodological repertoire. This includes greater emphasis on statistical methods of impact evaluation.

Annex 2 References

Acana, Sylvia, 2005a, *The role of National Assessment of Progress in Education in enhancing the quality of education in Uganda, Kampala*, Uganda National Examinations Board.

Acana, Sylvia, 2005b, *Using National Assessment of Progress in Education as a quality assurance mechanism in Uganda*, Kampala, Uganda National Examinations Board.

Adam, Christopher S. and Jan Willem Gunning, 2002, Redesigning the aid contract: donors' use of performance indicators in Uganda, in: *World Development*, Vol. 30, no. 12, pp. 2045-2056.

Africa Policy Department DFID, 2005, *Review of health and education progress in selected African countries* (RHEP-SAC), Synthesis Report, London, DFID.

Ark Consult Limited, 2005, *Masindi District Education Development Project, Draft final evaluation report*, Kampala, Ark Consult.

Baker, Judy L., 2000, *Evaluating the impact of development projects on poverty*, Washington DC, The World Bank.

Berry, John et al., 2003, *Local solutions to global challenges: towards effective partnership in basic education, country study report Uganda*, IOB/ the Netherlands Ministry of Foreign Affairs.

Boissiere, 2004, *Determinants of primary education, outcomes in developing countries*, Background paper for the evaluation of the World Bank's support to primary education, Washington, OED.

Byamugisha, Albert and Frank Ssenabulya, 2005, The SACMEQ II Project in Uganda: a study of the conditions of schooling and the quality of education, Harare, SACMEQ.

Chaudhury, Nazmul, Jeffrey Hammer, Michael Kremer, Karthik Muralidharan and F. Halsey Rogers, 2005, *Missing in action: Teacher and health worker absence in developing countries*, Revised JEP version 5/19/2005.

Carvalho, Soniya and Howard White, 1997, *Combining the quantitative and qualitative approaches to poverty measurement and analysis*, World Bank Technical Paper no. 366.

Colclough, Christopher, Samer Al-Samarrai, Pauline Rose and Mercy Tembon, 2003, *Achieving schooling for all in Africa; costs, commitment and gender*, Aldershot, Ashgate.

Das, Jishnu, Stefan Dercon, James Habyarimana and Pramila Krishnan, 2004, Teacher shocks and student learning: evidence from Zambia, Oxford, *Centre for the Study of African Economies*.

Duflo, Esther, Scaling Up and Evaluation, in: Bourguignon, Francois and Boris Pleskovic (eds.), 2004, *Accelerating development*, Washington, DC and Oxford, World Bank and Oxford University Press.

Duflo, Esther and Michael Kremer, 2005, *Use of randomization in the evaluation of development effectiveness*, in: Keith Pitman, Osvaldo N. Feinstein and Gregory K. Ingram, Evaluating development effectiveness, World Bank series on Evaluation and development, volume 7.

Eilor, Joseph, 2004, *Education and the sector-wide approach in Uganda*, Paris, UNESCO.

Glewwe, Paul and Michael Kremer, 2005, *Schools, Teachers, and Education Outcomes in Developing Countries, Second draft of chapter for Handbook on the Economics of Education.*

Greene, William H., 1993, The econometric approach to efficiency analysis, in: Garold A. Fried, C.A. Knox Lovell, Shelton S. Schmidt (eds.), *The measurement of productive efficiency*, New York, Oxford University Press, pp. 68-119.

Ingram, George, Annababette Wils, Bidemi Carrol, and Felicity Townsend, 2006, *The Untapped Opportunity: How Public-private partnerships can advance education for all*, Washington, EPDC.

IEG, 2006, *From schooling access to learning outcomes, an unfinished agenda, an evaluation of World Bank support to primary education*, Washington, World Bank.

IOB, 2003, *Local Solutions to Global Challenges: towards effective partnership in Basic Education* (final report), The Hague, The Netherlands Ministry of Foreign Affairs.

IOB, 2006, From project aid towards sector support, an evaluation of the sector-wide approach in Dutch bilateral aid 1998-2005, The Hague, The Netherlands Ministry of Foreign Affairs.

Kingdon, Geeta, 2005, Chapter on Education Economics, in: *DFID Economists' Guide*, London, DFID, 2005.

Leliveld, André, 2005, *Sector-wide Approach, Working Document Uganda*, Den Haag, IOB.

Lister, Stephen, Wilson Baryabanoha, Jesper Steffenson and Tim Williamson, 2006, *Joint Evaluation of General Budget Support 1994-2004, Uganda Country Report*, London, DFID.

Malinga, Florence, Uganda: lessons learned from the education sector-wide approach, *ADEA Newsletter* 14 (4), 7-8.

Michaelowa, Katharina, 2003, *Determinants of Primary Education Quality: What can we learn from PASEC for francophone Sub-Saharan Africa?*, Paris, ADEA.

Michaelowa, Katharina and Annika Wechtler, 2006, *The cost-effectiveness of inputs in primary education: insights from the literature and recent surveys for sub-Saharan Africa*, Paris, ADEA.

Ministry of Education & Sports, The Republic of Uganda, 2004, *The Education Sector Annual Performance Report (ESAPR), financial year 2003/2004*, Kampala, MoES.

Ministry of Education & Sports, 2004, The Republic of Uganda, *Education Sector Strategic Plan 2004-2015*, Kampala, MoES.

Ministry of Education & Sports, The Republic of Uganda, 2005a, *The Education Sector Annual Performance Report (ESAPR), financial year 2004/2005*, Kampala, MoES.

Ministry of Education & Sports, The Republic of Uganda, 2005b, *Uganda Education Statistics Abstract 2004*, Kampala, MoES.

Ministry of Education & Sports, The Republic of Uganda, 2005c, *Aide memoire for the second annual education sector review*, Kampala, MoES.

Moncrieffe, Joy, 2004, *Uganda's political economy: a synthesis of major thought*, London, OFDI.

Murphy, Lynn, 2003, *Does increasing access mean decreasing quality? An assessment of Uganda's progress towards reaching EFA goals*, Background paper for EFA Monitoring report.

Namirembe Bitamazire, Geraldine, 2005, *Status of education for rural people in Uganda*, Kampala, MoES.

Nannyonjo, Harriet, 2007, *Effective use of education inputs in Uganda, An analysis of factors influencing learning achievement in grade six*, Washington, The World Bank.

Netherlands Ministry of Foreign Affairs, 2000, *Education: a basic human right, development cooperation and basic education: policy, practice and implementation*, The Hague, the Netherlands Ministry of Foreign Affairs.

Netherlands Ministry of Foreign Affairs, 2005, *Results in Development, Report 2004*, The Hague, The Netherlands Ministry of Foreign Affairs.

Okech, Anthony, 2005, Uganda case study of literacy in education for all 2005, a review of policies, strategies and practices, Paris, UNESCO.

Pitman, George Keith, Osvaldo N. Feinstein and Gregory K. Ingram, 2005, *Evaluating development effectiveness*, New Brunswick, Transaction Publishers.

Pritchett, Lant, 2004, Access to Education, in: Bjørn Lomborg (ed.), *Global crises, global solutions*, Cambridge, Cambridge University Press, pp. 175-234.

Ravallion, Martin, 2001 The mystery of vanishing benefits: an introduction into impact evaluation, *The World Bank Economic Review*, vol. 15, no. 1, pp. 115-140.

Ravallion, Martin, 2005, Evaluating anti-poverty programs, in: R.E. Evenson and T.P. Schulz (eds.), *Handbook of Agricultural economics Volume 4*, North Holland.

Rawlings, Laura, 2005, Operational reflections on evaluating development programs, in: George Keith Pitman, Osvaldo N. Feinstein and Gregory K. Ingram, *Evaluating development effectiveness*, New Brunswick, Transaction Publishers, pp. 193-204.

Reinikka, Ritva and Jakob Svensson, 2003, *The power of information: evidence from a newspaper campaign to reduce capture*, Washington, World Bank.

Reinikka, Ritva and Jakob Svensson, 2004, Local capture: evidence from a central government transfer program in Uganda, in: *The quarterly Journal of Economics*, vol. 19.

Rivkin, Steven G., Eric A. Hanushek and John F. Kain, 2005, Teachers, schools and academic achievement, in: *Econometrica*, Vol 73, No. 2, pp. 417-458.

Rosenbaum, P.R. and D.B. Rubin, 1983, The central role of the propensity score in observational studies for causal effects, in: *Biometrika* 70, pp. 41-55.

Smith, Ian, 2004, *Analysis of resource allocation trends in primary education 1998 onwards*, Report prepared for the Royal Netherlands Embassy, Kampala.

Smith, Harvey, 2005, Ownership and capacity: Do current donor approaches help or hinder the achievement of international and national targets for education?, in: *International Journal of Educational Development* 25, pp. 445-455.

Uganda Bureau of Statistics, 2002, *Uganda DHS EdData Survey 2001, Education Data for Decision Making*, Entebbe, UBOS.

Uganda Bureau of Statistics, 2003, *Uganda National Household Survey 2002/2003, Report on the socio-economic survey*, Kampala, UBOS.

Uganda Bureau of Statistics, 2006a, *Uganda National Household Survey 2005/2006, Report on the socio-economic module*, Kampala, UBOS.

Uganda Bureau of Statistics, 2006b, *Uganda National Household Survey 2005/2006, Qualitative module report*, Kampala, UBOS.

Uganda Bureau of Statistics, 2007, *Uganda Demographic and Health Survey 2006*, Kampala, UBOS.

UNESCO, 2004, *EFA Global Monitoring Report 2005: Education for All: the Quality Imperative*, Paris, UNESCO.

UNESCO, 2005, *EFA Global Monitoring Report 2006: Literacy for life*, Paris, UNESCO.

UNESCO, 2006, *EFA Global Monitoring Report 2007: Strong foundations, Early childhood care and education*, Paris, UNESCO.

Verspoor, Adriaan M. (ed.), 2006, *The challenge of learning: improving the quality of basic education in Sub-Saharan Africa*, Paris, ADEA.

Walle, Dominique van de and Dorothyjean Cratty, 2005, *Do Donors Get What They Paid For? Micro Evidence on the Fungibility of Development Project Aid*, World - Bank, World Bank Policy Research Working Paper 3542.

Walugembe, Fredrick Edward, 2003, *Factors affecting pass rates in primary education in Uganda 1992-2000*, Kampala (PhD).

Ward, Michael, Alan Penny and Tony Read, 2006, *Education reform in Uganda – 1997-2004. Reflections on policy, partnership, strategy and implementation*, London, DFID.

White, Howard, 2004, *Books, buildings, and learning outcomes: an impact evaluation of World Bank Support to basic education in Ghana*, Washington DC, OED, The World Bank.

White, Howard, Shampa Sinha and Ann Flanagan, 2006, *A review of the state of impact evaluation*, Washington, Independent Evaluation Group, World Bank.

Wils, Annababette, Bidemi Carroll and Karima Barrow, 2005, *Educating the World's Children*, Washington, EPDC.

Winkler, Donald, 2007, *The efficiency of public education in Uganda*, Washington, World Bank.

Wooldridge, Jeffrey M., 2002, *Econometric analysis of cross section and panel data*, Cambridge.

Annex 3 Glossary

Primary education	The first years of formal, structured education during childhood, usually from 6-7 years of age until 12-14 years of age.
Enrolment	Number of pupils enrolled at a given level of education, regardless of age.
Gross enrolment ratio	Total enrolment as a percentage of the official school-age population.
Net enrolment ratio	Enrolment of the official age group expressed as a percentage of the corresponding population.
School attendance rate	The number of children of the official age for primary education regularly attending school as a proportion of the total population of children of the official age for primary education.
Survival rate	Percentage of a cohort of pupils enrolled in the first grade who reach each successive grade.
Completion rate	The total number of pupils completing the final year of primary education as a percentage of the population at the official primary graduation age.
Dropout rate (by grade)	Percentage of pupils or students who drop out from a given grade in a given school year.
Repetition rate	The proportion of pupils from a cohort enrolled in a given year who study in the same grade in the following school year.
Gender parity index	Ratio of female to male values of a given indicator
Pupil teacher ratio	Average number of pupils per teacher, based on headcounts for both pupils and teachers.

Annex 4 Regions, zones and districts

Region	Zone	District	Region	Zone	District
Central	Central I	Kayunga	**Northern**	Mid North	Apac
		Mpigi			Gulu
		Mukono			Kitgum
		Wakiso			Lira
	Central II	Kiboga			Pader
		Luwero		North East	Kotido
		Mubende			Moroto
		Nakasongola			Nakapiripirit
	Central III	Kalangala		West Nile	Adjumani
		Masaka			Arua
		Rakai			Moyo
		Sembabule			Nebbi
	Kampala	Kampala			Yumbe
Eastern	Far East	Kaberamaido	**Western**	Far West	Kabale
		Katakwi			Kanungu
		Kumi			Kisoro
		Pallisa			Rukungiri
		Soroti		Mid West	Bundibugyo
	Mid East	Busia			Kabarole
		Kapchorwa			Kamwenge
		Mbale			Kasese
		Sironko			Kyenjojo
		Tororo		North West	Hoima
	Near East	Bugiri			Kibaale
		Iganga			Masindi
		Jinja		South West	Bushenyi
		Kamuli			Mbarara
		Mayuge			Ntungamo

Annex 5 Interventions

This annex summarises several of the main interventions in the primary education sector based on the Annual Education Sector Performance Reports.

- The recruitment of 40,000 primary school teachers.
- Increasing the number of trained teachers through the Teacher Development Management system (TDMS).
- The construction of 84,500 classrooms (planned).
- Adopting a law to prosecute head teachers imposing unauthorized school charges.
- The development of a national strategy for girls' education in Uganda, with the purpose of mainstreaming girls' concerns in education.
- The establishment of 45 Primary School Teachers' Colleges (23 core; 22 ordinary).
- Investment in instructional materials: textbooks have been provided to all government-aided primary schools to introduce the new curriculum.
- The provision of furniture to primary schools.
- Building efficient education inspection capacity at MoES and in local governments.
- Enriching the primary school curriculum with agriculture, production skills, performing arts and physical education.

Annex 6 The computation of enrolment rates

This annex presents difficulties encountered in the computation of enrolment rates.[44]

1. *The computation of population figures*

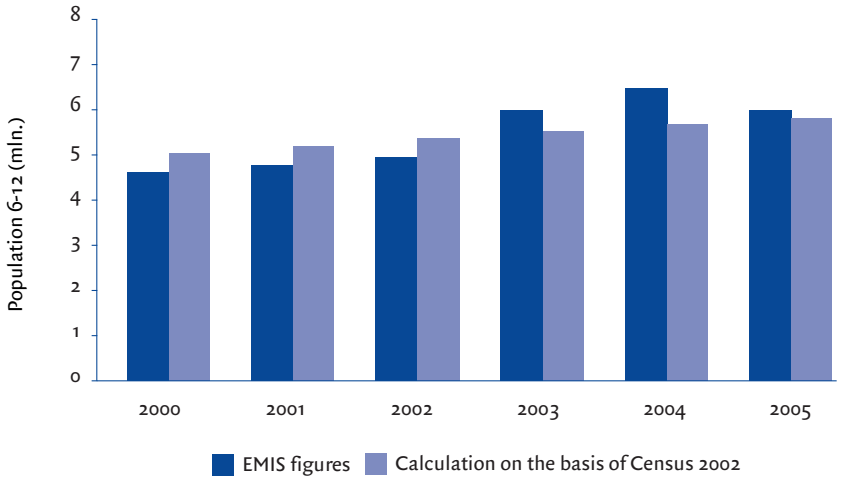
The 2002 *Population and Housing Census* forms the basis for estimates of the population by gender and age between 2002 and 2005 (and can even be used for the computation of figures for 2000 and 2001). However, different estimation methods tend to lead to different results. For the EMIS database, population figures are calculated on a yearly basis, with the most accurate estimates at that moment. This method may lead to inconsistent results if one wants to follow developments through the years.

It seems to be easier and more consistent to compute population figures directly from the 2002 census data. Using this method, the number of children at age x in year t = number of children at age x-1 in year t-1 – mortality. This method ignores the effects of emigration, immigration and migration between districts. The first method more accurately reflects the total population growth; the second method more accurately reflects the age distribution within the population.

Figure 1 illustrates the differences between the two methods for 2000-2005 (at the national level).

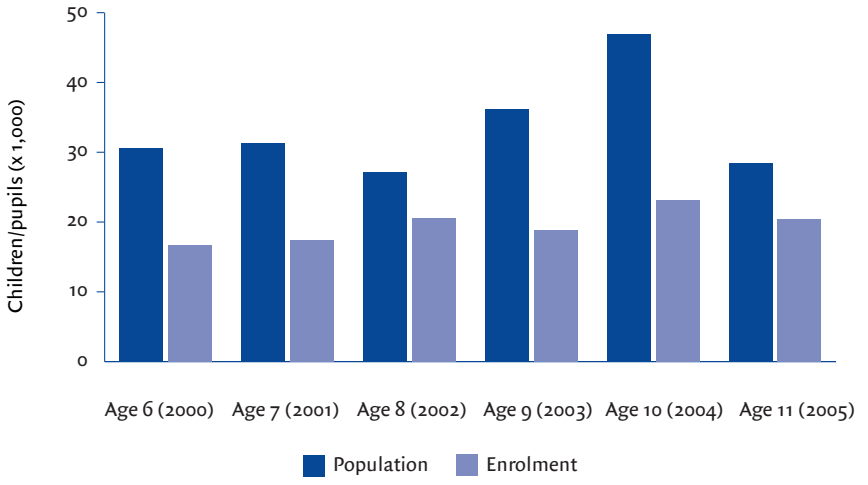
44 See also Status of Education Statistics, MoES, June 2006.

Figure 1 *Estimation of the number of children aged 6-12 years (2000-2005)*



As an example, figure 2 presents the enrolments figures for the Kampala district based on the first computation method. Differences in enrolment mainly reflect differences in the participation in the school census. Therefore, it seems difficult to reliably estimate enrolment figures for districts like Kampala (with many private schools). This problem seems to be aggravated by volatile population estimates.

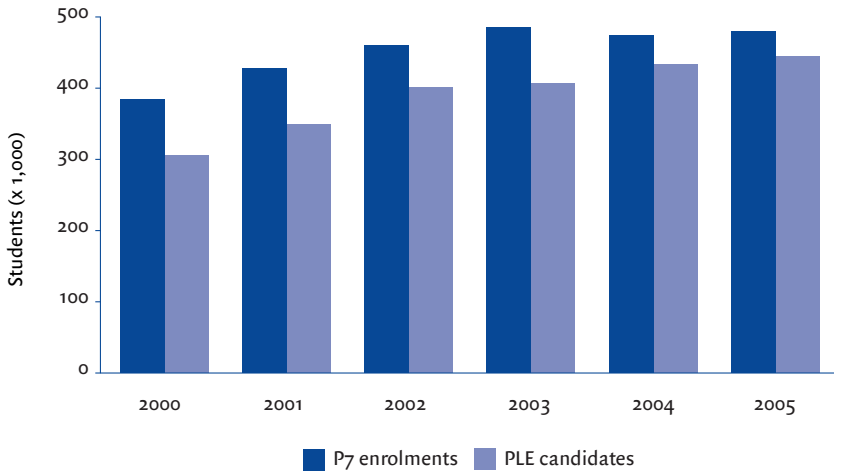
Figure 2 *Population and enrolment figures (2000-2005)*



2. *Over- and underreporting*

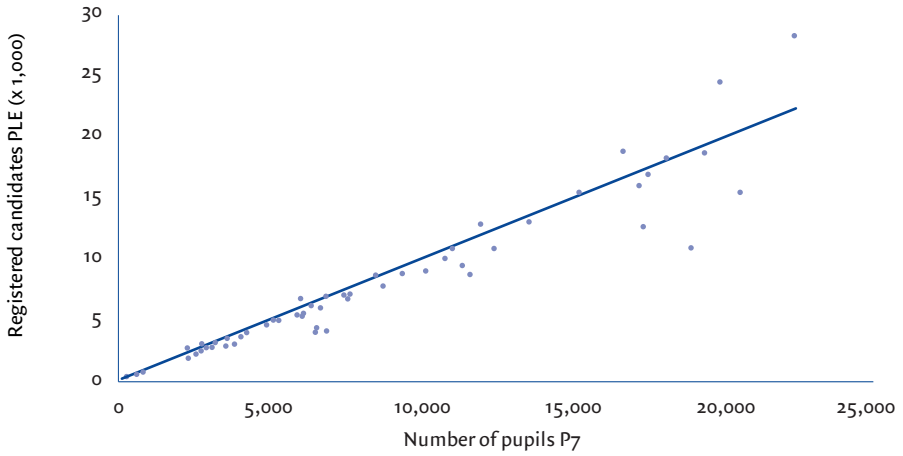
The low enrolment rates for (for instance) Kampala district suggest that schools underreport. Especially private schools do not always return the school census forms. The MoES report of June 2006 that presents the facts of the 2005 school census already referred to the problem of over- and underreporting. The comparison between the enrolment of pupils in primary 7 and the number of (registered) PLE candidates leads to the same conclusion.

Figure 3 *Enrolments in P7 and number of registered PLE candidates (2000-2005)*



The aggregate figures do not show large differences between districts. Figure 4 illustrates these differences for 2005. The figure compares the number of pupils in P7 with the number of (registered) PLE candidates in each district.

Figure 4 *Pupils in P7 and PLE candidates (districts, 2005)*

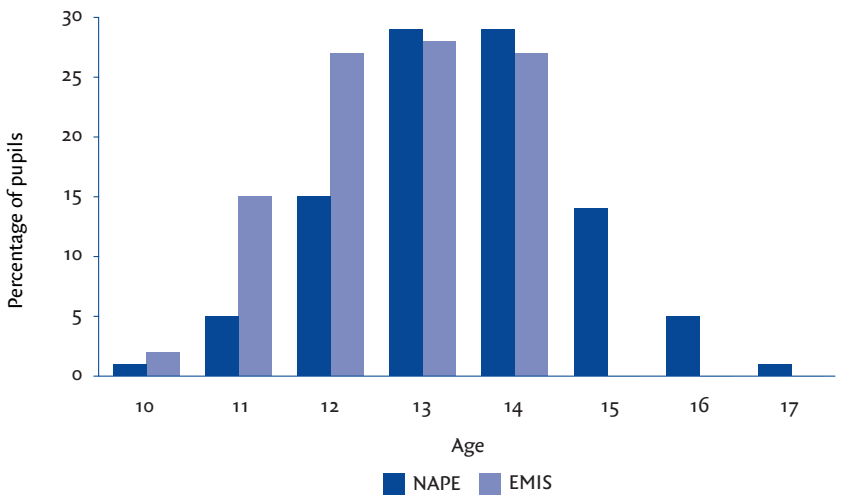


The figure shows three larger districts with a low PLE P7 ratio. Not surprisingly, these districts have reported net enrolment rates above 100% (Apac, Lira and Mbale). On the top right of the graph, two districts have much more PLE candidates than enrolments in P7 (Kampala and Wakiso). These districts have low net enrolment rates.

3. *The age of pupils*

Net enrolment rates are computed by dividing the number of pupils aged 6-12 years by the correspondent population group. This computation assumes that the reported age of pupils is reliable. This is not necessarily the case. A comparison between EMIS data and UNEB data (NAPE and exam data) shows striking differences in age distribution. Figure 5 shows these differences at P6.

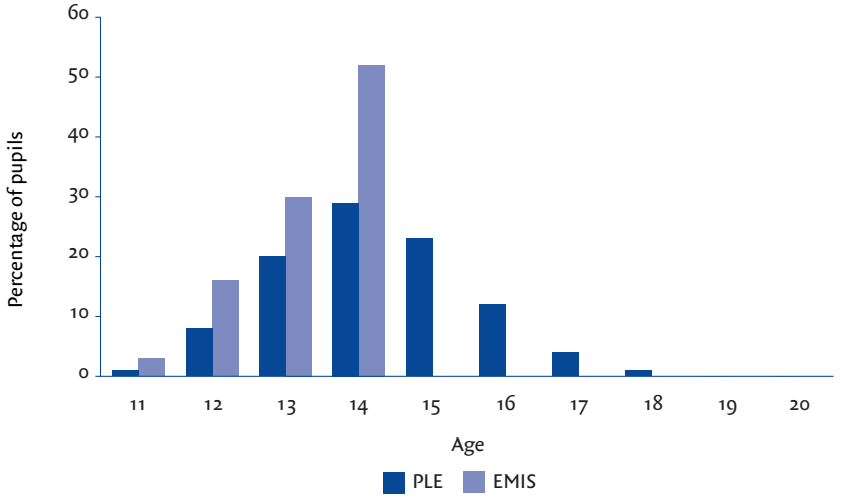
Figure 5 *Age distribution at P6 (NAPE and EMIS; 2005)*



Source: EMIS / NAPE / computation IOB.

According to EMIS data, approximately 45% of the pupils in P6 are aged between 10 and 12 years; according to NAPE data, this is only 22%. This phenomenon may partly explain the (too) high net enrolments rates. Exam data confirm this assumption (see figure 6). According to EMIS data, approximately 18% of the pupils in P7 are not older than 12, but according to PLE data this is only 9%. So, according to UNEB figures, high net enrolment ratios may be caused by a misstatement of the age of pupils.

Figure 6 *Age distribution at P7 (PLE and EMIS; 2005)*



Source: EMIS / PLE (UNEB) / computation IOB.

4. Conclusions

Gross and net enrolment rates are important variables for the evaluation of progress in the realisation of UPE and the MDGs on education. However, several factors hamper the accurate computation of these rates, especially regarding net enrolment rates. It must be concluded that reliable estimates of net enrolment rates are hampered by:

1) uncertainties of estimates of the school aged population, especially at lower levels of aggregation (district county or even parish). It appears that these estimates change very much each year and this complicates a comparison of enrolment rates in time;
2) changes in the inclusiveness of the annual school censuses and the reliability of enrolment data. A comparison of primary 7 figures with the number of examination candidates (PLE) shows that for most districts there is not a large discrepancy between the two figures, although there are several notable exceptions;
3) a comparison of school census data with data from UNEB shows that schools do not always accurately report the age of their pupils. In general, pupils appear to be older than reported in the school census. This means that net enrolment rates, calculated by school census data, tend to be too high;
4) changes in the administrative structure (the formation of new districts). These changes hamper the comparison of figures between years (at the district level).

Annex 7 Socio-economic background

The EMIS database does not contain data on household characteristics. This creates the risk that important variables are omitted. As a result, estimates may be biased (see chapter 2). Therefore, a variable should be included that forms an indicator for the background and wealth of the parents. This was done in two ways. First of all, a socio-economic variable was created on the basis of the 2001 DHS EdData survey. Unfortunately, this survey provides no information about the socio-economic status of the parents (such as income or expenditure). Therefore, a socio-economic variable was constructed using principal components analysis:

1) based on three other variables in the DHS, a first variable was constructed as a proxy: the frequency of reading newspapers, the frequency of listening to the radio and the frequency of watching TV;
2) a second variable gives information about parents' education level.

Both variables appear to be highly correlated (r=0.58), thereby creating a *multicollinearity* problem. In order to solve this problem, these two variables were combined through principal components analysis, creating a new variable indicating education level and socio-economic status.

This new variable is correlated with the inverse of the teacher pupil ratio (r=0.39) and with parents' school-related expenditures (r=0.56).[45] Parents' expenditures are also correlated with the teacher pupil ratio (r=0.41). These findings confirm the hypothesis that better-educated parents with higher incomes spend more money on the education of their children and (as a result) these children go to schools with smaller class size. This conclusion does not confirm the hypothesis

45 Correlation (r) is a measure for the relation between two variables. If r=0, there is no relation at all; if r=1, the correlation is perfect.

that class size is irrelevant. On the contrary: if parents have a choice and they can afford it, they send their children to schools with small classes. However, it is problematic to give separate estimates of either the effects of pupils' background or the effect of class size.

With principal components analysis, a new variable is constructed that shows the effect of small classes with pupils with better-educated parents who spend much on the schooling of their children.[46] The correlation of this new variable with the three compounding variables is:

- education and use of media: 0.82
- expenditures on schooling: 0.84
- teacher pupil ratio: 0.72

The attractiveness of the DHS EdData is that the survey contains valuable information on the education of children at the household and pupil levels. A disadvantage is that the sample is actually not extensive enough for the purpose of this study. A (10%) sample of the Population and Housing Census of 2002 was used to be able to include household data in a larger survey.

The Population and Housing Census does not contain information about households' income or expenditures. However, several variables were used to construct an indicator for the socio-economic position of the households in the sample:

- percentage of paid employees in a parish (r=0.78)
- percentage who went to school in a parish (r=0.84)
- average job level in a parish (r=0.70)
- average education level in a parish (r=0.95)
- average literacy level in a parish (r=0.88).

A high score on the newly constructed variable means that most employees in the parish have a good job and a good educational background; a low score is an indication that fewer people have good jobs and a good educational background.

46 Principal components analysis is a technique to reduce the number of variables. In essence, the technique consists of combining indicators of the same phenomenon to form one single variable. The method is used, for instance, for psychological tests, in which the test uses several indicators (questions) to measure intelligence, management skills, etc.

Annex 8 SACMEQ II

Introduction

In 1991, the Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ) started as a national survey on the quality of primary education in Zimbabwe. It was supported by UNESCO's International Institute for Educational Planning (IIEP) and soon expanded to other African countries. In 1995 this resulted in the establishment of a network of seven Ministries of Education which conducts large-scale cross-national studies on the conditions of schooling and the quality of primary education. Its purpose is to inform policy development aimed at improving the performance of their systems and achieving EFA as well as the Millennium Development Goals. The overall objective of SACMEQ is to:

1) expand opportunities for educational planners to gain the technical skills required to monitor and evaluate the quality of basic education, and
2) generate information that can be used by decision-makers to plan the quality of education.

Due to the success of SACMEQ I in the period between 1995 and 1998 when it was conducted in Kenya, Malawi, Mauritius, Namibia, Zambia, Zanzibar and Zimbabwe, it was soon followed and expanded by SACMEQ II. The expansion concerned both the content of the survey as well as the number of participating Ministries of Education. By 2000, the SACMEQ network included fifteen members: Botswana, Kenya, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania (mainland), Tanzania (Zanzibar), Uganda, Zambia and Zimbabwe. The content was expanded to include information on both pupils and teachers and their performance on reading and mathematics tests. It covered the following main themes:

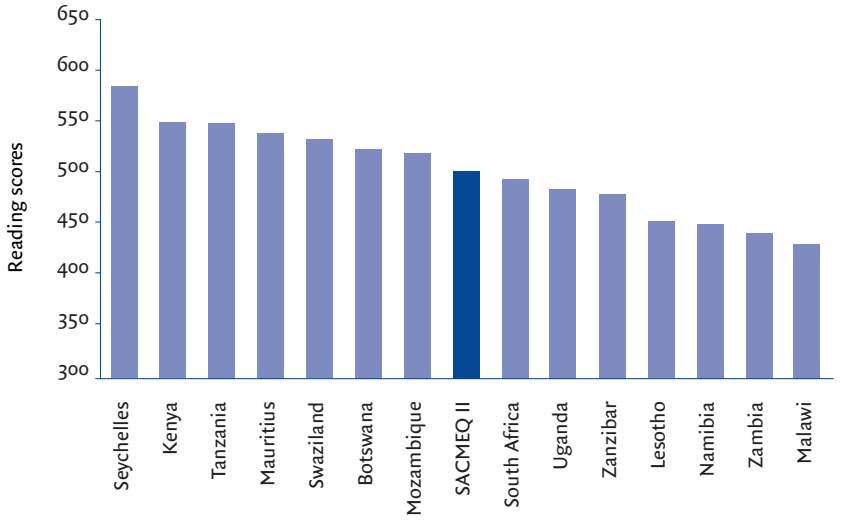
- grade 6 pupils' characteristics and their environments;
- grade 6 teachers' characteristics and their views on teaching, classroom resources, professional support, and job description;
- school heads' characteristics and their views about educational infrastructure, the organisation and operation of schools, and problems with pupils and staff;
- equity in the allocation of human and material resources among educational regions and among schools within regions;
- reading and mathematics achievement of grade 6 pupils and their teachers.

Even though the SACMEQ members have different curricula, the tests were developed in such a way that results are nevertheless comparable.[47] Thus, a comparative analysis can be conducted on quality and equity between school systems.

Figures 1 and 2 show pupils' mean scores on reading and mathematics tests per country. These two figures indicate the average pupil scores of each country and the SACMEQ II average (standardised score=500). The standardised score can only be used to compare between SACMEQ II countries, and not as a broader international measurement. In general, the countries that perform either above or below the SACMEQ II average are the same for both subjects. Uganda is an exception, since its country average for reading is below the SACMEQ II average and for mathematics it is above average.

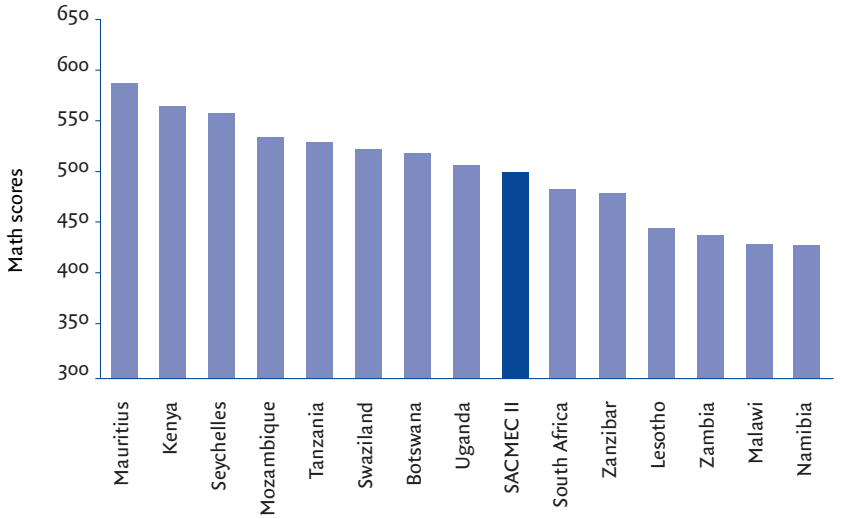
47 Excluding differences in socio-economic contexts.

Figure 1 *Pupils' mean reading scores per country*



Source: SACMEQ II database.

Figure 2 *Pupils' mean mathematics scores per country*



Source: SACMEQ II database.

Analysis on the basis of SACMEQ II data

SACMEQ II data have been used for an analysis of policy interventions to improve pupils' performance in Uganda. SACMEQ II data consist of information on both teacher and pupil performance and characteristics. The SACMEQ II database for Uganda consists of 163 different primary schools, 2,642 grade 6 pupils, 200 reading teachers and 126 math teachers.

Impact analysis of pupils' math performance

This analysis uses regional, pupil, teacher, and school characteristics to explain variation in pupils' math performance. An interesting result of the analysis is that the number of meals per day has a major effect on pupils' performance. The number of meals taken per day depends on the income of the pupil's household, but meals may also be provided by the school. Another factor that has a major impact on pupils' performance is the pupil teacher ratio.

The negative sign for test scores of pupils taking extra classes is easy to explain. Pupils with low scores need extra classes and pupils who score higher can do without. This does not mean that these extra classes are not helpful. More remarkable is the effect of books. Sharing or owning a book does not seem to have the expected effect in this analysis. This result is not consistent with the results of the impact analysis for Uganda and needs further analysis. On school the level, well-trained teachers are of great importance.

Impact analysis of pupils' reading performance

This analysis again shows how important it is that pupils have enough to eat. Considerable differences are the fact that sharing books does have an impact (compared to having no books), but pupil teacher ratio does not have a strong effect. The availability of sufficient school resources seems to have a more positive effect on pupils' reading performance.

Table 1 *Variables explaining pupils' math test results*

	Coefficient	Standard error	t-value	
Regional Characteristics				
East	-15.3	7.9	-1.9	
West	-59.1	10.2	-5.8	**
South West	-34.6	10.6	-3.3	**
North	-33.9	8.2	-4.1	**
Urban	21.9	7.5	2.9	**
Pupil Characteristics				
Girl	-15.9	5.6	-2.9	**
Meals per day	9.0	1.2	7.4	**
Age	-0.2	0.05	-4.3	**
Household income + parents' education	7.0	3.6	2.0	*
Taking extra math classes	-3.3	5.5	-0.6	
Taking extra classes on other subjects	-29.0	5.8	-5.0	**
Pupil absence	-5.0	5.0	-1.0	
School Characteristics				
Private	9.2	13.0	0.7	
Average distance from clinic, road, etc.	-0.07	0.2	-0.5	
Pupil Teacher Ratio	-1.2	0.2	-8.0	**
Bad school building condition	-17.7	7.2	-2.5	*
Pupil Toilet Ratio	0.04	0.02	1.8	
Total resources	-0.5	1.0	-0.6	
Teacher Characteristics				
Average staff teacher training	24.3	5.0	4.9	**
Teacher Math Performance	0.02	0.03	0.8	
Constant	535	33	16.3	**

N = 1,447
Adj. R^2 = 0.20
*significant at p<0.05; **significant at p<0.01.
Source: SACMEQ II.

Table 2 *Variables explaining pupils' reading test results*

	Coefficient	Standard error	t-value	
Regional characteristics				
East	-0.2	5.1	-0.04	
West	-28.2	6.4	-4.4	**
South West	-22.0	6.4	-3.5	**
North	-12.0	5.7	-2.1	*
Urban	12.1	5.1	2.4	*
Pupil Characteristics				
Girl	-14.5	3.7	-4.0	**
Meals per day	5.6	0.8	7.1	**
Age	-3.5	1.0	-3.5	**
Household income + parents' education	13.6	2.4	5.7	**
Taking extra reading classes	-11.3	3.6	-3.1	**
Taking extra classes on other subjects	-6.6	3.8	-1.8	
Share reading book	28.0	4.6	6.1	**
Own reading book	9.8	6.0	1.6	
School Characteristics				
Private	32.0	9.1	3.5	**
Average distance from clinic, road, etc.	0.03	0.1	0.3	
Pupil Teacher Ratio	-0.2	0.1	-1.7	
Bad school building condition	-10.9	4.8	-2.3	*
Pupil Toilet Ratio	-0.05	0.02	-3.6	**
Total resources	4.9	0.6	8.5	**
Pupil absenteeism	-1.1	3.4	-0.3	
Teacher Characteristics				
Average staff teacher training	-0.2	3.4	-0.1	
Teacher Reading Performance	0.02	0.02	1.0	
Constant	461	24	19.0	**

N = 1,931
Adj. R^2 = 0.24
*significant at p<0.05; **significant at p<0.01.

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