

**Report No. 29784-TP**

# **Timor-Leste**

## **Education Since Independence From Reconstruction to Sustainable Improvement**

**Human Development Sector Unit  
East Asia and Pacific Region**



**The World Bank**

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**Currency Equivalents**

(As of March 25, 2004)

Currency Name = US\$

**Fiscal Year**

July 1 – June 30

**Number of School Days/Year**

180

**Number of Instructional Hours/Year**

900

**Abbreviations and Acronyms**

AusAID	Australian Agency for International Development
CFET	Consolidated Fund for Timor-Leste
CIDA	Canadian International Development Agency
CNRT	Conselho Nacional da Resistencia Timorese
EFA-FTI	Education for All-Fast Track Initiative
ETTA	East Timor Transitional Administration
EU/EC	European Union/European Commission
FSQP	Fundamental School Quality Project
GDP	Gross Domestic Product
GER	Gross enrollment ratio
JICA	Japanese International Cooperation Agency
MDGs	Millennium Development Goals
MECYS	Ministry of Education, Culture, Youth, and Sports
MICS	Multiple Indicator Cluster Survey
MOF	Ministry of Finance
MoRA	Ministry of Religious Affairs (Indonesian Government)
NDP	National Development Plan
NER	Net Enrollment Ratio
OECD	Organization for Economic Cooperation and Development
PSAS	Primary School Assessment Survey
STR or PTR	Student-teacher ratio or pupil-teacher ratio
TFET	Trust Fund for East Timor
TLSS	Timor-Leste Living Standards Measurement Survey
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNTAET	United Nations Transitional Administration in East Timor
UNTIL	Universidade Nacional Timor Lorosa'e (University of Timor-Leste)
UNICEF	United Nations International Children's Fund
UPE	Universal primary enrollment

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## **FOREWORD**

*Timor-Leste Education Since Independence: From Reconstruction to Sustainable Improvement* is a study that arose out of the reconstruction of the education sector. At a time when the people of Timor Leste was facing enormous challenges, it was clear that the new country and its formative government were very much aware of the need to move from an emphasis on school reconstruction to school quality and towards enhanced effectiveness. The Government also recognized the importance of managing basic financial operations in the education sector and to see that by FY 2001/02 they had developed a national education budget that accounted for all sources of support for the sector: the government's own funds (CFET), the combined donor assistance fund administered by the World Bank (TFET), and other funds provided by bilateral donor assistance. As school organization and budgets were restored, focus quickly shifted to an assessment of what children were learning.

This study reports on each of these aspects and focuses on the study of children's achievement (PSAS 2003). Importantly, this study identifies those things associated with improving children's learning which can be favorably influenced by government policy.

In responding to the request for an analysis of the sector, we sincerely hope that , through this report, we are able to contribute to ongoing policy debate and to the dialogue between the Government, the people of Timor-Leste and its international partners.

**EMMANUEL Y. JIMENEZ**

Director  
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*Washington, D.C., November 17, 2004*



## **PREFACE**

Before Timor-Leste regained its independence on May 20, 2002, the transitional administration consulted with the East Timorese people on their aspirations for the future. Seven out of ten people cited education as their top national priority. The first National Development Plan made education a cornerstone of its strategy to alleviate poverty and facilitate economic growth. This sector study on education is a response to the aspirations of the people of East Timor and to its government's priorities.

The study provides analytical support for medium-term policy options to expand coverage, raise internal efficiency and student achievement, and improve sectoral and expenditure management. At the most fundamental level, the government's target is to reach the Millennium Development Goals of gender parity in enrollment by 2005 and universal enrollment in and completion of primary education by 2015. This study focuses mainly on primary education with little coverage of youth, the labor market, or tertiary education, which deserve separate reports. The study begins by discussing the evolution of the education system and how historical legacies shape current conditions. It examines the barriers to access, efficiency, and quality as well as the policies needed to remove them. It also discusses institutional issues and the medium-term public expenditure framework and assesses the options for improving sectoral management and achieving financial sustainability.

The study draws from a number of data sources: the Suco Survey (2001), the Timor-Leste Living Standards Measurement Survey (TLSS 2001), School Mapping (2001), the Primary School Assessment Survey (2003), Indonesian household surveys (SUSENAS 1995, 1997, 1998, 1999), and the Indonesian labor market survey (SUKENAS 1998). It cites findings from other data sources: the UNICEF Multiple Cluster Indicators Survey (2002), Indonesia's 1990 Population Census, and various studies conducted before and after the transition. It also draws information from interviews and discussions with teachers, students, parents, district officers, officials in the Ministry of Education, Culture, Youth and Sports, the Ministry of Planning and Finance, and development partners. This study also draws from the World Bank education team's analysis of education finance (2000), the financial data generated by the team's assistance to the government in the preparation of the National Education Budget for FY2001/2, and the public expenditure review undertaken by the Poverty Reduction and Economic Management team of the World Bank.



## **ACKNOWLEDGMENTS**

This report, in particular the Primary School Assessment Survey (PSAS), is the result of a close collaboration between the World Bank and the Timor-Leste Ministry of Education, Culture, Youth, and Sports (MECYS) through its Fundamental School Quality Project (FSQP).

We would like to thank Hon. Armindo Maia, Minister of Education, Culture, Youth, and Sports for supporting the study and providing guidance to ensure its timely completion. We would also like to thank Messrs. Domingos de Souza and Antonino Pires, Director General and Deputy Director General, respectively, who facilitated preparations for the PSAS field trials and ensured that the ministry's computer facility could be used for PSAS data entry.

A number of other staff of the MECYS provided support to the PSAS study. We wish in particular to acknowledge the assistance given by Mr. Rui da Costa Belo, Assistant Director for Curriculum, and Mrs. Delfina Borges, Assistant Director for Primary Education. Mr. Belo made the initial translations of the questionnaires from English to Bahasa Indonesia, and Mrs. Borges helped to identify and classify schools in the preparation of a school- and student-sampling frame.

The operational phase of the PSAS was largely supported by FSQP, which provided support for the printing of the survey questionnaires, transport facilities for the fieldwork, and further support for the computerization of the data. We are particularly indebted to Mr. Francisco Osler de Almeida, Project Director of FSQP, and Ms Tracey Morgan, volunteer education worker, for the consistent support that they provided in this work. To all others in the FSQP who provided assistance, we also extend our sincere thanks.

We are very thankful to the staff of the Statistics Office of the Ministry of Finance and Planning for their collaboration in the PSAS. Mr. Manuel Mendonca (Head of the Statistics Office) and Mr. Elias dos Santos Ferreira (Field Manager) ensured that we had the full cooperation and support of the Statistics Office in all facets of the fieldwork and computerized data entry. The Statistics Office selected suitable enumerators for the fieldwork and was instrumental in forming and managing field teams, pilot testing the questionnaires, training personnel, and monitoring the actual survey. Mr. Ferreira's contribution was outstanding and went beyond mere collaboration. His initiative, attention to detail, and concern with quality and the need for the timely execution of the survey contributed greatly to the survey's success. We are also grateful to the survey teams in charge of fielding the mathematics test and questionnaires.

We would like to thank Mr. Aderito Punef, who was specifically appointed to assist in the PSAS study. Mr. Punef provided invaluable assistance at all stages of the study, particularly as translator in training workshops, in the preparation and translation of questionnaires, and in data entry.

To all others not specifically mentioned who contributed to the PSAS, we extend our sincere thanks—the students, teachers, and other people who participated in the survey. Their assistance and the data they provided will be used to build a better education system for their country.

We are grateful to Mr. Marcial Salvatierra, Advisor to the Minister, and Ms. Trina Supit, Education Specialist, Institute for Teacher Development in Timor-Leste, for their careful reading of the report and thoughtful comments. We appreciate the collaboration of the Ministry of Finance in providing data on public expenditure on education. We are grateful to the staff of the Universidade Nacional Timor Lorosa'e for sharing their views and their vision for higher education.

We wish to thank AusAID, the Australian Government's agency for international development, for making available to the study team their consultant, George Morgan, who provided technical assistance to the PSAS, and for providing funds through the Australian Consultants Trust Fund, which supported Mr. Morgan's participation as part of the World Bank team for the PSAS. We acknowledge UNICEF for sharing information and insights on the 2002 Multiple Cluster Indicators Survey.

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## **EXECUTIVE SUMMARY**

Timor-Leste, which was ruled by the Portuguese from 1515 to 1975, and by Indonesia from 1975 to 1999, regained its independence on May 20, 2002. The island nation—located in the eastern half of Timor—is home to 828,000 people who speak 33 indigenous languages, Portuguese, and Bahasa Indonesia. It has a predominantly agrarian economy and a per capita gross domestic product (GDP) of about \$480. Timor-Leste has an advantage that most lower-income countries do not—oil and gas reserves, that can be harnessed to fund development. However, it is likely to be many years before these can be fully realized. The key question is: what needs to be done in the next three to five years to build the foundation for the country's equitable development? Unquestionably, education is a key part of the answer. It provides a foundation for democratic discourse through literacy; it helps increase productivity; and it provides skills and abilities for an increased workforce in the formal sector. Education is so fundamental to the country's development that seven out of ten Timorese listed it as the top national priority, and the National Development Plan and budget allocation reflect this high priority. This report reviews the accomplishments that have been made in the education sector since the years of transition to independence (1999–2002) and assesses medium-term options for increasing coverage, improving quality, ensuring the sustainability of educational finance, and strengthening sectoral management.

### **Educational Development Prior to Transition**

Investment in education during the pre-transition period was insufficient and, as a result, today's illiteracy rate is high—over 40 percent of the adult population can neither read nor write, including nearly one-half of all adult females and about one-third of all adult males. During the Indonesian occupation, managerial, administrative, professional, and technical positions were largely filled by Indonesians. In the education sector, 20 percent of primary school teachers and about 90 percent of secondary school teachers were not Timorese.

Between 1976 and 1999, primary education grew, but junior secondary and senior secondary education expanded much more slowly. As a result, the younger generation has higher levels of educational attainment than the older generation. In 2001, 57 percent of the adult population had little or no schooling, 23 percent had only primary education, 18 percent had a secondary education, and 1.4 percent had a higher education. People in the poorest two quintiles were the least likely to attend school and, even among better-off groups, enrollment rates did not reach 100 percent. This makes building up human resources a particularly difficult challenge.

### **The Destruction and Recovery of the Education System**

After the referendum on East Timor's independence from Indonesia, violence broke out,

buildings were torched, and 95% of schools were damaged. Four out of five schools were destroyed, and almost all non-Timorese teachers left the country, precipitating the collapse of the education system.

The country embarked on a rapid rebuilding campaign soon after the United Nations peacekeepers arrived and a transitional administration was put in place. Within two short years, with the help of many dedicated Timorese educators and the technical and financial support of the international community, many schools were rehabilitated, new teachers were hired, and the education system—while not completely restored—became operational again by the start of the October 200 school year.

Enrollment increased rapidly. Most of the new enrollees were girls and from poor and rural families, owing to a surge of optimism and the temporary abolition of school fees. In primary education, the gross enrollment ratio GER (i.e. the number of students enrolled in primary education irrespective of their age, divided by the total number of primary school-age children) rose from 89 percent before the transition to 110 percent in 2001; the net enrollment ratio (NER) (i.e. the number of right-aged students enrolled in each grade of primary school) rose from 51 to 70 percent. This was a very significant achievement given the scale of destruction and the short transition period.

Further progress was made between 2001 and 2003. The number of primary school teachers increased from 2,992 to 4,080, and there was a corresponding fall in the pupil-teacher ratio from 67:1 to 45:1. At the junior secondary level, the number of students increased from 29,586 to 38,180 and the number of teachers from 884 to 1,103.

The National Development Plan (NDP), which was formulated in 2002 after nationwide consultation, has a rolling, three-year fiscal planning framework and a five-year timeframe for development planning, from July 1, 2002 to June 30, 2007. Recognizing that Timor Leste's low educational coverage and attainment were due to previously low levels of public investment in education and inefficiencies, the NDP made education a cornerstone of its strategy for alleviating poverty and nation-building.

The NDP envisages that by 2020 the Timor-Leste people will be well educated, healthy, highly productive, self-reliant, and espousing the values of patriotism, non-discrimination, and equity within a global context. The NDP's goals are: to improve the education status of the people; to contribute to the improvement of the economic, social, and cultural well-being of individuals, families, and communities in Timor-Leste; and to promote gender equity and empower women in Timor-Leste.

Eight key programs in education aim to: (1) expand education access and improve internal efficiency of the school system; (2) improve the quality of education; (3) build management capacity and improve service delivery; (4) promote non-formal education and adult literacy; (5) promote Timor-Leste's culture and arts; (6) promote physical education and school sports; (7) promote youth welfare; and (8) develop tertiary education.

### **Challenges to Education in the Medium Term**

To realize the vision of the NDP, a number of challenges will need to be addressed in the next three to five years. These include: (i) removing barriers to increasing access, coverage, and internal efficiency; (ii) raising student achievement, particularly in reading literacy and numeracy; (iii) sustaining the financing of education; and (iv) strengthening sectoral management capacity.

### *Increasing Access, and Internal Efficiency*

In spite of the impressive expansion in enrollments, many children enter school late and are at risk of dropping out early. According to the Timor Leste Living Standards Measurement Survey in 2001 (TLSS 2001), among the 50,000 out-of-school children, the vast majority were aged 7-to-9 years, i.e., of primary school age. By the age of 13 and 14, many of those who do attend school begin to drop out. The problem is most serious in rural areas: half of the out-of-school children live in the rural center of the country and 20 percent in the rural east. The out-of-school population is equally divided between boys and girls. At the junior secondary level, the gross enrollment rate (GER) drops to 51 percent and the net enrollment rate (NER) to 25 percent. At the senior secondary level, the GER goes down even further to 28 percent and the NER to 17 percent.

In order to develop successful strategies for addressing these problems, it is essential for policymakers to understand the reasons why children are not attending school. According to the TLSS 2001, about 70 percent of families with children aged 5–6 years believed that their children were not the right age for school. Among families with children aged 7–12 years, about 22 percent considered that their children were not of the right school age. In families with children in the same age group, about 32 percent of the poorest families and 26 percent of the richest families had “no interest” in sending their children to school.

Given the very small percentage of wage employment in the economy, it is difficult for many parents to understand that their children will be able to earn more as adults if they go to school while they are young. The weaknesses in demand for schooling must be overcome until the economy begins functioning better and generating stronger incentives for parents to allow their children to be educated.

On the supply side, many parents cite the long distances between their home and the nearest school as a key factor for non-enrollment, as the majority of students walk to school. Other factors that affect the demand for education are the poor physical condition of many schools, the shortage of learning materials, the language of instruction, the poor quality of the instruction, teacher absenteeism, and the curriculum’s lack of relevance.

Increasing efficiency is clearly key to ensuring universal enrollment at reasonable cost. Currently, between 20 and 25 percent of students repeat grades, and about 10 percent drop out from each grade in primary and junior secondary education. Senior secondary education has lower dropout and repetition rates in part because students who have continued to that level tend to be more persistent and also tend to come from wealthier families who can afford to keep them in school. Girls have slightly lower repetition and dropout rates and higher promotion rates than boys.

If this level of inefficiency persists, it is likely that only 47 percent of those who enter Grade 1 will eventually complete Grade 6, while 53 percent will drop out. On average, the dropouts will complete only four years of schooling after repeating some grades. The level of skill acquired by these children is likely to be very low, as they are not in school long enough to master basic literacy and numeracy skills. When repetition and dropout rates are high, fewer children acquire the requisite skills to become productive workers in the economy, particularly in the formal sector.

High repetition and dropout rates are very expensive. The current estimate of the cost per student of six years of primary education is about \$300, while the actual cost per student who completes primary school is \$600, owing to additional costs incurred when students repeat grades.

### *Raising Student Achievement*

High repetition and dropout rates are closely related to poor quality education and low student achievement. The Primary School Assessment Survey (PSAS 2003) of the Ministry of Education, Culture, Youth, and Sports (MECYS) confirms this. The PSAS assessed a sample of 3,478 students in Grades 3 and 4 in 95 schools, using the same test in mathematics. The test questions were in Portuguese because it was the official language. At the same time, survey workers interviewed teachers and students in the sample schools to collect information on their characteristics so as to assess the determinants of student achievement. The findings suggest that the key issues are the quality of education and the language in which instruction is given:

- *Differences between grades.* On average, third graders got 28 percent correct answers on the math test. Fourth graders got an average of 37 percent of the answers correct. This difference in scores is interesting because it is slightly higher than the differences in achievement between these two grades in other countries. It may be attributable to the high dropout rates in Timor-Leste, meaning that only higher achievers remain in the system.
- *Gender differences.* Girls scored lower and improved less between Grades 3 and 4 than boys.
- *Differences between school types.* The sample was stratified into six types of schools: urban public, urban private, rural public, rural private, remote public, and remote private. The differences in the average scores in Grade 3 between urban and rural and between public and private schools were small but increased by Grade 4.
- *Differences across language groups.* Students who have different mother tongues scored differently. Students whose mother tongue was Midiki and Kairui were the highest scoring group.
- *Differences across districts.* In almost all districts, students in Grade 4 had higher scores than those in Grade 3, except in - Ermera where the reverse was true. Students in Baucau and Lautem had higher Grade 4 scores than other districts. Students in Oecussi had the lowest average scores in both grades.

Drawing from the findings of Poverty Assessment Survey of 2001 and the PSAS 2003 and from interviews with teachers and students, one can conclude that the factors that negatively affect student achievement include: (i) shortages of textbooks and of teaching and learning materials; (ii) too few hours of instruction; (iii) insufficient preparation by teachers; (iv) language difficulties; (v) the poor physical infrastructure of schools; and (vi) high rates of student and teacher absenteeism.

- *Textbooks and learning materials.* More than half of all students have no books. As a result, much teaching and learning takes the form of teachers copying their notes on the blackboard and students copying them in their exercise books. This is time-consuming and prevents teachers from using more efficient or effective methods of teaching. The shortage of reading materials also makes it impossible for teachers to assign any meaningful homework.

- *Hours of instruction.* Officially, schools are supposed to provide five hours of instruction per day for 180 days of the year. Each session in Grades 1 to 3 should last for half an hour, while each session in the upper grades should last for 40 minutes. In practice, some schools split those five hours into two shifts—two hours (8–10 AM) for Grades 1 to 3 and three hours (10 AM–1 PM) for Grades 4 to 6, meaning that children receive fewer than the statutory hours of instruction that are required to achieve the objectives of the curriculum.
- *Teacher preparation.* Of the 3,000 teachers recruited through examination in 2000, the vast majority had varying qualifications. In three successive years, fewer than 10 percent of the candidates were selected to become teachers. Teachers need to upgrade their knowledge of content areas (which should happen with the new primary curriculum) and also of the pedagogy appropriate to each subject area and to the constraints of the Timor classroom, with its huge student numbers in the crucial early grades. In the school year 2003/04, 65 percent of primary teachers had had some form of education training.
- *Language of instruction.* The constitution designates Portuguese and Tetum as the official languages of the country, with Bahasa Indonesia and English as working languages. Through MECYS, the government designated Portuguese as the language of instruction. The implementation of this policy began with Grades 1 and 2 in 2000 and has progressively moved up one grade each year since. Portuguese books are gradually replacing Indonesian books, but are in short supply, and in practice many teachers continue to rely on Tetum to explain lessons to children.

Implementation of the new language policy has been challenging for a number of reasons. First, for the most part, only those teachers who finished secondary education before 1975 can speak any Portuguese. The others, comprising the vast majority of teachers, were educated in Bahasa Indonesia. The government has organized training courses for teachers to learn Portuguese for a few hours weekly, but this may not be enough for teachers to acquire the new language sufficiently well to communicate effectively with students, impart knowledge and skills, and observe and evaluate outcomes across a range of school subjects. Second, students studying under teachers who themselves are not proficient in Portuguese are less likely to attain mastery of the language. Since language governs thought and the cognitive process, less than full proficiency in the language of instruction must impede the teachers' mastery of concepts and undermines their performance. Third, Portuguese is only the third or fourth language of many students. Also, those children whose mother tongue is not Tetum will need to learn it first. Although the mother tongue of only 16 percent of the population, Tetum has become the *lingua franca* for many more and appears not too difficult to acquire. However, this means that many children will learn their mother tongue at home and then will have to learn Tetum (if it is not their mother tongue), and then Portuguese to understand the instruction they will be receiving in school. Students who started school before 1998 also had to learn Bahasa Indonesia. Fourth, language-learning materials are in short supply, which makes it difficult for students to develop literacy in any language. Finally, Tetum is currently more commonly used in schools attended by children of the poorest quintile, and Bahasa Indonesia and Portuguese are more commonly used in schools attended by children of the higher income quintiles. The introduction of a

new language of instruction is therefore likely to be more problematic in poorer areas than wealthier areas.

- *Physical infrastructure.* Although over 80 percent of classrooms were restored and useable within 18 months of the disturbances and fires of 1999, many schools are still not in good condition. Even in 2002, many classrooms had no windows so that wind-blown rain swept across the rooms. Most had no lights, as few schools had electricity, and most schools had no running water or toilets. The absence of toilets adversely affected girls in particular and may be a deterrent to them attending school at all. Some students still do not have even a desk or a chair.
- *Teacher and student absenteeism.* Teacher and student absenteeism are both high, with student absenteeism usually being a precursor to dropping out. According to the Poverty Assessment Survey, illness was cited as the reason for students' absence from school on the week before the survey in the case of 22 percent of students from the poorest quintile and, surprisingly, 46 percent of students from the richest quintile. This finding was also corroborated by PSAS 2003.

Looking at the characteristics of the higher performing students (those who had 50 percent or more correct answers on the math test) and schools - yielded the following useful findings:

- Pre-school attendance increased the probability of getting more than 50 percent of the answers correct on the test.
- Among students who had attended pre-school, those who were in classes with higher absenteeism scored - lower on the test.
- Fourth graders had a higher probability than third graders of scoring over 50 percent; this suggests that if students persist in school longer, they have more opportunities to learn more.
- Schools with high dropout rates were less likely to have high average scores than those with low dropout rates.
- Children who repeated fewer grades were more likely to score higher than children who repeated more grades.
- Holding student background variables constant, those students whose language of instruction was entirely Tetum had a greater probability of being a high performer than those who had been taught in a mixture of Portuguese and Tetum in the classroom. This seems to suggest that Tetum presents less of a barrier to learning than other languages or than a mix of languages.

Although the PSAS is the first of its kind in Timor-Leste and its results should be regarded as only suggestive or indicative, its findings point to some serious issues about the quality of education that warrant the urgent attention of policymakers.

The fact that Grade 3 students scored very low should be a cause of concern and a subject for further investigation. The *curriculum* should be revisited and the test then recalibrated to ensure that future tests measure the appropriate learning level of the students. The relationship between the need for proficiency in the official *language of instruction* and the mastery of the subject matter should be further examined, and the experience of other

countries with regard to this sensitive issue should be explored for policies and practices that may be useful for Timor-Leste. Any information thus derived should then be disseminated in teachers' guides and in-service teacher training courses.

Expanding *access to pre-school* and encouraging regular attendance in school is likely to have a positive effect on achievement, while grade repetition reduces this likelihood. Since *illness* is a major reason for student absenteeism, health and education authorities need to collaborate on both preventive and curative health interventions in schools. *Reducing repetition* by automatically promoting all students to the next grade regardless of their test scores is not an effective intervention, as this will mean that many students will complete school as low achievers and even functional illiterates, unprepared for productive work. Instead, repetition can be reduced by: (i) extending the hours of instruction, thus increasing students' opportunity to learn; (ii) providing more textbooks, bilingual primers, and dictionaries of Portuguese and the mother tongues; (iii) training teachers in subject-specific pedagogy and in diagnosing learning problems; and (iv) soliciting the help of local communities to monitor teacher absenteeism and to promote students' regular attendance in school.

As girls tend to score lower than boys, interventions for *increasing achievement among girls* should be considered when developing curricula in the future. Given that Grade 4 students outscored Grade 3, it's clear that *each additional year of schooling contributes to academic performance*. Introducing an effective strategy on the language of instruction (for example, initially teaching children to read in their mother tongue and then gradually teaching the official language) supported by an integrated package of instructional, listening, and reading materials should improve students' academic performance on a major scale.

In summary, improving the quality of education requires the development of a relevant curriculum that addresses the needs of the country, that manages the transition of the language of instruction from the child's mother tongue to the official languages of Portuguese and Tetum, the provision of teaching and learning materials, and the undertaking of periodic student assessments and continual in-service teacher training. These policies have budget implications but can be realized if the institutional and expenditure frameworks provide sustained support.

### *Sustaining Education Finance*

There are many competing demands for investment in the education system, from improving infrastructure to building capacity and ensuring the supply of learning materials. It is important for the government to develop a process for prioritizing investments and ensuring that the most critical recurrent cost items are adequately financed. To date, public spending has been supported by substantial external assistance flows, which amounted to over 60 percent of GDP in FY2002. Domestic revenues cover roughly half of the government's expenditure, while external sources cover the rest. Education commands the largest share of the government's budget, at about 4 percent of GDP. The Trust Fund for East Timor adds 2–3 percent, and bilateral aid adds 6–7 percent. In total, external aid provides the equivalent of 12–14 percent of GDP to fund education in Timor-Leste. These large aid flows made it possible to rebuild the country in only two years. While those investments have represented a unique opportunity for reconstructing the education sector, the government now needs to start preparing its budget for the time when those aid commitments begin to recede.

To meet the government's objectives, the medium-term requirement for recurrent cost

financing alone in the education sector is projected to grow from \$14.0 million in 2002 to \$17.0 million in 2006. Overall, the government's current intrasectoral resource allocation strongly emphasizes primary education, consistent with the priorities of the NDP. To expand other sub-sectors, such as early childhood education, secondary education, and tertiary education, additional resources will have to be found, either through increased public expenditure, cost recovery at the post primary level, or external financing.

When capital expenditure is included, the total financing requirement increases to \$17.7 in 2002, and \$20.3 million in 2006. The main challenges in education finance are: (i) managing aid flows to ensure the continuity and stability of funding; (ii) ensuring equity in spending by ensuring that sufficient amounts are spent at the primary level; (iii) directing sufficient resources to support complementary inputs such as textbooks, instructional materials, and guides and curriculum development; (iv) identifying cost drivers and adopting cost-effective strategies; and (v) structuring incentives to induce better performance from teachers and students.

### *Strengthening the Capacity of Sectoral Management*

Focusing on four strategic areas would help the government make lasting and significant progress: (i) strengthening management and administrative capacity to implement policies successfully; (ii) clarifying policies on key issues and building a shared understanding with stakeholders about working toward a common goal; (iii) providing predictable and adequate resources to enable the sector to develop toward its priority goals in a sustainable manner; and (iv) conducting a public campaign to inform parents and the community of their rights and responsibilities within the system

There is an urgent need to build up administrative and management capacity in the education system. At the central ministry level, key positions need to be filled. Also, the management information system needs to be further developed so that basic enrollment statistics can be collected regularly (preferably every semester rather than every year), accurately (organized by district, grade, and gender), and in a timely manner to provide a basis for planning and budgeting. Finally, the financial management system needs to be capable of providing information on whether budgets have been spent according to plan. At the district level, superintendents and their deputies need to be provided with tools such as effective communication techniques, interactive management, and the ability to give technical guidance to teachers and principals and thereby strengthen their links to the schools. At the school level, principals need to be more empowered by being given sufficient financial and technical resources to support their autonomous search for local solutions to their local problems.

The government is supporting research and consulting with stakeholders to develop comprehensive policies and strategies for achieving its education goals, but also to minimize the effects of piecemeal measures, which sometimes work at cross-purposes. To construct a coherent framework for education sector policies, the government needs to consider: (i) setting and justifying targets for access at each level of education in order to define the scope of work, the level of funding needed, and the measurement of progress; (ii) setting the norms for annual instructional hours, multiple school sessions (double shifts), textbook provision; (iii) developing a strategy for helping students to learn Portuguese; (iv) specifying teacher qualifications and the pupil-teacher ratios in order to set standards for the quality of inputs and the basis for costing those inputs; and (v) describing the respective roles of the government and the private sector in the provision and financing of education in order to delineate the total capacity of and the resource



requirements for service delivery. Once these considerations have been taken into account, then a new education law should be adopted that establishes the lines of authority and clarifies levels of responsibility at MECYS vis-à-vis stakeholders and private providers in the sector.

### **The Way Forward**

Policymakers face a fourfold challenge: (i) increasing access and coverage and ensuring that children complete school at a reasonable cost; (ii) enhancing student achievement; (iii) achieving the sustainability of public sector financing in the face of large competing demands for resources; and (iv) improving the management of the sector from the central level down to the district and school levels where building professional staff capacity would have a significant and immediate payoff.

#### *Increasing Access and Coverage, and Ensuring Completion at Reasonable Cost*

In the case of primary education, where universal enrollment and completion is the goal, key supply-side interventions will include providing more teachers, classrooms, learning materials, and interesting co-curricular activities to make school engaging for students. However, these are expensive interventions, which would best be pursued in combination with efforts to improve efficiency. Improving school quality and addressing the causes of repetition have the potential to improve efficiency: as students progress to higher grades (rather than repeat and occupy the same student-place for another year), up to one-fourth of the total number of student places can be made available to students entering the system. In locations where the school-age population is growing faster than elsewhere or in underserved remote areas, extension classrooms or small multi-grade schools may need to be built and more teachers hired or redeployed from other, better-served areas. In the case of those children who have never attended school, it will be necessary to convince their parents of the importance of educating their children. This can be done by launching campaigns to inform parents about the age children can attend school, the importance of enrolling in school and attending daily, and school meal or similar subsidies for their children. An enhanced government-private sector-NGO partnership framework would help to expand service provision in various levels of education.

#### *Raising Student Achievement*

The PSAS results clearly demonstrate the need for policymakers to focus on the quality of education. If quality cannot be improved, it will not be possible to meet other, related program objectives, especially expansion of coverage. The suggested strategies for raising academic quality include revising the curriculum to make it relevant, developing initial instruction in the children's mother tongue to ease the transition to learning the official languages of education, providing textbooks to students and continuous in-service training for teachers, providing teachers' guides and instructional aids, and monitoring and evaluating student learning on a regular basis, with systematic feedback from the assessments to teachers and students specifically focused on teacher inputs and learning outcomes. A final strategy is expanding the scope of early childhood education to include parent centers, playgroups, and other communal activities in early childhood education. This strategy increases the chances of enhancing the cost-effectiveness of later interventions, in primary school.

#### *Building a Sustainable Financing System*

In the medium term, it is vital to manage the flow of aid effectively. With adequate policy

preparation and strategic planning, it is possible to attract and direct donor financing to priority areas. This will require detailed statistical records and systems for monitoring outputs from aid, to provide the information needed by the government to assess needs and the impact of existing programs. Building up these data and monitoring systems should proceed simultaneously with developing the capacity to formulate policies. Focusing on cost-effective interventions, such as a multiple integrated package that combines a new syllabus, learning materials, teachers' guides, in-service training, testing and feedback, and school-based management, will make the education system work better. Providing more discretionary funds to districts and schools would help the administrators, principals, and teachers to do their jobs better. It may be possible to raise new revenue to subsidize primary education by increasing the extent of cost-sharing in senior secondary and tertiary education.

### *Strengthening Management Capacity*

Given that many of Timor-Leste's administrative and professional staff are relatively new in their jobs, continuous professional development in specific areas is needed and should be adequately planned and funded. Internal administrative accountability and controls need to be strengthened to make the education system function more efficiently. Creating a framework for enabling and encouraging community participation in decision-making on local education would help to improve public oversight at the school level and strengthen the governance of the system.

The demands on the education sector are numerous, and there is a need to prioritize and sequence interventions by focusing on those parts of the system which need the most urgent attention and that are most likely to have a significant and lasting impact on development. Ministries of education worldwide normally take decades to develop the capacity to manage the sector, formulate policies, expand and improve service delivery, and monitor and evaluate outcomes. Timor-Leste has found itself having to compress this timeframe into a few years in order to meet the extraordinary challenges that arose after independence.

While making these strategic interventions, it is very important not to neglect the political process, which calls for increasing popular participation and building coalitions with members of civil society. This should take place on a regular basis, although the results may not be immediately felt. In making policy, education administrators need to consult widely with stakeholders, even on the management and allocation of education expenditures. Making information public makes for a transparent and accountable system. The cost of the investments proposed above can be achieved within the medium term with donor support.

## Summary of Challenges and Strategies to Move Forward

Challenges	Strategies to Move Forward
<p><b>Access and coverage</b></p> <p>Reasons for being never enrolled:</p> <ul style="list-style-type: none"> <li>③ Parental belief that their child is below school age or not the right age (could be too old for schooling)</li> <li>③ No interest in attending</li> <li>③ Too expensive</li> <li>③ Work at home or agricultural work</li> <li>③ Security, harassment (mostly for girls)</li> <li>③ School too far away from family home.</li> </ul>	<p><b>Improving access and coverage</b></p> <ul style="list-style-type: none"> <li>③ Conduct publicity campaigns and educate parents about the benefits of early enrollment and higher educational attainment</li> <li>③ Make the curriculum relevant by introducing more science-based topics (to improve health, agriculture, and the environment)</li> <li>③ Establish and enforce strict regulations on harassment and violence by teachers and students so that general security can improve over time</li> <li>③ Consider establishing small schools for remote communities and developing bilingual and self-paced learning materials to complement multi-age, multi-grade settings.</li> </ul>
<p><b>High repetition and dropout rates, low completion rates, and low student achievement</b></p> <ul style="list-style-type: none"> <li>③ Lack of textbooks and learning materials.</li> <li>③ Short hours of instruction, particularly in “multi-grade” schools, which are operating double shifts by halving the instructional time.</li> <li>③ Poor pre-service preparation of primary teachers. No pre-service preparation for over 90% of current secondary teachers.</li> <li>③ Language of instruction presents a barrier to learning among children who speak a number of different mother tongues. Teachers themselves are not proficient in Portuguese. Language-learning materials are in short supply.</li> <li>③ Poor physical infrastructure, including the lack of water or toilets, which adversely affects girls more than boys.</li> <li>③ High teacher absenteeism which may be caused by illnesses such as malaria and tuberculosis</li> <li>③ High student absenteeism often due to illness.</li> </ul>	<p><b>Ensuring school completion and enhancing student achievement</b></p> <ul style="list-style-type: none"> <li>③ Revise curriculum</li> <li>③ Provide Timor-developed student textbooks and self-instructional materials</li> <li>③ Enforce total hours of instruction in all schools to provide opportunity to learn</li> <li>③ Provide teacher guides, teacher in-service and pre-service training, with a strong focus on diagnosis of learning problems and multi-grade teaching</li> <li>③ Develop simple dictionaries of Tetum and Portuguese, and of Tetum and various languages, and develop bilingual primers for the early primary grades</li> <li>③ Regularize student assessment and provide feedback to teachers, parents and students on how to improve it</li> <li>③ Provide extra classes after school and summer school classes to accelerate learning of over-aged students and low performers</li> <li>③ Coordinate with the Ministry of Health on interventions</li> <li>③ Support cost-effective early childhood programs</li> <li>③ Provide discretionary funds to schools to buy supplies, furniture and reading materials, but also provide them with</li> </ul>

<b>Challenges</b>	<b>Strategies to Move Forward</b>
	<p>financial management and set out clear accountability guidelines</p> <p>③ Create public information campaigns for parents on good child rearing practices, the benefits of education, and the importance of school attendance and homework to raise achievement</p> <p>③ Encourage parental participation in school-based management to strengthen community involvement in education.</p>
<p><b>Uncertainty of education finance</b></p> <p>③ Heavy dependency on external aide</p> <p>③ Insufficient prioritization in education finance</p> <p>③ Inadequate capacity to formulate policy in order to assess the most cost-effective interventions.</p>	<p><b>Building a sustainable financing system.</b></p> <p>③ Manage aid flows for continuity and stability of funding</p> <p>③ Ensure equity in spending by spending sufficiently at the primary level, which may entail cutting subsidies in other areas or increasing cost sharing in post-primary education</p> <p>③ Direct sufficient resources to fund complementary inputs such as textbooks, instructional materials and guides, and curriculum development</p> <p>③ Identify cost drivers and adopt cost-effective strategies for sustained financing</p> <p>③ Structure incentives to induce better performance by teachers.</p>
<p><b>Lack of Capacity in sectoral management</b></p> <p>③ Timor-Leste, being a new country, has inherited many problems from the past but is too young to have the experience and human resources to address the challenges.</p>	<p><b>Strengthening sectoral management capacity.</b></p> <p>③ Provide opportunities for continuous professional development in specific areas such as planning, budgeting, policy formulation</p> <p>③ Strengthen internal administrative accountability</p> <p>③ Create a framework for community participation that would help improve oversight at the school level and strengthen governance of the system.</p>

## THE EVOLUTION OF THE EDUCATION SYSTEM

The education system in Timor-Leste was shaped by three distinct historical periods: Portuguese colonial rule (1515–1975), the Indonesian administration (1975–1999), and the transition to independence (1999–2001). Understanding the legacies of these three

periods is necessary in order to identify strategies for overcoming the constraints to constructive change in the sector.

## **1.1. THE PORTUGUESE LEGACY**

Nearly 500 years ago, the Portuguese colonized the territory that is now Timor-Leste, while the Dutch asserted their rule in what is now Indonesia, including West Timor. This colonial legacy gave Timor-Leste certain characteristics distinct from the rest of the region. These include the incorporation of some Portuguese words into indigenous languages,<sup>1</sup> the introduction of Catholicism, and the development of political ties with Portugal. After World War II, Indonesia gained its independence from the Netherlands, but Timor-Leste remained under Portuguese rule until it became independent on November 28, 1975.

Because of this heritage, the Catholic Church is a key religious and social institution in Timor-Leste. Not only did the Church introduce Catholicism to this region, which was largely dominated by Islam, but it also provided critical non-governmental educational services. In the early days of the Portuguese period, the Church established a number of *colegios* using the Portuguese curriculum (see Annex 1.2). Subsequently, the Church also played a key role in founding and operating kindergartens, primary schools, seminaries, and a teacher training institution. In 1992, the Church assisted the provincial government of Timor-Leste (at the time known as Timor Timur) to establish the University of Timor-Leste (UNTL).<sup>2</sup> At present, Catholic schools account for about 10 percent of enrollment in primary and secondary education.<sup>3</sup>

Nonetheless, mass education was not a policy objective of Portuguese colonial rule, which mainly aimed at training an administrative elite. By the end of the colonial period in 1975, the illiteracy rate in Timor-Leste was estimated to be 90 percent (Saldanha 1994). The 1990 census showed that in the 35–39 age group, the illiteracy rate was as high as 72 percent among male heads of household and 89 percent among female heads of household born in Timor-Leste, and was even higher among older generations (Figure 1.1). These cohorts were of school-going age during the Portuguese administration. By contrast, among heads of households born elsewhere, only 4 percent of males and 20 percent of females in the 35–39 cohort were illiterate. The younger generation born in Timor-Leste had lower illiteracy rates. This intergenerational gap in literacy reflects the lack of emphasis on mass education during the Portuguese time. In summary, while the Portuguese colonial rule brought important contact with the West and introduced the

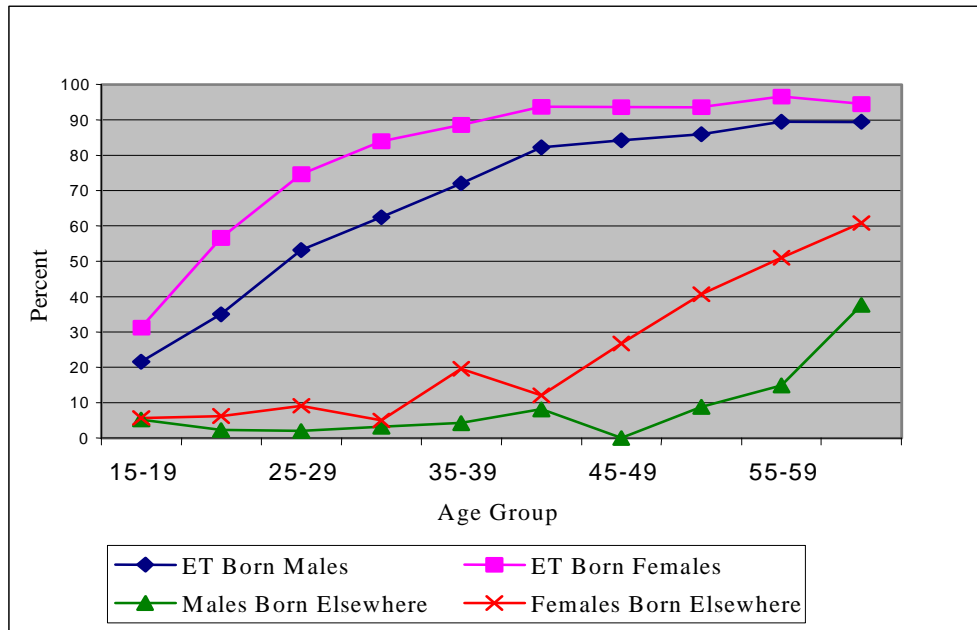
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<sup>1</sup>There are about 33 known indigenous languages in Timor-Leste: Tetum, Bunak, Baikeno, Mambae, Tokodede, Kemak, Makasae, Makalero, Makroni, Naueti, Tetum Terik, Galole, Nanaek, Beloi, Bikeli, Waimoa, Lakelai, Makili, Lacede, Carhili, Midiki, Makadade, Maquer, Aniei, Lolein, Kairui, Bekais, Sunda, Alor, Larantuka, Malou, Manuroni, and Mantui. Some of these languages are spoken by very few people, and many are not mutually intelligible. About 13 or so languages are spoken by sizable communities. In addition, Portuguese and Bahasa Indonesia are the mother tongue of some Timorese. Few of the indigenous languages have any linguistic affinity with Portuguese and little with Bahasa Indonesia. Tetum, the mother tongue of the largest group of people (about 16 percent) and the indigenous lingua franca, is spoken and understood by most Timorese. Portuguese and Tetum are the official languages of the country.

<sup>2</sup>Prior to the establishment of local tertiary education institutions, the Timorese would go to Indonesia for tertiary education. Almost an equal number of Timorese were attending tertiary institutions in Indonesia as were attending local institutions at the time of the transition.

<sup>3</sup>The first public secondary school opened in 1952.

**Figure 0.1: Illiteracy Rates in East Timor by Place of Birth, 1990**



Source: Timor-Leste Population Census 1990

Catholic Church with its lasting influence, it also left Timor-Leste in an extremely disadvantaged position in terms of human development (see Annexes 1.9–1.11).

## 1.2. THE INDONESIAN LEGACY

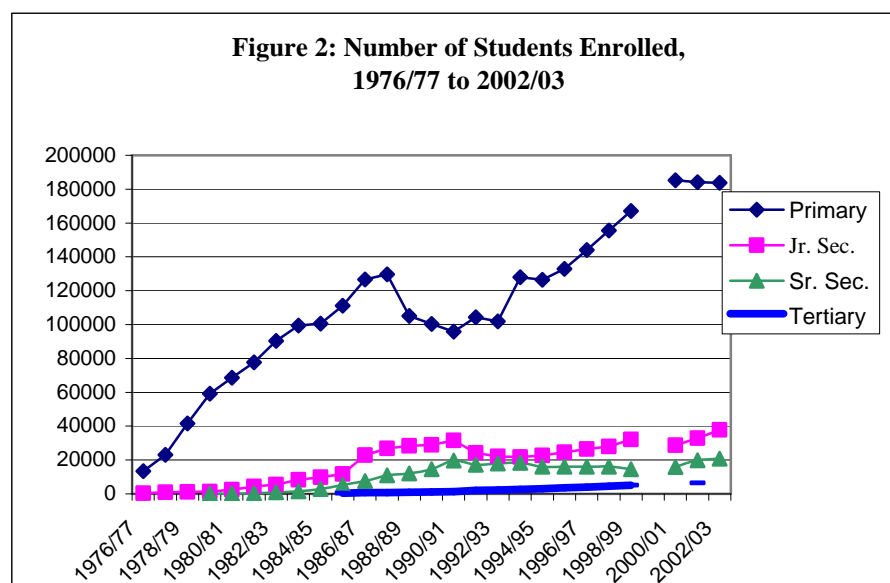
Indonesia invaded and annexed Timor-Leste after the latter became independent from Portugal in 1975. In the ensuing 24 years, Timor-Leste remained the second poorest province of Indonesia (see Annex 1.5). In 1998, the province had a per capita gross domestic product (GDP) of \$412,<sup>4</sup> which amounted to only 63 percent of Indonesia's per capita GDP of \$680 (World Bank 1999). During the occupation, the Indonesian education system replaced the Portuguese system, and Bahasa Indonesia became the language of instruction. The education structure comprised two years of pre-school, six years of

primary education, three years of junior secondary education, three years of academic or technical and vocational education, two years of polytechnic education, and three to four years of university education. Children were required to enroll in primary school by the age of 7. In 1994, school enrollment was made obligatory up to the age of 15 so that compulsory basic education constituted nine years of schooling, but there was no mechanism to enforce this.

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<sup>4</sup>The IMF estimates that GDP (in current prices) in Timor-Leste was \$375 million in 1998 and \$270 million in 1999. We obtained figures for GDP per capita by dividing GDP by the population, which was 910,000 in 1998 and had decreased to 830,000 in 2001 due to Indonesian citizens returning to Indonesia. About 20,000 refugees moved to West Timor.

**Figure 0.2: Number of Students Enrolled, 1976/77–2002/03**



Sources: *Timor-Leste in Figures*, 1998 for the historical data; Ministry of Education, Culture, Youth, and Sports for 2000/01 and 2001/02 data.

Notes:

- (1) Indonesia reclassified its enrollment statistics in 1989/90 to separate public from private enrollment. The decline in enrollment in primary education enrollment in those years was due to this reclassification.
- (2) There were no data for 1999/2000.

Between 1976 and 1998, enrollment in primary education increased from 13,500 to 165,000 students<sup>5</sup>. By the mid-1990s, primary education was available in most villages. Over the same period, junior secondary enrollment grew from 315 to 32,000 students, and senior secondary education enrollment grew from 64 to 14,600 students (see Figure 1.2 and Annex 1.1). In spite of this rapid expansion, enrollment was far from universal. Public spending on education was low, accounting for about 2.9 percent of GDP in 1998/99.

An analysis by Pradhan and Sparrow (2000) of enrollment trends in 1995, 1997, 1998, and 1999 in various Indonesian provinces using SUSENAS data<sup>6</sup> shed much light on the

<sup>5</sup>In Indonesia, universal primary school enrollment was reached around 1986. Since the extension of the mandatory upper school age was raised to 15 years, enrollment in junior secondary has been increasing steadily but is not yet universal. In 1997, gross enrollment in junior secondary education was 72.2 percent, while gross enrollment in senior secondary education stood at 46.5 percent (see Lanjouw et al. 2000).

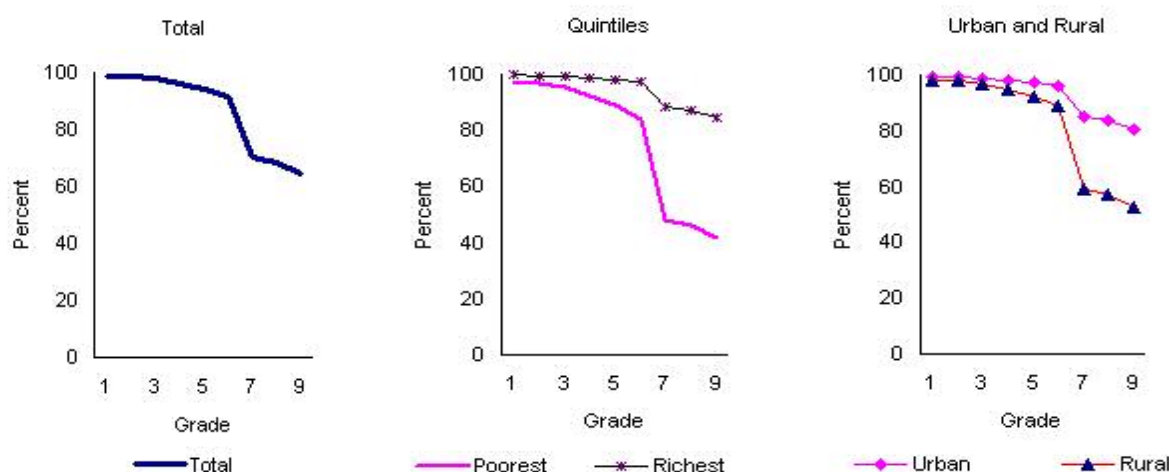
<sup>6</sup>The SUSENAS is Indonesia's main socioeconomic household survey conducted nationwide annually around January. The survey has a core/module design. The core collects the main socioeconomic statistics and data on enrollment, educational attainment, and daily activities of those aged 10 years and older. The sample sizes were 873,643 individuals for the 1995 survey, 887,266 for 1997, 880,040 for 1998, and 864,580 for the 1999 surveys. The module rotates every three years and collects more detailed information on a particular area for a third of the sample. The module contains information on education expenditures and daily activities of those aged 10 years and under. It should be noted that, because data were collected in January, the 1999 data set

status of Timor-Leste education during the Indonesian time. The gross and net enrollment rates in primary, junior secondary, and senior secondary education in Timor-Leste were well below those in Indonesia (see Annex 1.4). In 1999, gross enrollment in primary education reached 94 percent but net enrollment was only 74 percent. Enrollment in junior secondary education was significantly lower than in primary education: 64 percent gross but only 36 percent net in 1999. Senior secondary enrollment was even smaller: 39 percent gross and 20 percent net. Differences between urban and rural areas in Timor-Leste were also much more pronounced than those in Indonesia, and these gaps became wider at higher levels of education. The trend in 1995, 1997, 1998, and 1999 showed that the East Asian financial crisis of 1997 affected the average gross and net enrollment rates in primary, junior secondary, and senior secondary education in Timor-Leste more than those of Indonesia.

Figures 1.3A and 1.3B compare the profiles of educational attainment of Indonesian and Timorese youths between the ages of 16 and 18 in 1999. This age group should have benefited from education expansion under Indonesian rule. Figure 1.3A shows the Indonesian attainment profiles, Figure 1.3B the Timor-Leste profiles, and 1.3C the Temor-Leste profiles by gender. These figures show that there were wide gaps between Indonesia and Timor-Leste.

### Figure 0.3: Comparative Educational Attainment Profiles

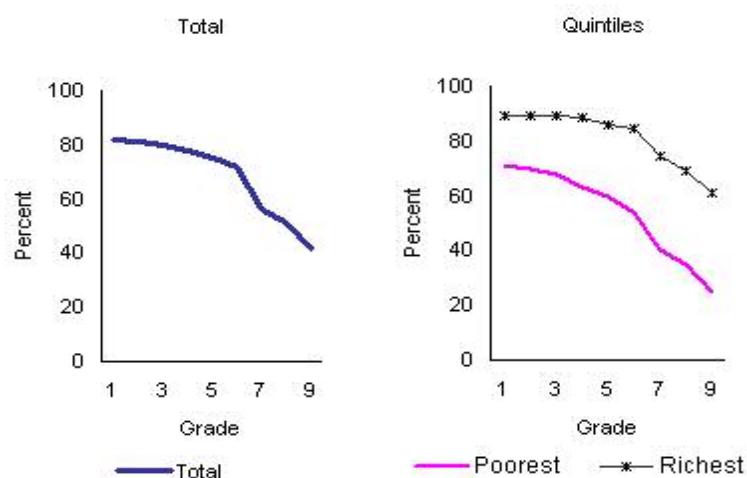
Figure 1.3A: Indonesia: Youths Aged 16-18, 1999



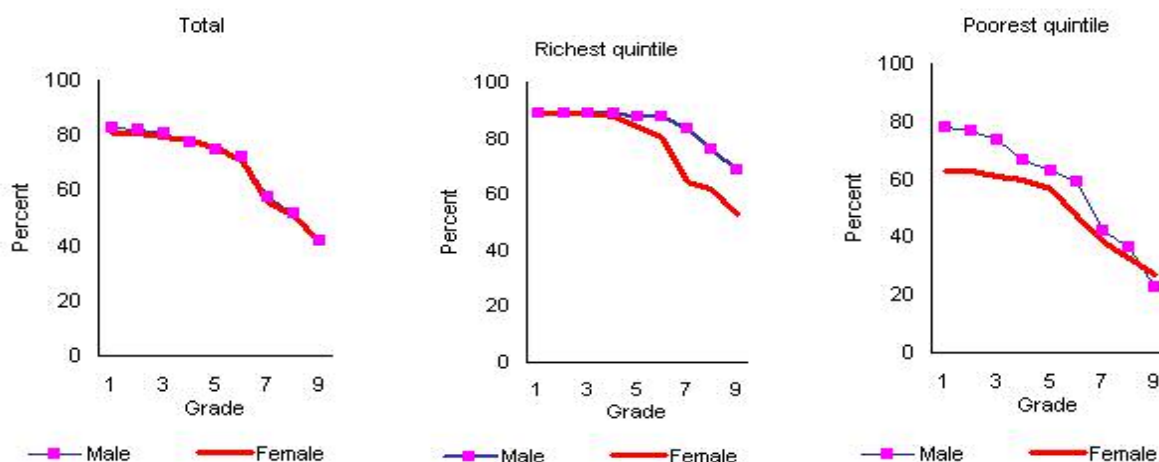
provides the most up-to-date information on Timor-Leste's education sector prior to the referendum of August 1999.



**Figure 1.3B: Timor-Leste: Youths Aged 16-18, 1999**



**Figure 1.3C: Timor-Leste: Males and Females Aged 16-18, 1999**

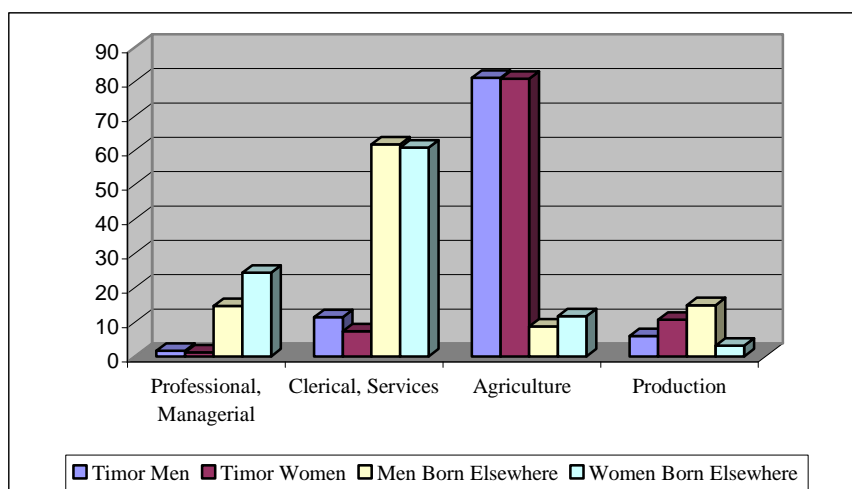


Source: SUSENAS 1999

Overall, about 80 percent of Timorese youths had at least three grades of primary education, in contrast to almost 100 percent of Indonesian youths. Only 42 percent of Timorese youths had attained Grade 9 compared with 64 percent of Indonesians. Of youths from the poorest quintile, only 25 percent of Timorese had a Grade 9 education, in contrast to 42 percent among Indonesians. Of youths from the richest quintile, only 69 percent of Timorese had attained Grade 9, much lower than the 84 percent of their Indonesian counterparts. Rural youths were distinctively at a disadvantage within Timor itself. While 80 percent of rural youths had attained grade 1, only 38 percent made it through Grade 9, compared with the 94 percent of urban youths who made it through Grade 1 and the 65 percent who made it through Grade 9. In contrast, Indonesia had universal attainment in Grade 1 in both urban and rural locations, and 52 percent of rural youths and 80 percent of urban youths had attained Grade 9.

Figure 1.3C shows that the biggest gender gap in Timor was in the first quintile, where only 63 percent of young women had attained grade 1 compared with 78 percent of young men. However, females from that quintile tended to stay in school for longer than

Figure 0.4: Occupations of Household Heads by Birth Place, 1990



Source: 1990 Population Census in Timor-Leste

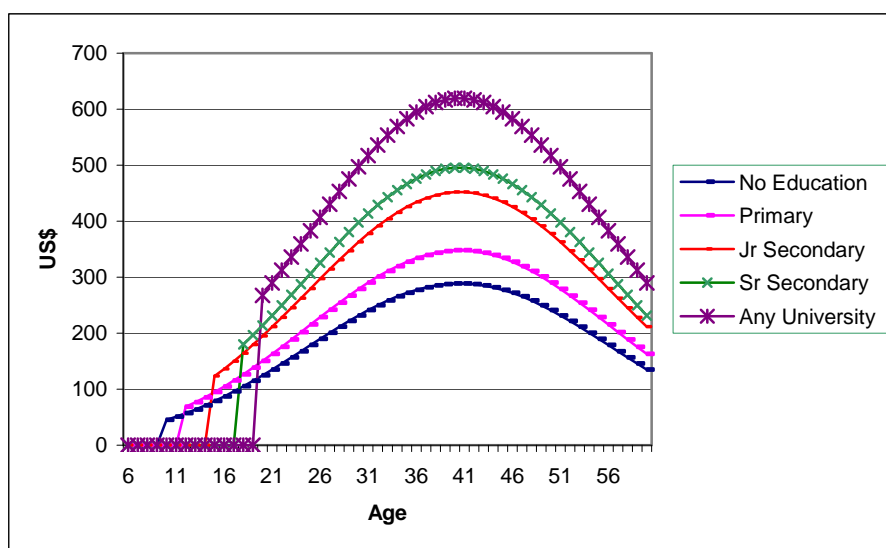
males, as evidenced by the 27 percent of young women having attained grade 9 compared with only 22 percent of young men in the same quintile. In the richest quintile, however, the reverse was true. While there was no gender difference in the lower grades in the richest quintile, more males (67 percent) than females (52 percent) attained grade 9.

The low educational attainment of the adult Timorese population adversely affected their employment prospects under the Indonesian administration. The 1990 census data showed that fewer than 2 percent of Timorese males and females were in professional, administrative, or managerial positions compared with 15 percent of non-Timorese males and 24 percent of non-Timorese females. A high 81 percent of heads of household born in Timor-Leste were engaged in agriculture, in contrast to only 9–12 percent of those born outside Timor-Leste (see Figure 1.4).

A regression analysis of the Indonesian labor force survey (SUKENAS 1998) found that average monthly wages in Timor-Leste were lower than those in Indonesia after holding experience constant (see Annex 1.6). However, the relationship between education and earnings was much stronger in Timor-Leste than in Indonesia. Education explained 62 percent of the differences in earnings in Timor-Leste but only 38 percent in Indonesia. Factoring in occupation variables did not change the picture in Timor-Leste. The strong relationship between education and earnings was probably due to a scarcity of skills in Timor-Leste, which thereby put a much higher premium on tertiary education. However, as white-collar jobs tended to go to people from Indonesia, the distribution of earnings was also skewed in favor of outsiders, which was a source of tension.

In Timor-Leste in 1998, workers with a primary education earned about 20 percent more, on average, than those with no education. This is not a very large percentage, reflecting poor education quality and low completion rates. However, workers with a junior secondary education earned 57 percent more on average than workers with no education. Workers with a senior secondary education earned on average 72 percent more than workers with no education.

**Figure 0.5: Age-Earning Profiles of Workers with Different Education Levels, 1998**



Source: Indonesian Sukenas 1998

Workers with a technical senior education earned almost as much (107 percent over those with no education) as workers with some university education (114 percent), indicating a strong demand for technician skills in Timor-Leste. Male workers earned, on average, over 37 percent more than females. Public sector workers earned, on average, over 55 percent more than private sector workers (Figure 1.5).

The Indonesian administration used the low stock of well-educated Timorese to justify recruiting people from other parts of Indonesia to do white-collar work, including teaching. Few Timorese had acquired the administrative, managerial, technical, and professional experience essential for running an independent country. When the skilled people from Indonesia departed after the 1999 referendum, in which the Timorese people voted for independence from Indonesia, the Timorese had to build their administrative infrastructure and all public and private services from nearly nothing.

### **1.3. ACCOMPLISHMENTS DURING THE TRANSITION**

After 24 years of determined resistance to the Indonesian occupation, the Timorese found a window opened by the East Asian financial crisis of 1997, which led to the eventual fall of the Suharto government in Indonesia. Jakarta was forced to grant a referendum for the Timorese to decide their fate. When an overwhelming majority of the voters opted for independence, pro-Indonesian militia set the country on fire within minutes of the announcement of the result of the vote. Public, commercial, and residential buildings were torched, including 95 percent of schools. The United Nations was forced to change its role as mediator and an observer of the referendum to peacekeeper and administrator during this period of transition to independence. Ten thousand UN peacekeepers were stationed in Timor-Leste to keep the peace and to train the Timor-Leste defense force and police, with help from the UN police. In October 1999, the UN passed a resolution setting up the United Nations Transitional Administration in East Timor (UNTAET). This organization, working with the indigenous transitional government, the East Timor

Transitional Administration (ETTA), governed Timor-Leste until independence on May 20, 2002.

Most Indonesians in East Timor returned to Indonesia in 1999,<sup>7</sup> including 20 percent of primary school teachers and nearly 90 percent of secondary school teachers. When the violence subsided, many Timorese teachers and volunteers started to offer their services.<sup>8</sup> Schools were officially reopened in October 2000; UNTIL resumed classes in November 2000.

The strategy for education of the transitional administration was to: (i) restart schooling as quickly as possible; (ii) restore educational infrastructure; (iii) recruit teachers to teach in the school system; (iv) rebuild the administrative and management structure of the education system; and (v) begin dealing with a wide range of strategic policy and delivery issues. These objectives were achieved by the time of independence less than three years later.

### **Rebuilding the Education System**

Massive injections of financial and technical assistance from multilateral and bilateral sources resulted in the rapid restoration of the education system. Within 18 months, about 86 percent of classrooms were rehabilitated. A total of 922 schools were in operation, of which 82 percent offered primary education, 11 percent junior secondary education, 3 percent senior secondary education, and the rest other types of education.<sup>9</sup> A total of 237,551 students enrolled, 48 percent of them girls. Teachers were recruited at an average ratio of one teacher to 52 students, and 28 percent of these teachers were female (Table 1.1).

### **Dramatic Increase in School Participation Rates**

Whereas in 1998 there were about 167,000 primary school students, by 2000, the number had increased to 185,000. Student intake in grade 1 in 2000 was more than 50 percent larger than in 1998.<sup>10</sup> The largest increase in enrollment between 1998/99 and 2001/02 was among children between the ages of 5 and 14 (Figure 1.6). Many children of that age group who missed schooling in 1998/99 enrolled in later years. The shaded cells in Annexes 3.7A and 3.7B show that a progressively larger number of children entered schools even as they became older. The trend was reversed for adolescents at age 14 in

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<sup>7</sup>Based on the 1990 census, it is estimated that about 10 percent of East Timor's population were from outside the province.

<sup>8</sup>Between January and March 2000, UNICEF paid a stipend of 150,000 rupiah and the World Food Program (WFP) provided 50 kilos of rice to each primary school teacher. From April to May, UNTAET funds were used to pay primary school teachers a salary of 300,000 rupiahs while the WFP continued to supply them with 50 kilos of rice per month. UNTAET paid secondary school teachers \$100 per month from January 2000 onward. School rehabilitation went on, with UNICEF putting roofs on the structures that remained intact. From August 2000 onward, the Trust Fund for Timor-Leste financed rehabilitation on a larger scale.

<sup>9</sup>These data are from the School Mapping Survey (2001).

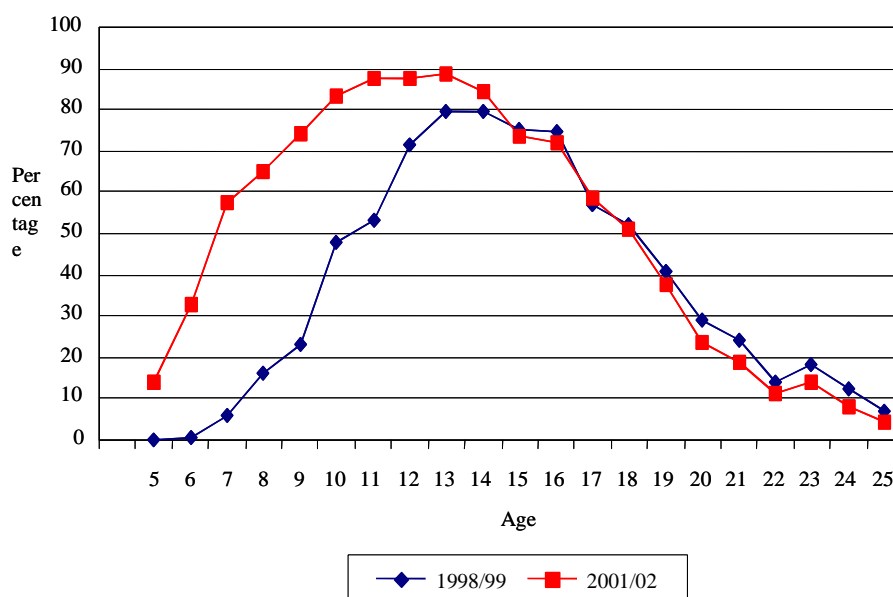
<sup>10</sup>The participation rates in 1998 were based on data on the population who remained in Timor-Leste during the time of the TLSS in 2001. This population excluded those migrants from other parts of Indonesia who left Timor-Leste after 1999 and those Timorese refugees who still have not returned to Timor-Leste. In other words, the participation rates in 1998 reported in the TLHS 2001 are not the same as those reported in SUSENAS, 1999, because the latter included Indonesians and those who later became refugees.

1998 because they were getting too old to enter the primary grades and make up for the years of missed schooling.

**Table 0.1: Restoration of School System by 2001**

Number of schools	922
State operated	717
Church operated	173
Privately operated	26
Others	6
Number of classrooms	
Before the violence in 1999	5,162
Useable as of early 2001	4,449
Percentage of schools operating	
One shift	71
Two or more shifts	29
Percentage of schools	
Primary	82
Junior Secondary	11
Senior Secondary	3
Others	4
Number of teachers	5,789
Female	1,633
Male	4,156
Number of students in early 2001	237,551
Girls – 48%	114,627
Boys – 52%	122,924
Average student-teacher ratio	52
Public schools	56
Church schools	40
Private schools	41
Others	46
Source: School Mapping Survey 2001	

**Figure 0.6: School Participation Rates by Age, 1998/99-2001/02**



Source: TLSS 2001

### *Increase among Special Groups*

The increases in enrollment have narrowed the gaps in school participation rates between the richest and the poorest quintiles, boys and girls (see Figure 1.7), and urban and rural areas. Reductions in the cost of schooling because of the abolition of school fees, parent-teacher association (PTA) contributions, and requirements for uniforms are likely to have contributed to the increase in enrollments. The average monthly expenditure for attending public primary school in 2001 was \$0.56, in contrast to \$1.55 in 1995 (in 2001 exchange rate and prices).<sup>11</sup> Annex 3.17 shows the distribution and levels of school expenses for public primary schools in 2001. In that year, households in the poorest quintile spent \$0.31 per month per student, while households in the richest quintile spent \$0.91 per month. Tuition fees, PTA fees, and textbook costs were very low for the bottom four quintiles. The main expenditure was on educational materials other than textbooks.<sup>12</sup> In contrast, in 1995, monthly expenditure fees ranged from \$0.82 for the lowest quintile to \$2.67 for the richest quintile.<sup>13</sup> A regression analysis showed that household resources<sup>14</sup>

<sup>11</sup>In the pre-crisis period, the Indonesian exchange rate was 2,200 rupiah to \$1. In FY98/99 it was 9,784 rupiah, and in FY99/00 it was 7,489 rupiah.

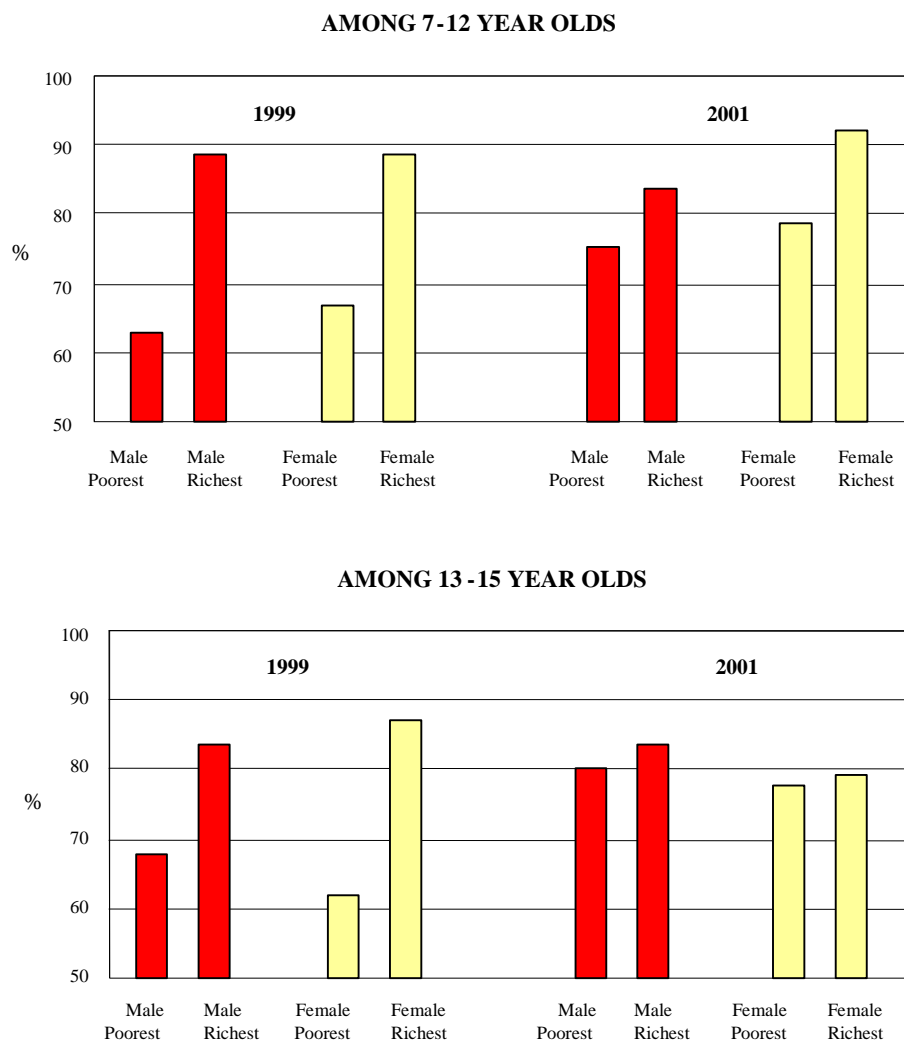
<sup>12</sup>The questionnaire in 2001 asked about expenditures on uniforms and other clothing, while the questionnaire for 1999 asked only about uniforms. Because this might have caused some ambiguity, we do not discuss this category.

<sup>13</sup>In 1995, for those households in the poorest quintile, fees accounted for 13 percent of per capita household spending on public primary education, while PTA charges accounted for 9 percent, uniforms for 52 percent, textbooks for 16 percent, and other instructional materials for 10 percent.

<sup>14</sup>Nominal household expenditure was used in this case because appropriate deflators for pre-2001 values were not available. For all other statistics using per capita expenditure, values are in real terms, adjusted for temporal and spatial price differences.

had a much weaker relationship with school enrollment in 2001 than in 1999 or 1995 after controlling for age, gender, and urban/rural residence. For every 10 percent increase in household resources, enrollment increased by about 2 percentage points in 1995, 1.6 percentage points in 1999, and 0.28 of a percentage point in 2001 (see Annexes 3.18a–d).

**Figure 0.7: School Participation by Quintile and Gender, 1999 and 2001**



Source: TLSS 2001

### *The National Development Plan.*

The National Development Plan (NDP) was prepared on the basis of data collected on several occasions and a nationwide consultative process. It reflected a vision for eight sectors and specified the goals, objectives, policies, and strategies for each sector (see Box 1.1).



### **Box 0.1: The National Development Plan for Education and the State of the Nation Report**

#### **Vision**

By 2020, the people of Timor-Leste will be well educated, healthy, highly productive, self-reliant, espousing the values of nationalism, non-discrimination, and equity within a global context.

#### **Goals**

1. To improve the educational status of the people of Timor-Leste
2. To contribute to the improvement of the economic, social, and cultural well-being of individuals, families, and communities in Timor-Leste
3. To promote gender equity and empower women in Timor-Leste

#### **Key Programs**

1. Expand educational access and increase internal efficiency
2. Improve the quality of education
3. Build internal management capacity and improve service delivery
4. Promote non-formal education and adult literacy
5. Promote Timor-Leste's culture and arts
6. Promote physical education and school sports
7. Promote youth welfare
8. Develop tertiary education

#### **The Education Challenges identified by the State of the Nation Report**

- A rapid expansion of primary school enrollment, particularly for girls and for children from poor rural households
- A reduction in the high dropout rate at primary level
- A substantial improvement in teacher quality
- The re-introduction of Portuguese and the development of Tetum as a medium of instruction (both being official languages of the country)
- The design and implementation of new curricula at primary, junior secondary, and senior secondary levels
- The achievement of financial sustainability – the pressing need to examine the possibility for cost-recovery and cost-sharing strategies while increasing participation in primary education by poor households
- The design of appropriate management systems and the definition of the respective roles of different Ministries, the Church, NGOs, and the local communities.

The NDP<sup>15</sup> provided both a three-year medium-term focus for fiscal planning and a five-year horizon for development planning, from July 1, 2002 to June 30, 2007. Recognizing that the low educational coverage and attainment were due to previously low levels of public investment in education and inefficiencies, the NDP made education a cornerstone to alleviate poverty and build the nation. The NDP set broad strategic directions but left specific policy and financing issues to be addressed by the government's line ministries.

**Table 0.2: Estimated School-Age Population by Age Group**

Age Group	Estimated Population	%
0–6	196,803	24
7–12	140,408	17
13–15	55,144	7
16–18	43,373	5
19–25	74,835	15
26 and over	317,624	38
Total	828,205	100

Source: TLSS 2001

## **1.4. THE CONTEXT OF EDUCATIONAL DEVELOPMENT**

In spite of these accomplishments, policymakers face several serious challenges, from nation-wide issues within the general economic context to sector-specific issues pertaining to coverage, internal efficiency, quality, and capacity. This section discusses the broad context of educational development; the next chapter discusses the sectoral issues.

### *Large Share of the School-age Population*

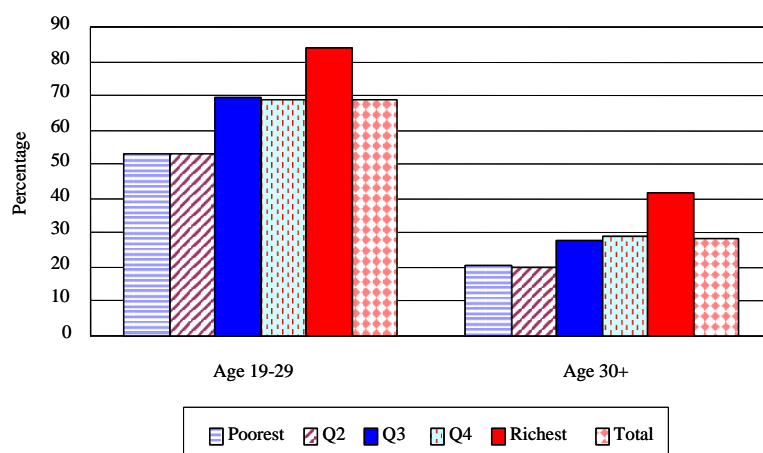
Timor-Leste is a young nation, with about 48 percent of the population being at or under the age of 15 in 2001 (Table 1.2).<sup>16</sup> In that same year this age group constituted 31% of Indonesia's population, 27% of Asia's population, and 37% of inhabitants of low-income countries. The average number of dependents for every working person in the total population was 93. Having a large cohort of school-age children puts more pressure on the education system in Timor-Leste than is being felt in most other countries. Furthermore, the country's total fertility rate in 2001 was about 7.5 children per adult female, which is among the highest rates in the world. This means the school system will have to continue to expand just to maintain its current level of services.

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<sup>15</sup> In preparation for independence, the Planning Commission, supported by the donor community, undertook a Suco Survey, a Household Survey, and a Participatory Potential Assessment in 2001 to assess the state of the nation. The Consultative Commission for Civil Society on Development undertook a countrywide consultation on the vision and aspirations of the people to feed into the national development planning process. Eight sector working groups, each chaired by the relevant Minister, worked out the details of the first NDP. The NDP covered (i) macroeconomic and public finance policy; (ii) political development, foreign relations, defense, and security; (iii) poverty reduction and rural and regional development; (iv) social and human development; (v) agriculture, fisheries, and forestry; (vi) natural resources and the environment; (vii) industry, trade, and the private sector; and (viii) infrastructure. The draft plan was discussed at a consultative workshop and then presented to the Parliament for adoption after independence.

<sup>16</sup> In 1999, under the Indonesian administration, Timor-Leste had 910,000 inhabitants, of whom 41 percent were under the age of 15 and 57 percent were between the ages of 15 and 64. The dependency ratio was 77. Nearly 10 percent left after the vote for independence, and the estimated population for the new nation is now about 800,000–830,000. The true figure will only be known with the results of the 2003 population census.

**Figure 0.8: Timorese People Who Have Ever Attended School by Quintile and Age**



Source: 2001 TLSS.

### *Poor Maternal and Child Nutrition and Health*

Timor-Leste is a predominantly agrarian society with about 76 percent of the people living in rural areas and engaged in subsistence farming. As a result, over 40 percent of the population lived below the poverty line of \$0.55 per day in 2001. Given the very high fertility rate, it is unlikely that these poor families would be able to afford proper nutrition and health care for either the mother or the child. According to UNICEF's Multiple Indicator Cluster Survey (MICS) of 2002, 26 percent of women had chronic energy depletion (CED), while 47 percent of children under the age of 5 were stunted, 43 percent were underweight, and 12 percent were wasted.<sup>17</sup> Overall, 56 percent of children had experienced some form of illness in the two weeks preceding the MICS. Given that child malnutrition and poor health adversely affect children's cognitive development and academic achievement, nutrition and health components should be an integral part of interventions in education.

### *Low Educational Attainment*

The adult population has a very low educational attainment. Overall, 57 percent has had little or no schooling, 23 percent only primary education, 18 percent secondary education, and 1.4 percent higher education. However, the younger generation has a higher attainment than the older generation. According to the TLSS (2001), only about 31 percent of 19–29-year-olds had not attended school compared with 72 percent of the population of over 30 years of age (see Figure 1.8). Within each age group, the rich were more likely to have attended school.<sup>18</sup> Thus, age and socioeconomic status are good predictors of educational attainment (see Annexes 3.1a, 3.1b, 3.2a, and 3.2b). The low education level of adults means that parents' general knowledge about health, sanitation, and good child rearing practices is limited, and that their ability to help their children

<sup>17</sup> Stunting (low height for age), underweight (low weight for age), and wasting (low weight for height) are the standard measures of children's nutritional status.

<sup>18</sup> Illiteracy rates were highest among the poor and the older generation. However, among children aged 13 to 15, these disparities across income groups had been narrowed.

with homework is severely constrained. This means that the school will have to play the key role in education. At the same time, the pool of well-educated people with the ability to teach in schools or to manage the sector is very small, which hinders the efforts to improve education quality.

*An Agrarian Economy with Oil and Gas Reserves*

In 2001, agriculture, forestry, and fishery accounted for 21 percent of GDP, mining, petroleum, and quarry for 19 percent, construction for 12 percent, and services for 27 percent. The traditional subsistence agricultural sector was large and was supported by household-based crafts and services. Coffee was the only cash crop that was exported. The public sector was the country's largest employer. Wage employment accounted for only 12 percent of the total population. The private exchange economy had typically been small scale, based on low-technology manufacturing (mainly textiles and food processing) and services (for example, food kiosks and servicing of motor vehicles). The oil and gas reserves in the Timor Gap (the sea between Timor and Australia) are the country's greatest potential mineral wealth, with the main revenue expected in 2005 or 2006. Revenue from these reserves is estimated to reach \$2 billion for a 20-year period, but thereafter, the reserves may dry up. Although the government has a savings plan for the potential windfall, the country cannot count on unlimited wealth from natural resources. It must rely on the productivity its human resources can generate, which is why education is so important.

In spite of Timorese willingness to make education a top priority, the country has a long way to go before it can boast a highly skilled population. The need to reconstruct the country exacerbates the skill shortages. According to an AusAid Survey (Maglen 2001), employers in the private sector reported that the following skills were in short supply among Timorese job-seekers:

- The skills required to produce work of an international standard – for example, in plumbing and electrical installation;
- Commitment to quality and attention to detail;
- Work habits and attitudes;
- Front-line management and supervisory skills; and
- Communications skills (in) writing, understanding written instructions, dealing with customers, clients, and suppliers in general, and English language comprehension (because of the need to communicate internationally).

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During the transition period, the shortages of these skills were met “by employing foreign workers, on short-term contracts, by producing poorer quality products, and/or by providing inferior services (both of which can only be tolerated under boom conditions, and/or in markets not yet sophisticated enough to demand higher quality); and by postponing or canceling projects, not bidding for work” (Maglen 2001). As a result, the profits from the boom economy during the UNTAET period—created by the large influx of expatriate civilian and military personnel—were largely captured by foreign entrepreneurs and administrators. Timorese citizens tended to fill the demand for less-skilled service jobs, while the subsistence economy benefited only marginally.

Meanwhile, unemployment rates have continued to rise. With the highest rate being among those with a senior secondary education. While this indicates that many East Timorese maintain an expectation that the completion of secondary education will be a bridge to employment in the formal economy, this expectation has yet to be met for many senior secondary graduates.

In the future, however, Timor-Leste will rely increasingly on private initiatives and on attracting business capital investments. Although, in the medium term, most jobs will be created in the informal economy, mainly in services, rural communities, and, to a limited extent, the manufacturing sector, jobs may eventually be created in the modern formal manufacturing and service sectors, producing goods and services of international standard. And, for the economy to make the transition to the modern formal manufacturing and service sectors, the Timorese workforce will need the key competencies—literacy, numeracy, a basic knowledge of scientific principles, health and sanitation standards, and the ability to use information and computer technology – most usually associated with a senior secondary education. These needs confirm an urgency to expanding educational coverage and improving the quality of schooling.





## THE CHALLENGES OF ACCESS AND INTERNAL EFFICIENCY

This chapter discusses access and efficiency in the education sector and identifies the constraints that will need to be overcome to widen access and increase efficiency. The discussion is informed primarily by data from the Timor-Leste Living Standard Measurement Survey (TLSS) of 2001, which collected information at the household level and makes it possible to analyze educational issues by expenditure quintiles. This information is supplemented by UNICEF's Multiple Indicator Cluster Survey (MICS) of 2002, which provided more up-to-date information on enrollment ratios.

### 2.1. ACCESS AND COVERAGE

After the departure of many Indonesian natives from Timor-Leste, both the educational attainment of the adult population and enrollment ratios changed. Table 2.1 shows that the gross enrollment (GER)<sup>19</sup> rose from 89 percent in the 1998/99 school year to 110 percent in 2001/02. The increase was due to the enrollment of those who had not previously been enrolled in school, and the percentage exceeds 100 because significant numbers of children older than 12 are enrolled in primary school. The net enrollment (NER) rose from 51 percent to 70 percent over the same period (calculated from age 7, the official age for starting primary education). The NER remained substantially lower than the GER due to the non-enrollment of some children, the fact that some students were over-age for their grade, and dropouts. The GER in junior secondary education and the NER in both primary and junior secondary education continued to rise in 2002/2003.

**Table 0.1: Gross and Net Enrollment Rates, 1998/99–2002/03**  
(%)

	1998/99	1999/2000	2000/01	2001/02	2002/03
<b>Gross enrollment ratio</b>					
Primary (7–12 yrs of age)	89	84	113	110	105
Jr. secondary (13–15 yrs of age)	44	42	47	51	65
Sr. secondary (16–18 yrs of age)	19	21	26	28	---
<b>Net enrollment ratio starting at age 7</b>					
Primary (7–12 yrs of age)	51	52	67	70	75
Jr. secondary (13–15 yrs of age)	24	21	22	25	30
Sr. secondary (16–18 yrs of age)	11	12	16	17	--

Source: TLSS 2001 and MICS 2002

In 2002, the gender gap in the GER in primary education was small but grew much bigger at the junior secondary level and was particularly wide in rural areas (see Table 2.2). For enrollment by gender, urban and rural location, income quintile, and age group, see Annex 3.5.

<sup>19</sup>The GER in primary education is the number of students enrolled in primary education, irrespective of their age, divided by the total number of children of primary education age. The NER is the number of students of the right age enrolled in each grade of primary education.



**Table 0.2: Enrollment Rates of Primary and Lower Secondary Education, by Gender and Residence, 2002**

		Primary Education (Ages 7–12)		Junior Secondary Education (Ages 13–15)	
		GER	NER	GER	NER
<b>Male</b>	Urban	114.6	86.1	87.0	42.1
	Rural	102.0	72.7	62.9	24.4
	Total	105.1	76.0	69.9	29.5
<b>Female</b>	Urban	110.4	83.7	89.0	45.5
	Rural	103.1	71.8	52.0	24.8
	Total	104.8	74.6	60.7	29.7
<b>Both Genders</b>	Urban	112.6	85.0	87.9	43.7
	Rural	102.5	72.3	57.1	24.6
	Total	104.9	75.3	65.1	29.6

Source: MICS 2002

### *Out-of-school Children*

In 2001, about 50,000 children, or 27 percent of the 7–14 age cohort, were not enrolled in school. (During the same year, 25,500 6-year olds were not enrolled in school.) About 29 percent of the 7–14 year olds were from families in the lowest income quintile, while 6 percent were from the top quintile (see Table 2.3 and Annex 3.3). An equal number of boys and girls were not enrolled in school.

**Table 0.3: Out-of-School Children by Age and Quintile (Ages 7–14)**  
(%)

Age	Poorest	Quintile 2	Quintile 3	Quintile 4	Richest	Total
7	30	24	26	19	1	100
8	25	21	24	21	9	100
9	43	14	21	17	6	100
10	15	23	18	28	15	100
11	20	23	30	21	7	100
12	33	31	16	21	0	100
13	33	20	8	26	13	100
14	27	41	18	3	10	100
Total	29	23	22	20	6	100

Source: TLSS 2001

Some 46% of out-of-school children lived in the rural center of the country, and another fifth lived in the rural east (see Table 2.4). In both of these regions, the share of out-of-school children exceeded the share of the school-age population. Urban areas accounted for 15 percent of all out-of-school children, lower than their share of the population of school-age children. (See Annex 3.4 for the number of enrolled children and the relevant age population; see Annex 3.6 for enrollment by region.)

**Table 0.4: Geographic Distribution of Out-of-School Children under the Age of 15, 2001**

	<b>Dili/ Baucau</b>	<b>Other Urban</b>	<b>Rural Center</b>	<b>Rural East</b>	<b>Rural West</b>
% of school age population	12.5	9.9	39.8	18.8	18.9
% of out-of-school children	8.0	7.4	45.9	20.6	18.1

Source: TLSS 2001

In order to develop successful strategies to reach the country's enrollment objectives, it is essential for policymakers to understand the reasons why children are not attending school (see Figures 2.1A, 2.1B, and 2.1C). According to the 2001 TLSS, about 70 percent of parents of out-of-school children between the ages of 5 and 6 considered their children to be below the school age. Among the parents of out-of-school children between the ages of 7 and 12, about 22 percent considered that their children were not of the right school age. (We interpreted "below school age" to include those children who were not of the right age or were over-age.) The parents of about 32 percent of the poorest and 26 percent of the richest 7–12-year-olds had "no interest" in schooling.

Given the very small percentage of wage employment in the economy, it is difficult for many parents to understand that their children will earn more as adults if they attend school while they are young. Thus, in spite of the high national priority accorded to education by the people in theory, there was a weak demand for schooling among those who did not attend.

On the supply side, many parents cited the long distance between their homes and their children's schools as a key factor for their non-enrollment. Annex 3.12 shows that almost all children walked to school, including children from the richest quintile. Although the average time that children took to get to school was only about half an hour, this average implies that some students might have taken twice as long while others took much less. In addition, there were other supply-side factors that affected demand, such as the poor condition of the school, the non-availability of learning materials, the language of instruction being different from the languages spoken by the students, the poor quality of instruction, teacher absenteeism, and irrelevant curriculum content.

## Figure 0.1: Reasons for Children Never Being Enrolled

Figure 2.1A: Ages 5–6, 2001

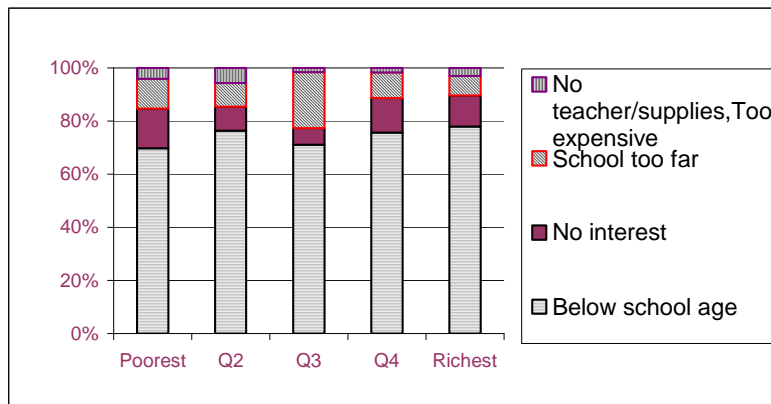


Figure 2.1B: Ages 7–12, 2001

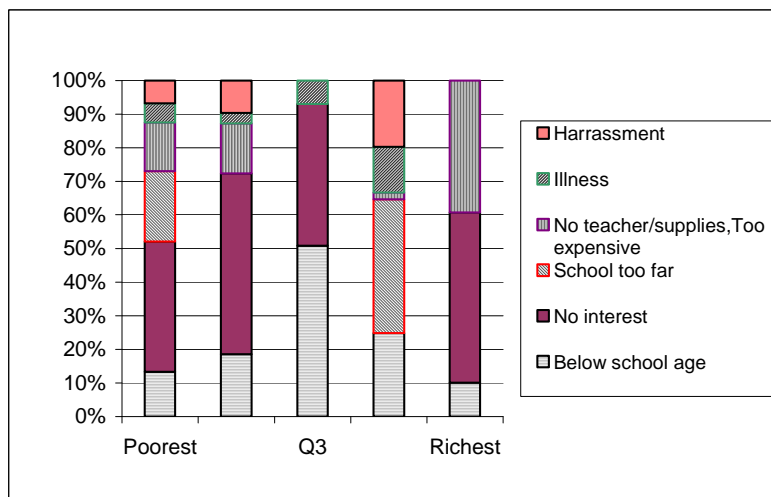
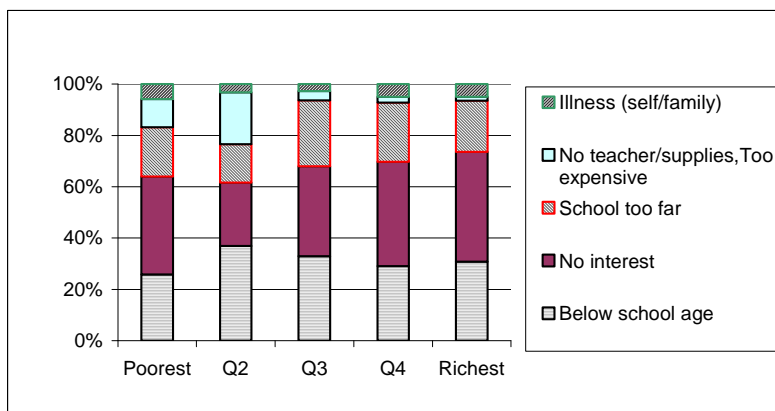


Figure 2.1C: Ages 13–15, 2001



Source: TLSS 2001

## **2.2. INTERNAL EFFICIENCY**

This section discusses over-age enrollment, repetition, and dropout rates. Because of its scope and importance, the discussion of reasons for the inefficiency is set out in a separate section.

### *Over-age Students*

The pattern of over-age student enrollment in Timor-Leste is very typical of post-conflict societies. Students who enrolled in 2000 or 2001 but had not been enrolled in 1999 tended to be over-age for the lower grades in primary school in which they had enrolled. For example, in 2000/01, over 70,000 students enrolled in Grade 1, more than double the estimated number of 7-year-olds in the country. Since most of the newly enrolled students enrolled in the lower grades, whatever skills they were learning must be of a very low level. As late entrance is common, students tend to have relatively few years of schooling, particularly if they drop out early. These over-age students may also find the lower grade curriculum unsuitable for their age. Table 2.5 shows the percentage of students of various ages in each grade. The shaded area indicates the percentage of students who were the right age to start school at the official age of 7. The non-shaded part shows under- and over-age students. In Grade 1, only 29 percent of students were 7 years old when they started school. By Grade 6, only 15 percent of the students were aged 11, the appropriate age for that grade.

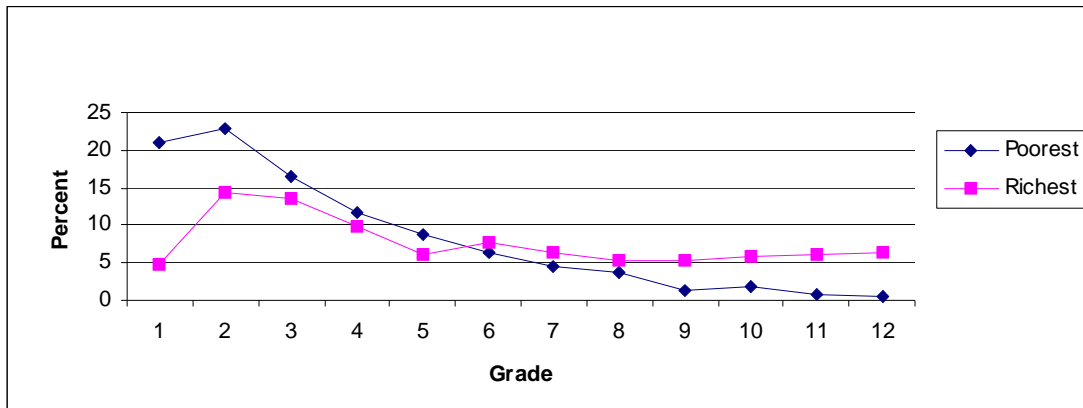
**Table 0.5: Distribution of Enrollment by Age and Grade, 2001**

(%)													
Age	Pre- primary	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 9	Grade 10	Grade 11	Grade 12
3	10.1	0.1											
4	26.7	0.3											
5	34.7	2.2	0.2	0.1									
6	24.4	31.1	2.3	0.2									
7	3.7	29.1	16.8	1.5	0.2	0.1							
8	0.4	17.8	26.1	11.3	1.1	0.1							
9		9.1	20.8	20.7	9.3	1.1	0.1						
10		5.2	14.0	23.1	19.9	8.6	0.9						
11		2.4	8.2	16.3	21.0	16.7	6.3	0.4	0.1				
12		1.4	5.6	12.1	20.2	22.2	14.6	6.0	0.8	0.1			
13		0.7	2.8	7.2	13.8	20.3	20.4	12.3	5.9	1.0	0.1		
14		0.4	1.6	3.4	8.6	15.9	21.6	19.2	13.1	4.9	1.6	0.9	0.1
15		0.3	1.0	1.8	4.2	8.9	17.9	22.6	20.9	13.5	9.4	4.2	0.6
16		0.1	0.5	1.3	2.2	4.5	12.7	18.0	24.5	23.3	20.9	9.5	5.5
17			0.2	0.7	0.4	1.2	3.6	13.4	19.4	26.2	27.2	26.1	12.3
18				0.4	0.2	0.4	1.2	6.0	10.9	18.7	24.4	32.3	36.7
19				0.2	0.1	0.1	0.7	2.2	4.5	12.3	16.5	27.0	44.9
20								0.4	0.8	3.0	6.4	15.1	34.8
21								0.1	0.4	1.4	2.4	6.6	21.9
22								0.1	0.1	0.2	0.4	2.1	9.1
23								0.1			0.1	0.6	5.0
24										0.1		0.3	2.9
25										0.1	0.1	0.1	2.1
Total %	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Students	2,484	69,772	33,593	24,129	18,706	15,606	14,944	10,743	7,968	6,958	5,535	3,580	2,101

Source: School Mapping Survey 2001

Note: The shaded cells indicate the percentage of students who started school at the official age of 7 and progressed through the system without repeating any grades.

**Figure 0.2: Enrollment by Grade of the Poorest and Richest Quintiles**



Source: TLSS 2001

Poor children tended to be concentrated in the lower grades, whereas children from upper quintiles tended to be distributed more evenly across all grades. Even if both rich and poor children attended school for the same number of years, those from the richest quintile tended to have a higher level of attainment because more of them remained in school long enough to reach the upper grades (see Figure 2.2). Only 10 percent of children from the poorest quintile started Grade 1 at the age of 7, and 26 percent of them started at the age of 9 (see Annex 3.8a). By contrast, 29 percent of children of the richest quintile started Grade 1 at the age of 7 (see Annex 3.8b). Boys were doing worse than girls on the whole (see Annexes 3.9a and 3.9b). Although 22 percent of boys started Grade 1 at the age of 7 (compared with 14 percent of girls), there were more girls than boys at the age of 9 by Grade 3 because they had lower repetition rates. Rural children were worse off than urban children. Only 16 percent of rural children started Grade 1 at the age of 7 compared with 28 percent of urban children. By Grade 4, only 6 percent of rural children were of the right age for their grade compared with 12 percent of urban children.

#### *High Repetition and Dropout Rates*

A substantial part of the age-by-grade misalignment was due to high repetition rates. Table 2.6 shows that between 20 and 25 percent of children repeated a grade and around 10 percent dropped out of each grade in primary education and junior secondary education. Senior secondary education had lower dropout and repetition rates because students who reached that level were more persistent and also tended to come from wealthier families who could afford to keep them in school. Girls had lower repetition and dropout rates and higher promotion rates than boys.

A cohort flow analysis found that, at this level of internal efficiency, only 67 percent of children would reach Grade 4 and only 47 percent would eventually complete Grade 6, while 53 percent would drop out. On average, the dropouts would complete four grades. The cost per student of six years of primary education was about \$300. However, the cost per graduate from Grade 6 was twice as much because of the high repetition and dropout rates (see Annex 3.9).

**Table 0.6: Repetition, Promotion, and Dropout Rates  
by Grade and Gender, 2001**  
(%)

<b>Primary Level</b>	<b>Grade 1</b>	<b>Grade 2</b>	<b>Grade 3</b>	<b>Grade 4</b>	<b>Grade 5</b>	<b>Grade 6</b>
<b>Males</b>						
Repetition	20	24	25	25	25	23
Promotion	70	68	66	67	66	68
Dropout	11	9	9	9	10	9
<b>Females</b>						
Repetition	20	23	24	24	23	20
Promotion	70	69	68	68	69	72
Dropout	10	8	8	8	9	8
<b>Secondary Level</b>	<b>Grade 7</b>	<b>Grade 8</b>	<b>Grade 9</b>	<b>Grade 10</b>	<b>Grade 11</b>	<b>Grade 12</b>
<b>Males</b>						
Repetition	23	25	24	9	10	11
Promotion	71	68	69	87	86	87
Dropout	6	6	7	3	4	2
<b>Females</b>						
Repetition	21	23	24	9	8	8
Promotion	75	70	70	89	90	90
Dropout	5	7	6	2	3	2

Source: School Mapping Survey 2001

This high level of inefficiency has serious implications. From the educational point of view, the levels of skills acquired by the students enrolled were likely to be low because about half of them were not in school long enough to master literacy and numeracy. From the fiscal perspective, this inefficiency is expensive as, for a given amount of resources, only a small number of children can acquire the requisite skills. The cost per graduate (not the cost per student) is the key measure of the efficiency of resource use.

Because the majority of children in school are over-age, if the repeaters move on and fewer newcomers repeat grades, more space will be available to accommodate the 70,000 children who are currently not enrolled in school. In 2001, enrollment in primary education exceeded the total number of the relevant-aged children because of the high numbers of over-age students in the primary grades. Therefore, if the age-by-grade distribution becomes more normal, there will be enough places and teachers in primary schools to accommodate many of those who are now not enrolled in school.

### 2.3. REASONS FOR INEFFICIENCY

Poor quality or inadequate inputs usually contribute to high repetition and dropout rates. An analysis of TLSS 2001 revealed the following problems: lack of textbooks and learning materials, too few hours of instruction, poor teacher quality, high student-teacher ratios in primary schools, inadequate preparation for the language of instruction, poor condition of physical infrastructure, and high student and teacher absenteeism. Each of these problems is discussed below.

### *Lack of Textbooks and Learning Materials*

More than half of students had no book at all from which to learn, between 30 and 40 percent had some books, and fewer than 10 percent had a full set of books (see Annex 3.13). There was much variation among quintiles—for example, only 2 percent of students in the middle quintile had a complete set of books. Because of the lack of books, teaching and learning had to take the form of teachers copying their notes on the blackboard and students copying them into their exercise books. The government distributes free exercise books to schools; without this subsidy, some students would not even have a notebook to write in. Few schools reported having a library or a reading corner. Even when schools did receive textbooks, they tended to lock them up in a cabinet because there were insufficient copies to distribute to all students. The number of hours of homework was minimal, about one hour per week on average. The lack of reading materials made it difficult for children to develop literacy. Very few students had access to any reading material outside of the school. This problem was exacerbated by the introduction of a new language of instruction, which will be discussed below.

### *Too Few Hours of Instruction*

Officially, schools are required to provide five hours of instruction per day for 180 days a year. Each session in Grades 1–3 lasts for half an hour and each session in the upper grades for 40 minutes. Even if the full required hours are delivered, the total number of instructional hours is 900, lower than the 1,000 hours recommended by the Education for All Fast Track Initiative. In practice, some schools divided those five hours into two shifts—two hours (8–10 AM) for Grades 1–3 and three hours (10 AM–1 PM) for Grades 4–6. This arrangement was erroneously called “multi-grade teaching” and was substantially different from double-shifting, which provided morning and afternoon sessions of five hours each. (The so-called multi-grade sessions were taught by teachers in their respective homogeneous-grade classes.) However, whether they taught for two, three, or five hours, teachers were paid the same amount. There was little rotation of grades among primary teachers, who covered all of the subjects in the grade that they taught.

### *Poor Teacher Quality*

Timorese teachers were poorly prepared for their profession for two reasons. First, under the Portuguese and Indonesian administrations,<sup>20</sup> people with limited academic backgrounds were able to enter the profession, which resulted in serious issues of quality. From this pool came the current stock of primary school teachers. Second, due to historical under-investment in education, the pool of well-educated people in the country as a whole is extremely small, and even fewer are qualified to teach. Several attempts to recruit teachers through examinations have yielded only a very limited number. For example, the vast majority of successful candidates for the 3,000 positions filled by

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<sup>20</sup>Under the Indonesian system, the education sector was used to generate employment but at low salaries (on average 200,000 rupiah per month). This would be \$91 per month at the exchange rate of 2,200 rupiah to \$1 before the financial crisis, or \$20 when the exchange rate rose in 1998/99 to 9,784 rupiah to \$1 in the aftermath of the crisis. Salaries were so low that talented teachers sought better career prospects. The government ended up with large numbers of poor quality teachers on its payroll. *le.*



recruitment through examination<sup>21</sup> in 2000 had varying qualifications.<sup>22</sup> In 2003, of the 620 positions budgeted, only 200 were filled.

The appointment of secondary teachers followed a different process because there are very few qualified Timorese teachers in the system, particularly in mathematics, physics, chemistry, Tetum, English, and Portuguese. Well-qualified English teachers tended to go for better-paying jobs elsewhere. The majority of Timorese Portuguese language teachers had completed Portuguese primary school, which only had four grades. Because of the shortage of qualified teachers, only university graduates, or those who had had at least six semesters of tertiary education or, those tertiary-qualified primary school teachers at the D2 level (the Indonesian qualification of two-year post-secondary teacher training), were invited to apply for a teaching position. Even at this relaxed standard, very few people applied. The difficulty of recruiting qualified teachers is an enormous constraint on how fast the system can expand and improve qualitatively. Poor teacher quality, exacerbated by the lack of teaching materials in large classes, does little to engage students in the learning process.

#### *High Student-Teacher Ratios in Primary Schools*

Due to the difficulty in recruiting teachers, the STR remained high. From an average of 25:1 in 1999, the STR rose to 62:1 in 2000, before falling to 52:1 in 2001 and 47:1 in 2002. However, the STRs varied widely across districts, from 44:1 in Ermera to 52:1 in Manufahi (see Annex 2.2). The STRs also varied between urban and rural schools, between public and private schools, and among grades (see Table 3.4).

#### *Inadequate Preparation for the New Language of Instruction*

The Constitution of Timor-Leste designates Portuguese and Tetum as the official languages, with Bahasa Indonesia and English as working languages. The MECYS mandates Portuguese as the language of instruction. This was introduced in Grades 1 and 2 in 2000 and has progressively moved up one grade per year since then, reaching Grade 5 in the school year 2003/04. In those grades where Portuguese has been introduced, Indonesian books have been withdrawn. However, there were not enough Portuguese books to replace them. Meanwhile, teachers have been allowed to use Tetum to explain lessons to children.

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<sup>21</sup> The examination was developed by 12 Timorese experts with external technical assistance. A bank containing 1,000 items were written, of which half were on subject content and the other half were on pedagogy. The examination was field-tested. Some 200 items were then selected from the item bank to constitute the final version of the examination. The examination was administered in 13 districts and 64 sub-districts, which at that time were secured by UN peacekeeping forces. The answer sheets were read by computer in Australia. Many teachers who served under the Indonesian administration but who did not meet ETTA's minimum qualification requirements did not take the examination but served as volunteers in administering the examination, hoping that they would be given special consideration in future recruitment efforts.

<sup>22</sup> Only about 100 had the "required" qualifications in 2000. The teachers were examined in three areas: mathematics, science, and social science with questions taken from frequently used textbooks. The older teachers who had specialized in teaching Grades 3 or 4 for many years and who no longer had any books available for revision had forgotten their Grade 6 mathematics and science, unlike the younger high school graduates against whom they were competing. All of the teachers who were hired had the equivalent of senior high school qualifications, although some older grade 4 primary graduates from the Portuguese era were also employed. These teachers are now employed at all levels to teach Portuguese, and many are taking the *bacharelato* to upgrade their qualifications.

Changing the language of instruction has had many complications. First, only those teachers who finished their primary education before 1975 had learned Portuguese; the vast majority of teachers were educated in Bahasa Indonesia. The government organizes training courses for learning Portuguese for a few hours every week and expects teachers to become proficient enough to communicate effectively with their students, to impart knowledge and skills, and to observe and evaluate students across a range of school subjects. This ambitious goal has yet to be met. Second, students studying under teachers who themselves are not proficient in Portuguese are less likely to master the language. Since language governs thoughts and the cognitive process, a teacher's less than full proficiency in the language of instruction is likely to impede his or her students' mastery of concepts, discourage classroom interaction, and undermine their performance. Third, for many students, Portuguese is the third or fourth language. Tetum is only one of the 22 indigenous languages of Timor-Leste and is the mother tongue of only 16 percent of the population, although it has become the new country's *lingua franca*. Children whose mother tongue is not Tetum will need to learn it. But because there are large numbers of people who speak varieties of Tetum, the language appears to be not too difficult to learn. Nonetheless, this means that many children will learn their mother tongue at home and then Tetum (if it is not their mother tongue), and then Portuguese to understand instruction in school. Students who started school before 1998 also learned Bahasa Indonesia. This multilingual environment is extremely challenging to any learner, especially when language-learning materials are in short supply.

An AusAID pilot study on student achievement (Morgan 2001) found that performance of many third and fourth graders was seriously affected by the use of a language of instruction other than their mother tongue (Bahasa Indonesia was the language of instruction at the time of the study). Many non-responses or wrong answers in mathematics and science tests were assumed to be due to the students' limited comprehension of the meaning and intent of very basic text in Bahasa Indonesia. If language of instruction affects student achievement, then it must also affect attendance and dropout because students become disengaged quickly when they cannot follow the lessons in class. By 2003, Bahasa Indonesia was no longer taught as a subject in Timorese primary schools. Although teachers have used a mixture of Indonesian and Tetum in the classroom, Tetum has been dominant. However, in junior secondary and secondary schools, because the students have not been taught Portuguese, they have continued to use Indonesian books while learning Portuguese at the same time.

In the 2001/02 school year, about 46 percent of students reported that Tetum was used as the language of instruction in their school, 46 percent reported the use of Bahasa Indonesia, and 8 percent reported the use of Portuguese (TLSS 2001). Tetum was more commonly used in the schools attended by children from the poorest quintile, whereas a higher proportion of schools attended by students from the richest quintile use Portuguese. The introduction of Portuguese as a language of instruction in school is likely to adversely affect the poor more than the rich, further exacerbating the socioeconomic inequality in learning outcomes (see Table 2.7).

**Table 0.7: Language of Instruction by Quintile, 2001**

(%)						
Language	Poorest	Quintile 2	Quintile 3	Quintile 4	Richest	Total
Tetum	52	54	42	47	37	47
Bahasa Indonesia	44	42	48	43	53	46
Portuguese	4	5	10	10	10	8
Total	100	100	100	100	100	100

Source: TLSS 2001

*Poor Condition of Physical Infrastructure*

Although over 80 percent of the country's classrooms were restored and useable within 18 months of their destruction, many schools were not in good condition even by 2003. In many schools, there were no windows that could be closed to prevent rain from sweeping across the room, making the classrooms unusable during the monsoon season. Most classrooms were dark, as few schools had electricity. Most schools had no water or toilets, which adversely affected girls' attendance in particular. Only 81 percent of the students had a desk and a chair to use in class (see Annex 3.15).

*Teacher and Student Absenteeism*

Only 63 percent of students reported that their teachers were present all the time, and 31 percent reported that they themselves were present almost all the time. About 7 percent of students reported that their teachers were absent all the time<sup>23</sup> (see Annex 3.16). Student absenteeism was also a problem, with more students from better-off families being absent than those from poor families (see Table 2.8). Teacher and student absenteeism affects the opportunity to learn, contributing to student disengagement, low achievement, and eventual dropout.

In primary school, the overwhelming reason cited for students' absence was illness (66 percent) across all quintiles (see Annex 3.11a). This may be related to the poor nutrition and health status of many Timorese mentioned earlier. The distance between the student's home and school weighed heavily on the lower four quintiles but did not affect the richest quintile at all. Work was the reason cited for absenteeism by more in the upper than lower quintiles. By junior secondary education, illness still accounted for 77 percent of absenteeism across all quintiles (see Annex 3.11b). The school being too far away and the need to work at home affected those in the lowest quintile disproportionately more than those in the other quintiles. In senior secondary education, illness again accounted for the highest percentage of absenteeism (81 percent) and affected students across the board (see Annex 3.11c). The vast majority reported that they had eaten breakfast before going to school, but for the minority who did not have breakfast, hunger might be what keeps them from going to school.

<sup>23</sup>The TLSS 2001 questionnaire did not ask why the teachers were absent. However, malaria is a problem in Timor-Leste, and some teachers also have active tuberculosis. When sputum tests were given to over 400 teachers in August 2000, four out of five teachers tested positive for tuberculosis. Many also lack corrective lenses, as their eyeglasses were destroyed in 1999 and they could not afford new ones or lived too far away from the places where they could be replaced.

**Table 0.8: Students Absent One or More Days  
During the Previous Three Months, 2001**

	(%)				
	Poorest	Quintile 2	Quintile 3	Quintile 4	Richest
Primary	22	28	43	35	46
Jr. Secondary	22	28	42	35	29
Sr. Secondary	16	37	29	22	27

Source: TLSS 2001

## **2.4. SUMMARY**

The analysis in this chapter was drawn from the TLSS 2001, which has provided baseline data for the poverty assessment of Timor-Leste as well as for this examination of the state of education in the country. Our findings show that, even though access has been widened, non-enrollment is still highly correlated with poverty, although the reasons given for non-enrollment varied by age group and were related to both supply- and demand-side factors. Those children who are enrolled in school, face enormous challenges due to the lack of textbooks and learning materials, the short hours of instruction, poor teacher preparation, high student-teacher ratios, a new language of instruction (which many students do not speak), and the poor physical condition of most schools. Students from the lower quintiles have to overcome more obstacles than those from the upper quintiles in order to remain in school. On the whole, the situation is dire, a fact which is reflected in the country's high repetition and dropout rates and low educational attainment.



## THE CHALLENGES OF QUALITY

An education system that is inefficient tends to be characterized by poor quality inputs and low student achievement. This chapter examines the level of student achievement in Timor-Leste and its determinants through an analysis of MECYS's first Primary School Achievement Survey (PSAS).<sup>24</sup> Some of the reasons for low achievement appear to overlap with the factors that have contributed to inefficiency, described in the previous chapter. Since the household-based TLSS and the school-based PSAS provide consistent information, assessments of where the problems lie can be assigned more confidence, in turn strengthening the exploration of policy interventions.

The PSAS was conducted in 2003 and tested 3,487 students in the third and fourth grades in 95 schools with the same mathematics test.<sup>25</sup> In these schools, the students who took the test, their teachers and principals, and all 13 district education superintendents and their deputies, were asked to fill in four separate questionnaires. Table 3.1 presents the sampling frame.

**Table 0.1: The Sample of the Primary School Achievement Survey, 2003**

	Urban Private	Urban Public	Rural Private	Rural Public	Remote Private	Remote Public	Total
Schools	9	31	10	30	5	10	95
Teachers	28	104	22	60	10	19	243
Students	356	1,202	361	1,073	156	330	3,478
Grade 3	180	609	191	557	73	180	1,790
Grade 4	176	593	170	516	83	150	1,688

Source: PSAS 2003

The students' questionnaire contained questions on their age, gender, mother tongue, parental education, home resources, schooling experience, language of instruction, and labor market experience (as child labor). The teachers' questionnaire asked about their age, gender, professional qualifications and experience, language of instruction, teaching conditions, terms and conditions of services, and expectations for their students. The principals' questionnaire asked about the background and characteristics of the school, the characteristics of the principal, teachers, and students, the school's management and monitoring practices, and the school's finances and sources of support. All three

<sup>24</sup>In 2001, a pilot study (Morgan 2001) was carried out in a small sample of about 30 schools in which students in Grades 3 and 5 were tested in mathematics and science with the questions being written in Bahasa Indonesia. Since this study was a pilot, the PSAS 2003 built on this experience and is considered to be the first of its kind. The 2003 results were completely consistent with the 2001 pilot.

<sup>25</sup>On the basis of data provided by the MECYS, a sampling frame of primary schools was prepared, and the schools were stratified by location (urban, rural, or remote) and type (government school or non-government school). Schools were randomly selected from each stratum (using probability proportional to total Grade 3 and Grade 4 enrollment rates) to yield the necessary number of schools. Twenty students were then randomly selected from Grade 3 and Grade 4, respectively, if the number of students enrolled in the grade was greater than 20, and all students were selected if the number of students enrolled in the grade was 20 or fewer. See Technical Note 1 for details.

questionnaires contained questions on the language of instruction and teacher and student absenteeism in order to check for consistency among the answers of the three different groups of respondents. The district superintendents' questionnaire contained questions on their age, gender, qualifications, work experience, communication with the central ministry, system of school inspections, and perception of education problems.

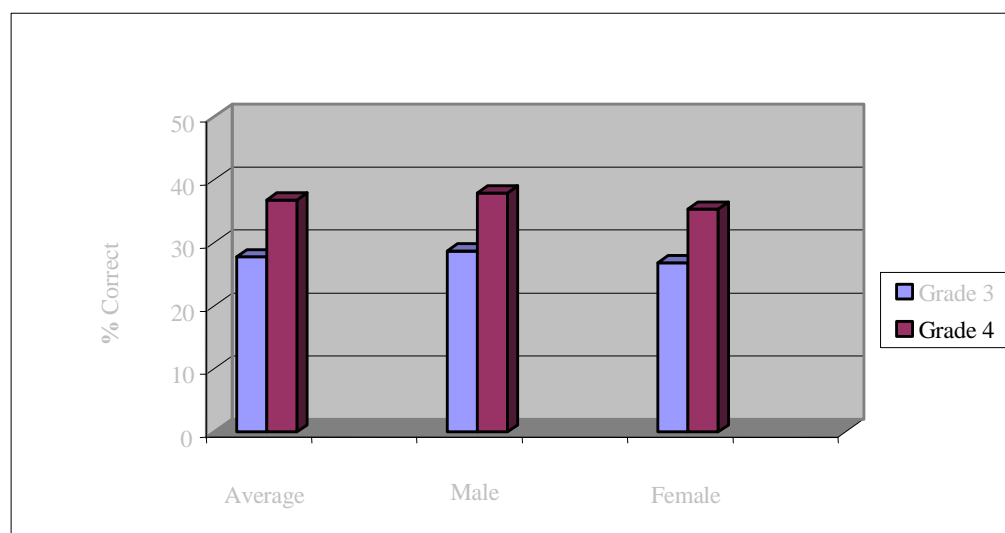
Since the PSAS test instrument and questionnaires were used for the first time in 2003 (albeit having been piloted three months before in the field) and the sample of remote private and public schools was very small, its results should be viewed as being merely suggestive rather than definitive. The experience gained in fielding this survey will be useful in improving future efforts to assess student achievement.

It should be noted that at the time of the survey, third graders consisted mainly of the cohort who started school in 2000/01, and fourth graders consisted of the cohort who entered first grade in 1998/99, as the schools were closed during the disturbance in 1999. However, both grades likely included repeaters from various cohorts who entered the system before the referendum, given the high repetition rates and the movement of refugee children in and out of schools.

Another caveat is that the policy of using Portuguese as a language of instruction was adopted in 2000 and began with the first and second grades in that year, extending to the upper grades by one grade each year. Therefore, in principle, those third graders who had not repeated a grade should have been instructed in Portuguese throughout their schooling, whereas fourth graders would have started their schooling in Bahasa Indonesia in 1998/99 and then switched to Portuguese in 2000/01. Reality may not be so clear cut, however, as policy does not always get implemented, particularly in this case when only a minority of teachers spoke Portuguese and few students had any textbooks, much less textbooks written in Portuguese.

Nevertheless, the test was written in Portuguese because both Grades 3 and 4 were supposed to be taught in Portuguese in 2002/03. Mathematics was chosen as the subject of the test because it was the least dependent on language proficiency. Of the 26 items in the test, 11 involved only numbers but the other questions required some understanding of Portuguese in order to provide the correct answers. The mixture of different items aims to discern what outcomes are associated with a poor understanding of the concepts and what are due to a combination of poor understanding and a lack of proficiency in Portuguese.

**Figure 0.1: Mathematics Test Scores by Grade and Gender**



Source: PSAS 2003

### 3.1. AVERAGE MATHEMATICS ACHIEVEMENT

The analysis of PSAS generally found low levels of achievement, and substantial differences between groups.

#### *Differences between Grades*

Figure 3.1 shows that, on average, third graders answered 28 percent of the questions correctly. This is only marginally better than what students would have achieved if they had guessed throughout the test, since each question offered a choice of four answers. Fourth graders did better, getting an average of 37 percent correct.<sup>26</sup> Overall, fourth graders scored higher than third graders by about half a standard deviation, which is similar to the improvement in achievement observed between these two grades in other countries. However, due to confounding effects attributable to differences between the cohorts and the high dropout rate after Grade 3, it is impossible to determine the absolute improvement of 4<sup>th</sup> graders (See Annex 4.1 for the average percentage of correct answers, the standard deviation, and the coefficient of variation by subgroups.)

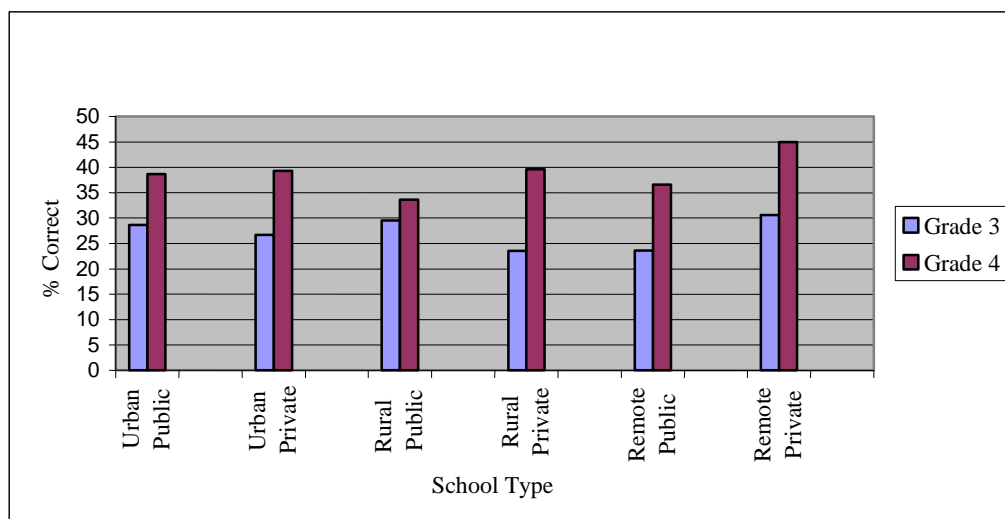
#### *Differences between Boys and Girls*

Figure 3.1 also shows the differences in scores between Grades 3 and 4 as well as the difference in scores by gender, with girls scoring lower in both grades.

<sup>26</sup>The pattern of student non-responses suggests that many students were averse to guessing. In these cases, students simply left blank those questions that they could not answer. It also suggests that students were not familiar with the test format.



**Figure 0.2: Percent Correct by School Type and by Grade**

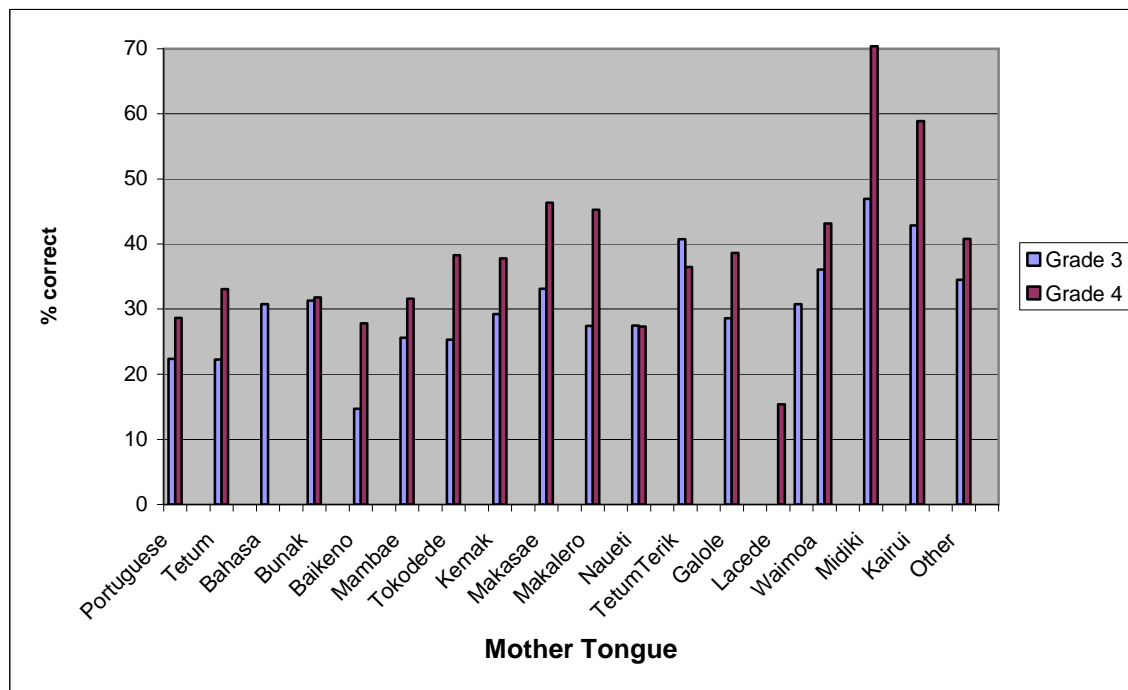


Source: PSAS 2003

### *Differences between School Types*

Figure 3.2 shows the difference in average scores between urban and rural schools and between public and private schools, both of these differences being surprisingly small.

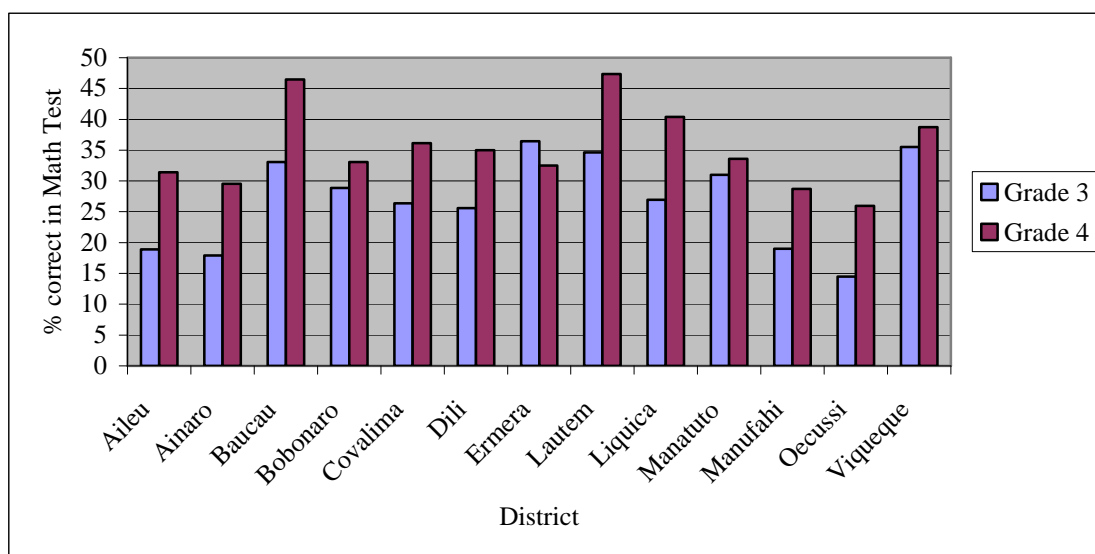
**Figure 0.3: Test Scores by Mother Tongue by Grade**



#### *Differences across Language Groups*

Figure 3.3 shows that students whose mother tongue was Midiki constituted the highest scoring group. Surprisingly, students who claimed that their mother tongue was Portuguese had lower average scores than Tetum speakers. Subsequent examination of language by family resources found that a majority of the students who claimed to be Portuguese speakers were poor.

**Figure 0.4: Test Scores by District and by Grade**



Source: PSAS 2003

### *Differences between Districts*

Figure 3.4 shows that in almost all districts, students in Grade 4 had higher scores than those in Grade 3, except in Ermera, which was the highest scoring district for Grade 3. Students in Baucau and Lautem had the highest scores in Grade 4. Students in Oecussi had the lowest average scores for both grades; this district also has fewer Portuguese-speaking teachers than elsewhere, and Tetum is spoken relatively little there.

## **3.2. STUDENT CHARACTERISTICS**

To put results like this into their proper context, it is useful to examine the characteristics of the students, the teachers, and the schools that were involved in the PSAS survey. Table 3.2 presents the cross-tabulation of student characteristics by school type. Some of the numbers in the cells are quite startling, but it is important to note that this is likely due to the fact that the sample of remote schools was very small.

### *Family Characteristics*

There was not much variation in students' background characteristics across school types, in terms of household size, the students' age when starting school, having to walk to school, liking school, liking learning, and having to work by helping families. But there were large differences between urban and rural schools in terms of parental education (the percentage of parents of urban students who attended school was 20 points higher than that of parents of rural students), home resources, and parents who read newspapers and read to their children. Whereas about 55 percent of students attending urban schools had running water, only 26 percent of students attending rural schools did. Similarly, about 60 percent of students attending urban schools had electricity at home, whereas only 5–8 percent of students attending remote schools had it. The possession of "luxury" items such as radios, television sets, and refrigerators displayed the same pattern of urban

and rural differences. Even for urban households, however, only a privileged minority owned these goods. Between 70 and 80 percent of students across all school types reported that they always had breakfast, but only 59 percent of students in remote private schools said so.

### *Language Spoken at Home*

The vast majority of students in all school types spoke a language other than Tetum or Portuguese. None of the children in private schools, whether they were urban, rural or remote, spoke Portuguese at home; even in urban public schools, only 3 percent of students said that they did.<sup>27</sup> Surprisingly, about 10–11 percent of children in rural public and remote public schools reported that they spoke Portuguese at home. Tetum was the mother tongue of 36 percent of private school students, 29 percent of public school students, and under 20 percent of rural and remote school students.

### *Language of Instruction*

About 40–50 percent of the students reported that the languages used in their classrooms were a combination of Portuguese, Tetum, and Bahasa Indonesia. A very low percentage of students (0.3–8 percent) reported that only Portuguese was used as the language of instruction.

### *Schooling Experience*

Between 18 and 50 percent of students across all school types had textbooks with which to learn, and one-third of them reported that they were given textbooks by their schools. Between 95 and 99 percent of all of these children walked to school. Around 95 percent of the students worked: over half of them helped with housework, one-third took care of siblings, and about a quarter helped in agricultural labor.

### *Student Absenteeism as Reported by Students*

The PSAS finding on student absenteeism was consistent with that of the TLSS. About 32 percent of students in urban private schools, 39 percent in urban public schools, 40 percent in rural private schools, and 43 percent in rural public schools reported that they were absent from school during the previous week. The number of days that they were absent was on average 2.2 days across all school types, which is almost half of a five-day week. The main reason cited for being absent was illness, ranging from a low of 55 percent of students in rural public schools to a high of 76 percent of students in remote private schools. The second most cited reason was that the students needed to stay home to help their family.

### *Teacher Absenteeism as Reported by Students*

Teacher absenteeism was also high, ranging from 12 percent in private schools to 25 percent in remote schools. About 70–80 percent of students reported that there were no replacement teachers to take the classes of absent teachers. The total number of days of learning lost either due to student absenteeism or teacher absenteeism appears to be huge.

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<sup>27</sup>Portuguese is used in family prayers, which are said regularly. After a family member has died, prayers usually continue throughout the period of mourning. This may why some students answered that they speak Portuguese at home.

*Students' Ability as Rated by Teachers*

More private school teachers than public school teachers rated their students highly (good) in all school locations—urban, rural, or remote.

*Repetition and Over-age Students*

Between 10 and 15 percent of students reported that they had repeated Grade 1, between 9 and 15 percent had repeated Grade 2, between 7.5 and 13 percent had repeated Grade 3, and fewer than 5 percent had repeated Grade 4. Rural private and remote private schools had lower repetition rates than others. A high percentage of over-age students was a major problem across the board but more so in Grade 4 (38–63 percent) than in Grade 3 (29–51 percent). It was also far more serious in public schools than in private schools.

**Table 0.2: Student Characteristics by School Type, 2003**

(% unless otherwise indicated)

	Urban Private	Urban Public	Rural Private	Rural Public	Remote Private	Remote Public	Total
<b>No. of Grade 3 Students</b>	180	609	191	557	73	180	1,790
Percent girls	43.9	51.9	48.2	47.0	57.5	44.4	48.7
Percent over-age	29.4	39.2	50.8	49.9	21.9	45.0	42.7
Average age in Grade 3 (years)	10.0	10.3	10.7	10.8	9.7	10.6	10.4
<b>No. of Grade 4 Students</b>	176	593	170	516	83	150	1,688
Percent girls	51.1	49.2	44.7	48.3	49.4	51.3	48.8
Percent over-age	38.1	48.2	57.6	63.0	68.7	56.0	54.3
Average age in Grade 4 (years)	10.6	10.8	11.3	11.3	10.9	11.0	11.6
<b>Mother Tongue</b>							
Tetum	36.0	29.3	11.7	16.3	0.0	18.6	27.1
Portuguese	0.0	3.0	0.0	10.2	0.0	11.3	5.2
Others	64.0	67.7	88.3	73.5	100.0	70.1	67.7
<b>Household Size</b>							
No. of people in home	7.5	7.4	7.0	7.3	7.2	7.4	7.3
<b>Parental Education</b>							
Mother attended school	52.7	55.0	27.7	32.0	32.7	33.3	41.6
Father attended school	58.0	56.8	29.6	34.3	30.8	34.2	43.6
Highest grade mother attended	7.6	7.8	7.0	6.6	5.9	6.5	7.6
Highest grade father attended	8.6	8.5	6.7	7.3	6.1	7.3	8.3
Parents read newspaper?	37.3	43.1	16.1	11.0	7.1	24.2	26.4
<b>Home Resources</b>							
Running water	53.9	54.5	34.1	24.3	13.5	32.1	39.0
Electricity	60.1	61.2	10.8	10.2	4.5	8.2	32.5
Radio	62.6	61.8	43.5	42.3	25.6	28.5	49.2
Television	20.8	27.9	1.7	2.6	2.6	1.2	13.0
Refrigerator	8.7	14.1	0.8	0.7	2.6	0.0	6.2
Have breakfast always	79.4	75.4	72.0	74.8	59.0	72.7	74.2
<b>Schooling Experience</b>							
Morning shift	82.0	71.5	89.2	83.2	100.0	96.1	81.6
Attended pre-school	6.2	14.7	15.0	15.8	15.4	14.8	14.4
Age when starting school (years)	7.4	7.3	7.2	7.3	7.3	7.6	7.3
Given food in school	0.6	1.0	0.8	2.8	0.6	5.1	1.7
Get to school by walking	94.9	95.7	99.4	99.1	99.4	97.3	97.4
Like school:	99.7	100.0	98.9	98.5	100.0	99.4	98.7
I like to learn	94.9	93.0	93.4	90.2	94.2	94.8	92.8
It helps earn more money	3.4	3.1	4.4	5.5	3.8	4.2	4.1
<b>Student Absent Last Week</b>	32.1	38.9	41.0	42.8	44.2	37.9	40.0
Times absent (no. of days)	2.2	2.2	2.4	2.3	2.3	2.1	2.3
Reason for absence: Illness	57.3	60.4	67.4	54.5	76.3	69.4	60.6
Help family	32.3	34.7	26.5	40.1	23.7	25.1	34.0
Help friends	2.1	0.5	0.8	0.5	-	-	0.6
Not interested in school	3.1	1.2	2.3	1.9	0.0	0.9	1.6
School far from home	2.1	0.7	0.0	0.9	0.0	1.8	0.9
Rain	3.1	2.6	3.0	2.1	0.0	1.8	2.3

	Urban Private	Urban Public	Rural Private	Rural Public	Remote Private	Remote Public	Total
<b>Teacher Absent Last Week</b>	12.0	23.4	21.9	21.2	25.6	23.6	21.8
Replacement teacher	74.1	79.1	79.2	82.9	67.9	81.5	80.3
<b>Language of Instruction</b>							
Portuguese	0.3	3.1	0.3	4.2	5.2	7.9	3.4
Tetum	0.6	1.4	2.0	42.0	0.0	0.3	1.8
Portuguese, Tetum	37.9	32.0	48.9	30.9	35.7	31.5	34.1
Portuguese, Tetum, Indonesian	47.8	53.5	47.5	51.5	49.4	43.9	50.6
Portuguese, Tetum, Other	13.5	10.0	2.8	9.4	9.7	16.4	10.0
<b>Textbooks and Homework</b>							
Have: Textbooks	44.1	36.4	17.7	35.7	52.6	40.9	36.2
Notebooks	97.2	84.9	86.4	85.2	76.3	84.5	86.0
Pencils, pens	89.6	80.2	77.3	82.4	74.4	80.9	81.3
Given homework	96.6	98.4	97.0	97.8	86.7	80.8	96.2
Times per week (no. of days)	2.6	2.1	2.6	2.4	1.9	2.4	2.3
Who helps with homework?							
No one	70.5	64.9	80.9	72.4	85.7	59.2	69.8
Father	6.4	8.8	4.6	6.8	5.6	7.7	7.3
Mother	3.2	6.2	4.0	4.0	2.4	8.5	5.0
Siblings	14.3	15.9	8.3	15.9	6.4	17.9	14.8
Others	5.6	4.2	2.2	0.9	0.0	6.7	3.2
Textbooks given by: School	34.0	26.0	12.2	29.4	30.1	35.2	27.5
Parents	1.7	4.2	4.4	2.8	10.3	2.4	3.7
<b>Repetition</b> (including multiple)							
Grade 1	15.2	13.1	9.2	14.6	6.4	10.9	13.2
Grade 2	12.9	14.5	7.2	9.6	7.7	8.8	11.8
Grade 3	10.1	12.8	8.6	8.8	9.6	5.5	10.3
Grade 4	3.9	4.5	4.2	2.8	4.5	0.6	3.5
<b>Teacher-Rated Student Ability</b>							
Good	50.3	35.1	37.5	23.5	47.4	22.9	31.8
Medium	44.3	52.4	58.9	51.9	41.7	61.6	52.2
Poor	5.4	12.6	10.6	17.7	10.9	15.5	13.0
<b>Labor Market Experience</b>							
Do you work?	96.2	95.3	93.6	92.6	87.2	91.5	92.1
What do you do for work?							
Take care of younger siblings	30.3	30.9	23.8	30.2	37.2	29.7	30.0
Help with housework	53.9	57.6	61.8	63.6	57.1	55.5	59.3
Help in agricultural work	23.3	27.6	23.5	20.6	19.2	26.7	24.1
Work in street	0.7	0.0	0.0	0.3	-	-	0.3

Source: PSAS 2003

### **3.3. TEACHER CHARACTERISTICS**

How much did the characteristics of teachers vary across school type? Table 3.3 presents the descriptive statistics.

#### *Age, Gender, Place of Birth*

Of the 243 teachers in the sample, about 12 percent taught in urban private schools, 43 percent in urban public schools, 9 percent in rural private schools, 25 percent in rural public schools, 4 percent in remote private schools, and 8 percent in remote public schools. More than half of urban teachers were female, but women accounted for only 23 percent of teachers in rural schools and 10 percent in remote schools. This could be due to the limited pool of educated females in rural areas. Urban teachers were older, in their early 40s, while rural teachers were in their mid-30s. An overwhelming majority of them were born in the district they teach in, irrespective of school type, particularly among rural and remote school teachers. Also, between 63 and 90 percent were teachers during the Indonesian administration.

#### *Qualifications*

The qualification that the largest number of teachers possessed across all school types was technical-vocational training: 72 percent in private schools, 62 percent in urban public schools, 46 percent in rural schools, and 74 percent in remote schools.<sup>28</sup> The second largest was secondary education, accounting for 22 percent in private schools, 14 percent in urban public schools, 40 percent in rural schools and 13 percent in remote schools. No private school teachers had only primary education, but 11 percent of teachers in urban public schools, 5 percent of teachers in rural private schools and 4.3 percent of teachers in remote public schools are of this category. Only 2 percent of teachers in urban public schools, and 5 percent in both rural private schools and rural public schools had university degrees. The years of teaching experience ranged from an average of 12 years in private schools to 15 years in public schools, and from nine to ten years each in rural and remote schools.

#### *Motivation*

Between 86 and 93 percent of teachers entered teaching because they liked it. More urban teachers felt this way than rural teachers. About 10 percent of teachers in remote schools said that they chose teaching because there were no other employment opportunities; between 14 and 24 percent of rural teachers would like to leave teaching compared with only 6 percent in urban public schools and 21 percent in private schools.

#### *Working Conditions*

About 10 percent of teachers in remote schools reported experiencing delays in receiving their salary. Only about 14–27 percent of teachers had guides for teaching in Portuguese,

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<sup>28</sup>The qualifications reported in this survey based on a small sample are not necessarily the same as the ones in the teacher database in MECYS. As of December 2003, the database contained the most up to date information about 3,600 teachers. Of these teachers, 583 had an academic senior high school qualification, and only 194 had some kind of technical and vocational high school qualification.



and about 10–37 percent had guides for teaching mathematics. Teachers reported that over half to 84 percent of their students did not have Portuguese textbooks, and between 40–75 percent of their students did not have mathematics textbooks.

#### *Self-Reported Teacher Absenteeism*

About 14–16 percent of rural teachers were absent during the previous week, while 9 percent of public school teachers and 11 percent of private school teachers were absent. The absenteeism figures reported by teachers, however, were lower than the teacher absenteeism rates reported by the students. The number of days teachers admitted to being absent was very high: over three days in private, public, and rural schools and 1.5 days in remote schools. In remote schools, 14 percent of teachers had another paid job, compared with 6 percent of rural and urban public school teachers and 4 percent of private school teachers. Among the teachers in urban, rural, and remote public schools, the number of hours that they worked in other paid jobs ranged from 1.3 to 14.3 hours per week on top of the 30 hours of statutory school teaching hours, two to three hours of lesson preparation, and about two hours of correcting student assignments.

#### *Teachers' Perception of Problems*

The majority of teachers felt that the lack of textbooks was a big problem for all school types. More rural and remote teachers than urban teachers considered the following issues to be big or very big problems: poor infrastructure, a lack of water and sanitation, the use of Portuguese, inadequate teacher training, confusing directives from the Ministry of Education, an irrelevant curriculum, a lack of transport for teachers, a lack of discretionary resources, and a lack of contact with the district education office. Urban public school teachers ranked the following issues as big or very big problems: a lack of discretionary resources, poor infrastructure, an irrelevant curriculum, a lack of transport, a lack of contact with the district education office, and a lack of water and sanitation. As for the language of instruction, twice as many teachers in rural and remote schools than in urban schools cited this as a problem, although in terms of teachers' assessment of their own proficiency in Portuguese, there was not much variation across school types.

The teachers regarded inadequate materials as the main reason for low student achievement. The next most frequently cited reason was a lack of family support, and the third was language. Over half to three-quarters of teachers across all school types said that they needed more mathematics textbooks, Portuguese textbooks, bilingual textbooks, audiovisual materials, distance learning materials, and reading materials to help them in their work. They also indicated that they would like to receive training in teaching mathematics and Portuguese, learning Portuguese as a second language, teaching in a multi-grade setting, psychological development, and school and classroom management. To a lesser extent, they also claimed to need training in student assessment.

**Table 0.3: Teachers' Characteristics by School Type, 2003**  
(% unless otherwise indicated)

	Urban Private	Urban Public	Rural Private	Rural Public	Remote Private	Remote Public	Total
<b>Demographics</b>							
Number of teachers in sample	28	104	22	60	10	19	243
Women	50.0	54.8	31.8	20.0	10.0	10.5	38.3
Teaching in morning shift	71.4	66.3	95.5	86.7	100.0	73.7	77.0
Age (no. of years)	40.0	42.3	37.3	35.9	35.7	38.3	39.4
Speak excellent Portuguese	3.6	10.6	3.3	-	-	-	5.8
Speak excellent Tetum	14.3	26.0	18.2	35.0	-	10.5	23.9
Speak excellent Indonesian	10.7	15.4	10.7	15.4	9.1	26.7	16.0
Born in district	89.3	73.1	95.5	86.7	100.0	73.7	81.5
<b>Academic Qualifications</b>							
Primary	-	10.6	4.5	-	-	5.3	5.3
Pre-secondary	3.6	6.7	4.5	1.7	10.0	5.3	4.9
Secondary	14.3	11.5	27.3	35.0	10.0	10.5	18.9
Technical-vocational	46.4	50.0	45.5	35.0	40.0	68.4	46.5
University	-	1.9	4.5	5.0	-	-	2.5
Other	35.7	19.3	13.7	23.3	40.0	10.5	21.8
Years of teaching experience	12.3	14.6	9.7	9.0	11.00	8.68	11.9
Taught under Indonesians	64.3	76.0	81.8	65.0	90.0	63.2	72.0
Training attended (programs)	1.1	1.9	1.3	1.2	0.7	0.9	1.9
Received training in Portuguese	53.6	62.5	50.0	35.0	50.0	36.8	51.0
Would like to leave teaching	21.4	5.8	22.7	25.0	30.0	5.3	14.8
<b>Working Conditions</b>							
Type of contract: Permanent	60.7	95.2	77.3	95.0	70.0	84.2	87.7
One-year contract	1.0	14.3	4.5	1.7	-	10.5	3.7
Volunteer	1.9	10.7	13.6	-	10.0	5.3	4.1
Hours in school per week	33.2	30.5	30.2	29.4	33.2	31.3	30.4
Hours preparing lessons	2.9	2.8	2.9	2.8	2.8	2.2	2.7
Hours marking homework	2.2	2.2	2.2	2.2	2.2	2.2	2.2
Delay receiving salary	3.6	-	4.5	5.0	20.0	5.3	3.3
<b>Teaching Tools</b>							
Have: Portuguese guide	14.3	26.9	31.8	28.3	20.0	21.1	25.5
Mathematics guide	10.7	24.0	22.7	35.0	20.0	36.8	25.9
<b>Students Lack Access to:</b>							
Portuguese textbooks	64.3	65.4	54.5	65.0	80.0	84.2	66.3
Mathematics textbooks	75.0	57.7	40.9	55.0	60.0	73.7	58.8
<b>Teacher Absenteeism</b>							
Absent last week	10.7	8.7	9.1	16.7	30.0	5.3	11.5
Days absent	3.3	3.4	1.0	3.5	1.6	1.0	2.9
Has other paid job	3.6	5.8	9.1	5.0	10.0	15.8	6.6
Hours spent in other paid job	3.0	1.3	3.0	2.3	2.0	14.3	5.1
<b>Perceived Problems in Education</b>							
Poor infrastructure	32.1	32.7	36.3	51.6	50.0	52.6	39.9
Lack of water and sanitation	17.8	21.2	18.2	30.0	40.0	21.1	25.1

	Urban Private	Urban Public	Rural Private	Rural Public	Remote Private	Remote Public	Total
Lack of textbooks	60.7	46.1	50.0	65.0	80.0	68.4	56.0
Use of Portuguese	17.8	17.3	18.1	41.7	30.0	36.9	25.5
Inadequate teacher training	7.2	15.4	31.7	50.0	30.0	47.4	27.5
Confusing Ministry directions	-	16.3	31.8	26.7	40.0	26.3	20.2
Irrelevant curriculum	14.3	25.9	27.2	41.7	70.0	42.1	31.6
Lack of transport for teacher	21.4	26.9	50.0	51.6	70.0	63.2	39.1
Student absenteeism	-	6.7	36.4	58.3	-	26.3	9.5
Lack of parental involvement	3.6	12.5	4.5	13.4	-	36.9	10.7
Lack of discretionary resources	42.4	39.2	31.8	56.7	50.0	52.6	45.7
Lack of contact with district	17.9	25.9	22.7	35.0	50.0	26.4	28.0
<b>Reason for Low Achievement</b>							
Lack of family support	21.4	39.4	9.1	28.3	20.0	21.1	29.6
Inadequate materials	53.6	47.1	72.7	46.7	70.0	73.7	53.1
Language barrier	25.0	9.6	13.6	18.3	10.0	5.3	13.6
<b>Need More of the Following:</b>							
Mathematics text	67.9	64.4	54.5	58.3	40.0	78.9	62.6
Portuguese text	71.4	65.4	45.5	58.3	50.0	73.7	62.6
Bilingual text	75.0	73.1	54.5	58.3	60.0	78.9	67.9
Audiovisual materials	71.4	76.9	59.1	63.3	40.0	84.2	70.4
Distance learning materials	75.0	77.9	59.1	61.7	50.0	89.5	71.6
Reading materials for library	78.6	67.3	50.0	58.3	30.0	78.9	64.2
<b>Would Like Training on</b>							
Teaching mathematics	67.9	70.2	77.3	85.0	100.0	73.7	75.7
Teaching Portuguese	60.7	71.2	77.3	88.3	100.0	73.7	76.1
Teaching multi-grade settings	53.6	70.2	68.2	76.7	80.0	68.4	70.0
Evaluation of student achievement	28.6	51.9	40.9	76.7	60.0	63.2	55.6
Classroom management	35.7	52.9	36.4	75.0	60.0	57.9	55.6
Psychological development	60.7	56.7	36.4	85.0	60.0	68.4	63.4
<b>Principals' Characteristics</b>							
Age	42.8	39.2	37.0	39.2	40.0	40.2	40.8
Female	44.4	22.6	10.0	10.0	30.0	-	18.9
Academic qualifications: Primary	-	-	3.3	-	-	-	1.1
Pre-secondary	-	-	-	10.0	10.0	-	1.1
Secondary	-	9.7	3.3	-	10.0	-	6.3
Teacher's college	-	71.0	90.0	90.0	70.0	100.0	80.0
University degree	-	19.4	3.3	-	10.0	-	11.6
Teaching certificate	88.9	83.9	90.0	90.0	90.0	100.0	88.4
Teaching experience (years)	17.78	19.42	13.7	11.3	10.8	14.2	15.4
Experience as principal (years)	6.2	5.5	4.4	3.9	3.9	4.0	6.5

Source: PSAS 2003

### **3.4. SCHOOL CHARACTERISTICS**

The statistics on size of schools, student-teacher ratios, repetition and dropout rates, availability of resources, and frequency of inspection are presented in Table 3.4 by type of school.

#### *School Size and Student-Teacher Ratios*

Urban schools were clearly bigger than rural schools in size, with as many as 379 students on average. Urban private schools and rural public and private schools had 235–245 students on average. Even remote schools had an average of about 171–180 students. The average student-teacher ratio (STR) in Grade 3 ranged from a high of 43:1 in urban public schools to a low of 26:1 in remote private schools and 29:1 in remote public schools. The STR declined with each grade, probably due to the combined effect of a much larger birth cohort in recent years and a high dropout rate in the higher grades.

#### *Internal Efficiency*

Repetition and dropout rates were high, particularly in the first four grades. Private schools had lower repetition rates but much higher dropout rates than public schools. Rural schools had higher repetition and dropout rates than urban schools, but remote schools had lower dropout rates, as there were few alternative schools or activities to engage children in those areas.

#### *School Resources*

Schools had very few resources across the board, but rural schools were much more disadvantaged. None of the urban private or the remote public schools had a library; only 22 percent of urban public schools and 13 percent of rural public schools had a library. Electricity was a predominantly urban phenomenon, as 45 percent of urban schools had it, compared with only 3 percent of rural public schools, 10 percent of remote schools, and none of the rural or remote private schools. More private schools than public schools in both rural and urban areas, however, had such basic facilities as a teachers' room, a desk for every student, drinking water, and toilets.

#### *School Inspection*

School inspections were rarely carried out. About 40–50 percent of urban and rural public schools and only 25 percent of remote schools reported that superintendents had been occasionally visited for school inspection. Of the remote schools, 50 percent reported having had inspection visits quarterly. About 42 to 50 percent of private schools were visited only once during the school year.

**Table 0.4: School Characteristics by School Type, 2003**

(% unless otherwise indicated)

	Urban Private	Urban Public	Rural Private	Rural Public	Remote Private	Remote Public	Total
No. of schools in the sample	9	31	10	30	5	10	95
<b>Average school size</b> (no. of students)	245	379	244	236	180	171	273
Grade 1	71	98	71	73	51	58	78
Grade 2	48	77	59	51	39	37	58
Grade 3	40	67	44	43	26	34	48
Grade 4	32	48	28	30	22	17	34
Grade 5	30	43	21	21	24	14	28
Grade 6	25	43	21	18	17	12	26
<b>Students per Teacher (STR)</b>							
Grade 1	Na	na	na	na	na	na	na
Grade 2	43	43	40	41	39	33	41
Grade 3	34	36	32	38	26	29	35
Grade 4	22	27	21	28	22	15	24
Grade 5	22	28	21	19	24	13	22
Grade 6	20	29	18	16	17	12	20
<b>Repetition Rate</b>							
Grade 1	11.7	11.9	24.2	16.2	7.0	20.9	15.2
Grade 2	12.5	13.5	20.5	12.1	2.2	17.0	13.4
Grade 3	13.7	13.3	27.0	10.6	1.3	16.2	13.6
Grade 4	15.1	10.0	8.5	7.2	2.5	7.3	8.7
Grade 5	12.3	7.0	2.4	7.2	1.0	3.4	6.4
Grade 6	4.5	6.0	2.8	3.2	11.8	10.3	5.5
<b>Dropout Rate</b>							
Grade 1	27.0	8.4	23.5	13.9	13.0	5.0	12.4
Grade 2	21.3	9.5	24.1	9.4	14.8	1.5	9.6
Grade 3	22.6	10.8	21.2	9.2	13.5	0.7	7.7
Grade 4	22.3	10.3	27.2	10.2	19.2	2.3	9.6
Grade 5	17.5	11.4	30.0	14.0	18.4	-	8.9
Grade 6	14.0	8.6	22.9	15.1	41.8	4.2	12.9
<b>School Resources</b>							
Has: Library	-	22.2	10.0	13.3	20.0	-	8.4
Teachers' room	44.4	25.8	60.0	30.0	40.0	40.0	29.5
Drinking water	88.9	71.0	70.0	56.7	20.0	80.0	66.3
Electricity	44.4	45.2	-	3.3	-	10.0	21.1
Toilets for students	88.9	67.7	80.0	83.3	60.0	90.0	77.9
Desk for each student	88.9	64.5	70.0	63.3	80.0	90.0	70.5
Government subsidy	55.6	48.4	80.0	23.3	40.0	20.0	41.1
Amount of subsidy (\$)	29.0	54.8	28.5	10.0	14.0	-	7.5
<b>School Supervision</b>							
Frequency of visit: Monthly or more	14.3	12.0	16.7	15.0	33.3	-	13.8
Quarterly	28.6	16.0	-	10.0	-	50.0	15.4
Twice a year	-	12.0	-	-	-	-	4.6
Annually	42.9	16.0	50.0	25.0	-	25.0	24.6
Occasionally	14.3	44.0	33.3	50.0	66.7	25.0	41.5
Superintendent or district officer:							
Observed class	44.4	61.3	50.0	50.0	60.0	30.0	51.6
Checked school records	44.4	54.8	60.0	50.0	20.0	20.0	47.4

Source: PSAS 2003. \*Only a very small sample of schools answered the questions on school finance. The figures reported from the remote private schools are not credible

### **3.5. THE EFFECTS OF STUDENT AND SCHOOL CHARACTERISTICS ON STUDENT ACHIEVEMENT**

Do students with the same characteristics attending different schools have different outcomes?<sup>29</sup> If so, what are the policy implications? In order to address these questions, it is important to move beyond comparing unadjusted mean performance and examine the marginal effects of student and school factors simultaneously. This section presents model-based results. Since the data present a clustered structure, with students nested within schools, we applied the hierarchical linear modeling technique to address these two questions. We analyzed the effects of a number of predictors on learning outcomes, controlling for students' inherent characteristics (such as gender, over-age, home resources, whether their father read a newspaper, and their mother tongue). Additional student predictors, such as school readiness (proxied by pre-school attendance), grade level (third or fourth), number of days absent, whether a student has books in the home, teachers' rating of student ability, grade repetition, teacher absenteeism, and language of instruction. Several models were tested, but the final one presented in Table 3.5 includes a reduced set of predictors and excludes those that did not achieve statistical significance or substantively changed the interpretations of the results.

An unconditional model (without predictors) was first used to partition the variance across the levels in the model. Differences between students (within schools) accounted for 67 percent of the variance in test scores. Differences between schools accounted for the remaining 33 percent of variance in test scores. It is common to use the proportion of variance that lies between schools as a rough indicator of how unequal schools are in a school system. Between-school variance of about 30 percent and above is considered to indicate considerable inequalities between schools. In highly unequal systems, between-school differences could account for as much as 60 percent of the variance, such as that in Guatemala in 2002 (World Bank 2003). In the Nordic countries the same indicator is under 10 percent (Schleicher and Yip 1994). A series of conditional models was attempted next, to explore the influences of student- and school-level predictors on test scores. The findings are summarized below.

#### *Linear Models of Student Test Scores*

*Student characteristics and family background.* Students who spoke Makasae and other indigenous languages performed better than students who spoke Tetum and much

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<sup>29</sup>Using the hierarchical linear modeling technique, a number of models were tested to explore the effects on student achievement of various combinations of variables at the student and school levels. The student level model examined the extent to which student achievement was influenced by the grade attended, gender, mother tongue and fathers' education, over-age status, repetition, homework, having help with homework, having textbooks, and helping families. The school-level model examined the extent to which the scores were influenced by the following school factors: percentage of boys, multi-grade, public, urban, percentage of Tetum-speaking teachers, percentage of female teachers, percentage of teachers absent, average years of teaching experience, percentage of teachers with another job, percentage of teachers in the school who would like to leave teaching, use of replacement teachers, student-teacher ratio in Grade 4, dropout rate in Grade 3, and the percentage of students in the class who had attended kindergarten.

better than students who were self-reported speakers of Portuguese.<sup>30</sup> Students who were over-aged for grade in school, whose fathers read newspapers, scored higher. However, home resources aggregated to the school level had no effects on achievement.

*Schooling experience and opportunity to learn.* The biggest negative effect was multi-grade schooling. As mentioned before, dividing the school day in half drastically reduced students' opportunity to learn, and reduced the test scores by an average of 6.23 percentage points. Another major predictor was the average teacher-rated ability of students, which had a positive effect (3.5 percentage points). Students whose teachers were absent the previous week scored on average one point lower, a difference that was not statistically significant effect at the 0.05 p-value level, but was significant at 0.1 level. Controlling for the students' inherent characteristics and other policy variables such as whether students had textbooks, grade repetition, and the percentage of students having attended pre-school had no statistical significance.

*Additional year of schooling.* An additional year of schooling had the largest positive effect, as fourth graders scored 8.84 points higher on average than third graders. This higher test score was reduced, however, in schools that had higher student-teacher ratios—a cross-level interaction that should be investigated further, as it suggests bigger classes may provide reduced opportunities to learn. The changes in STR between the third and fourth grades and the mean teacher rating of student ability had no effect on the increase in test scores.

*Language of instruction.* This variable examined whether students were taught in Portuguese alone, in Tetum alone, or in a combination of Portuguese, Tetum, and other indigenous languages. The comparison was with the combined use of Portuguese and Tetum. Controlling for other variables, no statistically significant effects were found regarding any combination of languages of instruction, in comparison with a mixture of Portuguese and Tetum in the classroom.

*Variance in test scores explained.*<sup>31</sup> The unconditional variation in student test scores indicated that 67 percent of the variation is attributable to students within schools, while 33 percent is attributable to variation between schools. The unexplained variance could be associated with factors that have not been captured by the survey, such as innate ability and nutritional and health status of students. The latter could be extremely strong predictors of learning outcomes, given that many students were suffering from malnourishment and poor health. Future surveys should try to measure this.

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<sup>30</sup>The group of “Portuguese speakers” had low home resources. However, even the best performing group, the Makasae, had relatively limited home resources. Home resources do not correlate or interact with mother tongue.

<sup>31</sup>Estimated with the unconditional HLM model as the basis. HLM does not generate R-squared statistics. However, the variance explained is based on the reduction in the unconditional variance (at each level separately) due to variables added to the model.

**Table 0.5: Fixed Effects of Student and School Characteristics on Test Scores**

	Coefficients	Standard Errors	p-value	Effects Size
<b>Intercept</b> (mean scores)	26.72	1.66	0.000	
<b>Student Characteristics</b>				
Mother tongue (compared with Tetum)				
Portuguese	-4.10	1.36	0.003	0.242
Mambae	-0.82	1.52	0.588	0.048
Makasae	3.63	1.17	0.002	0.214
Other	3.16	0.99	0.002	0.186
<b>Family Background</b>				
% of parents read newspaper in school	1.52	0.65	0.019	0.09
Home resources aggregated to school level	0.25	0.18	0.177	0.014
<b>Schooling Experience</b> (and opportunity to learn)				
Multi-grade	-6.23	1.95	0.002	0.361
Attending pre-school:	0.22	0.91	0.808	0.013
School days absent	1.71	4.43	0.699	0.147
% attended pre-school	1.92	4.83	0.690	0.123
Student has books	0.16	0.55	0.766	0.009
Student repeated a grade	-0.38	0.55	0.485	0.022
Teacher was absent last week	-1.08	0.08	0.080	0.230
Teacher rating of student ability	3.50	0.45	0.000	0.063
<b>Additional Year of Schooling</b>				
(by enrolling in Grade 4)	8.84	0.9	0.000	0.523
<b>School-Level Predictors</b>				
% of boys in school	2.23	0.54	0.000	0.131
% of over-age students for grade at school level	1.19	0.47	0.012	0.070
School mean of teacher rating of student ability	2.84	2.12	0.182	0.128
Pupil-teacher ratio in Grade 3	-0.11	0.05	0.016	0.398
Changes in STR between Grades 3 and 4	-2.41	2.29	0.293	0.128
<b>Language of Instruction</b>				
(compared with mixed Portuguese and Tetum)				
Portuguese	1.15	1.66	0.487	0.095
Tetum	1.62	2.04	0.426	0.043
Portuguese, Tetum, other	0.73	0.69	0.288	0.131

Source: PSAS 2003

*Logistic Models of Student Status as High Achievers*

Given that the overall performance of students was quite low, it is possible that due to the clustering of scores at the low end of the distribution, it is difficult to parse out systematic effects. The question arises as to whether the determinants of higher performance may be different from those of average performance. We focused on factors that potentially influence the likelihood that students are classified as top performers, defined as those who scored 50 percent or above correct on the test. From a statistical point of view, the



randomness observed with the lower performers (percentage of correct answers of about 25 percent in multiple choice items with four options) could be reduced by examining the factors associated with higher performance. Fifty percent correct is more than one standard deviation above the average, and roughly 15 percent of students who took the test belonged to this category. We coded these high performers as 1 and the rest as zero in order to make this comparison. We then used the same predictors displayed in Table 14 on the new dichotomous outcome within a logistic multilevel model. Table 15 presents the findings that are generally consistent with the model for the continuous outcome reported in Table 14. There are, however, several differences that warrant comment:

- Having attended preschool increased the probability of scoring above 50 percent correct by 3.1 percentage points. This translated into a 29.6 percent relative increase compared to the base probability of 12.2 percent of scoring above 50 percent correct for those students who did not attend pre-school.
- However, the advantage for students who attended pre-school is reduced if they attended classrooms that had higher than average absenteeism. In statistical terms, students in classrooms where mean absenteeism was one standard deviation above the average were approximately 1.4 percent less likely to score above 50 percent, compared to students in classrooms where absenteeism was one standard deviation below average.
- Fourth graders had a higher probability than third graders of scoring 50 percent correct or more. The probability that a fourth grader would be in the high scoring group is .237, which translates to a 123.8 percent advantage compared to third graders. In addition, this increase was larger in schools where the average ability of the students (as perceived by their teachers) was higher. It should be noted, however, that given the high dropout rates, the selection is likely to be an important confounding factor. Therefore, the increase in test scores should be taken as the upper bound of what one more year of schooling could achieve, without controlling for selection.
- The drop in the pupil-teacher ratio between Grades 3 and 4 had a negative effect—the steeper the drop, the lower the probability of scoring 50 percent. In many contexts a lower student-teacher ratio is associated with higher test scores, but the PSAS found that students in Grade 4 with a low STR due to dropout tended to score poorly. This would seem to indicate that the factors leading to high dropout rates are also implicated in poor academic performance.
- Grade repetition reduced the probability of higher performance (by 1.1 percent), in comparison with non-repeaters.
- The language of instruction demonstrated the most interesting effect in this model. Controlling for relevant student background variables, students attending classes in which the language of instruction was purely Tetum would have a 9 percent higher probability of being a high performer, which is equivalent to an increase of 0.96 of a standard deviation, in comparison to those who reported a mixture of Portuguese and Tetum in the classroom. Portuguese-only instruction and a mixture of Portuguese, Tetum, and other languages had no statistically significant effects.

**Table 3.6: Estimated Probabilities Associated with 50 Percent Correct or Higher, 2003**

	<b>Estimated Log Odds</b>	<b>Se</b>	<b>p- value</b>	<b>Estimated Probability (%)</b>	<b>Difference (%)</b>	<b>Relative Effect (%)</b>
<b>Mean</b>	-1.975	0.108	0.00	12.2		
<b>Student Characteristics</b>						
Boys' advantage over girls	0.272	0.075	0.00	15.4	3.2	31.3
Over-age for grade	0.016	0.071	0.83	12.4	0.2	1.6
Mother tongue (compared with Tetum):						
Portuguese	0.098	0.176	0.58	13.3	1.1	10.3
Mambae	-0.390	0.168	0.02	8.6	-3.6	-32.3
Makasae	0.608	0.144	0.00	20.3	8.1	83.7
Other	0.287	0.129	0.03	15.6	3.4	33.2
Father read newspaper	0.092	0.097	0.35	13.2	1.0	9.6
Home resources	-0.005	0.026	0.85	12.1	-0.1	-0.5
<b>Schooling Experience</b>						
Effect of attending pre-school:	0.259	0.113	0.02	15.2	3.1	29.6
School mean days absent (1)	-0.482	0.214	0.03	10.8	-1.4	-38.2
Attended pre-school	0.372	0.249	0.56	18.7	6.5	45.1
Multi-grade	-0.456	0.197	0.02	8.1	4.1	-36.6
Student has books	0.094	0.079	0.23	13.2	1.0	9.9
Student repeated a grade	-0.110	0.067	0.07	11.1	-1.1	-10.4
Teacher was absent last week	-0.131	0.079	0.10	10.9	-1.3	-12.3
Teacher rating of student ability	0.323	0.073	0.00	16.1	3.9	38.1
<b>Additional Year of Schooling</b>						
Grade 4	0.806	0.099	0.00	23.7	11.5	123.8
School mean of teacher rating of student ability (2)	0.685	0.230	0.00	32.8	20.6	98.4
Pupil-teacher ratio in Grade 3	-0.020	0.005	0.00	23.5	11.3	-2.0
Changes in STR between Grades 3 and 4	-0.597	-1.690	0.09	17.3	5.0	-45.0
<b>Language of Instruction</b> (compared with mixed Portuguese and Tetum)						
Portuguese	0.331	0.259	0.20	16.2	4.0	39.2
Tetum	0.671	0.228	0.00	21.3	9.2	95.6
Portuguese, Tetum, other (3)	0.019	0.097	0.84	12.4	0.2	1.9

Source: PSAS 2003

Notes:

- (1) The probability presented is the effect of a student who is in a classroom that is one standard deviation above average in student absenteeism against a student who is in a classroom that is one standard deviation below average in student absenteeism.
- (2) The probability presented is the effect of a student who is in a classroom that is one standard deviation above average in mean teacher rating of ability against a student who is in a classroom that is one standard deviation below average in mean teacher rating of ability.
- (3) The comparison group was taught in a mixture of Portuguese and Tetum as the languages of instruction.

### **3.7. POLICY IMPLICATIONS**

The PSAS was the first survey of its kind in Timor-Leste and the results should be considered as suggestive only. The findings of the survey do suggest some serious issues about the quality of education that warrant urgent attention from policymakers.

First of all, the fact that Grade 3 students scored so low on average that their answers approached the level of randomness should be cause for concern and a subject for further investigation. Although Ministry officials considered the test to have been set at the right level for Grade 3 students, it will have to be recalibrated after the development of the national curriculum to ensure that future tests are pitched at the right level to the students. Item response modeling should be used to see whether there are any systematic patterns of answers from certain groups of students. This will help policymakers and curriculum developers understand what misconceptions students have about mathematics and the extent to which their lack of proficiency in Portuguese has undermined their cognitive development in this subject. This information can then be used to correct teachers' guides and in-service training courses.

The language of instruction has clearly emerged as a major issue. In the typical Timorese classroom, there is no official curriculum or syllabus and students do not have any textbooks. Most of the teaching/learning process involves students copying notes that have been written on the blackboard by the teacher. Given this situation, a well-organized bilingual education program will be essential for improving student achievement.

That pre-school attendance increased the probability of scoring above 50 percent suggests that investing in early childhood education could have a positive effect on children's readiness for school and their subsequent achievement. This finding is consistent with international experience on early childhood education.

However, the fact that the advantage of early childhood education was eroded by student absenteeism also highlights the importance of using social mobilization and media campaigns to encourage regular attendance in school.

The fact that many of the usually reliable predictors (such as textbooks and learning materials and teachers' qualifications) had no statistically significant effects on outcomes should not be taken to indicate that these indicators are not important. It only means that either these predictors were so evenly distributed across the country that they did not explain the variance in outcomes or that they were of such low quality or little relevance that they had no impact.

Another interesting aspect of the PSAS's results is teachers' ratings of their students' ability. These ratings had a very low correlation with the test scores of the full student sample (0.2) and a slightly higher but still low correlation to the test scores of the highest-performing students (0.37). However, when teachers' ratings are aggregated to the school level, these ratings become a good predictor. This indicates that teachers have some general notion of who in their classes are good students, but the teachers do not have the tools to measure achievement objectively and accurately, particularly if they have never tested their students on subject matter in Portuguese. This indicates the need to start a student assessment system that can provide valid and reliable measures of achievement and inform teaching practice as well as in-service training.

### **3.8. SUMMARY**

The strategy for improving quality must reflect the need for quality-enhancing inputs and pedagogical practices. This means developing a relevant curriculum that addresses the needs of the country, effective strategies to facilitate the transition into the new languages of instruction (from the mother tongue to the official languages of Portuguese and Tetum), providing learning materials and teaching guides, devising a system of student assessment, and providing continuous in-service training for teachers. However, these actions can only be realized if educational institutions and budgets provide sustained support.



## **THE CHALLENGES OF INSTITUTIONAL DEVELOPMENT**

To move the sector forward strategically, it is necessary to develop: (i) a strong capacity for management and administration at the program and institutional levels to bring the priority issues together and to address them successfully; (ii) a clear and shared understanding of the main directions for the sector, set out concisely in documents available to all concerned stakeholders in the sector; and (iii) predictable resources to enable the sector to develop towards its priority goals in a sustainable manner. This and the following chapters discuss how these issues can be addressed.

### **4.1. MANAGEMENT AT THE CENTRAL LEVEL**

Building internal capacity to identify, prepare, and implement responsive programs is absolutely essential for expanding and improving service delivery. However, due to a general lack of experienced educational managers, external advisors have been heavily involved in developing the means for service delivery. Weaknesses have been evident in the following areas: organizational development, core educational planning and support services, management information, budgeting, and budget execution and control. Under-developing one area could adversely affect how the others function.

#### *Organizational Development*

Up to the end of 2003, many of the elementary organizational aspects were lacking in the sector. The organizational structure of the Ministry was not finalized, which meant that there were uncertainties about the central government's functions and the relationships between them. Several key positions, for example, the Directors of Planning and of Finance and Administration, were not filled, particularly those most responsible for cross-sectoral and strategic overviews. The finance section had some staff to carry out day-to-day activities but had no capacity for planning or control. It was unclear who had the responsibility for reporting regularly to senior management in the Ministry on the various ongoing programs, for identifying difficulties in the system, or for encouraging program directors to meet the planned targets.

#### *Educational Planning and Support Services*

The core educational planning and support services include the following areas: curriculum development, the development and provision of instructional materials, and student assessment. The primary school curriculum is based on the 1994 Indonesian curriculum updated by the ETTA. Syllabuses have yet to be developed for new subjects, such as Tetum and Portuguese. The preparation of the new syllabuses for all the subject areas, including citizenship and social science, was under way and scheduled for completion by the end of 2003. The existing curriculum has yet to be fully integrated into textbook content, teacher training, and student assessment or to be developed in detail in the teachers' guides to textbooks. In addition, the number of subjects and their level of difficulty have been excessive for teachers and students to handle effectively. Although the inclusion of some local content is allowed under the curriculum, making for a certain

amount of flexibility in instruction in different regions, this feature is a further load onto an already overloaded curriculum.<sup>32</sup>

Some pressing issues related to the curriculum include: (i) the need to evaluate the relevance and effectiveness of the existing curriculum; (ii) the need for teachers, teacher educators, parents, and students to feel that the content and approach of the teaching/learning materials are properly suitable for the Timor-Leste context; (iii) the desirability of moving slowly away from the national primary examination (EBTANAS) and toward continuous assessment of students in the classroom; and (iv) the need to build up the education sector's capacity to manage curriculum development in the future.

Because developing a new curriculum must necessarily precede the development of other educational services such as the production of new textbooks and the development of measures of student assessment, the latter activities have been delayed, which means that at the present time students have no books, and teachers have no teachers' guides. However, to avoid putting every other educational activity on hold, some intermediate support must be provided to students and teachers, for example, by producing and distributing unbound basic materials and worksheets. The PSAS 2003 made a start on the student assessment process by collecting baseline survey information on students' academic achievement. The Ministry of Education should ensure that curriculum developers are fully briefed on the findings of the PSAS so that they can make any necessary adjustments to the new curriculum. Not only is there a need to build capacity in all of these areas, but it is also critical to build systematic professional links between curriculum developers, teachers, teacher educators, assessment specialists, and universities. While all of these stakeholder groups are represented on the subject syllabus committees, it would be advisable to create more permanent bodies on various specialized areas of education where these groups could continue to meet to share information and concerns.

### *Planning and Budgeting*

Due to the lack of any coherent definition of the Ministry's major functions or of any clear statements on policies, there was little to guide the development of an annual plan and budget for 2003. The NDP's eight priority programs<sup>33</sup> did not cover the mechanics of

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<sup>32</sup>Donors have supported a range of curriculum development activities, including: the procurement of primary school textbooks in Portuguese (through the multi-donor TFET project FSQP and the Government of Portugal); the development of a syllabus and books for primary school social science and mathematics, of posters for primary science, and of a syllabus for primary physical exercise and health (UNICEF); the production of teachers' manuals for primary mathematics and science (AusAID); and the development of a syllabus and a teachers' manual for kindergarten (Plan International). However, these activities are piecemeal and short-term. The government supports the development of a framework of curriculum priorities and processes to which donors can contribute. The Education Sector Joint Donors Mission of October 2002 recommended that resources should be made available under the policy development component of the FSQP to support the review and development of the curriculum. The Trust Fund for Timor-Leste (TFET) has responded by allocating to FSQP a supplemental grant of \$0.7million for curriculum development.

<sup>33</sup>These programs are: (i) to expand access and improve internal efficiency; (ii) to improve the quality of education; (iii) to build internal management capacity and improve service delivery; (iv) to promote non-formal education and adult literacy; (v) to develop tertiary education; (vi) to promote Timorese culture and the arts; (vii) to promote youth welfare; and (viii) to promote

service delivery for the pre-primary, primary, junior and senior secondary education, and technical and vocational education although they could be inferred. The Ministry's budget was organized into 12 programs, reflecting how service delivery was organized,<sup>34</sup> but there was a mismatch between the budget and programs, although some overlapping occurred in the areas of culture and sports. This has compounded the difficulty that program directors have faced in trying to plan and cost a sequence of activities in their work plans.

Up to the end of 2003, none of the NDP's costs were allocated to the most appropriate budget heading. For example, the salaries of program staff, their training and travel costs, and all operational costs were allocated under administration, instead of to their respective programs.<sup>35</sup> District administration costs were included with those of the central administration in the budget structure. Large sums for expenditure at school level were provided in several programs for such things as maintenance and instructional materials without being disaggregated, so it was not clear what provision had been made for any district or school. Program directors, who were responsible for prioritizing, sequencing, and costing the programs, had no responsibility over the management of their budgets. Furthermore, key central functions, such as curriculum development, planning, and finance, did not appear in the budget structure at all, so managers for these functions had no idea of the extent of their budgets. A subprogram structure was needed to hold managers of central or cross-sectoral functions accountable for resources and outcomes. A substantial proportion of the budget was allocated to only a few programs; the four largest goods and services programs had been given two-thirds of the total goods and services budget, while the two largest capital programs had three-fifths of the total capital budget.

There was no consultation with key stakeholders in the planning and budget processes. Even private providers were not consulted, although they delivered significant services at every level. For example, any decisions by the Catholic Church to open, close, or expand their schools would have a significant effect on demand for places in government schools, just as any expansion or contraction by private providers in the provision of technical-vocational education and training or tertiary courses could affect places in these sectors. Nevertheless, the planning and budgeting processes did not take this into account.

### *Management Information System*

These problems with the planning and budgeting might have arisen in part due to the lack of a functioning management information system (MIS) in the MECYS. Even basic data

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physical education. The first three are broad strategic programs. The remaining five are more narrowly focused on specific interventions within the ministry's areas of responsibility in education, culture, and youth welfare and sports.

<sup>34</sup>These are: early childhood education, primary education, junior secondary education, senior secondary education, technical-vocational education and training, non-formal education, university education, culture, administration and management, youth welfare, physical education and sports, and an institute for continuing education. One is primarily administrative, seven refer to specific levels of education (plus one that refers to a specific institution for delivering educational services), three refer to other responsibilities of the Ministry.

<sup>35</sup>Some (such as workshop and training costs but not salary costs) were reallocated to individual programs during the budget review at midterm of the fiscal year 2002/3.



were not readily available or were stored in the Ministry only in electronic forms. Computer viruses were rampant, causing regular crashes. The Ministry did possess hard copies of school-level data that had been sent in by the districts, but this was not enough to constitute an MIS. Also, these data were not consistent in terms of their level of disaggregation. For example, the data for junior secondary schools for 2001/2 were not classified by gender, while those for 2002/3 were.<sup>36</sup> For senior secondary schools, the reverse was the case. The data for primary schools for 2001/2 simply gave totals by class without any gender distinction, while the data for 2002/3 did not include all districts. The initial collection of the school statistics for the 2002/3 school year had not started as of March 2003, but teacher data were ready by November 2002. The lack of reliable, accurate, and timely enrollment statistics meant that budget planning for 2003/4 could not be done on the basis of the latest information.

Even when data did exist, they were not available in a form that could be easily used in decision-making. A school statistical system was being developed for the Ministry with funding from UNICEF. However, this is likely to remain a limited management system because personnel or financial records will not be included, except in an aggregated way, as the system has yet to be programmed for disaggregated data entry. However, school-level data for the school year 2004 are being collected in a timely manner.

With regard to financial information, the Ministry has yet to develop any computerized system for recording its financial plans, commitments, or transactions. It depends entirely on outputs from the Ministry of Finance and apparently does not access these frequently or regularly. Therefore, there is no provision for the MECYS management for information on financial issues, apart from filed copies of cash payment vouchers submitted to the Ministry of Finance. It is still unclear whether one will be developed soon.

#### *Budget Execution and Financial Management*

The Annual Action Plan and the Quarterly Reporting Matrix should flow from the main matrix of Ministry activities for the medium term agreed by the government and the World Bank for the latter's provision of support for the national budget from international donors. The MECYS should then develop a system to enable national programs or district units to report on their expenditures against either the NDP's priorities or the budget programs. One way to do this would be to designate the activities under each NDP priority program as sub-programs even if this is only at the internal Ministry level, to facilitate the compilation of costs by activity. There is certainly an urgent need to set up some computerized (or even manual) system that would make it easier to plan and execute budgets.

There have been grave problems with budget execution. Only 30 percent of the 2002/2003 budget allocation had been spent after the first seven months of that fiscal year, mostly on wages and salaries. For the category of goods and services, only 8 percent had been spent. For capital expenditure, it was less than 1 per cent (see Annex 5.1). This situation was largely due to a lack of capacity at the central level. Much of the difficulties arose because program directors did not understand the required

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<sup>36</sup>This appears to be a continuation of the practice under Indonesian rule. To date, Indonesian school statistics consolidate gender statistics at the district level so they are not available or disaggregated at the national or regional levels. The Timor-Leste districts do not submit gender-disaggregated data to the central government even though they collect the data in this form because this was how the data were reported under the Indonesian system.

procedures for accessing budgetary resources and because of a lack of overall direction by senior MECYS management.

The existence of these problems points up the strong need to develop the capacity of the middle management. Continuous professional development is needed in specific areas of management, such as education planning, administration and policy, MIS, organizational development, budgeting, forecasting and control, and overall financial management. This could be done by developing short, in-country courses focusing on specific existing issues instead of on broad theories, by sending staff on external training courses, or even by seconding them to Ministries of Education in other countries to learn ways of carrying out regular functions.

## **4.2. MANAGEMENT AT THE DISTRICT LEVEL**

The district education offices have been established and staffed, and some of them are already operational. An independent panel appointed the superintendent and deputy superintendent of each of the 13 district education offices. Each district office has 10 staff positions, except Dili, which has 15. These staff positions consist of a superintendent, a deputy superintendent, a secretary, an education specialist, a cultural specialist, a sports specialist, a goods and services procurement officer, a materials and supplies logistics officer, a personnel officer, and a technical, development, and examination officer.

In 2003, each district office was equipped with one desktop computer, which did not always work, and little other office equipment. The district office was given a monthly education fund of \$550 that was earmarked to be spent as follows: \$100 on training or workshops, \$100 for operational materials and supplies, \$100 for the maintenance of equipment and buildings, \$100 for other operational expenses, \$100 for local travel, and \$50 for miscellaneous items. All goods, services, and logistical support came from the MECYS in proportion to the number of students in each district because of the economies of scale that could be realized by the MECYS buying in bulk for the whole education system. However, there is a need to take some administration and supervision functions away from the central Ministry and assign them to districts, which are closer to the point of service delivery.

Do the staff of the district offices have the capacity to carry out their functions? The 2003 PSAS survey yielded data on the characteristics of district superintendents and deputy superintendents (see Table 4.1).

**Table 0.1: Characteristics of the District Offices, 2003**

	<b>No.</b>	<b>%</b>	<b>Total</b>
Superintendents	13		
Deputy Superintendents	13		
Female		11.5	
Mean age (years):	44.2		
30–39		23	
40–49		58	
50 and over		19	100
Born in the same district		77	
Live near office		50	
Live with own families		85	
Highest educational attainment: University		58	
Technical-vocational		23	
Secondary		19	100
Have studied abroad		27	
Have studied in Indonesia		23	
Subject specialty: Mathematics and science		8	
Arts and humanities		25	
Social science and management		67	100
Languages spoken: Tetum		100	
Bahasa Indonesia		27	
Portuguese		27	
Other		46	200
Proficient in: Tetum		46	
Bahasa Indonesia		31	
Portuguese		15	
Other		8	100
Previous position: Teacher		32	
District education office		32	
Principal or head teacher		28	
Ministry of Education		8	100
Worked in the district office in Indonesian times		85	
Path to this position: By promotion within this office		90	
By promotion or transfer from other office		10	100
Years of experience as administrator	14		
Years as administrator in this district	7		
Observe teaching during school visits: Always		34	
Sometimes		62	
Never		4	100
Provide advice to improve teaching during school visits:			
Always		58	
Sometimes		38	
Never		4	100
Provide advice on curriculum during school visits:			
Always		42	
Sometimes		46	
Never		12	100
Meet with parents during school visits: Always		19	
Sometimes		77	

	No.	%	Total
Never		4	100
Main reason for school visits: Inspect teaching, learning		42	
Teacher issues		38	
Meet parents		8	
Infrastructure		8	
Textbook delivery		4	100
Transport for school visits:			
District office's transport		67	
Own motorcycle or vehicle		29	
Friend's motorcycle or vehicle		4	100
School visits made in the last few months:			
Over 10 times		19	
6–10 times		4	
1–5 times		69	
None		8	100
Distance of furthest school visited last month:			
> 2 hours by car/motorcycle		42	
1-2 hours by car/motorcycle		35	
< 1 hour by car/motorcycle		23	100
Visit to Ministry in Dili last month: none		12	
1–5 times		76	
6–10 times		4	
More than 10 times		8	100
Transport for visit to Ministry in Dili last month:			
District office's vehicle		60	
Bus		25	
Own motorcycle or vehicle		10	
Friend's motorcycle or vehicle		5	100
Visited other districts to exchange experiences		31	
Visits per year to exchange experiences: once		45	
2 times		22	
3 times		22	
4 times		11	100
What is the most serious problem in education? (multiple responses)			
Irrelevant curriculum		19	
Lack of transport		19	
Inadequate teacher preparation		15	
Infrastructure		15	
Lack of water and sanitation		12	
Lack of discretionary resources		12	
Lack of textbooks		12	
Confusing decisions from Ministry		8	
Use of Portuguese		8	
Teacher absenteeism		8	
Student absenteeism		4	

Source: PSAS 2003

The average age of a district officer was 44, and only 12 percent were females. About 77 percent of them were born in the district where they are now serving. About 58 percent of them had had a university education, 23 percent had had a technical and vocational education, and 19 percent had had a secondary education. About 27 percent had studied abroad, 23 percent of them did so in Indonesia. Given the high percentage of university graduates among the district officers and their exposure to the world outside Timor-Leste, the merit-based selection criteria seem to have been effective.

All district officers speak Tetum, 27 percent reported that they spoke Portuguese, and 27 percent that they spoke Bahasa Indonesia.<sup>37</sup> About 50 percent of them spoke another indigenous language, but a lower percentage of district officers were fluent in these languages: 15 percent in Portuguese, 46 percent in Tetum, 21 percent in Bahasa Indonesia.

Only 8 percent of district officers had worked in the Ministry of Education during Indonesian times. However, 32 percent of them had worked in a district office, 28 percent had been principals or head teachers, and 32 percent had been teachers. About 90 percent came to their current positions by being promoted, and the rest by being transferred. The social stability restored by the new government is also apparent from the background of these new district officers—85 percent had worked in the same district during the Indonesian time. The average district officer has 14 years of experience as an administrator and seven years experience of working in his or her particular district.

Their views about what constitutes the most serious problems in education were not consistent with those of the teachers. Only 4 percent of them considered student absenteeism and only 8 percent considered teacher absenteeism to be a serious problem. None thought that the lack of parental involvement affected children's education. They tended to be more concerned with the curriculum and the lack of transport (19 percent in both cases) than with inadequate teacher education or infrastructure problems (15 percent in both cases). Only 12 percent considered the lack of textbooks to be a serious problem, which is completely contrary to the views expressed by teachers and ignores reports that the lack of textbooks has been so pervasive that it has in fact impeded the teaching and learning process. Although 39 percent of the district officers claimed that the purpose of their visits to schools was to address teachers' issues and 42 percent of them claimed that the purpose was to inspect teaching and learning, they failed to recognize that the non-availability of textbooks and student and teacher absenteeism are large contributing factors in the low achievement of students. This casts doubt on the ability of the district offices to understand and address the issues related to repetition, dropout, and student achievement.

More district superintendents and their deputies (76 percent) traveled to Dili for meetings in the Ministry in the previous month than visited schools (69 percent). Because of the poor condition of most roads, it took them at least half a day or more to travel from their districts to Dili. Factoring in the time taken up by meetings, these trips might easily take officials out of the district office for two or three days. The need for the superintendent to go to Dili was exacerbated by the lack of reliable telecommunications. All written directives are delivered by hand via a courier system, which means that there is little scope for receiving immediate feedback and response. Thus, district officials are not able to use their time in the most efficient way to maximize their impact on their districts. The

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<sup>37</sup> Since many had studied in Indonesia, there could be a misunderstanding about the intent of this question. All district officers speak Indonesian but no longer on a daily basis.

lack of telecommunications also means that there is very little sharing of information or experiences among the district officials themselves.

### **4.3. MANAGEMENT AT THE SCHOOL LEVEL**

The 2003 PSAS also asked school principals about the pattern of parental participation in school affairs and about how decisions are made within their schools (see Table 4.2).

#### *Parents' Participation*

About 80 percent of urban public schools, 53 percent of rural public schools, and 100 percent of remote public schools had parent-teacher associations (PTAs). A high percentage of rural and remote private schools also had PTAs. However, none of these PTAs appear to be very active, as only 40 to 60 percent met quarterly. When they met, the most common topics for discussion were expenses, the budget, fundraising, facilities, and discipline. A lower percentage of PTAs discussed student performance, and a much lower percentage discussed instructional methods.

#### *School-level Finance*

Unfortunately, most schools were not able to provide the PSAS with information on how much money they raised either through tuition fees, parents' contributions, or other sources such as business and external donors. (The information provided by two remote private schools was not credible.) Nevertheless, anecdotal evidence suggests that schools have gone back to the former practice of raising funds by charging fees that are higher than the low monthly limits set by the MECYS in 2002. The issue to watch in the future is whether this practice will result in discouraging poor children from attending school.<sup>38</sup>

#### *School Autonomy*

Private schools in urban, rural, and remote locations had far more decision-making power than public schools over dismissing teachers, setting salaries, selecting teachers for training, choosing teaching methods, developing teaching materials, adapting the curriculum to local conditions, determining the working hours of teachers, setting standards for students, setting school fees, adding new grades to the school, and scheduling meetings with their community.

Rural schools, irrespective of whether they were private or public, had more autonomy than urban schools in determining the working hours of teachers, determining class sizes, setting standards for students, evaluating students, closing schools, deciding which students were exempt from fees, deciding to construct school facilities, maintaining schools, and how to spend school funds. Such authority should be balanced with accountability so that it is exercised judiciously and that student welfare and standards are maintained.

In summary, to manage their schools well, principals or head teachers need to develop the skills for reaching out to the community, involving the parents in their schools' activities,

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<sup>38</sup> A memorandum went out from the Director-General of MEYCS in 2002 setting out the amounts that schools could charge their pupils per month: \$0.50 for primary, \$1 for junior secondary, and \$1.50 for senior secondary students.

raising funds, deciding which students to exempt from fees or to provide with additional support, sending teachers for training, lobbying for textbooks and teachers' guides, and leading in the effort to improve teacher performance and student achievement. Developing such a wide range of administrative and entrepreneurial skills requires specific training. Training is a highly cost-effective investment because having competent school leaders makes school-based management accountable to the community and in turn makes the education system more responsive to the needs of the stakeholders and improves service delivery.

**Table 0.2: Parental Participation and School Decision-Making Power, 2003**

	<b>Urban Private</b>	<b>Urban Public</b>	<b>Rural Private</b>	<b>Rural Public</b>	<b>Remote Private</b>	<b>Remote Public</b>	<b>Total</b>
<b>Parental participation</b>							
School has PTA	66.7%	80.6%	90.0%	53.3%	100%	70.0%	71.5%
Frequency of PTA meetings:							
Monthly or more	22.2%	16.1%	20.0%	10.0%	50.0%	20.0%	17.3%
Quarterly	44.4%	41.9%	50.0%	40.0%	-	60.0%	42.0%
Twice a year	-	12.9%	20.0%	-	20.0%	-	7.3%
Annually	-	6.5%	-	3.3%	-	20.0%	5.2%
Most common topic discussed in association (not mutually exclusive):							
Expenses and budget	66.7%	64.5%	60.0%	43.3%	80.0%	40.0%	55.7%
Facilities	55.6%	67.7%	70.0%	33.3%	60.0%	70.0%	55.7%
Fundraising	55.6%	38.7%	60.0%	33.3%	100%	40.0%	44.2%
Instructional methods	22.2%	29.0%	20.0%	20.0%	20.0%	-	21.0%
Student discipline	66.7%	64.5%	80.0%	50.0%	100%	50.0%	62.1%
Student performance	33.7%	61.3%	70.0%	46.7%	100%	40.0%	54.7%
<b>Autonomy and decision-making</b>							
Principal is influential or very influential in the following decisions:							
Hiring teachers	25.0%	21.4%	26.7%	22.2%	60.0%	28.6%	25.3%
Dismissing teachers	37.5%	24.1%	44.4%	50.0%	60.0%	50.0%	40.3%
Evaluating teacher performance	37.5%	35.7%	37.5%	35.7%	77.8%	46.7%	39.4%
Setting teacher salaries	37.5%	10.7%	33.3%	23.3%	40.0%	14.3%	21.5%
Selecting teachers for training	22.2%	25.0%	44.4%	46.7%	60.0%	42.9%	37.3%
Choosing teaching methods	25.0%	26.7%	66.7%	46.7%	60.0%	42.9%	40.5%
Developing teaching materials	37.5%	31.0%	66.7%	46.7%	80.0%	28.6%	42.6%
Adapting curriculum to local conditions	37.5%	27.6%	44.4%	43.3%	80.0%	42.9%	39.6%
Determining working hours of teachers	37.5%	32.5%	66.7%	40.0%	60.0%	28.6%	39.9%



*Timor-Leste Education Since Independence from Reconstruction to Sustainable Improvement*

	<b>Urban Private</b>	<b>Urban Public</b>	<b>Rural Private</b>	<b>Rural Public</b>	<b>Remote Private</b>	<b>Remote Public</b>	<b>Total</b>
Determining class size	25.0%	32.1%	55.6%	43.3%	60.0%	28.6%	38.5%
Selecting students for admission	33.3%	41.4%	60.0%	53.3%	60.0%	25.0%	45.6%
Setting standards for student promotion	50.0%	36.7%	77.8%	56.7%	60.0%	28.6%	48.9%
Evaluating students	25.0%	35.7%	55.6%	53.3%	60.0%	28.6%	42.8%
Closing a school	25.0%	32.1%	22.2%	60.0%	80.0%	28.6%	41.3%
Adding new grades to existing school	33.3%	13.8%	40.0%	30.0%	60.0%	-	24.5%
Setting school fees	50.0%	25.0%	66.7%	40.0%	100%	28.6%	40.8%
Deciding which students are exempted from fees	25.0%	31.0%	66.7%	40.0%	60.0%	28.6%	38.3%
Deciding on the construction of school facilities	25.0%	14.3%	44.4%	43.3%	60.0%	28.6%	31.5%
Maintaining and rehabilitating facilities	12.5%	32.1%	66.7%	53.3%	80.0%	28.6%	42.7%
Deciding on how to spend school funds	22.2%	32.1%	44.4%	43.3%	60.0%	28.6%	37.1%
Scheduling meetings with community School finance*	50.0%	42.9%	66.7%	53.3%	60.0%	42.9%	50.2%
Schools where students pay tuition (% of schools that responded)	4 (44.4%)	3 (9.7%)	5 (50.0%)	5 (16.7%)	2 (40.0%)	1 (10.0%)	20 (21.0)
Average amount each student paid per year in those schools (\$)	\$15.7	\$20.3	\$23.4	\$43.0*	\$6.5	\$5.0	\$25.0

Source: PSAS 2003

\*Due to the low response rate, the information on school finance cannot be considered reliable.

#### **4.4. THE LEGAL FRAMEWORK AND FORMAL POLICY POSITIONS**

The Education Law, which as of March 2004 had not yet been finalized, will spell out the authority and responsibility of the Ministry of Education, the rights and responsibilities of the teaching profession, and the legal status of various institutions (such as the local communities and the Catholic Church) and their relationship with the Ministry in the areas of education standards, public subsidies, and cost recovery. The legislation should also point out how education functions will be assigned to the different levels of the system, delineate accountability mechanisms, and ensure that the common interest of the community is protected.

Although the forthcoming Education Law provides a legal basis and the NDP sets out broad directions for the sector, neither provides much guidance on overall education policy. Therefore, it is vital that education policymakers arrive at a coherent development strategy for the sector that sets out specific policy objectives and a plan for achieving them. In the past, although unequivocal priority was given to widening access and increasing efficiency in education, many policy decisions were made in an *ad hoc* way, owing to the emergency, and at the request of external agencies or donors or were simply a continuation of practices followed under the Indonesian administration.<sup>39</sup> It is also very important to put the policy positions of the development strategy in writing and disclose the evidence and analysis used to justify them. At the same time, policymakers should allow ample time for public consultation and debate before adopting the strategy as a formal document.

There are three sets of key questions that policymakers must address in the medium term.

##### *Coverage Targets at Each Level*

What is the target for access at each level of education? What are the costs and benefits of investing in one level versus the other, and what are the trade-offs? The NDP sets out the aim of achieving universal enrollment in nine years of basic education but made no clear statement about pre-primary, secondary, technical, or tertiary education. Without clear targets, it is impossible to know how much to budget for each level of education in the future or how the system as a whole will serve society at large.

##### *Standards for Inputs and Outcomes*

What is the official position regarding the annual number of instructional hours, multiple shifting, textbook provision, STRs, and minimum acceptable standards of achievement for students to be promoted from one grade to the next? Answering these questions is vital for planning the quality of inputs and the quality of learning outcomes, and the answers have implications for both the recurrent and capital costs of schooling.<sup>40</sup>

In 2003, about a third of schools used some form of double shifting, but there was little consistency in terms of how many hours of instruction per year were offered or how

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<sup>39</sup> For example, as mentioned above, districts do not submit gender-disaggregated data to the central government even though they collect the data in this form, as was done in Indonesian times.

<sup>40</sup> This is so whether there are two sets of teachers or just one set paid a premium wage to teach two sessions.

heavy a workload teachers were expected to carry. Many schools that do not have enough classrooms or teachers for their enrollment have divided the teaching day in half and provide two hours of classes to the lower primary grades and three hours to the upper primary grades. Thus, each student's opportunity to learn was drastically reduced in these schools. However, until enough qualified teachers are recruited and trained or enough classrooms provided, double shifting may have to continue in some schools as a temporary means of ensuring the widest possible access to schooling. In those schools where this is necessary, principals should ensure that the details of the operation of double shifting are fully documented so guidelines can be developed for other school and district managers to follow.

STRs also vary tremendously across districts. Similarly, in the absence of a firm policy position on minimum acceptable STRs now and in the medium term, it is difficult to predict staffing, training, and recruitment needs. Setting targets for future STRs for each level of education is crucial because of the time it takes to train teachers, particularly at the higher education levels and in the technical-vocational education and training, the latter an announced priority of the Ministry.

#### *Private Schools Integral to the Service Delivery System*

Private schools, particularly Catholic schools, have played a very important role in Timorese education both historically and currently. By injecting diversity and competition into the system, private schools have the potential to provide alternative approaches to quality improvement. However, policymakers need to clarify the following questions: What aspects of private schools should the government regulate (for example, the safety of buildings, teacher qualifications, and curriculum standards) and over what aspects of their operations should private schools be given maximum autonomy? To what level and how should the government subsidize private providers? What is the most effective strategy for using private schools as a means to expand enrollment, particularly at the post-basic level? Furthermore, what is the government's position with respect to charging fees in public and private schools?

Since the transition period, the public sector has treated Church and government schools equally with regard to teachers' salaries and instructional materials. However, it is not clear in the education budget whether maintenance funds are also intended for these non-government schools.<sup>41</sup>

## **4.5. SUMMARY**

While it is vital for the government to formulate coherent policy positions on education, its ability to do so is related to its institutional capacity to collect and analyze data that inform policy decisions. Policy development is also dependent on the government's management and administrative capacity. In the foreseeable future, the education project (FSQP) will be underwriting the employment of consultants to write policy papers to help the government to devise an effective set of education policies. However, in the medium to longer term, it is of critical importance to develop the national capacity to gather and analyze data. Forging strong links between the government and the country's universities

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<sup>41</sup> Many priests and nuns in private schools are on the government's payroll, although Catholic schools often pay for additional teachers from their own resources.

will enable policymakers to tap into the research capacity of those institutions. It is also necessary to build up a technical cadre in the government and to provide short training courses and even advanced studies in education economics and policy for education sector managers.



## **THE CHALLENGES OF EDUCATION FINANCE MANAGEMENT**

The new government of Timor-Leste inherited from the transitional administration an education finance framework based on a large flow of external grants. To meet the government's objectives for the education sector as set out in the NDP, the medium-term requirement for recurrent cost financing alone is projected to grow from \$14.0 million in 2002 to \$17.0 million in 2006 (see Annex 5.5). When capital expenditure is included, it will grow from \$17.7 million to \$20.3 million over the same period (see Table 5.1). The key challenges in education finance are: (i) managing the flow of aid to ensure the continuity and stability of funding; (ii) ensuring equity in spending; (iii) directing enough resources toward coordinating inputs to education, including those from aid sources; (iv) identifying cost drivers and adopting cost-effective strategies; and (v) structuring incentives to induce better performance from students, teachers, schools, and local education managers at the district level. In this chapter, we explore how these challenges can be met.

### **5.1. MANAGING AID FLOWS**

Since the transition, external funding for education has flowed through three channels:

- The Consolidated Fund for East Timor (CFET), which covers all of the system's operating costs (salaries and wages, goods and services, and some capital expenditure);
- The Trust Fund for Timor-Leste (TFET), which covers mainly capital expenditure for rehabilitation and investments in education projects; and
- Bilateral contributions, which may come in the form of in-kind aid, technical assistance, or scholarships.

In 2002/3, funding from these three sources totaled \$41.1 million, representing about 25 percent of total government expenditure. The CFET covered 43 percent of the total public spending on education, the TFET covered 11 percent, and bilateral aid covered 44 percent (see Table 5.1). The government's own revenue amounted to less than half of the total CFET expenditure. This high level of aid, typical of post-conflict or newly independent states, highlights the precarious nature of education finance in Timor-Leste.

Expressed as a percentage of GDP, the CFET expenditure on education was equivalent to 3.1 percent in 2001 and 2002, rising to about 5 percent in 2003 and 2004. This level of CFET funding exceeded the Indonesian government's expenditure on education in the province of Timor Timur (Timor-Leste), which was less than 3 percent. This took into account spending on education from other Indonesian ministries besides the Ministry of Education, namely, the Ministries of the Interior and Religion (see Annexes 1.7 and 1.8). The TFET has added another 2 to 3 percent of GDP in the last two years, but this has fluctuated due to the variability in the estimates of disbursements. Bilateral aid provided

an additional 6 percent of GDP (see Table 5.1). In total, these three sources added up to 14 percent of Timor-Leste's GDP in 2001 and 13 percent in 2002. This level was high, as the average low-income country spends about 3 percent of its GDP on education, and the average middle-income country spends between 4 to 5 percent of its GDP.

**Table 0.1: Financing of Education Sector, 200/01-2005/06**

Year	CFET	TFET	Bilateral	Total External Aid	GDP (\$ million)
<b>Total (\$ million)</b>					
2000/01	10.1	10.5	21.2	45.1	321
2001/02	11.8	8.8	23.7	50.1	385
2002/03	17.7	4.5	18.3	41.1	377
2003/04	17.6	15.8	16.8	50.2	336
2004/05	19.4	0	14.5	33.8	427*
2005/06	20.2	0	13.5	33.7	457*
<b>% Share by Source</b>					
2000/01	22	23	47	100	
2001/02	24	18	47	100	
2002/03	43	11	45	100	
2003/04	35	31	33	100	
2004/05	57	0	43	100	
2005/06	60	0	40	100	
<b>As % of GDP</b>					
2000/01	3.1	3.3	6.6	14.0	
2001/02	3.1	2.3	6.2	13.0	
2002/03	4.7	1.2	4.9	10.9	
2003/04	5.2	4.7	5.0	14.9	
2004/05	4.5	0.0	3.4	7.9	
2005/06	4.4	0.0	3.0	7.4	

Source: MOF, MECYS, and bilateral agencies; IMF for GDP estimates

Note: The CFET figures for 2000/01 and 2001/02 are actual expenditures and that for 2002/03 is the revised budget. The GDP for 2004/5 and 2005/6 are earlier IMF estimates. The earlier years are recent IMF estimates.

These large aid flows have contributed to the rapid reconstruction of the education sector and enabled over 2,000 students per year to complete their on-going studies at Indonesian universities and in other countries. However, forward projections anticipate a gradual decline in bilateral aid, including the end of the TFET upon completion of the current project, originally programmed for 2004 (see Table 5.1). In the near future the government will have to assume the operating costs currently funded by the CFET or will have to continue to depend on external donors or lenders. The government needs to establish a clear policy agenda and devise a set of prioritized and costed programs to guide its own future spending or to attract continued external support. Thus, the need to manage well the flow of aid is intertwined with the need to formulate policy and develop institutional capacity.

Programs that have been heavily dependent on external funds would suffer greatly if these funds were withdrawn or redirected. For example, major capital construction was funded by the TFET. When that project comes to an end, capital spending is likely to decline. In another example, UNTIL depends on the CFET for one-quarter of its budget, used to pay salaries, and it obtained the other three-quarters of its funds from bilateral agencies in 2002/3. Some of these funds are for short-term measures, such as external tertiary training to build up national human capital quickly. Such large amounts of external aid may not be available to UNTIL over the long term. It may increasingly have

to rely on student fees to supplement its revenue.<sup>42</sup> As UNTIL continues to be an integral part of the MECYS, all of its fee income is currently remitted to the central exchequer. If the university were to become autonomous, it would need to generate its own funds; if it were to be semi-autonomous, it would need an annual grant or subvention provided through the MECYS budget.

Increasingly, the majority of funding for the sector will have to come from the government budget or from loans if these funds are not sufficient. Even in the medium term, the level of non-CFET aid provided to the sector is expected to halve. Annex 5.5 projects the financing needs of all levels of education from 2004 to 2018 and shows the total need growing from \$17.7 million to \$35 million in those 14 years. It shows that the sector's long-term needs will be substantial. Even with the availability of oil and gas revenue and savings, prudent management will be necessary in order to use the country's resources well. Government commitment would also be needed for this source of funding to continue to support the education sector adequately.

To secure the stability of education financing in the medium to long term, the MECYS must assess what can be funded within the government budget and what should be funded from external sources. The level of funding available from all sources will then determine the scope and mix of the services that can be delivered. There has been no active debate on this issue. Most program directors at the MECYS do not yet have the capacity to engage in such a debate, which means that the Ministry is unlikely to respond in a systematic way when sharp reductions in some programs in the medium term become necessary. Until that internal capability begins to influence decision-making in the direction of self-financed budgeting, Timor-Leste will continue to rely on donor assistance for financing the education budget.

Another challenge regarding the financing of the sector is whether the Ministry has the capacity and opportunity to spend the funds already budgeted for designated priority programs. For donors to assess needs and evaluate the impact of existing programs, detailed information must be provided to them by the government. For the government to provide that information, detailed statistical records and monitoring systems are needed, which have not yet been established in Timor-Leste. Building this data-gathering and monitoring system is therefore necessary if coherent policies are to be formulated.

## **5.2. THE EQUITABLE DISTRIBUTION OF PUBLIC EXPENDITURE**

In this section, the following aspects of public expenditure will be discussed: inter- and intrasectoral budget allocations, expenditures per student, consistency between budget provision and actual expenditure, public subsidy of private education, and household contributions to education.

### *Inter- and Intrasectoral Allocations*

The high priority that the government has put on education is evident in the large share of total CFET expenditure allocated to the sector—roughly 20 percent in 2001 and 25

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<sup>42</sup> The financing of higher education deserves a separate study and is beyond the scope of this report.



percent in 2002—the largest budget allocation except that for infrastructure. Within the education sector, the largest share of the budget is allocated to basic education. In 2002/03, some 46 percent was allocated to primary education, 16 percent to junior secondary education, 10 percent to senior secondary education, 4 percent to technical and vocational education and training, and 6 percent to university education (Table 5.2).

### *Per Student Spending*

In the aggregate, the allocation to basic education in 2002/03 seems adequate. However, on a per student basis, it was less equitable owing to the variation in the size of the student population at each education level. The CFET per capita expenditure alone was \$46 on primary education, \$97 on junior secondary education, \$82 on senior secondary education, \$520 in technical and vocational education and training, and \$168 on tertiary education (see Figure 5.1). Taking TFET and bilateral aid into account, the unit expenditure was \$87 on primary education, \$181 on junior secondary education, \$182 on senior secondary education, \$801 on technical and vocational education and training, and \$1,641 on tertiary education (see Figure 5.2).<sup>43</sup> A very large proportion of bilateral funds was allocated either directly to UNTIL or generally to the tertiary subsector through the provision of tertiary scholarships abroad. The total amount of CEFT, TFET, and bilateral spending on tertiary education was about 19 times as high as that spent on primary education. While tertiary education requires much more costly inputs in order to maintain quality, this pattern of spending can be seen as not being pro-poor. Students from richer households can afford not to work for a living as they continue their studies, while few students from poor families make it as far as tertiary education to benefit from the public subsidies at this level. The unit costs of the technical and vocational sub-sector were also high, mainly due to the very low number of students per teacher. This points to the need to identify more economical alternatives for providing technical and vocational training.<sup>44</sup>

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<sup>43</sup> These figures do not take into account all of the costs. “Volunteer” teachers are not counted as staff. There are hundreds of volunteer teachers, over 200 in Dili alone. They each earn \$50 a month. The nature of the curriculum and the needs for infrastructure and equipment for certain subjects, such as for laboratories in secondary schools and machinery for technical-vocational schools, imply that some levels of education will cost more than others.

<sup>44</sup> Technical and vocational education and training also deserves a separate study and is beyond the scope of this report.

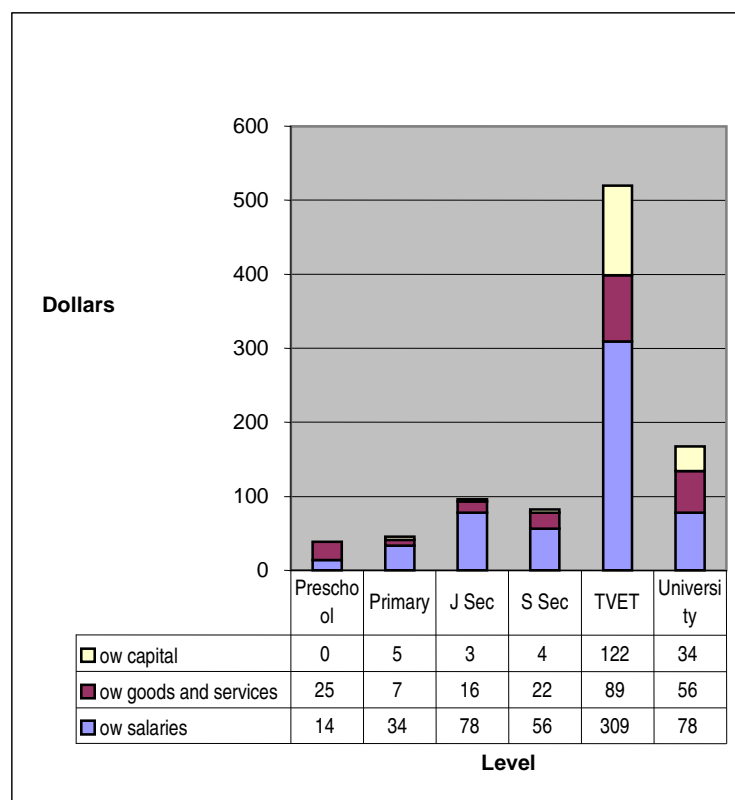
**Table 0.2: Medium-Term Expenditure Framework, CFET Education Sector,  
2002/03 – 2005/06 (%)**

<b>Sub-sector</b>	<b>2002/03</b>	<b>2003/04</b>	<b>2004/05</b>	<b>2005/06</b>
Minister's Office	0	0	0	0
Early Childhood	1	1	1	1
Primary Education	46	42	43	43
Junior Secondary Education	16	16	17	17
Senior Secondary Education	10	10	10	10
Technical and Vocational Education	4	4	4	4
Non-formal Education	3	2	2	2
University Education	6	8	7	7
Culture	1	1	1	1
Administration and Management	9	8	7	7
Youth Welfare and Development	0	1	1	1
Physical Education and Sports	0	2	1	1
Institute for Continuing Education	4	4	4	4
Total (%)	100	100	100	100
Total (million)	\$17.7	\$17.7	\$19.4	\$20.3

Source: Ministry of Finance

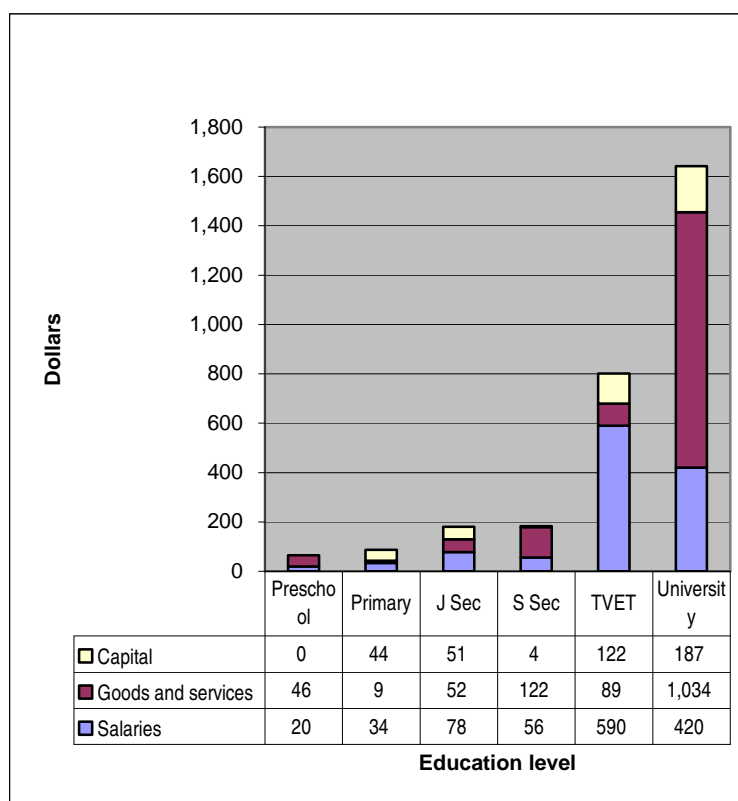
Note: The figures for year 2002/3 are from the revised budget, while those for 2003-6 are projections from the original budget framework.

**Figure 5.1: CFET Expenditures by Level, 2002/03**



Source: MoF

**Figure 5.2: Total CFET Unit Expenditures by Level, 2002/03**



Source: World Bank Team estimates

#### *Consistency between Budget and Actual Spending*

Actual spending is inconsistent with the original budgeted amounts (see Table 5.3). Overall, the CFET budget has appropriately emphasized primary education, which is the MECYS's highest priority, but in 2002/03 the proportion of expenditure on primary education in the budget was reduced to allow for an expansion in junior secondary schooling, non-formal education, and technical and vocational education and training. While the actual expenditure did not deviate from the budget proposal overall, it is important to be vigilant about changes in the revised budget that are inconsistent with national and sectoral priorities.

**Table 0.3: CFET Budget and Expenditure by Program, 2002/03**

<b>Program</b>	<b>2002/03 Budget (\$)</b>	<b>2002/03 Revised Budget (\$)</b>	<b>Actual to December 2002 (\$)</b>	<b>% Bud- geted</b>	<b>% Revised</b>	<b>% Spent</b>
Minister's Office	83,000	83,000	11,748	0	0	0
Early Childhood	203,000	166,000	18,977	1	1	0
Primary Education	9,119,000	8,427,000	2,969,149	50	46	54
Junior Secondary Education	2,851,000	2,928,000	1,063,537	15	16	19
Senior Secondary Education	1,458,000	1,816,000	550,715	8	10	10
Technical-Vocational Education	584,000	765,000	203,491	3	4	4
Non-formal Education	362,000	595,000	14,533	2	3	0
University Education	1,195,000	1,089,000	235,671	6	6	4
Culture	125,000	145,000	8,380	1	1	0
Administrat. and Management	1,473,000	1,619,000	392,043	8	9	7
Youth Welfare and Development	65,000	74,000	13,000	0	0	0
Physical Education and Sports	59,000	64,000	1,470	0	0	0
Institute for Continuing Education	840,000	666,000	24,125	5	4	0
<b>Total</b>	<b>\$18,417,000</b>	<b>\$18,437,000</b>	<b>\$5,506,839</b>	<b>100</b>	<b>100</b>	<b>100</b>

Source: MOF

#### *Public Subsidies to Private Education*

Private education is another area where better-off people in society are enjoying public subsidy. In 2001, public schools accounted for 83 percent of total enrollment, and private religious schools for 12 percent, private secular schools for 4 percent, and others for 0.4 percent. Many of the private secondary schools are Catholic. These tend to offer a higher quality of education than public schools, particularly in secondary education, in part because their teachers are more educated and qualified, in part because the schools have

**Table 0.4: Type of School Attended by Quintile, 2001**

	Poorest	Quintile 2	Quintile 3	Quintile 4	Richest	All
<b>All Age Groups</b>						
Public	88.5	91.5	86.3	83.1	84.2	86.5
Private secular	2.4	3.4	5.6	3.8	5.5	4.3
Private religious	9.1	5.1	8.0	13.1	10.3	9.3
Other	0.0	0.0	0.0	0.0	0.1	0.0
<b>Ages 7–12</b>						
Public	90.1	92.3	84.8	80.4	80.8	86.5
Private secular	2.5	3.8	4.7	3.5	7.3	4.1
Private religious	7.4	3.9	10.5	16.1	11.9	9.5
<b>Ages 13–15</b>						
Public	93.1	94.1	87.9	84.2	81.7	88.8
Private secular	0.5	1.5	5.0	1.4	5.2	2.5
Private religious	6.5	4.5	7.1	14.4	13.2	8.7

Source: TLSS 2001

greater resources (they receive support from the religious community in addition to tuition fees), and in part because their students are from better-off families with literate parents. The state has been paying most of the bill for teachers' salaries in religious schools and provides free textbooks to their students, even though these schools charge fees. Twice as many students from the top expenditure quintile attend private schools as students from poor families. Analyzing the incidence of education by type of school (public, private, or religious) reveals that public spending on primary schools is progressive, but public spending on religious or private primary education is less so. The breakdown for public spending on junior and senior secondary education indicates that public education is distributed more equitably than private education at both levels (see Table 5.4).

Politically, it would be difficult to withdraw public subsidies for private education. The government's current strategy is to maximize the use of the capacity and quality of private schools to enhance the quality of the sector as a whole. In 2001, the STR in private schools was lower than in public schools, particularly at the junior secondary and senior secondary levels. The government could choose to turn its subsidy to private schools into a capitation grant in which case each school's grant would depend upon the number of students enrolled there. This would provide these schools with an incentive to maximize their enrollments. The government's policy toward the private sector should not be limited to financing but should treat private schools as an integral part of the education system that introduces diversity and competition into the sector and that can enhance the scope and quality of service delivery.

#### *Household Contributions to Education Spending*

In most countries in the world, the financing for education comes mainly from public sources. However, households also contribute substantially toward their children's education, as do religious organizations, businesses, and private foundations. Private expenditure ranges from one to three percent of the GDP in a variety of countries. The share of private spending is often contingent on the level of public subsidies to education. In OECD countries, private expenditure is relatively low, just over one percent of GDP,

because the public sector subsidizes many essential elements of education, whereas in other countries, such as Peru, private expenditure accounts for over two percent of GDP.

Household expenditure on education usually covers the cost of tuition fees, school uniforms, shoes, books, transport, meals and private tutoring. Even in schools that do not charge fees, school uniforms, books and transport still constitute a substantial amount of money. The financial burden is particularly heavy on households that have several children in school and often deters poor families from sending their children to school. This was the situation in Timor-Leste under Indonesian occupation. However, after the transition, due to the abolition of school fees and the requirement for school uniforms and shoes in public schools, education has been primarily financed by the public sector, supported by external partners. This was a major cause for the surge in enrollment in 2000/01. The rapid expansion in enrollment in a number of African countries that abolished school fees in the 1990s and early 2000s is testament to this strategy's effectiveness in stimulating demand.

After many schools were rehabilitated and became operational, some schools resumed charging fees in order to have some discretionary resources for school supplies, minor repairs, or even teacher salaries. This was often done in consultation with parents. Anecdotal evidence shows that parental contribution has been on a voluntary basis in public schools, and students were not penalized if their parents could not afford to pay. In 2003, rural schools charged parents \$1–\$3 per month; some as much as \$5–\$10. For schools serving poor communities, parents were hard-pressed to contribute. This points up to the need for monitoring to ensure that schools do not make contributions compulsory, which could become a barrier to enrollment for students from poor households. Parents should be informed of their right to enroll their children particularly at the basic level, irrespective of their ability to pay. At the same time, parents should not be discouraged from contributing if they want to improve the learning environment for their children. The latter could create a sense of ownership of and commitment to the school. Further, a policy needs to be in place to balance the need for fund raising to support education at the post-basic level, and the need to ensure equitable access to schooling.

### **5.3. THE COMPLEMENTARITY OF INPUTS AND INCENTIVES**

In many countries, teacher salaries account for 90–98 percent of public expenditure on education. As a result there is little left over for other essential quality inputs, such as books and teaching materials, repairs and maintenance. This is a very inefficient way of spending resources. Without a balanced package of complementary inputs, both the outputs (number of graduates) and outcomes (student achievement) will be jeopardized and the 90 percent of public resources will be largely wasted, defeating the purpose of providing education to the people. Timor-Leste should learn from the experience of other countries and adapt its inputs accordingly

In 2000/01 and 2001/02, although the CFET budget allocated about 79 and 88 percent to wages and salaries, respectively, 15 and 11 percent to goods and services, 6 and 2 percent capital expenditure, the actual expenditure was quite different due to limited capacity to spend on goods and services (Table 5.5). Underspensing on goods and services was as high as 56 percent in 2000/01 and 25 percent in 2001/02, on capital expenditure 86 and 50 percent, respectively in these two years. As a result, the MECYS's total actual expenditure was much lower than allocated. About 90 percent of the expenditure on

**Table 0.5: CFET Budget by Economic Function, 2003 (\$ Million)**

	Revised Budget			Actual Expenditure		Difference between Budget and Expenditure (%)	
	2000/01	2001/02	2002/03	2000/01	2001/02	2000/01	2001/02
<b>MECYS</b>							
Wages & salaries	9.6	9.8	10.6	8.3	9.5	-13.5	-3.1
Goods & services	1.8	1.2	4.3	0.8	0.9	-55.6	-25.0
Training	-	0.5	0.5		0.1		-80.0
Capital	0.7	0.2	1.9	0.1	0.1	-85.7	-50.0
<b>Subtotal</b>	<b>12.1</b>	<b>11.2</b>	<b>16.8</b>	<b>9.2</b>	<b>10.6</b>	<b>-24.0</b>	<b>-5.4</b>
<b>University</b>							
Wages & salaries	0.8	0.5	0.5	0.3	0.5	-62.5	0.0
Goods & services	0.4	0.4	0.2	0.2	0.4	-50.0	0.0
Capital	0.1	0.5	0.2	0.4	0.3	300.0	-40.0
<b>Subtotal</b>	<b>1.3</b>	<b>1.4</b>	<b>0.9</b>	<b>0.9</b>	<b>1.2</b>	<b>-30.8</b>	<b>-14.3</b>
<b>Whole sector</b>							
Wages & salaries	10.5	10.2	11.2	8.6	10	-18.1	-2.0
Goods & services	2.1	1.6	4.4	1	1.3	-52.4	-18.8
Training		0.5	0.5	0	0.1		-80.0
Capital	0.8	0.7	2.1	0.5	0.4	-37.5	-42.9
<b>Total</b>	<b>13.4</b>	<b>12.6</b>	<b>17.7</b>	<b>10.1</b>	<b>11.8</b>	<b>-24.6</b>	<b>-6.3</b>
<b>In Percentages:</b>							
<b>MECYS</b>							
Wages & salaries	79	88	63	90	90		
Goods & services	15	11	26	9	8		
Training		4	3	0	1		
Capital	6	2	11	1	1		
<b>Subtotal</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>		
<b>University</b>							
Wages & salaries	62	36	56	33	42		
Goods & services	31	29	22	22	33		
Capital	8	36	22	44	25		
<b>Subtotal</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>		
<b>Whole sector</b>							
Wages & salaries	78	81	63	85	85		
Goods & services	16	13	25	10	11		
Training		4	3	0	1		
Capital	6	6	12	5	3		
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>		

Source: MECYS

wages and teacher salaries was automatically done by payroll so the shortfalls reflected the unfilled positions.

In spite of the desperate needs of core educational activities, no budget was allocated for curriculum development, textbook development and provision, or school inspection. The Examinations Office responsible for national examinations at grades 6, 9 and 12 was poorly staffed and did not have a formal budget allocation for assessment activity, except through the Trust Fund. The most educationally essential inputs were not funded or underfunded in the CFET, although the TFET and bilateral grants covered some of these



items. However, the latter coverage has remained piecemeal and ad hoc. After independence, the education budget should have included these line items in order to make them core funding items.

Another area where complementarity spending is called for is discretionary funds at the district and school levels. Although the 13 district education offices received \$550 per month, they were given specific instructions on how to spend it. District offices do not have much discretion. For example, they may have computers but do not have the money for maintaining them or for buying essential software with which to store enrollment statistics and other data about schools within their district in a virus-free environment. No discretionary funds were allocated to schools to buy even basic supplies. They had to rely on delivery from the central office, and on parents for contributions in order to raise petty cash to buy office and classroom supplies, or to do small repairs and maintenance. These amounts were small relative to the total educational budget, but would help create an enabling environment that would allow administrators and teachers to initiate actions to improve education.

Like the quality-enhancing inputs, the use of incentives can improve the effectiveness of public expenditure. The system provided few incentives for the principals and teachers to meet the policy priorities of expansion of access, and improvement of efficiency and quality. There was no reward for increasing girls' enrollment, or raising student attendance and test scores; there was no penalty for teaching only half of the hours required officially or being absent for more than a reasonable number of days. (It should be noted, however, where teacher attendance records were kept, teachers had payroll deductions for unexplained absence, for example, in Liquica.) There were no substitute teachers available if teachers were pulled out for training or learning Portuguese.

In 2003, there were seven levels in the civil service salary scale. Within each level, a flat rate in US dollars is paid irrespective of experience, which is unusual in other countries. The differentials were between levels, not within level. Primary teachers were assigned Level 3 on the public service pay scale, with a monthly salary of \$123. This was 4.2 times the per-capita GDP, higher than the Education for All Fast Track Initiative's (EFA FTI) indicative framework benchmark of 3.5.<sup>45</sup> Secondary teachers were given Level 4, with a monthly salary of \$155 and university faculty members, Level 5, with a monthly salary of \$201. A few supervisors and administrators held positions between Levels 6 and 7. The flat rate for each level left little room to reward qualifications, give incentives or enable promotion because of experience and performance within the level. The flat rate also did not cover the special housing needs of teachers in remote and rural areas.

It may be worth examining the mechanics of providing subvention grants to the school based on student enrollment and gender parity, together with regulations on the STR, curriculum and instructional materials. Additional bonuses could be provided to reward schools for serving various policy objectives. Salary deduction could be effected for absence above the allowable number of days or for teaching less than official hours, and a bonus to the school as a whole could be awarded for the school's improvement of test scores.

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<sup>45</sup> Teachers think that their salaries are low. They have trouble making ends meet with the high cost of living and the large number of members in the average family. Some principals use a proportion of the school fees that they collect to pay government teachers for "extra hours" of teaching. In some schools, honorary teachers are employed to cut the hours of the regular teachers.

#### **5.4. IDENTIFYING THE COST DRIVERS AND CONTAINING COSTS**

The largest single cost item in the education sector budget across countries in the world is teachers' salaries, which is recurrent in nature. Teacher positions are based on the number of students enrolled. Thus, the pupil-teacher ratio is a major cost driver. The level of internal efficiency, which affects student flow, is another. The criteria for new school construction is a third, and the need to maintain a large stock of school buildings, a fourth. Relative to these major cost drivers, the recurrent costs of quality enhancing inputs, such as textbooks, library books, teacher in-service training and student assessment, are small.

##### *Student-Teacher Ratios*

STRs vary by subsector, based on the nature and demands of the teaching. A forecast of student numbers can be made based on population estimates by age bands (see Annex 5.3 for modeled primary predictions). The need for teachers can also be estimated based on the policy on STRs (Table 5.6). The Education for All – Fast Track Initiative (EFA-FTI) suggests using a ratio of 40:1 as a benchmark. Lower ratios may help enable better interaction between teachers and students, but are fiscally prohibitive. However, sufficient teaching and learning materials are needed to support such a ratio in order to engage students in learning.

##### *Efficiency of the System*

The need for staff positions could be heavily influenced by the efficiency level. In 2001, about 25 percent of students in primary education and junior secondary education were repeaters, and extra teacher resources were tied up in teaching these students. With fewer repeaters, the Ministry could alter the staffing structure. The number of repeaters in primary grades would fill nearly 165 schools with six classrooms each, employing about 1,000 teachers. There are approximately as many children not in school as there are repeaters. Therefore, the sector already had more children in school than are expected to be in the primary age group by 2015. In the short-term, additional capital and operational resources must be mobilized to cope with the extra numbers resulting from over-age enrollment and repetition rates, but in such a way as not to interfere with the long-term need for redistribution and allocation

**Table 0.6: The Number of Teachers Needed for Various Student/Teacher Ratios**

	<b>Target STR</b>				
<b>Primary Enrollment</b>	30	35	40	45	47
150,000	5,000	4,286	3,750	3,333	3,191
185,000	6,167	5,286	<b>4,625</b>	4,111	<b>3,936</b>
200,000	6,667	5,714	5,000	4,444	4,255
<b>Junior Secondary Enrollment</b>	20	25	30	33	35
30,000	1,500	1,200	1,000	<b>909</b>	857
50,000	2,500	2,000	1,667	1,515	1,429
70,000	3,500	2,800	2,333	2,121	2,000
<b>Senior Secondary Enrollment</b>	20	25	30	35	36
20,000	1,000	800	667	571	<b>556</b>
40,000	2,000	1,600	1,333	1,143	1,111
60,000	3,000	2,400	2,000	1,714	1,667
Source: World Bank estimates					

The chief criteria mentioned for the allocation of new classroom blocks under the Fundamental School Quality Project (FSQP) are the level of poverty and overcrowding observed in schools. Selecting schools only on this basis may be problematic. Schools in poor areas have higher rates of repetition and higher repetition leads to overcrowding. Thus, there is a danger that inefficient schools may be rewarded with new resources. The Ministry ought to address repetition first with other solutions, such as double streaming and remedial classes, and restrict new school buildings to genuine demand pressure from new enrollments. The highest priority as outlined in the NDP is to expand access and improve internal efficiency. These are strongly interconnected as the cost of improving access may be increased considerably in an inefficient system. Likewise, access can be curtailed in an inefficient system when those who will not fully benefit from their participation in the education system occupy valuable places. The cost of funding extra places at various levels is also a consideration. Providing extra primary places may be relatively cheap on a per capita basis but may consume considerable resources if the access target is high.

#### *Criteria for School Construction*

Given limited capital resources, the establishment of construction criteria will be a strong determinant of the rate of expansion. Universal basic education would entail 150,000 to 200,000 children in the primary system and a further 60,000 to 80,000 in the junior secondary system under full efficiency. There should be enough places now in the primary system, as 185,000 students were enrolled in 2003. Although not all the school places are situated in the right areas, due to population movement and under-provision in the past, large-scale construction of completely new schools is less likely than rehabilitation, completion or extension of existing schools, or the provision of new types of schools, such as the *escola básica* providing for complete basic education at one site. All of these are likely to cost significantly less than new school construction.

At the secondary level, the expansion of the system from 40,000 to the 70,000 implied by full transition from grade 6 to year 1 of junior secondary is likely to involve further construction, though the current plan to build an additional 14 basic schools under FSQP will provide at least 2,000 places.<sup>46</sup> In the more distant future, expansion of the senior secondary system is likely to involve more construction, as there are relatively few senior secondary schools outside Dili. Bringing down the cost of construction will enable more classrooms to be built.

#### *Maintenance of a Large Stock of Buildings*

The need to maintain 900 or more delivery points is another major cost driver in the system. Some of the buildings are not owned by the government and presumably do not qualify for maintenance from government funds,<sup>47</sup> but the remainder are of sufficiently high capital value to incur a high notional maintenance cost on an annual basis. The Ministry has included this in the budget but at a much lower level than the value of the building stock suggests. This means that either the buildings are being allowed to become run down over time or that local communities are expected to provide for the upkeep of their schools in some informal manner.

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<sup>46</sup> One such pilot school visited during the mission was intended to house 360 students but had an enrollment of 1,350 who were taught in two shifts. However, to do this, the school had to take over all of the specialized areas (such as laboratories and libraries) and turn them into ordinary classrooms, thus reducing quality in exchange for providing greater access.

<sup>47</sup> During the initial emergency phase, all schools were treated alike for rehabilitation and repair purposes, to enable the system to return to normal as quickly as possible. It is not clear that this will continue to be the responsibility of the Ministry in the future.



## **POLICY OPTIONS**

The MECYS has transformed the education system from one largely deprived of experienced professional staff and suffering from destroyed infrastructure, in 1999, to one with a basic administrative structure and operational schools by the time independence was restored. Building on the initial successes of the transitional period will require a long-term vision and innovation to meet the following sectoral goals:

- Improving the quality of instruction in an environment of linguistic diversity and change;
- Ensuring universal access to primary education, while also meeting the need for secondary and tertiary education, as well as training in technical and vocational skills.
- Achieving sustainability of public sector financing while facing large demands for resources; and
- Improving the management of the sector, from capital center to district and school, where the lack of professional staff capacity is most acute.

This chapter discusses the options available to meet those goals. It concludes with a discussion of prioritizing and sequencing the needed interventions.

### **6.1. IMPROVING THE QUALITY OF EDUCATION**

The ultimate test for an education system is whether students have acquired the requisite skills and the desired values during their formative years in school. The PSAS results suggest that primary education quality deserves immediate and sustained attention from policymakers, because it forms the foundation of higher learning. The above diagnosis points to the urgent need for integrated, multiple interventions of curriculum revision, development of textbooks and learning packages, in-service teacher training, bilingual education, testing and provision of feedback to teachers and students, and school-based management. Of these activities, the most urgent and fundamental decision that needs to be made is the strategy to ease transition from the students' mother tongue to the official language.

#### *Easing the Transition from Mother Tongue to Official Language*

The government's language policy is to adopt Portuguese as the language of instruction, supplemented by Tetum as needed. As seen from the PSAS, current results are far from the government's desired outcome. Effective language learning strategies must be adopted to enable students to understand and learn in school, lest they repeat grades or drop out. Experience elsewhere in the world shows that a child can learn better and more easily when he or she learns in the mother tongue. Effective programs using children's first language in the early years of education have documented dramatic improvement in overall student performance and an easier transition to learning and using the official language. The use of the mother tongue as the language of instruction in early grades can build students' "confidence and independence, knowledge and understanding, skills and strategies, use of prior and emerging experience, and critical reflection" (Klaus et al. 2001). Box 6.1 provides a summary of effective strategies internationally for choosing a language of instruction.

Literacy cannot be developed without having books. Books must be made available to all students, not just to teachers, or in such limited numbers that teachers lock away the books. The strategies for developing primers and literacy materials mentioned in Box 6.1 can be pursued.

### **Box 0.1: Policy Options for Language of Instruction**

The six billion people in the world speak some 6,800 languages. About 92 percent of the world's people speak only 4 percent of the languages (or 300 languages). The remaining 96 percent of the languages are, for the most part, minority languages. Linguistic diversity is a characteristic of almost all of the countries in the world. Many countries have one or more official languages, which is not necessarily the mother tongue or home language of the people. The key question is what is the best way to acquire functional fluency in speaking, understanding, reading and writing the official language and/or the language of wider communication.

Experience from many countries shows that a child can learn better and more easily when he or she learns in his or her first language. An effective and time-tested strategy is to *use children's first language as the main language of instruction in early basic education*, transitioning gradually to the use of a language of wider communication. A country's policies for language of instruction are crucial for reaching the excluded, keeping them in school, helping them learn, and, in particular, helping them learn the official language. The benefits include: (i) widened access; (ii) decreased repetition and dropout; (iii) pedagogical benefits; (iv) linguistic benefits; (v) psychological benefits; (vi) social benefits; (vii) cultural benefits; and (viii) financial benefits.

Many countries have successful experiences. Papua New Guinea uses local languages in kindergarten and grades 1 and 2 of primary education, transitioning to English afterwards. Fourteen countries in Central and South America offer bilingual and intercultural education. In Somalia, enrollment in primary education increased from 13 percent to 34 percent of the age group as a result of the use of the Somali script in textbooks. In Madagascar, the introduction of a new curriculum in basic education with Malagasy as the language of instruction resulted in a significant decline in the dropout rates. In Mali, there was a marked improvement in test scores in all subjects after introduction of African home languages in initial instruction. In Brazil, the use of the local language in school leads to better acquisition of literacy skills among indigenous students. In the Philippines, children in pilot schools that use local languages performed better in all subjects than did children in control groups learning only in Filipino or English. In Ethiopia, children are taught in one of 13 regional languages through grade 6, although they start learning English as a second language early in primary education, and teaching from grade 7 onward is in English.

There are several strategies to deal with the language issue, even if the first language does not have a written script. First, specialists with linguistic training, working with local communities can develop a basic word list and grammar. If there is an agreement on a writing system, this can be completed in six months. An initial limited vocabulary, perhaps 500–600 words, can be used to develop literacy materials. Papua New Guinea has developed literacy materials in over 400 of the 800 distinct languages in this way. Often simple workbooks and primers are all that are needed to carry children to functional literacy in the mother tongue. Literary materials are produced locally in several countries and are used in combination with other teaching strategies using songs, stories, games, and hand-made visual graphics.

Source: Klaus et al. 2001

### *Enforcing Instructional Hours and Reducing Student and Teacher Absenteeism*

The PSAS results suggest that the practice of splitting instructional hours in half so that one teacher can attend to two sets of students adversely affects learning. Since schools vary in the total hours of instruction given to different grades, it is important to mandate that every grade receive five hours of instruction. Teachers and parents should be informed about this, as they can help to enforce the standard by volunteering to monitor compliance. To ensure that all students have equal opportunity to learn, schools that are short of classroom space could vary their weekly schedule, so that classes may be assigned to morning or afternoon or weekend sessions.

Related to the opportunity to learn is the need to reduce student and teacher absenteeism. The findings from PSAS on factors affecting high performers showed that even though students who attended pre-school had higher scores, their performance would be lowered if they attended classes with a higher than average absenteeism. This argues in favor of convincing parents that their children should miss as little school as possible. Information campaigns and adjustment of the school year may help promote more regular attendance. Adjusting the school year to include time off during peak farming times, such as during rice harvest, will help reduce non-attendance among children involved in agricultural work. Right now, Timor-Leste's long school holidays coincide with the time when demand for farm labor is at its lowest.

### *In-service Teacher Training Complemented by Teachers' Guides*

In the short term, unqualified and under-qualified teachers need to be identified and trained. The organization responsible for training is the Institute for Continuing Education, which has been provided with a substantial budget to conduct in-service training of teachers. Although PSAS data cannot correlate in-service training with student achievement, the types of in-service training and more effective ways of organizing such training should be reviewed.

International experience in training can provide some food for thought. Bangladesh's BRAC schools, which serve poor communities, recruit teachers with only 9 or 10 years of education to teach primary schools. It is difficult to recruit teachers with higher qualifications from these communities. To ensure that the teachers can deliver their lessons effectively, BRAC uses a very systematic and continuous training approach. All new recruits undergo 12 days of intensive training to learn the basics of teaching. For every 60 schools, there is a team office, with a teacher trainer. Every month, teachers in all the schools meet for a day to have refresher training, which is not only subject specific but even page specific on the content and pedagogy. In this way, there is a minimum guarantee of teaching standards.

With the availability of books, it is possible to train teachers to handle relatively large, multi-grade classes and still enhance student learning. The development of teachers' guides is very important. Where teachers are poorly prepared, it is necessary to provide very structured, written guidance on:

- How best to conduct the teaching/learning process;
- How to explain concepts more effectively by providing a variety of illustrative examples;



- Common misconceptions of students, and how best to correct them;
- Group work that can be done in and after class to reinforce learning; and
- How to conduct formative assessment with specific testing on each topic in each subject.

Teacher training should not be theoretical but should combine the subject matter knowledge with pedagogical suggestions on how to handle some very common classroom situations and student learning difficulties.

As for upgrading teacher qualifications, the prevailing view is that in the long term all teachers should have a basic university degree. It can be anticipated that in the long term there could be up to 200,000 primary students in the system. If the STR objective is 40:1, then there could be up to 5,000 primary teachers in the system. Similarly, the number of junior secondary students should rise over the long term to about 70,000 in total, and with a STR of 35:1, the total teachers needed would be about 2,000. This suggests a replacement need of at least 275 teachers per year in total, substantially fewer than the current number studying education. However, there is a very large variation by subject. For example, the replacement number for teachers of mathematics would be large. There is a need to develop a process of appointing new graduates to vacancies and training them in Portuguese. The Institute should play a major role in this process of training and placement.

#### *Student Assessment and Feedback to Teachers and Students*

One of the PSAS's findings suggests that teachers without any valid, reliable, and objective means to measure student outcomes are less effective in helping students to learn. The introduction of annual assessments of each grade in both reading and mathematics can help both teachers and students understand the standards expected of them and establish criteria for judging the acquisition of basic literacy and numeracy skills. Such assessments would also provide a more objective basis for promotion. Testing alone will not be effective unless feedback is provided to teachers and students as well as to curriculum developers and the makers of student assessment tests.

#### *Extending Early Childhood Education*

The PSAS findings show that early childhood education does have a positive effect on improvements in academic achievement from one grade to the next. This is consistent with findings in other countries on the impact of early childhood education. There are a number of ways of structuring and promoting early childhood education, which need not be institution-based. Where intervention is most needed is in the training of caregivers. Educational content can be strengthened to help prepare children for primary education. Provision of meaningful play and preschool materials are usually effective supplements to training.

#### *Nutritional and Health Interventions*

The high percentage of absenteeism and incidence of illness, discovered by the TLSS 2001 and the PSAS 2003, are consistent with other survey such as the MICS 2002 on the poor health status of children. This points to the need for coordination with the Ministry of Health in the area of school health. Although it is beyond the scope of this report to identify the types of interventions needed, several common strategies, such as

deworming, provision of micronutrients, and the use of mosquito nets for malaria control, should be considered and discussed with health authorities.

## **6.2. ACHIEVING UNIVERSAL PRIMARY EDUCATION AND EXTENDING COVERAGE TO HIGHER GRADES**

The strategy for expanding access must vary according to the target group and the strategy for enrollment expansion at different grades or educational levels. For the population that has never attended school, a strategy to stimulate demand is necessary in addition to supplying school places. Generally speaking, in primary education, many student places can be opened up by improving student flow. In locations with low enrollment prior to independence, a school-age population growing more rapidly than elsewhere, or in underserved remote areas, extension classrooms or small multi-grade schools may need to be built and more teachers hired or re-deployed. At the post-primary level, because of the existence of many private schools, capacity improvement should be pursued through partnership with the non-governmental sector.

### *Increasing Efficiency to Free Up Capacity and Resources*

After strong enrollment growth during the transition, the numbers of primary school students have now stabilized at about 185,000.<sup>48</sup> The school system has sufficient capacity in terms of primary school spaces and teachers to accommodate all primary-school-age children in primary education if the system were to become more efficient. Currently between 20 and 25 percent of primary and junior secondary students are repeaters. Every year the Ministry is providing teachers, infrastructure, furniture and operating expenses for more than 40,000 extra students than it would need to in a perfectly efficient system. The strategy is clear: reduce repetition to free up spaces and economize on the use of resources. Annual targets for reducing the repetition rate need to be set in order to focus on a collective effort to pursue this strategy.

The following are commonly pursued policy options: (i) *Automatic promotion*: As very little research evidence shows that repetition has positive effects on student achievement, automatic promotion has been adopted by a number of countries to reduce overcrowding in classrooms and enable teachers to teach more effectively, focusing more on individual students. In Timor-Leste, the mismatch between teacher rating of student ability and the performance of students on the standardized test indicates that teachers have a poor understanding of their student's strengths and weaknesses. If the lack of concordance between teacher perception and actual student performance is the result of overcrowding, then automatic promotion might be an option to consider. However, experience from other countries such as Jamaica shows that automatic promotion does not ensure that students learn. In Timor-Leste where language alone is a formidable barrier to learning, automatic promotion may not be a viable policy option. (ii) *Remedial classes*: Students whom teachers want to hold back can be taught on the weekend and over summer in special classes and then move up with the rest of their class. (iii) *In-service training of teachers*: Train teachers to diagnose learning problems, spot early warning signs of grade repetition, and provide the help and extra attention that struggling students so desperately need. Training must be complemented by the development of an ongoing student assessment system.

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<sup>48</sup> This is predicted from the age-specific enrollment data over the past few years. See Annex 5.3 for a model of student numbers up until 2015.

### *Demand-side Interventions*

Analysis of the TLSS data found that some 50,000 school-age children between the ages of 7 and 14 were not in school in 2001, in addition to some 25,000 6-year-olds. Late entrance is largely due to parental perceptions that children in this age group are not at the appropriate age for school. This perception should be corrected through community outreach and mass media campaigns educating parents about the importance of enrolling their children in school at the right age and the risk of repetition and drop-out due to enrolling them over-age.

For children who have no interest in schooling, it is important to make the curriculum relevant by relating the content to the life of the children and their community. Many science and environmental topics are highly relevant to agricultural societies and can promote productivity improvement and sustainable development. By acquiring such information, students can even help their parents to do a better job of farming. Providing high-interest reading materials in reading corners set up in each classroom can promote student interest in self-teaching. Co-curricular activities, such as songs, dance and sports, are intrinsically appealing to children and should be promoted and injected into regular school activities. International experience in this respect can be instructive. Bangladesh's BRAC schools, operated as an NGO that serves over one million children in poor communities, have mandated that one-sixth of the time in school be devoted to song and dance. This more holistic approach, combining culture with physical activity, relieves boredom, sustains children's interest in school, lengthens their attention span, and promotes health and well-being. School visiting or "open house" days should be organized to introduce parents and children to the school experience and the riches it offers, along with promotional campaigns to educate parents on good child rearing practices, the importance of enrolling children, daily attendance, and homework..

### *Partnership with Private Schools in Post-primary Education*

The Catholic Church has been a major player in education, its services ranging from pre-school to university. Its principals tend to be very well educated, its lay teachers well qualified. Many Catholic schools still have their infrastructure intact, untouched by the militia during the disturbances. In secondary education, their *colegios* are elite schools offering high quality education. In 2001, among the country's 112 junior secondary schools, over a quarter (31 of them) were Catholic. At the senior secondary level, 17 of the 42 schools were Catholic.

In the medium to long term, enrollment is likely to grow in secondary education, as the bulge of the post transition cohort moves up the system. Between 2002 and 2003, enrollment growth in junior and senior secondary schools was strong at 15 percent and 17 percent, respectively (Annexes 2.3 and 2.4). The STR was 33:1 at the junior secondary level and 36:1 at the senior secondary level, neither of which was unusually high by East Asian standards. Staffing has been particularly difficult, as the previous system depended heavily on Indonesian teachers. These have not been replaced through large-scale recruitment because the country lacks appropriately qualified candidates. Indeed, the number of teachers has remained static. However, as at other levels, there have been volunteer teachers, paid from parental contributions and other funds raised by the school. Some are unqualified; many others are under-qualified. Their presence in such large numbers (one in three teachers at senior secondary level is a volunteer) means that the STR is effectively much lower than inferred from official statistics. Tapping the

resources of the private provider is therefore a key to expanding teaching capacity for secondary education.

### **6.3. SECURING EDUCATION FINANCE**

Few education systems must contend with the immense challenges and limited resources and capacity of Timor-Leste. In terms of education finance, Timorese authorities must juggle several tasks and objectives: aid-flow management; investment in cost-effective interventions; structuring incentives; supporting autonomy; and opening new sources of funding. These are all needed to secure adequate and sustainable financing for education. Further, should oil and gas generate substantial revenues and savings, government must give education a high priority in the national budget allocation.

#### *Managing Aid Flows*

With adequate policy preparation and strategic planning, it is possible to attract and direct donor financing to priority areas. This requires keeping detailed statistical records and using monitoring systems that provide donors with information to assess needs and impacts, and program adequate resources for assistance to the sector.

#### *Investing in Cost-effective Interventions*

Relative to the size of the wage bill, expenditures on core educational activities are small, belying their enormous effect on teacher productivity. Smart spending on core educational activities can reap handsome payoffs in the long run and even help save on the biggest recurrent cost item, teacher salaries, which consume too much of the education budget in an ineffective system plagued by large numbers of repeating students.

#### *Structuring Incentives, Supporting Local Autonomy*

Some of the benefits of a more widely decentralized system include efficiency in distribution and expenditure. Mechanisms now exist to provide cash at the district level, which if extended to the schools themselves would enable them to maintain similar accounts on a replenishment basis. Another benefit to decentralization is empowerment, which comes from controlling operating funds that are provided to local schools and communities, and promotes a sense of ownership and responsibility for service delivery at the local level. Moreover, when a community is aware of the level of funds available locally, corruption can be minimized and sometimes even eliminated. In small subsistence farming communities, injections of cash may be very beneficial to the local economy.

#### *Opening New Sources of Revenue for Education*

Compelling cases can be made for primary education to be completely funded from the limited resources available to the government. Primary education is crucial to developing literacy, improving subsistence agriculture and health, and stabilizing the democratic process. At the same time, secondary education is the foundation of the formal labor market; technical and vocational education is perceived as a key to providing skills and jobs, while tertiary education is essential to train the next generation of leaders, managers and professionals in the public and private sectors. Since public resources are

constrained, it is important that the government weigh the benefits to the nation and to the individual of investing at each level.

Research in many countries suggests that the economic returns to the society for investment in basic education are highest, and external benefits, such as improved health outcomes of the population and intergenerational mobility, are also extremely high. The returns of post secondary education are highest to the individual. It is rational for the government to support basic education as widely as possible and provide for other levels through cooperation with individuals and the community. Thus, employers and individual donors could assist in funding vocational education, and the students themselves could pay for all or part of tertiary education. The case for a high level of government intervention may be made in the national interest, but the case should be made explicitly and transparently. In other words, the Government should explain why, when resources are few, this investment necessarily need be a government investment.

#### **6.4. STRENGTHENING INSTITUTIONS AND BUILDING CAPACITY**

Success in policy development and execution hinges on strengthening institutional capacity at the central ministry, district 1, and school levels. Four areas of special consideration are discussed below: monitoring and evaluation; continuous professional development; autonomy and accountability; and governance and participation.

##### *Monitoring and Evaluation*

This involves the systematic collection and updating of indicators as well as their routine use by policy makers, unit directors, district officials, principals, teachers, and even parents. The information can be used to guide decision-making, monitor service delivery, assess whether policy has been properly executed, and measure the extent to which interventions are successful. Table 6.1 provides a list of indicators needed to support decision-making and gauge whether objectives have been met.

##### *Continuous Professional Development*

Capacity building implies that staff acquire new knowledge and skills on a continuous basis. Therefore, professional development must be an integral part of the strategy for institutional strengthening and should be properly funded. To improve job performance, training in specific areas is needed, such as teacher training, planning, budgeting, financial management, school inspection, school-based management, and community outreach.

##### *Autonomy and Accountability*

Currently, the education system does not allow much autonomy at any level, nor does it enforce accountability. At the central level, to ensure that responsible managers are administering their programs and executing their budgets in a timely manner, it is desirable to use targets and annual work program agreements to enforce accountability. Performance evaluations of individual staff should be instituted, based on fulfillment of the work program agreements. In financial management, regular reports should be required to brief senior policymakers on the progress of budget execution, so that they can identify areas of need and direct support to them in an effective and timely manner.

**Table 0.1: Basic Indicators to Monitor the Achievement of Policy Objectives**

<b>Policy Objectives</b>	<b>Indicators</b>	<b>Sources</b>
<b>Coverage and access</b>	<ul style="list-style-type: none"> <li>Gross enrollment ratio by level, by gender and by district</li> <li>Net enrollment ratio by level, by gender and by district</li> <li>Pupil-teacher-ratio by grade, by district, and by school type</li> </ul>	Enrollment statistics Population census, and Household surveys
<b>Internal efficiency</b>	<ul style="list-style-type: none"> <li>Repetition rates by grade, by gender, by district, and by school type</li> <li>Promotion rates by grade, by gender, by district, and by school type</li> <li>Dropout rates by grade, by gender, by district, and by school type</li> <li>Primary education completion rate by gender, by district and by school type</li> </ul>	Generated from school records and aggregated to the district and central level
<b>Quality</b>	<ul style="list-style-type: none"> <li>Average daily student attendance by gender, by grade and school type;</li> <li>Average daily teacher attendance by gender, by school type</li> <li>Average daily hours of instruction by grade and by school type</li> <li>Student achievement in reading and mathematics by grade (ideally pre-testing at the beginning of the school year and post-testing towards the end of the school year)</li> </ul>	Generated from school records and aggregated to the district and central level
<b>Service delivery indicators</b>	<ul style="list-style-type: none"> <li>Percentage of students that have textbooks within one month of the new school year</li> <li>Percentage of teachers that have guides within one month of the new school year</li> </ul>	Generated from school records and aggregated to the district and central level
<b>Cost and finance</b>	<ul style="list-style-type: none"> <li>Share of budget allocation to each level and program</li> <li>Actual expenditure on each level and program</li> <li>Per student spending by level of education</li> <li>Construction cost per square meter</li> </ul>	Ministry of Finance and MECYS Department of Finance

Source: World Bank team suggestions

At the district level, targets for service delivery and a system of reporting need to be put in place. These are necessary to ensure that programs are properly executed in time and that funds allocated through the petty cash accounts are used to improve the effectiveness of the school system. To improve overall sectoral efficiency, the central ministry needs to delegate and decentralize certain types of decisions to the districts and schools and to support them with adequate discretionary resources.

In addition, the Ministry should consider developing a system for channeling expenditure directly to individual schools and institutions. Currently, most of the operational funds for schools and institutions are centralized and there is no system to allocate or expend them at the unit level. In part, of course, this is a response to the centralized procurement method used by the Ministry of Planning and Finance. While this has certain advantages in terms of efficiency and economies of scale that reduce the unit cost per item,

centralized procurement does not always produce the most effective delivery of goods and services when the network of delivery points is as vast and varied as that of the education sector.

### *Governance and Participation*

Policymakers would benefit from institutionalized consultation with stakeholders and civil society. Policy advisory councils composed of employers, principals, teachers, private schools, ministries of finance, labor and health, could provide invaluable advice and information to make education policies more relevant to the needs of society and build consensus and political support across sectors. At the district level, a similarly composed committee could be institutionalized to provide feedback to the superintendent on the needs of the community and the quality of the services delivered. At the school level, the parent-teacher association could be expanded into a school council that includes community leaders, parents, teachers and students. A highly participatory body would solidify ownership and commitment of stakeholders and provide useful information and support to the school to improve its services.

As mentioned in section 6.3, under “Structuring Incentives, Supporting Local Autonomy,” it is recommended that in the future, education monies, particularly for goods and services, be distributed directly to the school level in order to correct the current situation of unspent funds in these categories in the districts. This will also create a more enabling environment for school improvement. Making this system work entails introducing a bottom-up oversight arrangement, mostly through school councils and public information to the community. A community with good local knowledge and information about the plans and resources is likely to exert pressure on school authorities to perform better, thereby minimizing opportunities for misappropriation of funds. Uganda is a country that has pioneered direct funding of schools to support a rapid expansion of enrollment. Box 6.2 describes how it was done.

Most of the elements for such a system of channeling funds directly to the local level now exist in Timor-Leste: cash is already disbursed to district offices, and parent-teacher associations are being organized. The provision of maintenance or other funds to schools with operating PTAs can be a strong incentive for schools and communities to establish their own associations. To enhance financial control, funds could be disbursed per term or per month, with replenishment once funds have been accounted for. Another safeguard, used in Uganda, is random checks on districts and schools. Each year a sample of schools and each district office may be physically inspected for compliance.

## **6.5. CONCLUSION**

Worldwide, ministries of education take decades to develop the capacity to manage the sector, formulate policies, expand and improve service delivery, and monitor and evaluate outcomes. Timor-Leste has to compress the normal time frame into a few years to confront the challenges in education. There is a need to prioritize and sequence the interventions, using some simple criteria: (i) How urgent is the need? (ii) Can the issue be dealt with technically (and relatively quickly) or politically (which would require time and consensus building)? (iii) Is it affordable?

In terms of urgency, there is no doubt that the need for basic literacy materials to support teaching and learning ranks number one. Some simple materials need to be developed quickly for immediate use. Materials and primers in local languages can be developed

### **Box 0.2: Local Oversight and Accountability: The Experience of Uganda**

Uganda has created a miracle in education in that it has doubled primary education enrollment within six years, thereby achieving universal primary education within a short time. Part of its success is attributable to the abolition of school fees and part to direct funding of schools to enable them to meet their needs in a timely and efficient manner.

The process began with a system of notification by Treasury of dispatches of funds to district offices. When monthly funds for school operation or health units were sent to the districts for distribution to individual service delivery points, such as schools or clinics, a notice in a national newspaper publicized the fact and the amounts for each district. While the circulation of newspapers was limited in the country, district administrators found that head teachers soon learned about the publication and began to demand the allocation of the funds for their school. This cut back sharply on the previous temptation of district administrators to receive the funds and use them for other purposes, sometimes for several months, before releasing them to the intended beneficiaries.

In turn, district and sub-district offices were required to publicly notify the whole general public of the amounts allocated to each school. This was done by listing each school in the administrative areas, together with the amount for that school for each month. It was required that the list be placed on a public notice board outside the district office and be updated for each distribution. Thus, all schools were aware of the amounts due to them and every other school in the area.

Similarly, at the school level notification had to be given to the local community, with details of amounts received and expended on a monthly basis placed on a notice board accessible to any parent or community member, i.e., not inside an office or room. This information was to be displayed along with the school budget and the names and salaries of all teachers in the school. The notices were to be signed both by the head teacher and the head of the PTA. The handful of literate individuals in each rural area was sufficient to provide a check on the actions of those in charge of the funds. In practice, in small communities, it immediately became clear if a person acquired resources and could not account for them, and in this way, community social patterns could be used to conduct an extremely effective “audit.”

within six months. It is therefore within the realm of possibility that materials can be made available to all children in the first semester of the new school year.

Training in technical matters—subject matter knowledge, pedagogical techniques, MIS management, financial management, and such—can also be done quickly and at relatively low cost. Providing more discretionary funds to the district office and some funds directly to the school are, likewise, non-controversial and can immediately make the system operate more smoothly and effectively.

It is very important not to neglect the political process of popular participation and coalition building. Policy formulation necessitates widespread consultation with civil society and stakeholders. Education expenditure management and allocation should also be consultative. Finally, for a transparent and accountable system all information and decisions regarding education must be made public.





## **STATISTICAL ANNEXES**



## **ANNEX 1: EDUCATION BEFORE THE TRANSITION**

**Annex 1.1: Timor-Leste: Trends in Primary, Junior Secondary and Senior Secondary Education, 1976/77 to 2002/03**

School Year	Primary				Junior Secondary				Senior Secondary				Tertiary
	No. of Schools	No. of Teachers	No. of Students	Student per Teacher	No. of Schools	No. of Teachers	No. of Students	Student/ Teacher	No. of Schools	No. of Teachers	No. of Students	Student per Teacher	No. of Students
1976/77	47	499	13500	27	2	na	315	na	na	na	na	na	na
1977/78	107	614	23000	37	9	na	926	na	na	na	na	na	na
1978/79	202	959	41500	43	14	na	1041	na	na	na	na	na	na
1979/80	208	1610	59100	37	15	na	1248	na	na	na	64	na	na
1980/81	293	1515	68700	45	19	na	2474	na	na	na	225	na	na
1981/82	339	1821	77600	43	23	na	4274	na	na	na	454	na	na
1982/83	376	2226	90400	41	28	na	5453	na	na	na	977	na	na
1983/84	400	2446	99400	41	35	na	8247	na	na	na	1541	na	na
1984/85	410	2614	100600	38	43	na	9836	na	na	na	2770	na	na
1985/86	497	2910	111200	38	57	na	11735	na	na	na	5310	na	443
1986/87	540	3359	126700	38	71	na	22905	na	na	na	7599	na	675
1987/88	559	3723	129600	35	81	na	26787	na	na	na	10889	na	799
1988/89	565	4894	105100	21	90	na	28342	na	na	na	12088	na	969
1989/90	574	4739	100400	21	90	na	28964	na	na	na	14574	na	1210
1990/91	559	4574	95900	21	94	1245	31482	25	47	966	19634	20	1383
1991/92	590	4653	104400	22	97	1238	24261	20	48	1123	17177	15	2037
1992/93	654	5260	101935	19	101	1381	22122	16	52	1281	17947	14	2199
1993/94	652	6656	127989	19	103	1373	21779	16	54	1463	18303	13	2658
1994/95	677	6092	126549	21	107	1497	22650	15	51	1381	16121	12	na
1995/96	709	6511	132856	20	114	1547	24504	16	54	1452	16056	11	na
1996/97	736	6515	143956	22	114	1640	26445	16	54	1502	16099	11	na
1997/98	766	6392	155516	24	114	1640	na	na	54	1566	16154	10	na
1998/99	788	6672	167181	25	114	1963	32197	16	37	1059	14626	14	5121
1999/00	na	na	na	na	na	na	na	na	na	na	na	na	na
2000/01	707	2991	185180	62	99	955	28639	30	38	634	15820	17	na
2001/02	713	3901	184047	47	100	1026	32862	32	44	761	19923	26	6349
2002/03	714	3,926	183800	47	112	1121	37734	33	42	579	20869	36	na

Source: Provincial Government of East Timor, *East Timor in Figures*, 1993, 1998; Education Division of ETTA for figures in 2000/01; MEYCS for figures in 2001/02.

**Annex 1.2: Catholic Schools in Timor-Leste, 1998/99**

Level of Education	Schools	Students  Male      Female      Total			Teachers												Students/ Teacher	
					Government-Paid						Church-Paid							Total
								Non-ET			Timor-Lesteese			Non-ET				
					M	F	T	M	F	T	M	F	T	M	F	T		
Kindergarten	13	390	366	756	0	11	11	3	23	26				7	7	44	17	
Primary	122	8,998	7,575	16,573	231	201	432	179	99	278	16	6	22	15	4	19	751	22
Jr. Secondary	32	3,008	3,335	6,343	9	13	22	81	69	150	37	19	56	39	49	88	316	20
Sr. Secondary	13	1,669	1,648	3,317	5	2	7	40	29	69	29	4	33	77	43	120	229	14
Sec. Seminary	4	325	223	548				15	14	29	2	2	4	20	15	35	68	8
Pastoral Institute	1	100	131	231	3	0	3	7	2	9	3	3	6	2		2	20	12
Total	172	14,490	13,278	27,768	248	227	475	325	236	561	87	34	121	153	111	264	1421	20

Source: Catholic Schools' Pastoral Coordinators' Center in Timor-Leste

**Annex 1.3: Primary Education Enrollment by District and by Grade, 1996/97**

<b>District</b>	<b>Grade 1</b>	<b>Grade 2</b>	<b>Grade 3</b>	<b>Grade 4</b>	<b>Grade 5</b>	<b>Grade 6</b>	<b>Total</b>	<b>Percentage</b>
Aileu	1,541	1,234	1,335	890	780	710	6,490	3.9%
Ainaro	2,367	1,059	1,076	852	770	779	6,903	4.1%
Baucau	4,211	2,664	2,314	1,754	1,581	1,384	13,908	8.3%
Bobonaro	4,968	3,465	3,263	2,731	2,349	1,877	18,653	11.1%
Covalima	3,426	2,548	2,191	1,707	1,337	1,275	12,484	7.4%
Dili	5,550	3,548	3,734	3,521	2,854	2,656	21,863	13.0%
Ermera	4,360	3,792	2,881	1,955	1,142	740	14,870	8.9%
Liquica	2,599	1,805	1,548	1,335	1,079	1,337	9,703	5.8%
Lospalos	2,826	1,854	1,636	1,432	1,389	1,061	10,198	6.1%
Manatuto	1,754	1,147	1,192	1,020	813	697	6,623	4.0%
Manufahi	2,013	1,340	1,483	1,250	1,148	962	8,196	4.9%
Oecussi	2,573	1,403	1,322	1,305	1,192	1,416	9,211	5.5%
Viqueque	2,881	1,613	1,527	1,247	1,067	855	9,190	5.5%
<b>Total</b>	<b>41,069</b>	<b>27,472</b>	<b>25,502</b>	<b>20,999</b>	<b>17,501</b>	<b>15,749</b>	<b>148,292</b>	<b>100.0%</b>
<b>%</b>	<b>24.5%</b>	<b>16.4%</b>	<b>15.2%</b>	<b>12.5%</b>	<b>10.4%</b>	<b>9.4%</b>	<b>100.0%</b>	

Source: Provincial Government of East Timor. *East Timor in Figures 1997* (1998)

**Annex 1.4: Gross and Net Enrollment Ratios in Primary, Junior Secondary and Senior Secondary Education in Timor-Leste and Indonesia, 1995, 1997, 1998, and 1999 (Percentages)**

	Primary				Junior Secondary				Senior Secondary			
	1995	1997	1998	1999	1995	1997	1998	1999	1995	1997	1998	1999
<b>Timor-Leste</b>												
Gross Enrollment	93	92	90	94	50	57	56	64	40	36	39	35
Urban	111	110	111	105	73	85	92	105	72	69	71	64
Rural	92	90	88	94	47	53	51	59	36	31	34	30
Net Enrollment	72	72	70	74	27	31	34	36	18	20	21	20
Urban	84	85	89	89	40	54	56	67	36	41	42	40
Rural	71	70	68	73	26	28	32	33	16	17	17	17
<b>Indonesia</b>												
Gross Enrollment	107	108	108	108	66	74	73	76	42	47	47	48
Urban	108	109	108	108	86	91	89	91	65	69	71	71
Rural	107	108	107	108	55	65	64	67	27	31	30	32
Net Enrollment	92	92	92	93	51	58	57	59	33	37	38	39
Urban	93	93	93	93	67	71	70	71	50	54	56	57
Rural	91	92	92	92	43	51	50	52	21	24	24	25

Source: Analysis of SUSENAS by Pradhan and Sparrow, 2000.

**Annex 1.5: Indonesia Provinces Poverty (Headcount) Rates and other Indicators of Welfare by Region in 1996**

Province	Area	Perc. Poor using official poverty lines	Perc. Poor using alternative rescaled poverty lines	Adult illiteracy (%)	Children aged 15-17 that did not complete primary school (%)	Infant mortality	Children mal-nourished (%)
Aceh	Urban	7.2	5.4	3.38	4.1	43	46
	Rural	11.1	8.2	11.74	9.0	49	48
North Sumatra	Urban	9.5	3.8	2.19	4.1	57	43
	Rural	11.7	8.2	7.93	10.9	53	38
West Sumatra	Urban	5.3	2.1	3.07	5.2	43	29
	Rural	9.9	4.6	10.11	12.3	79	30
Riau	Urban	4.4	4.4	4.29	3.5	0	27
	Rural	9.5	12.8	7.92	12.6	49	38
Jambi	Urban	7.5	2.2	3.71	3.2	37	28
	Rural	9.2	4.7	10.05	13.4	58	35
South Sumatra	Urban	12.2	0.9	4.68	5.1	41	25
	Rural	10.6	12.7	11.96	21.4	63	31
Bengkulu	Urban	6.1	6.1	2.31	5.0	46	20
	Rural	10.4	19.3	10.80	17.9	72	26
Lampung	Urban	9.2	7.5	5.03	5.7	54	20
	Rural	11.1	24.2	11.33	9.8	63	35
Jakarta	Urban	2.5	1.4	3.19	2.9	34	22



West Java	Urban	10.1	4.6	6.05	5.1	47	24
	Rural	9.3	8.2	13.79	12.1	75	28
Central Java	Urban	13.9	3.0	12.11	4.8	44	27
	Rural	14.1	14.0	22.04	7.4	49	29
Yogyakarta	Urban	12.1	5.7	13.53	2.9	0	25
	Rural	7.4	8.5	27.06	6.1	38	33
East Java	Urban	13.3	11.0	10.24	3.8	42	27
	Rural	11.1	17.8	28.28	11.2	65	30
Bali	Urban	5.4	4.4	11.59	3.7	39	20
	Rural	3.7	4.0	25.56	11.2	47	21
NTB	Urban	19.7	15.4	18.57	14.1	80	37
	Rural	17.1	16.5	35.41	19.7	113	39
NTT	Urban	14.3	15.7	5.48	5.8	37	43
	Rural	19.6	34.4	23.85	26.3	67	37
East Timor	Urban	15.1	5.7	17.15	11.0	48	24
	Rural	33.1	32.8	57.87	44.8	84	38
West Kalimantan	Urban	11.7	4.6	11.74	7.3	51	24
	Rural	23.6	29.3	22.02	23.5	69	44
Central Kalimantan	Urban	6.8	2.8	2.80	6.1	39	33
	Rural	13.0	8.9	7.51	14.1	48	33
South Kalimantan	Urban	10.7	1.0	5.09	7.4	55	28
	Rural	13.7	4.7	11.84	17.3	93	34

<b>Province</b>	<b>Area</b>	<b>Perc. Poor using official poverty lines</b>	<b>Perc. Poor using alternative rescaled poverty lines</b>	<b>Adult illiteracy (%)</b>	<b>Children aged 15-17 that did not complete primary school (%)</b>	<b>Infant mortality</b>	<b>Children mal-nourished (%)</b>
East Kalimantan	Urban	5.3	0.6	5.66	6.0	43	22
	Rural	12.2	15.6	14.04	11.2	70	31
North Sulawesi	Urban	6.5	4.9	1.76	9.3	42	30
	Rural	12.5	31.2	3.77	17.8	42	36
Central Sulawesi	Urban	5.1	3.0	4.67	6.9	58	27
	Rural	9.3	13.2	11.06	13.3	84	39
South Sulawesi	Urban	11.5	7.0	9.17	8.9	48	30
	Rural	6.6	14.5	25.26	19.6	66	32
South East Sulawesi	Urban	7.1	12.0	7.05	7.8	46	26
	Rural	8.4	21.3	15.87	16.5	65	28
Maluku	Urban	6.4	4.2	1.24	2.8	34	29
	Rural	24.7	26.9	8.93	11.1	56	22
Irian Jaya	Urban	9.5	6.0	3.59	4.7	53	29
	Rural	23.7	53.9	44.13	35.4	53	28
Indonesia	Urban	9.8	5.0	7.12	4.8	39	27
	Rural	12.0	14.8	19.23	13.1	65	32
		11.1	11.1	14.66	9.8	57	30
No. of observations		264,786	264,786	588,689	60,219		82,150

Source: Lanjowu et al, 2000, citing poverty estimates, literacy, primary school completion and infant mortality based on author's calculations using 1996 Susenas. Malnutrition data are copied from based on results from Saadah, Waters, and Heywood (1999) who use the 1998 Susenas.

**Annex 1.6: Private (Mincerian) Rates of Return to Education in Timor-Leste and Indonesia, 1998**

	Timor-Leste		Indonesia	
	(1) Basic model	(2) Including industry	(1) Basic model	(2) Including industry
Age	0.162 (4.55)**	0.172 (5.03)**	0.044 (15.85)**	0.044 (15.98)**
Age squared	-0.002 (3.32)**	-0.002 (3.72)**	-0.000 (11.69)**	-0.000 (11.08)**
Primary	0.186 (0.88)	0.187 (0.88)	0.249 (14.13)**	0.260 (14.81)**
Junior secondary	0.448 (2.76)**	0.468 (2.83)**	0.455 (22.71)**	0.438 (21.58)**
Vocational Jr. sec	0.284 (1.60)	0.274 (1.45)	0.706 (33.66)**	0.690 (33.30)**
Senior secondary	0.540 (2.76)**	0.540 (2.64)*	0.780 (37.07)**	0.771 (37.19)**
Vocational Sr. sec	0.727 (3.79)**	0.736 (3.76)**	1.134 (38.94)**	1.138 (40.59)**
Any university	0.763 (4.11)**	0.767 (4.00)**	0.418 (34.99)**	0.349 (30.30)**
Male	0.372 (3.56)**	0.347 (3.63)**	0.164 (11.72)**	0.108 (7.43)**
Urban	0.100 (1.20)	0.069 (0.82)	0.110 (6.48)**	0.200 (10.39)**
Government service, defense	0.548 (3.68)**	0.579 (2.90)**		0.445 (13.66)**
Industrial processing sector		0.741 (1.33)		0.310 (11.99)**
Trading, retail, restaurant, hotel		0.595 (2.72)*		0.296 (11.40)**
Transport, storage, communication		0.710 (3.18)**		0.490 (18.05)**
Social and individual services		0.643 (2.28)*		0.153 (5.97)**
Other industry		1.164 (4.92)**		0.448 (18.17)**
Constant	8.069 (14.23)**	7.227 (11.02)**	10.463 (190.22)**	10.282 (182.76)**
Observations	214	214	28,175	28,175
R-square	0.62	0.63	0.38	0.42

Source: Analysis of the 1998 Indonesian Labor Force Survey (Sakernas), by D. Filmer (World Bank).

Notes: Numbers in parentheses are robust t statistics. \* significant at .05 level; \*\* significant at .01 level.

**Annex 1.7: Public Sector Education Expenditure by Level in Timor Leste Under Indonesian Occupation 1995/96 - 1999/00, (Billion Rupiah)**

	1995/96									1996/97									1997/98									1998/99								
	SBPP									SBPP									SBP									SB Inpres								
	MoNE				MoRA					MoNE				MoRA					MoNE				MoRA					MoNE				MoRA				
PROGRAM	DIK	DIP	DIK	DIP	SDO	SDN	BLN	Total	DIK	DIP	DIK	DIP	SDO	SDN	BLN	Total	DIK	DIP	DIK	DIP	SDO	P-SD	Inpres	BLN	Total	DIK	DIP	DIK	DIP	SDO	N	BLN	Total			
Preschool	0.1							0.1	0.1							0.1	0.1								0.1	0.1							0.1			
Primary School		0.9			16.8	0.5	9.9	28.1		1.0			19.3	0.7	11.4	32.4		0.9			25.5	0.8	17.4	44.6		0.9			29.2	1.2	16.0	47.3				
Religious Primary School								0.0								0.0								0.0			0.2						0.2			
Junior Secondary School	7.3	11.3						0.3	18.9	9.3	10.3					1.2	20.8	13.6	12.7					0.4	26.7	13.3	15.9					0.5	29.7			
Religious Jr. Secondary School								0.1								0.1								0.1								0.2				
Senior Secondary	6.3	4.2						0.2	10.7	7.6	5.2					1.7	14.5	10.1	6.3					1.6	18.0	10.0	6.1					1.8	17.9			
Religious Sr. Secondary School								0.1								0.1								0.1								0.1				
ContinuousTeacher Training & Formal Education	0.3	1.5							1.8	0.3	1.3					1.6	0.4	2.7						3.1	0.3	0.5							0.8			
Operation and Maintenance for Secondary School		1.7							1.7		2.5					2.5		1.1						1.1		4.3							4.3			
University	1.0	4.0							5.0	1.2	6.1					7.3	1.8	8.1						9.9	1.6	6.4							8.0			
Non-formal School																																				
Primary and Junior Secondary	0.2	0.9						0.9	2.0	0.4	1.2				0.6	2.2	0.5	1.6					0.2	2.3	0.4	2.2							2.6			
Art & Culture	0.1	0.7						0.8		0.4	0.3					0.7	0.7	0.4						1.1	0.6								0.6			
Regional Offices-MoNE/MoRA	6.3	0.3							6.6	7.3						7.3	9.2		0.5					9.7	9.1		0.4						9.5			
TOTAL	21.6	25.5	0.0	0.2	16.8	0.5	9.9	1.4	75.9	26.6	27.9	0.0	0.2	19.3	0.7	11.4	3.5	89.6	36.4	33.8	0.5	0.2	25.5	0.8	17.4	2.2	116.8	35.4	36.3	0.6	0.3	29.2	1.2	16	2.3	121.3

Source: Government of Indonesia.

Key:

MoNE	Ministry of National Education	SBBP-SDN	Operational Budget for Primary Schools for goods
MoRA	Ministry of Religious Affairs	SDO	Salary for Primary School Teachers
DIP	Development Budget	BLN	Loan
DIK	Recurrent Budget (approx. 85% is for salary)	INPRES	Development Budget for Primary Schools

**Annex 1.8: Public Sector Education Expenditure by Source in Timor Leste Under Indonesian Occupation, 1995/96 - 1999/00**

<b>In Billion Rupiah</b>										
	95/96		96/97		97/98		98/99		99/00	
	A	R	A	R	A	R	A	R	A	R
<b>Ministry of National Education</b>										
- Development Budget	26.5	25.5	28.4	27.9	34.5	33.8	37.2	36.3	41.6	17.3
- Recurrent Budget	23.8	21.5	26.9	26.6	29.4	36.4	28.4	35.4	41.9	20.0
<b>Province &amp; Districts</b>										
Development Budget for Primary Schools	9.9	9.9	11.4	11.4	17.4	17.4	16	16	29.0	4.3
Operational Budget for Primary Schools for Goods	0.5	0.5	0.7	0.7	0.8	0.8	1.2	1.2	1.4	
Salaries for Primary School Teachers	16.8	16.8	19.3	19.3	25.5	25.5	29.2	29.2	43.1	
<b>Ministry of Religious Affairs</b>										
- Development Budget	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.1
- Recurrent Budget	0.7		0.8		1	0.5	0.9	0.6	2.9	0.3
<b>Total Government of Indonesia (GOI)</b>	<b>78.4</b>	<b>74.4</b>	<b>87.7</b>	<b>86.1</b>	<b>108.8</b>	<b>114.6</b>	<b>113.2</b>	<b>119.0</b>	<b>160.2</b>	<b>42.0</b>
Loan from Ministry of National Education		1.4		3.5		2.2		2.2	0.9	0.9
<b>Total GOI and Loan</b>	<b>78.4</b>	<b>75.8</b>	<b>87.7</b>	<b>89.6</b>	<b>108.8</b>	<b>116.8</b>	<b>113.2</b>	<b>121.2</b>	<b>161.1</b>	<b>42.9</b>

Source: Government of Indonesia.

Note: A means allocation; R means realization.

**Annex 1.9: Proportion of Illiterate Population in East Timor by Age-Group and Place of Birth of Heads of Household, 1990**

Age Group	Heads Born in East Timor		Heads Born Elsewhere	
	Males	Females	Males	Females
15-19	21.6	31.2	5.2	5.7
20-24	35.0	56.6	2.3	6.2
25-39	53.2	74.6	2.0	9.1
30-34	62.5	83.9	3.2	5.0
35-39	72.0	88.5	4.2	19.6
40-44	82.2	93.7	8.1	12.1
45-49	84.2	93.6	0.0	26.7
50-54	85.9	93.6	8.8	40.7
55-59	89.4	96.6	14.9	51.0
60-64	89.4	94.5	37.6	60.8
65-60	88.8	73.0	22.2	35.5
Number	193,467	193,219	26,829	15,602

Source: Provincial Government of East Timor. 1990 Population Census

**Annex 1.10: Occupation of Heads of Household by Place of Birth, 1990 (Percentage)**

<b>Occupation</b>	<b>Head Born in East Timor</b>		<b>Head Not Born in East Timor</b>	
	<b>Male</b>	<b>Female</b>	<b>Male</b>	<b>Female</b>
Professional	1.5	1.2	13.9	24.1
Admin.& Manag.	0.1	0.0	0.8	0.3
Clerical	6.0	1.7	43.0	23.8
Sales	2.9	4.7	11.9	28.7
Service workers	2.5	0.9	6.8	8.3
Agriculture	81.1	80.8	8.7	11.7
Production	5.9	10.7	14.9	3.1
Total	100	100	100	100

Source: Provincial Government of East Timor. 1990 Population Census

**Annex 1.11: Educational Attainment of Head of Household Born in East Timor Aged 15-69, 1995 (%)**

Age-group	Male					Female				
	None or some Primary	Primary	Lower Secondary	Upper Secondary	Tertiary	None or some Primary	Primary	Lower Second.	Upper Second	Tertiary
15-19	52.9	32.1	13.8	1.3	0	52.4	32.1	13.5	2.0	0
20-24	44.6	21.8	18.9	14.2	0.5	58.4	17.7	13.4	10.4	0.1
25-29	48.6	15.2	12.4	23.1	0.7	70.1	13.0	7.9	8.6	0.4
30-34	67.5	13.5	4.6	13.0	1.4	86.3	7.2	2.8	3.3	0.5
35-39	77.6	11.6	4.9	5.3	0.5	91.5	5.0	1.9	1.6	0
40-44	80.1	12.6	3.7	3.2	0.4	93.2	3.5	1.3	1.7	0.2
45-49	92.6	4.6	1.4	1.2	0.2	98.2	1.6	0	0.2	0
50-54	94.7	3.9	1.4	0	0	98.2	0.9	0.7	0.2	0
55-59	94.9	4.4	0.7	0	0	98.1	1.6	0	0	0
60-64	97.5	1.3	0.8	0.4	0	99.5	0.5	0	0	0
65-69	98.5	1.5	0	0	0	99.4	0	0.6	0	0
No. of Persons	142,017	30,467	16,625	16,878	931	164,772	22,503	11,794	8,052	334
%	68.6	14.7	8.0	8.2	0.4	79.4	10.8	5.7	3.9	0.2

Source: Provincial Government of East Timor. 1995 Intercensal Population Survey.



## **ANNEX 2: STATISTICS ON SCHOOLS, TEACHERS AND STUDENTS AFTER THE TRANSITION**

**Annex 2.1. Primary Education Enrollment by District and by Grade, 2000/01**

District	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Total	Percentage
Aileu	8,347	1,562	1,166	880	658	604	13,190	7%
Ainaro	3,253	1,554	1,348	1,082	1,092	1,069	9,398	5%
Baucau	6,513	4,182	3,174	2,517	2,095	1,884	20,365	11%
Bobonaro	8,418	3,212	2,153	1,571	1,489	1,452	18,294	10%
Covalima	3,452	1,603	1,304	1,005	886	859	8,990	5%
Dili	9,425	4,893	4,166	3,765	3,013	3,071	28,333	15%
Ermera	8,194	4,299	2,512	1,668	1,257	1,146	19,076	10%
Liquica	5,593	1,971	1,455	1,202	909	859	11,989	6%
Lospalos	3,699	1,893	1,499	1,247	1,161	1,101	10,443	6%
Manatuto	2,045	2,331	1,445	1,265	1,123	960	9,169	5%
Manufahi	3,106	2,139	1,591	1,345	1,161	1,101	10,443	6%
Oecussi	4,201	1,462	1,309	1,104	933	923	9,932	5%
Viqueque	5,682	3,323	2,112	1,636	1,391	1,308	15,452	8%
Total	71,928	34,424	25,233	20,287	17,184	16,337	185,180	100%
Percentage	39%	19%	14%	11%	9%	9%	100%	

Source: Education Division of ETTA.

**Annex 2.2: Primary School Statistics by District, 2002/3**

<b>District</b>	<b>Number of Schools</b>	<b>Average School Size</b>	<b>Students</b>	<b>Student Growth Compared with Previous Years</b>	<b>Teachers</b>	<b>Teacher Growth</b>	<b>STR</b>	<b>Teachers/School</b>
Aileu	36	301	10,850	-18%	240	61%	45	7
Ainaro	38	262	9,951	6%	203	29%	49	5
Baucau	72	276	19,894	-2%	443	28%	45	6
Bobonaro	94	195	18,334	0%	381	32%	48	4
Covalima	68	205	13,924	53%	304	34%	46	4
Dili	64	433	27,692	-2%	614	29%	45	10
Ermera	65	292	19,002	-0%	434	15%	44	7
Liquica	38	301	11,445	-5%	228	16%	50	6
Lospalos	56	210	11,748	11%	246	43%	48	4
Manatuto	38	214	8,137	-11%	173	47%	47	5
Manufahi	50	217	10,829	4%	207	35%	52	4
Oecussi	43	212	9,134	-8%	193	32%	47	4
Viqueque	52	247	12,866	-17%	260	38%	49	5
Total	714	257	183,806	-1%	3,926	31%	47	5

Source: MECYS.

### **Annex 2.3: Junior Secondary School Statistics by District, 2002/3**

<b>District</b>	<b>Schools</b>	<b>Average School Size</b>	<b>Students</b>	<b>Student Growth</b>	<b>Teachers</b>	<b>Teacher Growth</b>	<b>STR</b>	<b>Teacher/School</b>
Aileu	7	255	1,786	82%	69	73%	26	10
Ainaro	6	254	1,526	19%	31	0%	49	5
Baucau	20	225	4,493	12%	149	4%	30	7
Bobonaro	8	380	3,041	18%	82	-1%	37	10
Covalima	9	317	2,850	22%	78	5%	37	9
Dili	16	509	8,148	8%	245	3%	33	15
Ermera	7	403	2,818	26%	64	23%	44	9
Liquica	5	349	1,744	57%	50	25%	35	10
Lospalos	7	394	2,761	9%	69	17%	40	10
Manatuto	6	263	1,580	12%	42	14%	38	7
Manufahi	9	258	2,326	-7%	72	-3%	32	8
Oecussi	5	455	2,274	17%	56	8%	41	11
Viqueque	7	341	2,387	-1%	121	19%	20	17
<b>Total</b>	<b>112</b>	<b>337</b>	<b>37,734</b>	<b>15%</b>	<b>1,128</b>	<b>10%</b>	<b>33</b>	<b>10</b>

Source: MECYS.

**Annex 2.4: Selected Senior Secondary School Statistics by District, 2002/3**

<b>District</b>	<b>Schools</b>	<b>Average School Size</b>	<b>Students</b>	<b>Student Growth</b>	<b>Teachers</b>	<b>Teacher Growth</b>	<b>STR</b>	<b>Teachers/School</b>
Aileu	2	819	1,637	162%	32	7%	51	16
Ainaro	2	269	537	63%	7	-42%	77	4
Baucau	3	539	1,617	-2%	53	2%	31	18
Bobonaro	2	499	998	-6%	41	3%	24	21
Covalima	2	562	1,123	34%	22	-15%	51	11
Dili	17	558	9,494	19%	240	11%	40	14
Ermera	2	336	671	-19%	21	0%	32	11
Liquica	2	436	871	-0%	20	33%	44	10
Lospalos	1	671	671	-26%	39	-9%	17	39
Manatuto	2	184	367	11%	9	0%	41	5
Manufahi	2	335	670	-8%	24	-31%	28	12
Oecussi	2	736	1,471	78%	22	-4%	67	11
Viqueque	3	247	742	-7%	49	-16%	15	16
Total	42	497	20,869	17%	579	-0%	36	14

Source: MECYS.

**Annex 2.5: Staffing by Education Level and by District, 2002/3**

<b>District</b>	<b>Primary</b>	<b>Jr. Sec</b>	<b>Sr. Sec</b>	<b>Admin</b>	<b>Other</b>	<b>Total</b>	<b>Pct</b>
Aileu	243	69	32	10	0	354	6%
Ainaro	205	31	7	11	0	254	4%
Baucau	484	149	53	9	21	716	11%
Bobonaro	391	82	41	10	17	541	8%
Covalima	318	78	22	7	0	425	7%
Dili	592	245	240	101	313	1,491	23%
Ermera	448	64	21	10	0	543	8%
Liquica	267	50	20	9	0	346	5%
Lospalos	255	69	39	8	16	387	6%
Manatuto	183	42	9	10	31	275	4%
Manufahi	206	72	24	6	13	321	5%
Oecussi	189	56	22	10	0	277	4%
Viqueque	299	121	49	9	0	478	7%
Total	4,080	1,128	579	210	411	6,408	100%

Source: MECYS.

### **Annex 2.6: Staffing by Salary Level and by District, 2002/3**

<b>District</b>	<b>L1</b>	<b>L2</b>	<b>L3</b>	<b>L4</b>	<b>L5</b>	<b>L6</b>	<b>L7</b>	<b>Total</b>
Aileu	1	1	246	105	1	0	0	354
Ainaro	0	0	210	42	1	1	0	254
Baucau	0	0	487	227	1	1	0	716
Bobonaro	0	0	394	145	1	1	0	541
Covalima	0	0	321	102	1	1	0	425
Dili	34	21	673	620	123	18	2	1,491
Ermera	0	0	452	90	0	1	0	543
Liquica	0	0	270	75	1	0	0	346
Lospalos	0	0	258	127	1	1	0	387
Manatuto	0	0	189	84	1	1	0	275
Manufahi	0	0	209	110	1	1	0	321
Oecussi	0	0	192	83	1	1	0	277
Viqueque	0	0	301	175	1	1	0	478
<b>Total</b>	<b>35</b>	<b>22</b>	<b>4,202</b>	<b>1,985</b>	<b>134</b>	<b>28</b>	<b>2</b>	<b>6,408</b>
MECYS	1%	0%	66%	31%	2%	0%	0%	100%
Total civil service	13%	23%	39%	20%	3%	1%	0%	99%

Source: MECYS.

**Annex 2.7. Teaching Staff and Students of the National University of Timor-Leste, 2001/2002**

	<b>Students</b>		<b>Faculty Members</b>	
	<b>Female</b>	<b>Total</b>	<b>Female</b>	<b>Total</b>
Education	464	1,438	6	27
Agriculture	237	1,057	2	25
Economy	672	1,344	1	11
Social/Political	1,417	1,881	1	19
Engineering	567	629	NA	38
General Discipl		NA	1	3
Total	4450	6,349	11	123

Source: National University of Timor-Leste



**ANNEX 3 FINDINGS FROM TIMOR-LESTE LIVING STANDARDS  
MEASUREMENT SURVEY (TLSS 2001)**

### **Annex 3.1A: Highest Grade Completed Among Those Who Have Attended, Ages 19-29**

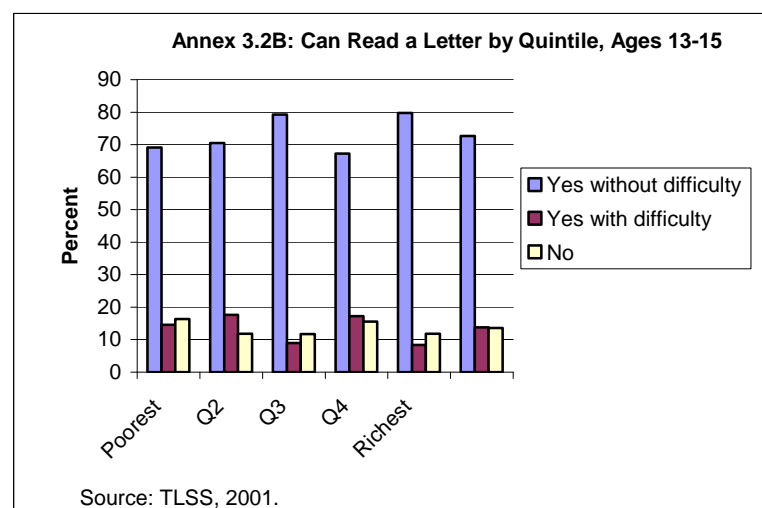
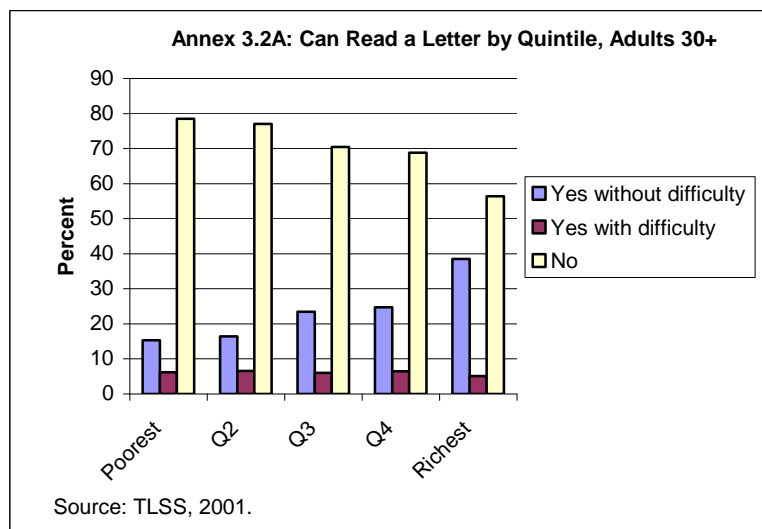
<b>Grade</b>	<b>Poorest</b>	<b>Quintile 2</b>	<b>Quntile 3</b>	<b>Quntile 4</b>	<b>Richest</b>	<b>All</b>
1	0.00	0.00	1.69	1.27	0.06	0.59
2	3.61	4.82	4.77	3.40	2.33	3.47
3	8.92	5.23	1.19	3.95	4.57	4.34
4	7.64	5.86	4.63	5.91	3.86	5.07
5	12.33	15.70	7.19	7.82	3.42	7.57
6	16.85	20.46	19.42	10.64	13.47	15.35
7	6.19	2.21	1.38	2.08	3.33	2.86
8	8.61	6.02	4.50	9.60	6.62	6.92
9	16.08	13.11	17.58	10.67	13.87	14.09
10	4.35	0.80	3.63	3.25	3.75	3.30
11	3.60	6.10	5.57	5.92	3.20	4.61
12	11.63	19.41	24.33	31.19	31.29	26.30
13	0.18	0.27	4.12	4.31	10.24	5.53

Source: TLSS, 2001.

### **Annex 3.1B: Highest Grade Completed, Among Those Who Have Attended, Ages 30+**

<b>Grade</b>	<b>Poorest</b>	<b>Quintile 2</b>	<b>Quntile 3</b>	<b>Quntile 4</b>	<b>Richest</b>	<b>All</b>
0	0.00	0.00	0.00	0.72	0.00	0.16
1	5.27	2.65	2.43	0.29	0.32	1.65
2	8.57	11.95	11.88	10.06	5.90	9.10
3	7.18	16.00	11.88	9.17	10.44	10.74
4	14.29	9.63	9.78	7.66	4.53	8.15
5	7.97	6.79	4.62	4.25	3.22	4.79
6	28.71	14.30	23.53	17.02	17.41	19.52
7	1.35	1.58	0.84	2.35	0.39	1.19
8	0.51	3.29	3.11	5.52	3.36	3.42
9	15.71	16.04	12.39	13.41	11.55	13.25
10	0.00	1.19	1.14	0.00	0.24	0.45
11	0.00	3.20	0.21	2.30	2.63	1.83
12	10.04	12.22	18.04	25.03	34.05	23.06
13	0.40	1.16	0.14	2.23	5.98	2.68

Source: TLSS, 2001.



### **Annex 3.3: Out-of-School Children by Age and Quintile (Ages 7 to 14)**

<b>Age</b>	<b>Poorest</b>	<b>Quintile 2</b>	<b>Quintile 3</b>	<b>Quintile 4</b>	<b>Richest</b>	<b>Total</b>
<b>No. of children</b>						
7	4,372	3,434	3,820	2,729	172	14,527
8	2,967	2,536	2,859	2,529	1,035	11,926
9	3,196	1,018	1,565	1,265	426	7,470
10	778	1,193	900	1,458	791	5,120
11	501	579	762	526	184	2,552
12	877	834	423	563		2,697
13	739	451	181	570	281	2,222
14	790	1,199	526	98	286	2,899
Total	14,220	11,244	11,036	9,738	3,175	49,413
<b>As % of total in each age</b>						
7	31%	31%	35%	28%	5%	29%
8	21%	23%	26%	26%	33%	24%
9	22%	9%	14%	13%	13%	15%
10	5%	11%	8%	15%	25%	10%
11	4%	5%	7%	5%	6%	5%
12	6%	7%	4%	6%	0%	5%
13	5%	4%	2%	6%	9%	4%
14	6%	11%	5%	1%	9%	6%
Total	100%	100%	100%	100%	100%	100%

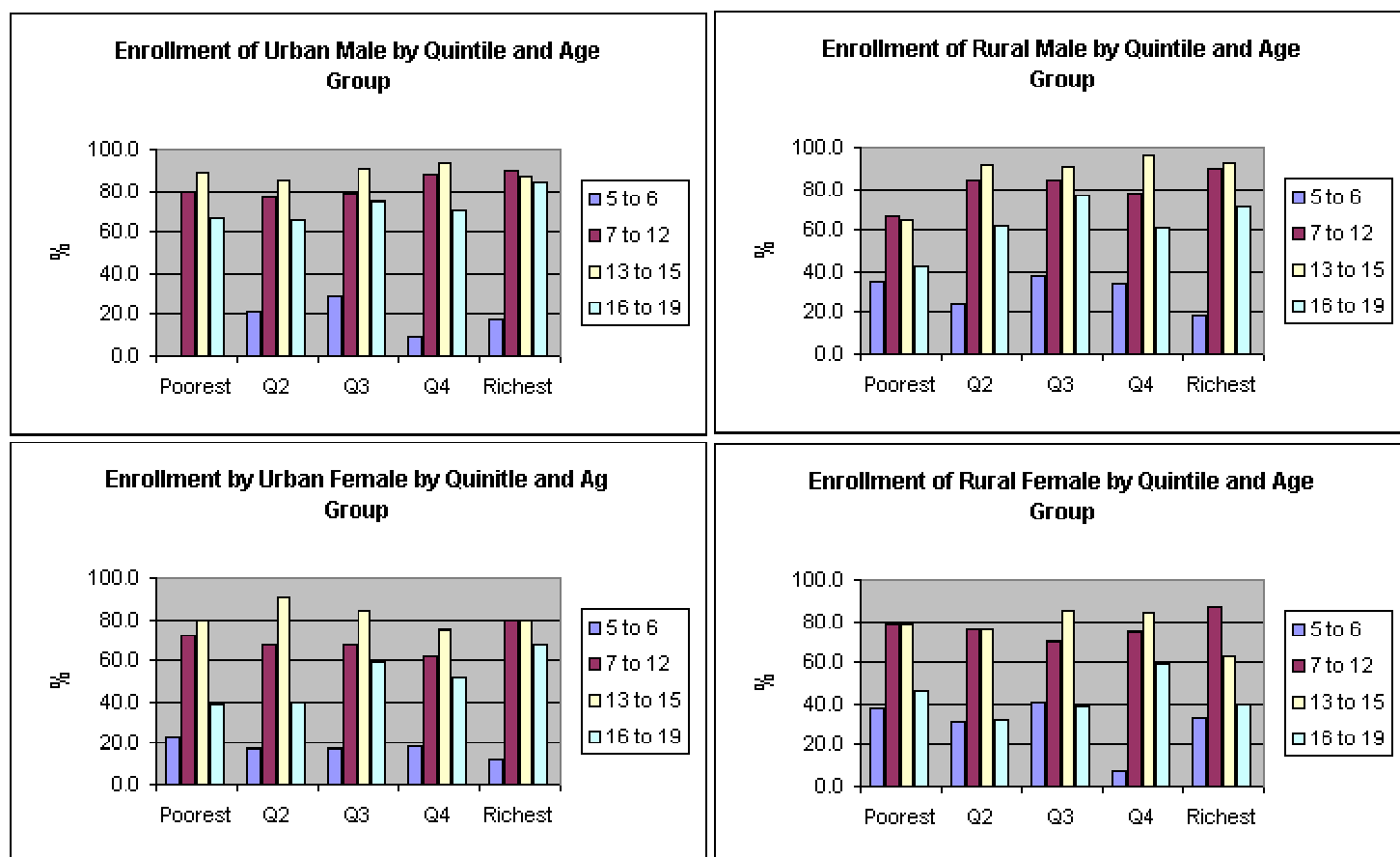
**Source: TLSS (2001).**

**Annex 3.4: Number of Enrolled and Relevant Age Population**

<b>Level</b>	<b>Primary</b>	<b>Junior Secondary</b>	<b>Senior Secondary</b>
Enrollment in 2000	183,268	26,542	15,443
Relevant Age Population	155,487	65,595	43,945

Source: ETTA Education Division statistics; TLSS, 2001.

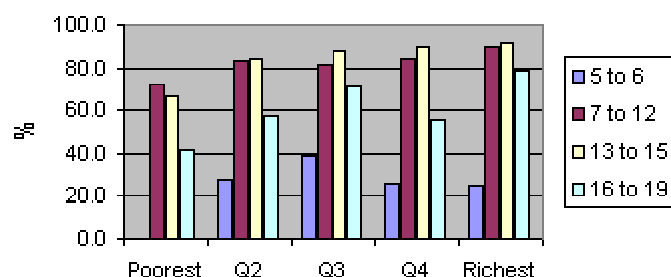
### Annex 3.5: Enrollment Pattern by Gender, Location, Quintile and Age Group



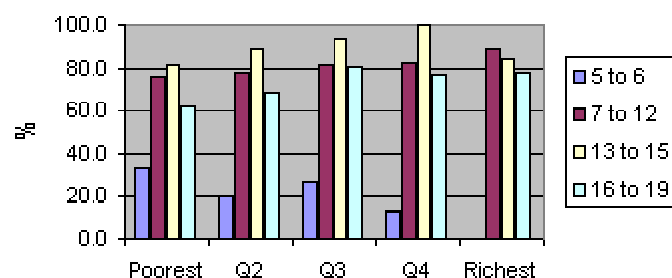
Source: TLSS, 2001.

### Annex 3.6: Enrollment Pattern by Region, Location, Quintile and Age Group

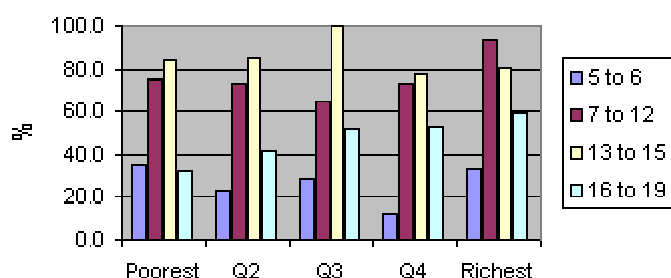
**Enrollment in Dili/Baucau by Quintile and Age Group**



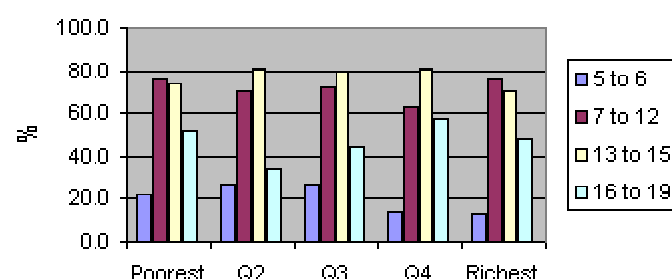
**Enrollment in other Urban Areas by Quintile and Age Group**



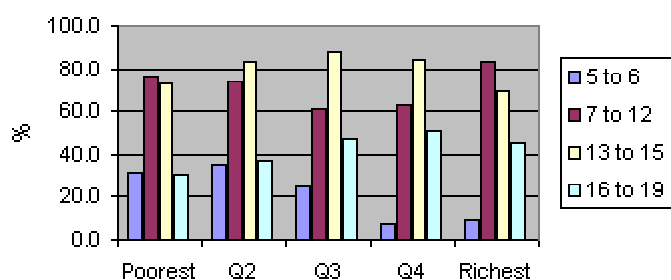
**Enrollment in Rural Highland by Quintile and Age Group**



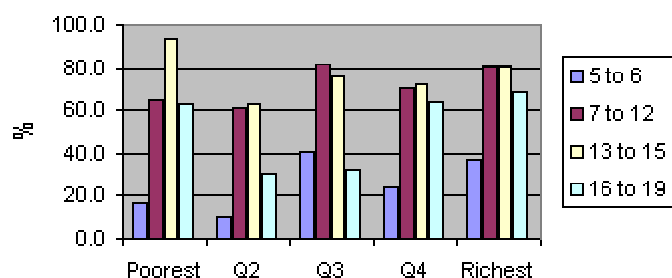
**Enrollment in Rural Lowland by Quintile and Age Group**



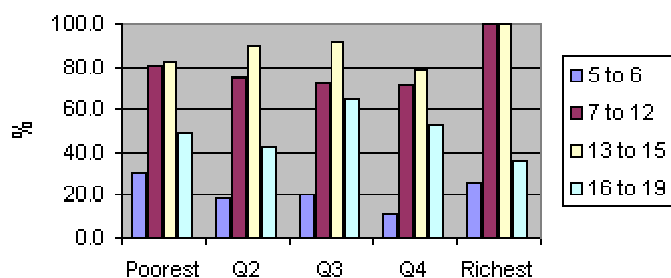
**Enrollment in Rural Center by Quintile and Age Group**



**Enrollment in Rural East by Quintile and Age Group**



**Enrollment in Rural West by Quintile and Age Group**



**Annex 3.7A: Enrollment by Age Group of the Population that Remains in Timor-Leste, 1998 to 2001 (%)**

Age-group	1998/99	1999/2000	2000/01	2001/02
3-5	0.0	1.5	7.4	13.8
6-11	21.7	30.4	55.7	64.2
12-14	76.8	68.3	86.6	86.9
15-16	74.8	67.8	73.9	73.0
17-18	54.5	49.6	53.6	54.4
19-29	15.2	12	12.5	12.5

Source: TLSS (2001).

**Annex 3.7B: Enrollment by Single Age of the Population that Remains in Timor-Leste, 1998 to 2001 (%)**

Age	School 1998/99	School 1999/00	School 2000/01	School 2001/02
5	0.000	0.015	0.074	0.138
6	0.007	0.046	0.188	0.330
7	0.060	0.146	0.438	0.575
8	0.161	0.259	0.573	0.652
9	0.233	0.350	0.698	0.742
10	0.476	0.576	0.773	0.832
11	0.533	0.627	0.866	0.875
12	0.714	0.683	0.867	0.875
13	0.798	0.717	0.888	0.885
14	0.796	0.647	0.843	0.846
15	0.751	0.671	0.737	0.739
16	0.745	0.686	0.742	0.719
17	0.572	0.557	0.572	0.584
18	0.520	0.444	0.504	0.509
19	0.410	0.351	0.380	0.375
20	0.291	0.231	0.246	0.238
21	0.243	0.210	0.185	0.188
22	0.141	0.087	0.095	0.114
23	0.182	0.139	0.157	0.141
24	0.122	0.069	0.081	0.079
25	0.069	0.051	0.044	0.044
26	0.022	0.022	0.013	0.010
27	0.020	0.013	0.013	0.020
28	0.019	0.007	0.014	0.014

Source: TLSS, 2001.

\* children aged 6 in 1998/99 were aged 9 in 2001/02 in yellow

\* children aged 14 in 1998/99 were aged 17 in 2001/02 in magenta



**Annex 3.8A: Number of Students by Age in Each Grade, 2001**

Age	Pre-primary	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 9	Grade 10	Grade 11	Grade 12
3	251	61											
4	664	207	10	1									
5	861	1526	51	12									
6	607	21725	764	39									
7	92	20278	5641	367	32	10							
8	9	12385	8776	2722	206	8	2						
9		6354	6984	4995	1729	167	10						
10		3612	4700	5573	3553	1337	139						
11		1643	2747	3920	3897	2634	935	42	4				
12		967	1865	2920	3777	3458	2183	646	66	4			
13		479	941	1726	2579	3168	3046	1318	471	71	2		
14		246	543	828	1611	2474	3229	2059	1045	344	91	32	1
15		185	334	431	785	1381	2674	2429	1664	939	522	151	12
16		77	160	308	405	703	1903	1933	1950	1621	1155	340	115
17		17	60	161	77	187	535	1436	1545	1826	1504	935	258
18		8	15	85	33	61	178	645	866	1297	1349	1156	771
19		2	2	41	22	18	110	235	357	856	912	966	944
20								43	60	211	352	542	732
21								14	35	95	130	237	459
22								3	7	17	24	75	192
23								3		3	5	22	105
24								2		6	1	12	60
25										3	3	3	44
Total	2484	69772	33593	24129	18706	15606	14944	10743	7968	6958	5535	3580	2101

Source: School Mapping 2001.

**Annex 3.8B: Age by Grade Distribution of the Poorest Quintile (Percentage)**

												<b>G-11</b>	<b>G-12</b>
7	10.1	4.0	2.1									<b>Age</b>	<b>G-1</b>
8	21.6	6.8	4.6	2.6									
9	25.7	17.1	5.3	1.6								5	3.6
10	8.6	20.9	14.6	9.9	9.9							6	6.6
11	12.7	21.5	15.3	5.2	0.0	5.8							
12	5.5	10.6	14.4	19.7	17.0	0.0							
13	0.9	5.9	21.5	25.8	11.4	15.0	3.6						
14	3.0	3.9	11.7	15.3	16.9	14.2	26.5	0.0					
15	1.0	1.8	2.4	12.8	18.2	13.7	22.6	25.9	16.3	5.2			
16	0.8	0.0	8.3	0.0	23.9	31.7	18.6	44.9	18.0	14.9			25.3
17		1.3		4.5	1.4	11.3	13.2	29.2	14.4	22.2			28.8
18		2.0		2.7	1.4	1.9	0.0		5.2	17.1			25.3
19						6.4	6.6		7.6	40.6	46.3		16.8
20							8.8		38.6		53.7		0.0
23													3.7

**Annex 3.8C: Age by Grade Distribution of the Richest Quintile (percentage)**

<b>Age</b>	<b>G-1</b>	<b>G-2</b>	<b>G-3</b>	<b>G-4</b>	<b>G-5</b>	<b>G-6</b>	<b>G-7</b>	<b>G-8</b>	<b>G-9</b>	<b>G-10</b>	<b>G-11</b>	<b>G-12</b>
5	2.5											
6	8.1											
7	29.1	12.2	4.8		1.4							
8	21.1	19.4	4.6	1.3	1.0							
9	12.6	24.4	25.6	7.4	1.8							
10	11.7	11.6	33.4	7.9	0.0	2.5	1.7					
11	2.8	6.7	4.7	14.9	10.7	1.5	1.6					
12	8.4	19.1	8.2	24.2	12.2	21.4	7.3	9.2				
13	0.0	3.4	5.3	9.4	30.4	20.8	8.7	11.7				
14	0.0	3.3	3.9	19.3	13.5	18.3	21.4	8.2	7.8			
15	2.4		2.2	5.5	6.2	18.2	27.6	17.6	3.2	4.9	2.2	
16	0.0		3.3	2.1	12.1	10.8	11.8	21.5	13.1	6.5	4.2	4.4
17	1.3		4.0		0.0	1.4	12.4	9.9	18.3	31.8	18.8	0.0
18					10.8		2.2	14.6	26.2	26.5	35.1	25.0
19							2.4	7.3	23.2	22.4	7.1	15.5
20						5.2			8.3	3.7	3.2	17.1
21							2.2			4.2	15.1	12.8
22											2.8	4.2
23				8.1							3.3	10.8
24											8.3	4.2
25												6.1

Source: TLSS 2001

### Annex 3.9A Age by Grade Distribution of Male

Age	G-1	G-2	G-3	G-4	G-5	G-6	G-7	G-8	G-9	G-10	G-11	G-12
5	2.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	5.5	1.5	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	21.9	3.6	1.3	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	20.6	13.1	5.5	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	17.5	19.3	7.1	0.9	0.6	0.0	0.0	0.0	1.6	0.0	0.0	0.0
10	8.6	17.4	22.4	7.9	7.3	0.4	0.9	0.0	0.0	0.0	0.0	0.0
11	10.3	15.5	13.2	12.2	6.9	2.0	0.8	0.0	0.0	0.0	0.0	0.0
12	6.3	12.4	14.2	20.1	15.8	2.9	3.8	8.0	0.0	1.2	0.0	0.0
13	3.3	6.7	16.4	24.7	14.2	15.7	5.9	1.0	0.0	0.0	0.0	0.0
14	1.5	6.7	8.1	11.9	18.6	19.5	23.7	14.8	4.5	0.0	0.0	0.0
15	1.5	1.2	3.9	11.7	20.1	23.1	22.9	19.6	7.7	2.5	2.5	4.2
16	0.0	0.8	3.6	3.6	8.4	19.5	12.3	9.1	19.9	8.7	2.0	1.3
17	0.3	0.0	3.5	0.7	1.6	9.7	9.4	19.6	9.7	11.9	18.0	4.7
18	0.0	1.0	0.0	1.3	6.1	3.6	8.6	11.0	25.8	16.1	48.7	17.7
19	0.0	0.0	0.0	1.4	0.0	1.8	9.5	16.9	19.6	34.9	19.0	16.0
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.5	12.0	1.6	13.6
21	0.0	0.0	0.0	0.0	0.0	1.8	0.0	0.0	0.8	7.3	5.8	17.8
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.5	0.0	7.6
23	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.2
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	2.6
25	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.0	0.0	0.0	0.0	8.4

### Annex 3.9B: Age by Grade Distribution of Female

Age	G-1	G-2	G-3	G-4	G-5	G-6	G-7	G-8	G-9	G-10	G-11	G-12
5	3.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	15.1	3.3	1.1	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0
7	14.4	8.5	1.4	1.4	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0
8	20.6	13.4	6.9	1.9	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	16.9	18.3	13.0	3.1	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	11.3	19.8	16.0	6.3	2.9	0.6	0.0	0.0	0.0	0.0	0.0	0.0
11	9.5	10.6	17.9	14.3	3.9	3.6	1.6	1.9	0.0	0.0	0.0	0.0
12	4.6	12.7	9.5	22.4	16.3	16.1	0.8	1.4	1.8	0.0	0.0	0.0
13	2.5	5.8	14.7	17.0	22.1	20.8	15.3	7.2	0.7	0.0	0.0	0.0
14	0.6	3.9	12.2	17.6	14.3	18.3	24.4	3.5	4.4	0.0	0.0	0.0
15	0.0	0.6	1.7	8.8	11.4	15.7	18.8	14.8	12.8	5.6	0.0	0.0
16	0.5	1.4	5.8	2.0	16.1	9.4	15.8	25.0	12.2	5.5	7.4	3.4
17	0.4	0.7	0.0	2.7	6.3	7.8	5.2	22.3	24.7	37.2	16.7	3.3
18	0.0	0.7	0.0	2.6	2.5	2.9	9.5	13.6	26.7	21.6	15.1	26.9
19	0.0	0.0	0.0	0.0	1.5	2.5	4.4	6.3	6.5	11.5	10.4	36.3
20	0.0	0.0	0.0	0.0	0.0	2.3	3.0	2.6	8.1	18.6	8.0	8.8
21	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	20.8	3.4
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	3.1	11.8
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.9	6.1
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.6	0.0

Source: TLSS 2001

### Annex 3.10: Hypothetical Cohort

			Flow				No. student
Year	G-1	G-2	G-3	G-4	G-5	G-6	Leave G-6
1	1000						
2	198	696					
3	39	302	473				
4	8	98	322	312			
5	2	29	147	289	209		
6		8	56	168	244	137	
7		2	19	78	172	192	92
8			6	32	94	158	130
9				12	44	99	107
10				3	19	52	67
11				1	7	24	35
12					3	11	16
13						5	16
14						1	7
15							3
<b>Total</b>							473
<b>Indicators of internal efficiency</b>							
Student-year by Grade							
	1247	1135	1023	895	792	679	5771
Survival by Grade							
	1000	868	771	674	599	520	
Dropout by Grade							
	132	96	95	76	78	62	539
Repetition by Grade							
	247	268	254	220	194	159	
Percentage that reaches Grade 4							67%
Percentage that reaches Grade 6							52%
Percentage that reaches Grade 6 without repetition							14%
Percentage that eventually complete Grade 6							47%
Percentage that drops out							54%
Note: Grade 6 complete and drop out add up to 101% due to rounding							
<b>Average duration of study</b>							
The entire cohort of 1000							5.8
Enrollees in Grade 6							10.2
Average grade completed in primary education by the dropouts							4.0
Average grade completed in primary education by the cohort							4.4

### **Annex 3.11A: Reasons for Absenteeism in Primary Education**

	<b>Poorest</b>	<b>Quintile 2</b>	<b>Quintile 3</b>	<b>Quintile 4</b>	<b>Richest</b>	<b>All</b>
Illness	68.5	78.2	63.1	57.1	65.4	66.1
Other	12.9	9.1	7.4	3.2	11.9	8.6
School too far	9.6	2.2	6.1	8.5	0.0	5.2
No interest	3.3	1.1	4.0	3.4	0.0	2.5
Family illness/death	1.6	0.0	0.0	1.5	1.1	0.8
Safety	1.4	0.0	0.0	0.0	0.0	0.2
No supplies	1.4	0.7	0.0	0.0	0.0	0.4
No teacher	0.8	0.7	0.5	0.0	0.0	0.4
Harassment	0.5	1.5	1.9	0.0	0.7	1.0
Completed studies	0.0	0.0	0.0	0.0	0.8	0.2
Too expensive	0.0	0.0	0.0	0.0	1.3	0.3
Agricultural work	0.0	4.1	3.3	16.3	3.1	5.4
Work at home	0.0	1.2	11.1	9.4	14.5	7.7
Other work	0.0	0.0	0.9	0.0	1.2	0.5
Displaced	0.0	0.0	0.0	0.5	0.0	0.1
Language	0.0	1.3	1.8	0.0	0.0	0.7

Source: TLSS 2001

### **Annex 3.11B: Reasons for Absenteeism in Junior Secondary Education**

	<b>Poorest</b>	<b>Quintile 2</b>	<b>Quintile 3</b>	<b>Quintile 4</b>	<b>Richest</b>	<b>All</b>
Illness	47.5	84.0	77.1	93.0	71.1	77.7
School too far	33.7	0.0	18.3	0.0	1.7	9.0
Work at home	18.8	0.0	0.0	7.0	6.1	4.9
Below school age	0.0	0.0	0.0	0.0	2.1	0.5
Agricultural work	0.0	0.0	3.4	0.0	7.6	2.9
No supplies	0.0	0.0	0.0	0.0	3.8	0.9
Family illness/death	0.0	16.0	0.0	0.0	7.6	3.8
Other	0.0	0.0	1.1	0.0	0.0	0.3

Source: TLSS 2001

### **Annex 3.11C: Reasons for Absenteeism in Senior Secondary Education**

	<b>Poorest</b>	<b>Quintile 2</b>	<b>Quintile 3</b>	<b>Quintile 4</b>	<b>Richest</b>	<b>All</b>
Illness	88.1	76.4	100.0	93.5	71.4	81.5
Other	11.9	0.0	0.0	0.0	10.5	5.7
Work at home	0.0	10.1	0.0	0.0	9.9	6.1
No teacher	0.0	6.0	0.0	0.0	4.1	2.8
Family illness/death	0.0	0.0	0.0	6.5	4.1	3.0
Harassment	0.0	7.5	0.0	0.0	0.0	0.9

Source: TLSS 2001

### **Annex 3.12: Related Aspects of School Attendance**

	Poorest	Q2	Q3	Q4	Richest
<b>Means of Transportation to School</b>					
Walk	97	96	94	94	73
Bicycle	1	0	0	0	1
Car	0	0	0	0	4
Bus	2	4	6	6	22
<b>Minutes of Walking to School</b>					
Primary	18	21	31	25	28
Junior Sec.	71	52	61	45	30
Sr. Sec.	19	54	45	36	26
<b>Have Breakfast before Going to School</b>					
Yes	93	98	95	98	99
No	7	2	5	2	1

Source: TLSS 2001

### **Annex 3.13: Schooling Characteristics**

	Poorest	Quintile 2	Quintile 3	Quintile 4	Richest
<b>Availability of Textbooks</b>					
Yes, complete	5	3	2	7	10
Only some	48	47	38	37	37
None	45	50	60	56	53
<b>Language of Instruction in School</b>					
Tetum	52	53	43	47	36
Indonesian	44	43	47	43	54
Portuguese	4	5	10	10	10
<b>Hours of Home Work</b>					
Primary	1.2	1.2	2.2	2.7	3.1
Jr. Second.	1.8	2.3	2.6	3.7	3.4
Sr. Second.	3.0	1.9	2.4	2.3	3.1

Source: TLSS 2001

**Annex 3.14A: How Obtained Textbooks, First Source**

	Poorest	Quintile 2	Quintile 3	Quintile 4	Richest	All
Provided by the school	25.7	33.2	29.0	37.5	46.1	33.8
Provided by the school	69.1	54.0	62.5	55.2	36.9	56.2
Newly purchased from	2.2	0.7	0.7	0.0	2.7	1.3
Newly purchased from	3.0	11.9	6.1	3.2	5.8	6.1
Gift	0.0	0.0	0.0	0.0	2.1	0.4
Passed down from old	0.0	0.2	0.7	1.0	2.3	0.7
Purchased used	0.0	0.1	1.0	1.4	3.9	1.2
Other	0.0	0.0	0.0	1.8	0.3	0.4

Source: TLSS 2001

**Annex 3.14B: How Obtained Textbooks, Second Source**

	Poorest	Quintile 2	Quintile 3	Quintile 4	Richest	All
Provided by the school	3.9	13.3	33.0	24.2	23.8	20.4
Provided by the school	26.0	44.7	28.8	41.4	20.9	31.8
Newly purchased from	0.0	0.0	7.3	0.0	9.5	3.9
Newly purchased from	55.0	6.6	4.8	3.5	19.4	17.0
Gift	0.0	1.5	0.0	0.0	1.0	0.5
Passed down from old	12.5	34.0	12.3	22.7	13.1	18.6
Purchased used	1.6	0.0	9.1	8.2	12.4	6.6
Other	1.0	0.0	4.7	0.0	0.0	1.3

Source: TLSS 2001

**Annex 3.14C: How Obtained Textbooks, Third Source**

	Poorest	Quintile 2	Quintile 3	Quintile 4	Richest	All
	0.0	0.0	0.0	30.5	0.0	3.5
Provided by the school	0.0	0.0	0.0	15.3	14.2	2.8
Newly purchased from	0.0	0.0	0.0	8.7	7.5	1.5
Newly purchased from	0.0	0.0	0.0	15.7	10.2	2.5
Gift	0.0	10.9	0.0	0.0	0.0	3.1
Passed down from older Child	0.0	0.0	14.1	12.3	20.9	6.1
Purchased used	100.0	89.1	76.1	11.0	47.3	77.6
Other	0.0	0.0	9.8	6.5	0.0	3.0

Source: TLSS 2001

**Annex 3.15: Has a Desk/Chair at School**

	<b>Poorest</b>	<b>Quintile 2</b>	<b>Quintile 3</b>	<b>Quintile 4</b>	<b>Richest</b>	<b>All</b>
Yes	84	73	80	83	84	81

Source: TLSS 2001

**Annex 3.16: Were Teachers in School**

	<b>Poorest</b>	<b>Quintile 2</b>	<b>Quintile 3</b>	<b>Quintile 4</b>	<b>Richest</b>	<b>All</b>
All the time	74.7	60.8	58.2	62.8	58.0	63.1
Almost all the time	21.3	30.1	36.3	32.9	33.6	30.7
Three quarters	2.9	7.8	4.4	3.0	5.8	4.8
About half the time	0.0	0.0	0.6	0.0	0.5	0.2
Quarter to half	0.0	0.1	0.3	0.0	1.1	0.3
One fourth	0.0	0.0	0.0	1.3	0.0	0.3
Barely there	1.1	1.3	0.2	0.0	1.1	0.7

Source: TLSS 2001



### Annex 3.17A: Monthly Household Expenditure on Schools, 2001

<b>Public Primary</b>										
<b>Level (Rp)</b>	<b>Tuition</b>	<b>PTA</b>	<b>Uniforms</b>	<b>Textbooks</b>	<b>Other Education Materials</b>	<b>Meals &amp; Transport</b>	<b>Extra Classes</b>	<b>Other</b>	<b>Total</b>	
<b>Poorest</b>	50	19	1,783	12	982	6	-	283	3,135	
<b>Q2</b>	211	39	2,365	76	1,812	57	3	336	4,899	
<b>Q3</b>	194	37	3,299	76	1,612	96	90	394	5,797	
<b>Q4</b>	348	66	3,511	33	2,467	277	20	334	7,055	
<b>Richest</b>	1,541	257	4,019	181	2,312	570	4	674	9,558	
<b>Shares (%)</b>	<b>Tuition</b>	<b>PTA</b>	<b>Uniforms</b>	<b>Textbooks</b>	<b>Other Education Materials</b>	<b>Meals &amp; Transport</b>	<b>Extra Classes</b>	<b>Other</b>	<b>Total</b>	
<b>Poorest</b>	1.6	0.6	56.9	0.4	31.3	0.2	0.0	9.0	100	
<b>Q2</b>	4.3	0.8	48.3	1.5	37.0	1.2	0.1	6.9	100	
<b>Q3</b>	3.3	0.6	56.9	1.3	27.8	1.7	1.6	6.8	100	
<b>Q4</b>	4.9	0.9	49.8	0.5	35.0	3.9	0.3	4.7	100	
<b>Richest</b>	16.1	2.7	42.0	1.9	24.2	6.0	0.0	7.1	100	
<b>Private Primary</b>										
<b>Shares (%)</b>	<b>Tuition</b>	<b>PTA</b>	<b>Uniforms</b>	<b>Textbooks</b>	<b>Other Education Materials</b>	<b>Meals &amp; Transport</b>	<b>Extra Classes</b>	<b>Other</b>	<b>Total</b>	
Poorest	34.9	0.0	32.7	0.0	28.2	0.0	0.0	4.2	100	2,567
Q2	55.8	2.1	12.0	0.1	14.2	10.9	0.0	4.9	100	18,350
Q3	30.6	4.0	27.7	0.0	32.2	0.8	0.0	4.7	100	6,834
Q4	32.0	2.0	31.0	0.9	25.0	4.0	0.0	5.1	100	11,347
Richest	31.5	5.4	14.9	0.0	27.1	8.4	2.5	10.2	100	10,193
<b>Public Junior Secondary</b>										
<b>Shares (%)</b>	<b>Tuition</b>	<b>PTA</b>	<b>Uniforms</b>	<b>Textbooks</b>	<b>Other Education Materials</b>	<b>Meals &amp; Transport</b>	<b>Extra Classes</b>	<b>Other</b>	<b>Total</b>	
Poorest	15.6	0.8	42.7	0.0	22.2	2.7	0.0	16.0	100.0	8,175
Q2	8.3	0.0	40.5	0.2	21.2	18.7	0.5	10.6	100.0	11,493
Q3	9.7	2.9	32.3	2.8	29.7	15.0	0.0	7.7	100.0	11,501
Q4	14.9	0.5	43.9	0.2	20.6	14.7	0.0	5.2	100.0	18,787
Richest	17.7	1.5	27.8	1.4	16.6	28.8	0.1	6.0	100.0	21,394

Source: TLSS 2001

**Annex 3.17B: Monthly Expenditure on Schools, 2001 (continued)**

<b>Private Junior Secondary</b>										
<b>Shares (%)</b>	<b>Tuition</b>	<b>PTA</b>	<b>Uniforms</b>	<b>Textbooks</b>	<b>Other Education Materials</b>	<b>Meals &amp; Transport</b>	<b>Extra Classes</b>	<b>Other</b>	<b>Total</b>	
Poorest	60.1	0.0	24.1	0.0	11.7	0.0	0.0	4.0	100.0	15,828
Q2	37.3	4.9	29.7	0.6	19.4	6.1	0.0	2.2	100.0	17,807
Q3	29.2	4.5	34.2	0.0	26.3	2.5	0.0	3.4	100.0	12,195
Q4	43.9	5.5	13.5	3.7	23.4	3.7	1.2	5.1	100.0	24,825
Richest	36.6	1.7	40.4	2.1	7.9	4.9	0.8	5.6	100.0	36,062
<b>Public Senior Secondary</b>										
<b>Shares (%)</b>	<b>Tuition</b>	<b>PTA</b>	<b>Uniforms</b>	<b>Textbooks</b>	<b>Other Education Materials</b>	<b>Meals &amp; Transport</b>	<b>Extra Classes</b>	<b>Other</b>	<b>Total</b>	
Poorest	0.0	35.7	41.3	0.0	20.1	0.0	0.0	2.8	100.0	14,021
Q2	7.2	4.8	32.8	0.0	16.7	22.8	0.0	15.8	100.0	22,911
Q3	13.3	2.4	10.1	9.4	36.5	22.4	0.0	6.0	100.0	13,067
Q4	24.7	6.8	22.5	1.2	27.4	10.5	0.1	6.8	100.0	21,777
Richest	29.5	2.6	12.5	3.3	15.6	28.5	0.5	7.5	100.0	37,312
<b>Private Senior Secondary</b>										
<b>Shares (%)</b>	<b>Tuition</b>	<b>PTA</b>	<b>Uniforms</b>	<b>Textbooks</b>	<b>Other Education Materials</b>	<b>Meals &amp; Transport</b>	<b>Extra Classes</b>	<b>Other</b>	<b>Total</b>	
Poorest	83.3	0.0	0.0	0.0	16.7	0.0	0.0	0.0	100.0	12,542
Q2	29.0	16.7	15.6	0.8	9.1	26.5	0.0	2.3	100.0	34,260
Q3	63.6	21.3	3.8	0.0	10.6	0.6	0.0	0.0	100.0	43,609
Q4	39.2	10.0	29.6	3.7	7.7	1.0	0.0	8.8	100.0	23,807
Richest	45.9	11.0	10.8	4.2	15.2	7.4	0.0	5.5	100.0	40,218

Source: TLSS 2001

### Annex 3.18A: Correlates of Enrollment (Ages 5-24)

	1995	1999	2001
Age spline ages 5-9	0.124	0.134	0.092
	(24.83)**	(25.25)**	(11.12)**
Age spline ages 10-14	0.101	0.109	0.090
	(32.42)**	(33.28)**	(17.26)**
Age spline ages 15-19	0.046	0.057	0.041
	(21.18)**	(24.65)**	(11.47)**
Age spline ages 20-24	0.013	0.020	0.009
	(7.27)**	(10.52)**	(3.15)**
Urban =1, else 0	0.083	0.139	0.140
	(4.58)**	(8.14)**	(6.71)**
Male =1, else 0	0.049	0.005	-0.005
	(4.83)**	(0.45)	(0.30)
Log hh pc expend (nominal)	0.198	0.158	0.028
	(19.70)**	(14.09)**	(2.14)*
Observations	12030	10798	4010

Source: Susenas 1995, 1999; TLSS 2001. Probit models with marginal effects shown. Absolute value of z-statistics in parentheses \* significant at 5% level; \*\* significant at 1% level.

### Annex 3.18B: Correlates of Enrollment, 1999 (Ages 5-24) for Male, Female, Urban and Rural Children

	Male	Female	Urban	Rural
Age spline ages 5-9	0.137	0.131	0.151	0.132
	(18.89)**	(16.79)**	(7.75)**	(24.03)**
Age spline ages 10-14	0.112	0.106	0.109	0.109
	(24.95)**	(22.05)**	(9.39)**	(31.96)**
Age spline ages 15-19	0.058	0.056	0.060	0.057
	(18.44)**	(16.39)**	(7.55)**	(23.52)**
Age spline ages 20-24	0.023	0.016	0.027	0.018
	(9.03)**	(5.91)**	(4.48)**	(9.27)**
Urban =1, else 0	0.162	0.115		
	(6.86)**	(4.64)**		
Male =1, else 0			0.062	-0.003
			(1.82)	(0.30)
Log hh pc expend (nominal)	0.166	0.149	0.142	0.159
	(10.74)**	(9.15)**	(4.69)**	(13.18)**
Observations	5615	5183	927	9871

Source: Susenas 1999. Probit models with marginal effects shown. Absolute value of z-statistics in parentheses \* significant at 5% level; \*\* significant at 1% level.

### Annex 3.18C: Correlates of Enrollment, 1999 (Ages 5-24) for Each Quintile Group

	Poorest	Quintile 2	Quintile 3	Quintile 4	Richest
Age spline ages 5-9	0.120	0.111	0.168	0.133	0.159
	(12.28)**	(10.48)**	(13.61)**	(10.50)**	(9.90)**
Age spline ages 10-14	0.100	0.097	0.133	0.111	0.117
	(16.26)**	(14.71)**	(17.23)**	(14.23)**	(12.14)**
Age spline ages 15-19	0.052	0.048	0.074	0.058	0.060
	(11.81)**	(10.09)**	(13.67)**	(10.63)**	(9.33)**
Age spline ages 20-24	0.014	0.006	0.034	0.019	0.026
	(3.41)**	(1.47)	(7.98)**	(4.40)**	(5.23)**
Urban =1, else 0	0.070	0.043	0.137	0.252	0.161
	(1.50)	(1.08)	(3.09)**	(6.92)**	(5.10)**
Male =1, else 0	-0.001	-0.006	0.007	-0.020	0.056
	(0.04)	(0.26)	(0.27)	(0.79)	(2.01)*
log hh pc expend (nominal)	0.099	-0.164	0.424	0.337	-0.065
	(2.09)*	(1.14)	(2.49)*	(2.47)*	(1.47)
Observations	2655	2515	2087	1963	1578

Source: Susenas 1999. Probit models with marginal effects shown. Absolute value of z-statistics in parentheses

\* significant at 5% level; \*\* significant at 1% level.

### Annex 3.18D: Correlates of Enrollment, 2001 (Ages 5-24) for Male, Female, Urban and Rural Children

	Male	Female	Urban	Rural
Age spline ages 5-9	0.120	0.062	0.102	0.088
	(10.28)**	(5.25)**	(8.06)**	(7.96)**
Age spline ages 10-14	0.110	0.068	0.092	0.087
	(14.78)**	(9.32)**	(11.77)**	(12.63)**
Age spline ages 15-19	0.057	0.024	0.049	0.038
	(11.25)**	(4.70)**	(9.31)**	(7.86)**
Age spline ages 20-24	0.022	-0.004	0.019	0.004
	(5.28)**	(1.02)	(4.46)**	(0.91)
Urban =1, else 0	0.160	0.114		
	(5.53)**	(3.74)**		
Male =1, else 0			0.048	-0.025
			(1.98)*	(1.07)
Log hh pc expend (nominal)	0.034	0.022	0.061	0.008
	(1.88)	(1.13)	(3.99)**	(0.39)
Observations	2095	1915	1810	2200

Source: TLSS 2001. Probit models with marginal effects shown. Absolute value of z-statistics in parentheses

\* significant at 5% level; \*\* significant at 1% level

**ANNEX 4. ADDITIONAL TABLES FROM THE PRIMARY  
SCHOOL ACHIEVEMENT SURVEY (PSAS 2003)**

### Annex 4.1: Average Percent Correct in Mathematics Test of Grades 3 and 4 Students

		Grade 3			Grade 4		Difference in Standard Deviation Between Grades
	Average % correct	Standard Deviation	Coefficient of Variation	Average % Correct	Standard Deviation	Coefficient of Variation	
<b>Average in the Sample</b>	27.75	16.54 (n=1790)	0.60	36.79	17.8 (n=1688)	0.48	0.55
Male	28.69	15.7 (n=918)	0.55	37.9	17.5 (n=863)	0.46	0.59
Female	26.82	17.2 (n=870)	0.64	35.34	18 (n=824)	0.51	0.50
<b>School type</b>							
Urban: Public	28.65	17.3 (n=609)	0.60	38.68	18.7 (n=593)	0.48	0.58
Private	26.68	14 (n=180)	0.52	39.27	15.5 (n=176)	0.39	0.90
Rural: Public	29.51	15.4 (n=557)	0.56	33.62	16.1 (n=516)	0.49	0.27
Private	23.58	16.0 (n=191)	0.71	39.6	19.4 (n=233)	0.49	1.00
Remote: Public	23.63	15.0 (180)	0.59	36.64	16.3 (n=150)	0.44	0.93
Private	30.56	23.6 (73)	0.77	44.95	24.5 (n=83)	0.55	0.61
<b>Mother Tongue</b>							
Portuguese	22.40	13.5 (n=92)	0.60	28.62	15.3 (n=88)	0.53	0.46
Tetum	22.28	14.7 (n=375)	0.66	33.07	16.3 (n=374)	0.49	0.73
Bahasa Indonesia	30.76	11.3 (n=4)	-	-	-	-	-
Bunak	31.29	14.1 (n=59)	0.45	31.76	19.3 (n=62)	0.61	0.03
Baikenno	14.70	11.7 (n=68)	0.80	27.81	17.6 (n=73)	0.63	1.12
Mambae	25.61	14.8 (n=343)	0.58	31.58	14.3 (n=313)	0.45	0.40
Tokodede	25.33	11.9 (n=17)	0.47	38.25	13.8 (n=19)	0.36	1.09
Kemak	29.22	16.8 (n=152)	0.57	37.79	20.8 (n=69)	0.55	0.51
Makasae	33.1	17.6 (n=295)	0.53	46.32	17.5 (n=342)	0.38	0.75
Makalero	27.41	16.8 (n=31)	0.61	45.26	12.5 (n=26)	0.28	1.06
Naueti	27.43	8.5 (n=19)	0.31	27.32	12.1 (n=19)	0.44	-0.01
TetumTerik	40.71	11.8 (n=29)	0.29	36.44	19.8 (n=40)	0.54	-0.36

		<b>Grade 3</b>			<b>Grade 4</b>		<b>Difference in Standard Deviation Between Grades</b>
	<b>Average % correct</b>	<b>Standard Deviation</b>	<b>Coefficient of Variation</b>	<b>Average % Correct</b>	<b>Standard Deviation</b>	<b>Coefficient of Variation</b>	
Galole	28.57	16.9 (n=65)	0.59	38.62	14.1 (n=47)	0.37	0.59
Lacede	-	-	-	15.38	(n=2)	-	-
Carhili	30.76	(n=1)	-	-	-	-	-
Waimoa	36.04	17.9 (n=62)	0.50	43.15	16.2 (n=59)	0.38	0.40
Midiki	46.93	19.8 (n=5)	0.42	70.38	14.9 (n=10)	0.21	1.18
Kairui	42.83	9.5 (n=22)	0.22	58.87	11.8 (n=13)	0.20	1.69
Other	34.46	16.9 (n=129)	0.49	40.77	16.1 (n=108)	0.39	0.37

Source: PSAS 2003

### **Annex 4.2: Test Scores by District and by Grade**

<b>Grade</b>	<b>District</b>	<b>Mean</b>	<b>N</b>	<b>Std. Deviation</b>
Grade 3	Aileu	18.9020	117	13.12649
	Ainara	17.9258	56	11.50991
	Baucau	33.0769	390	17.53075
	Bobonaro	28.8849	149	17.14591
	Covalima	26.3575	136	12.72210
	Dili	25.6142	191	15.40201
	Ermera	36.4469	126	15.15767
	Lautem	34.6154	110	17.47450
	Liquica	26.9231	20	10.21415
	Manatuto	30.9809	109	17.37353
	Manufahi	19.0283	190	11.61443
	Oecussi	14.5000	100	12.00003
	Viqueque	35.4968	96	12.70707
	Total	27.7568	1790	16.54178
Grade 4	Aileu	31.3908	99	16.50829
	Ainara	29.5385	50	12.65980
	Baucau	46.4844	384	17.93717
	Bobonaro	33.0769	80	22.76320
	Covalima	36.1421	131	14.74776
	Dili	34.9704	195	17.28529
	Ermera	32.5283	129	15.82898
	Lautem	47.3291	108	12.78827
	Liquica	40.3846	20	15.95599
	Manatuto	33.6105	111	15.98237
	Manufahi	28.6997	197	13.22957
	Oecussi	25.9402	90	16.20091
	Viqueque	38.7480	94	17.00745
	Total	36.7959	1688	17.80828

Source: PSAS 2003



**Annex 4.3: Student Achievement by District and Mother Tongue: Mean Percent Item Right (SD)**

	District												
<b>Tongue</b>	<b>Aileu</b>	<b>Ainaro</b>	<b>Baucau</b>	<b>Bobonaro</b>	<b>Covalima</b>	<b>Dili</b>	<b>Ermera</b>	<b>Lautem</b>	<b>Liquica</b>	<b>Manatuto</b>	<b>Manufahi</b>	<b>Oecussi</b>	<b>Viqueque</b>
Portuguese					31.9(14.2) n=30	25.0(17.0) n=36				46.1(21.7) n=2	22.8(13.2) n=36	15.6(11.3) n=39	32.2(9.9) n=37
Tetum			26.8(16.3) n=68	20.9(20.1) n=16	30.5(15.3) n=148	31.4(17.5) n=259	25.2(14.4) n=21		30.7(10.1) n=3	33.3(19.0) n=6	22.2(14.0) n=228		
Bahasa Indonesia				19.2(-) n=1		36.5(13.5) n=2	30.7(-) n=1						
Bunak		11.5(-) n=1		28.4(18.6) n=62	35.0(13.0) n=56	7.69(-) n=1	69.2(-) n=1						
Baikeno	65.3(-) n=1										38.4(-) n=1	21.0(16.0) n=139	
Mambae	25.0(15.7) n=205	23.4(13.6) n=99	41.0(5.8) n=3	46.1(-) n=1	26.9(-) n=1	29.4(12.0) n=48	35.0(14.6) n=185	38.4(-) n=1	76.9(-) n=1	34.6(-) n=1	28.7(11.3) n=111		
Tokodede						19.2(21.7) n=2			32.9(13.9) n=34				
Kemak		24.3(6.2) n=6		32.1(19.3) n=149	22.4(11.0) n=19	46.1(-) n=1	35.7(18.3) n=46						
Makasae			39.8(18.9) n=508		38.4(-) n=1	32.4(23.6) n=16		45.8(20.5) n=30	23.0(-) n=1	53.8(-) n=1			41.7(15.8) n=80
Makalero	11.5(-) n=1							35.9(17.2) n=56					
Naueti			44.2(7.3) n=4			15.3(-) n=1							25.9(8.8) n=33
Tetum Terik					42.3(-) n=1	36.5(13.5) n=2			34.6(-) n=1	33.3(19.2) n=25			41.3(15.6) n=40

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Galole	11.5(-) n=1		41.4(11.9) n=9			21.1(13.5) n=2				32.4(16.7) n=100			
Waimoa			39.5(17.4) n=121										
Lacede						15.3(5.4) n=2							
Carhili						30.7(-) n=1							
Midiki			62.5(19.6) n=15										
Kairui			48.8(12.9) n=35										
Lain-lain			58.3(20.4) n=6		19.2(10.8) n=2	34.6(10.1) n=5		41.8(14.8) n=131		31.5(16.0) n=81		20.5(15.5) n=12	
Total District Sample Size	208	106	769	229	258	378	254	218	40	216	376	190	190

Source: PSAS, 2003.

**Annex 4.4: Distribution of Students' Mother Tongue in the Sample**

		<b>Frequency</b>	<b>Percent</b>	<b>Valid Percent</b>	<b>Cumulative Percent</b>
Valid	Portuguese	180	5.2	5.2	5.2
	Tetum	749	21.5	21.8	27.1
	Bahasa Indonesia	4	.1	.1	27.2
	Bunak	121	3.5	3.5	30.7
	Baikenno	141	4.1	4.1	34.8
	Mambae	656	18.9	19.1	53.9
	Tokodede	36	1.0	1.0	55.0
	Kemak	221	6.4	6.4	61.4
	Makasae	637	18.3	18.6	80.0
	Makalero	57	1.6	1.7	81.6
	Naueti	38	1.1	1.1	82.8
	Tetum Terik	69	2.0	2.0	84.8
	Galole	112	3.2	3.3	88.0
	Waimoa	121	3.5	3.5	91.6
	Lacede	2	.1	.1	91.6
	Carhili	1	.0	.0	91.6
	Midiki	15	.4	.4	92.1
	Kairui	35	1.0	1.0	93.1
	Lain-lain	237	6.8	6.9	100.0
	Total	3432	98.7	100.0	
Missing	System	46	1.3		
Total		3478	100.0		

Source: PSAS, 2003.

#### **Annex 4.5: Mother Tongue by Home Resources**

<b>Mother Tongue</b>	<b>Mean</b>	<b>N</b>	<b>Std. Deviation</b>
Portuguese	1.9111	180	2.39480
Tetum	2.7023	749	2.28650
Bahasa Indonesia	3.0000	4	3.16228
Bunak	1.4711	121	1.59203
Baikeno	.9504	141	1.80605
Mambae	1.3034	656	1.44552
Tokodede	2.2778	36	1.52336
Kemak	1.2805	221	1.14932
Makasae	1.5133	637	1.71340
Makalero	.5614	57	.77960
Naueti	.9211	38	1.34328
Tetum Terik	.8696	69	1.21162
Galole	2.1518	112	1.66149
Waimoa	1.5207	121	1.55509
Lacede	7.5000	2	2.12132
Carhili	6.0000	1	.
Midiki	1.0667	15	1.75119
Kairui	1.2571	35	1.03875
Others	1.5105	237	1.66370
Total	1.7095	3432	1.88394

Source: PSAS 2003

Note: The lower the index, the poorer the group.

**Annex 4.6A: Language Spoken at Home by Teachers (Multiple Dichotomous Set)**

	<b>Language Spoken at Home</b>	<b>Frequency</b>	<b>Percent of Total</b>
Valid	Portuguese	25	10.3
	Tetum	176	72.4
	Indonesian	37	15.2
	Other	143	58.8
Total		243	100.0

Source: PSAS 2003

**Annex 4.6B: Language Proficiency of Teachers (Multiple Dichotomous Set)**

<b>Language</b>		<b>Not at all</b>	<b>A Little</b>	<b>Well</b>	<b>Excellent</b>
Portuguese	Speak	7.8	48.6	37.9	5.8
	Read	2.9	37.0	53.9	6.2
	Write	3.7	38.3	51.4	6.6
Tetum	Speak	0.0	1.6	74.5	23.9
	Read	0.0	1.6	74.1	24.3
	Write	0.0	1.6	74.1	24.3
Indonesian	Speak	0.8	7.0	76.1	16.0
	Read	0.8	5.8	77.4	16.0
	Write	0.8	6.2	77.0	16.0

Source: PSAS 2003

**Annex 4.6C: Training to Teach in Portuguese**

		<b>Frequency</b>	<b>Percent</b>	<b>Valid Percent</b>	<b>Cumulative Percent</b>
Valid	Yes	124	51.0	53.0	53.0
	No	110	45.3	47.0	100.0
	Total	234	96.3	100.0	
Missing	System	9	3.7		
Total		243	100.0		

**Annex 4.6D: Total Time Learning Portuguese by Teachers (In years)**

		<b>Frequency</b>	<b>Percent</b>	<b>Valid Percent</b>	<b>Cumulative Percent</b>
Valid	.00	11	4.5	4.8	4.8
	.08	6	2.5	2.6	7.4
	.17	13	5.3	5.7	13.0
	.25	10	4.1	4.3	17.4
	.33	6	2.5	2.6	20.0
	.42	1	.4	.4	20.4
	.50	17	7.0	7.4	27.8
	.58	2	.8	.9	28.7
	.83	3	1.2	1.3	30.0
	1.00	16	6.6	7.0	37.0
	1.08	1	.4	.4	37.4
	1.17	3	1.2	1.3	38.7
	1.25	2	.8	.9	39.6
	1.33	2	.8	.9	40.4
	1.42	2	.8	.9	41.3
	1.50	5	2.1	2.2	43.5
	1.58	1	.4	.4	43.9
	1.67	1	.4	.4	44.3
	1.83	1	.4	.4	44.8
	2.00	15	6.2	6.5	51.3
	2.25	2	.8	.9	52.2
	2.50	4	1.6	1.7	53.9
	2.75	1	.4	.4	54.3
	3.00	8	3.3	3.5	57.8
	3.17	2	.8	.9	58.7
	3.25	2	.8	.9	59.6
	3.50	1	.4	.4	60.0
	3.83	1	.4	.4	60.4
	4.00	16	6.6	7.0	67.4
	4.17	1	.4	.4	67.8
	4.33	1	.4	.4	68.3
	4.50	2	.8	.9	69.1
	5.00	10	4.1	4.3	73.5
	5.17	2	.8	.9	74.3
	6.00	17	7.0	7.4	81.7
	6.08	1	.4	.4	82.2
	6.17	1	.4	.4	82.6
	6.25	1	.4	.4	83.0
	6.42	1	.4	.4	83.5
	6.50	3	1.2	1.3	84.8
	6.75	1	.4	.4	85.2
	7.00	8	3.3	3.5	88.7
	7.83	1	.4	.4	89.1
	8.00	7	2.9	3.0	92.2
	8.17	2	.8	.9	93.0
	9.00	4	1.6	1.7	94.8
	9.08	2	.8	.9	95.7
	9.50	1	.4	.4	96.1
	10.00	1	.4	.4	96.5
	10.67	1	.4	.4	97.0
	11.00	1	.4	.4	97.4
	12.00	2	.8	.9	98.3

		<b>Frequency</b>	<b>Percent</b>	<b>Valid Percent</b>	<b>Cumulative Percent</b>
	14.00	1	.4	.4	98.7
	15.00	2	.8	.9	99.6
	Total	230	94.7	100.0	
Missing	System	13	5.3		
Total		243	100.0		
<b>Mean</b>	<b>3.32</b>				
<b>SD</b>	<b>3.35</b>				

Source: PSAS 2003





## **ANNEX 5. COSTS AND FINANCE**

**Annex 5.1: CFET Budget by Economic Function and Actual Mid-year Expenditure**

	Revised 2002/3 Budget			Mid Year Actual Expenditure		
Program	Salaries and Wages	Goods and Services	Capital	S&W (%)	G&S (%)	Capl (%)
Minister	43,000	40,000	0	27	1	na
Early Childhood	59,000	107,000	0	4	15	na
Primary Education	6,176,000	1,362,000	889,000	47	4	0
Junior Secondary Education	2,211,000	597,000	120,000	48	1	0
Senior Secondary Education	1,238,000	484,000	94,000	43	3	0
TVET	455,000	131,000	179,000	44	3	0
NFE	89,000	336,000	170,000	6	3	0
University Education	508,000	363,000	218,000	45	2	0
Culture	0	125,000	20,000	Na	7	0
Administration and Management	374,000	922,000	323,000	47	23	0
Youth Welfare and Development	0	74,000	0	na	18	na
Physical Education and Sports	0	64,000	0	na	2	na
Institute for Continuing Education	0	600,000	66,000	na	4	0
	11,153,000	5,205,000	2,079,000	46	7	0

Source: Ministry of Finance

**Annex 5.2: Bilateral Aid in Education**

		<b>Primary Education</b>	<b>Secondary Education</b>	<b>Tech-Voc Education</b>	<b>University Education</b>
<b>Policy Development</b>	TFET Australia	TFET	TFET	Brazil	
<b>Education Management</b>		TFET	TFET		
<b>School Infrastructure</b>		TFET UNICEF	TFET	Japan Brazil	Japan
<b>Teacher Training</b>		Australia Portugal UNICEF	Australia Portugal		Australia
<b>Curriculum &amp; Textbooks</b>		Portugal UNICEF	Australia Portugal	Brazil	Australia Portugal
<b>Language Training</b>		Portugal	Australia Portugal		Australia
<b>Scholarships</b>					Australia Japan Portugal

Source: TFET

**Annex 5.3: National Development Plan Priority Programs and Sequenced Activities 2003/4 - 2006/7**

Program/Project		Director/Asdir	Priority	2003/4	2004/5	2005/6	2006/7
<b>Program 1: Expand Access and Improve Internal Efficiency</b>				<b>13.33</b>	<b>15.48</b>	<b>16.19</b>	<b>16.99</b>
	<i>Manage and deliver Early Childhood Education</i>	Jardim da Infância	High/Routine	0.22	0.23	0.23	0.23
	<i>Manage and deliver primary education</i>	Ensino Primária	High/Routine	8.25	8.94	9.22	9.41
	<i>Manage and deliver lower secondary education</i>	Pre Secundario	High/Routine	2.33	2.94	3.27	3.59
	<i>Manage and deliver upper secondary education</i>	Ensino Secundário	High/Routine	1.42	1.85	2.12	2.36
	<i>Manage and deliver technical and vocational education</i>	ETV	High/Routine	0.70	0.99	1.00	1.13
	Information Campaign on the Importance of Schooling	Adm/Pires	High/03	0.10			
	Children Drop-out and Repetition Prevention	Adm/Pires	High/03	0.30	0.30	0.20	
	Multi-grade Schools	Ensino Primária	Medium/04		0.10	0.10	0.10
	Community-Based Pre-School Development	Jardim da Infância	Medium/04		0.05	0.05	0.05
	School Location Planning	Pólítica e Planificação	Medium/04		0.08		
	School Health and Nutrition	Ensino Primária	Low/06				0.10
<b>Program 2: Improve the Quality of Education</b>				<b>18.66</b>	<b>3.63</b>	<b>3.00</b>	<b>1.51</b>
	<i>Manage and deliver teacher training</i>	IFCP	High/Routine	0.12	0.11	0.11	0.11
	National Examinations	Exame Nacional	High/Routine	0.30	0.30	0.30	0.30
	School Supervision and Improvement	Supervisão	High/Routine	0.05	0.05	0.05	0.05
	<i>Introduction of Teaching Diploma</i>	IFCP	High/03	0.30	0.40	0.50	0.50
	Teacher and Headmaster Training [IFCP]	IFCP	High/03	0.23	0.42	0.50	0.50
	Language of Instruction Development (Tetum and	IFCP	High/03	1.50	1.50	1.50	

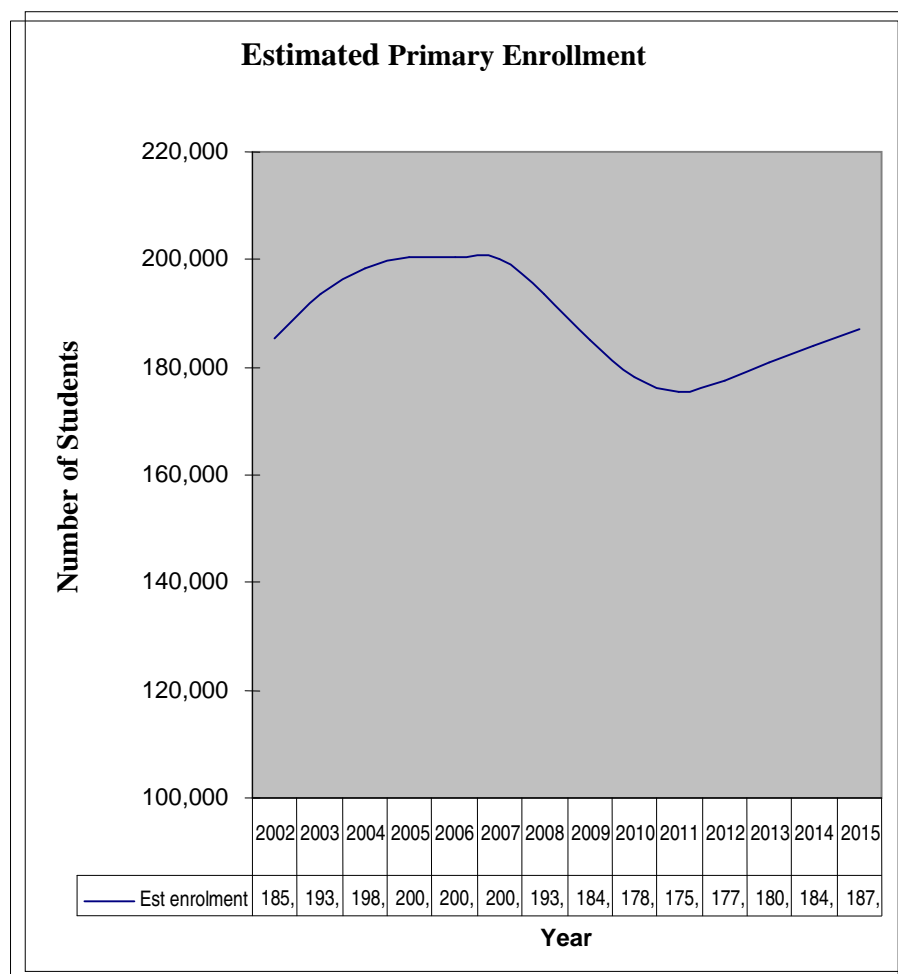
	Portuguese)						
	Curriculum Review and Development	Curriculo	High/03	0.70	0.30		
	Rehabilitation and Capacity Building of the Institute for Continuing Education	IFCP	High/03	0.06			
	Fundamental School Quality (TFET2)	FSQP /João Alves	High/03	15.30			
	International Cooperation and Linkages	Política e Planificação	Medium/03	0.05	0.05	0.05	0.05
	100 Schools Project (UNICEF-assisted)	Ensino Primária	Medium/03	0.05	0.05		
	Teachers' Career Development and Welfare	As Professores	Medium/04		0.03		
	Textbooks and Teaching Materials Development	Curriculo	Medium/04		0.40		
	Redefine Technical-Vocational Education.	ETV	Medium/04		0.03		
<b>Program 3: Build Internal Management Capacity and Improve Services Delivery</b>				<b>2.20</b>	<b>1.78</b>	<b>1.47</b>	<b>1.41</b>
	<i>Manage and administer central and district functions</i>	Adm/ Finanças	High/Routine	1.40	1.38	1.42	1.41
	<i>Establish legislative, regulatory and policy framework for education sector [FSQP]</i>	Política e Planificação	High/03	0.50	0.10	0.05	
	Training for Educational Managers	IFCP	High/03	0.10	0.10		
	Project to Build Capacity for Policy Formulation, Planning and Project Development	Política e Planificação	High/03	0.10	0.10		
	<i>EMIS Development</i>	Política e Planificação	High/03	0.10			
	Warehousing Expansion and Logistics Development.	Administração	Medium/04		0.10		
<b>Program 4: Non-Formal Education and Adult Literacy</b>				<b>0.39</b>	<b>0.44</b>	<b>0.44</b>	<b>0.46</b>
	<i>Manage and deliver literacy program</i>	Ensino Não Formal	High/Routine	0.12	0.14	0.13	0.13
	Literacy Campaign	Ensino Não Formal	High/03	0.27	0.27	0.27	0.27
	Distance Learning Project.	Ensino Não Formal	Medium/03				
	Literacy Project for Young Illiterate Women	Ensino Não Formal	Medium/04		0.02	0.04	
	Community Reading Centers Project.	Ensino Não Formal	Low/06				0.05

<b>Program 5: Develop Tertiary Education</b>				<b>11.08</b>	<b>1.59</b>	<b>1.15</b>	<b>1.12</b>
	<i>Manage and deliver tertiary education</i>	Ensino Universitário	High/Routine	10.68	0.99	1.05	1.12
	Curriculum Development	Ensino Universitário	High/03	0.40	0.30		
	<i>Textbooks and Teaching Materials Development</i>	Ensino Universitário	Medium/04		0.30		
	Staff Development	Ensino Universitário	Medium/05			0.10	
<b>Program 6: Promote East Timorese Culture and the Arts</b>				<b>0.28</b>	<b>0.66</b>	<b>0.66</b>	<b>0.26</b>
	<i>Manage and deliver cultural program</i>	Cultura	High/Routine	0.13	0.16	0.16	0.16
	Survey and Documentation of Traditional Culture/Arts Project	Cultura	High/03	0.12	0.40	0.40	
	Institutional Capacity Building for Culture Project	Cultura	High/03	0.03			
	Cultural Renewal and Promotion Project	Cultura	Medium/ 04		0.10	0.10	0.10
<b>Program 7: Promote Youth Welfare</b>		Juventude		<b>0.19</b>	<b>0.29</b>	<b>0.29</b>	<b>0.29</b>
	<i>Manage and deliver youth program</i>	Juventude	High/Routine	0.12	0.13	0.13	0.13
	Structuring and Institutional Support to Youth Sector Development	Juventude	High/03	0.07	0.07	0.07	0.07
	Project to Train Unskilled Youth	Juventude	Medium/04		0.10	0.10	0.10
<b>Program 8: Promote Physical Education and School Sports</b>				<b>0.30</b>	<b>0.29</b>	<b>0.29</b>	<b>0.18</b>
	<i>Manage and deliver sports program</i>	Desporto	High/Routine	0.15	0.14	0.14	0.13
	Structuring and Capacity-Building of Sports Institutions Project	Desporto	High/03	0.10			
	Information Campaign Project on the Importance of Physical Education and Sports.	Desporto	High/03	0.05			
	Teachers/Coaches Training Project	Desporto	Medium/04		0.05	0.05	0.05
	Rehabilitation of Sports Facilities Project.	Desporto	Medium/04		0.10	0.10	
				46.42	24.16	23.49	22.22

Source:MECYS

### Annex 5.4A: Primary Enrollment Projections 2003-2015 with Falling Repetition and Dropout Rates

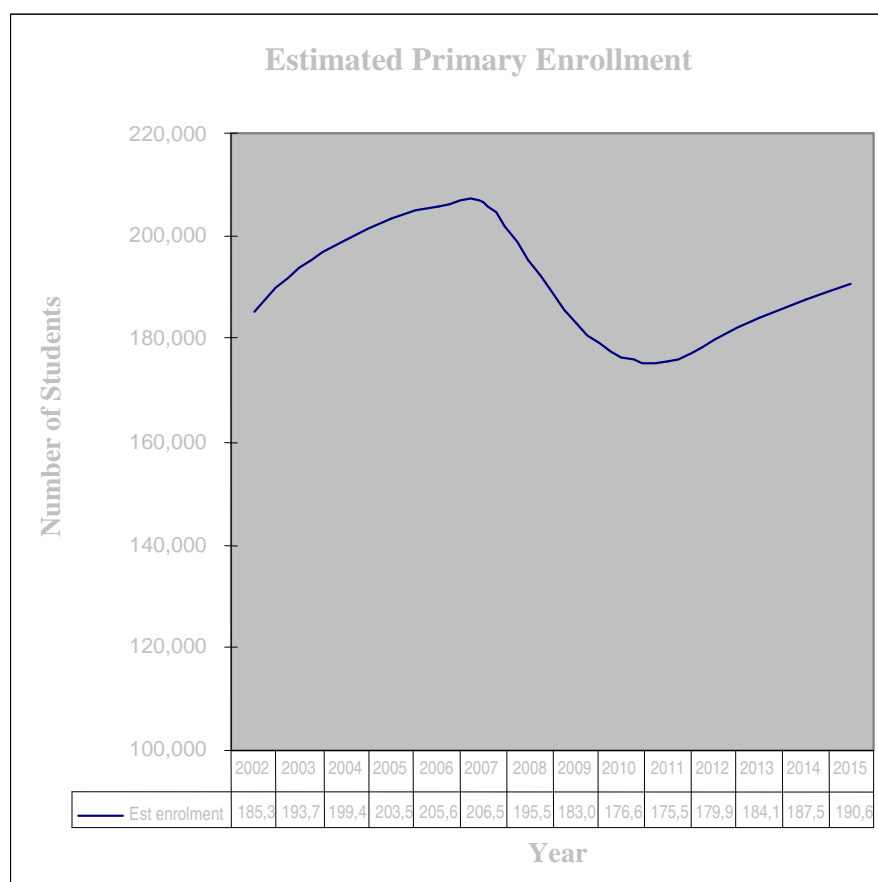
Year	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Total
2002	71,928	34,424	25,234	20,287	17,168	16,337	185,378
2003	51,576	58,080	29,591	21,877	17,713	14,929	193,765
2004	41,527	49,562	47,550	25,497	19,118	15,182	198,436
2005	36,017	40,521	45,920	39,455	22,213	16,425	200,552
2006	32,450	34,699	39,119	41,583	33,415	19,141	200,407
2007	32,440	31,207	33,553	37,127	37,490	28,368	200,185
2008	32,466	30,714	30,009	32,227	34,992	33,335	193,742
2009	32,784	30,847	29,236	28,805	30,895	32,367	184,934
2010	32,582	31,316	29,422	27,887	27,705	29,169	178,081
2011	32,615	31,374	30,030	28,133	26,742	26,383	175,277
2012	34,204	31,585	30,322	28,889	27,058	25,541	177,600
2013	33,475	33,226	30,714	29,412	27,965	26,011	180,803
2014	32,906	32,824	32,446	30,003	28,705	27,128	184,013
2015	32,972	32,431	32,321	31,879	29,499	28,131	187,234



Source: World Bank projection.

**Annex 5.4B: Primary Enrollment Projections 2003-2015 with Speedy Reduction in Repetition and Dropout**

2002	71,928	34,424	25,234	20,287	17,168	16,337	185,378
	<b>Grade 1</b>	<b>Grade 2</b>	<b>Grade 3</b>	<b>Grade 4</b>	<b>Grade 5</b>	<b>Grade 6</b>	<b>Total</b>
2003	51,576	58,080	29,591	21,877	17,713	14,929	193,765
2004	40,217	49,717	48,601	26,054	19,554	15,305	199,448
2005	33,750	38,341	47,578	42,884	23,841	17,110	203,505
2006	28,849	32,256	38,057	45,299	39,884	21,258	205,604
2007	28,133	27,991	32,106	37,287	44,630	36,414	206,560
2008	28,627	27,602	28,257	31,914	37,767	41,382	195,550
2009	29,421	28,594	28,194	28,490	32,787	35,555	183,040
2010	29,670	29,389	29,180	28,342	29,231	30,861	176,673
2011	30,201	29,643	29,996	29,305	28,944	27,502	175,591
2012	32,269	30,171	30,269	30,129	29,876	27,186	179,900
2013	31,950	32,223	30,802	30,417	30,721	28,043	184,156
2014	31,907	31,926	32,858	30,946	31,037	28,838	187,513
2015	32,475	31,880	32,615	32,975	31,569	29,142	190,656



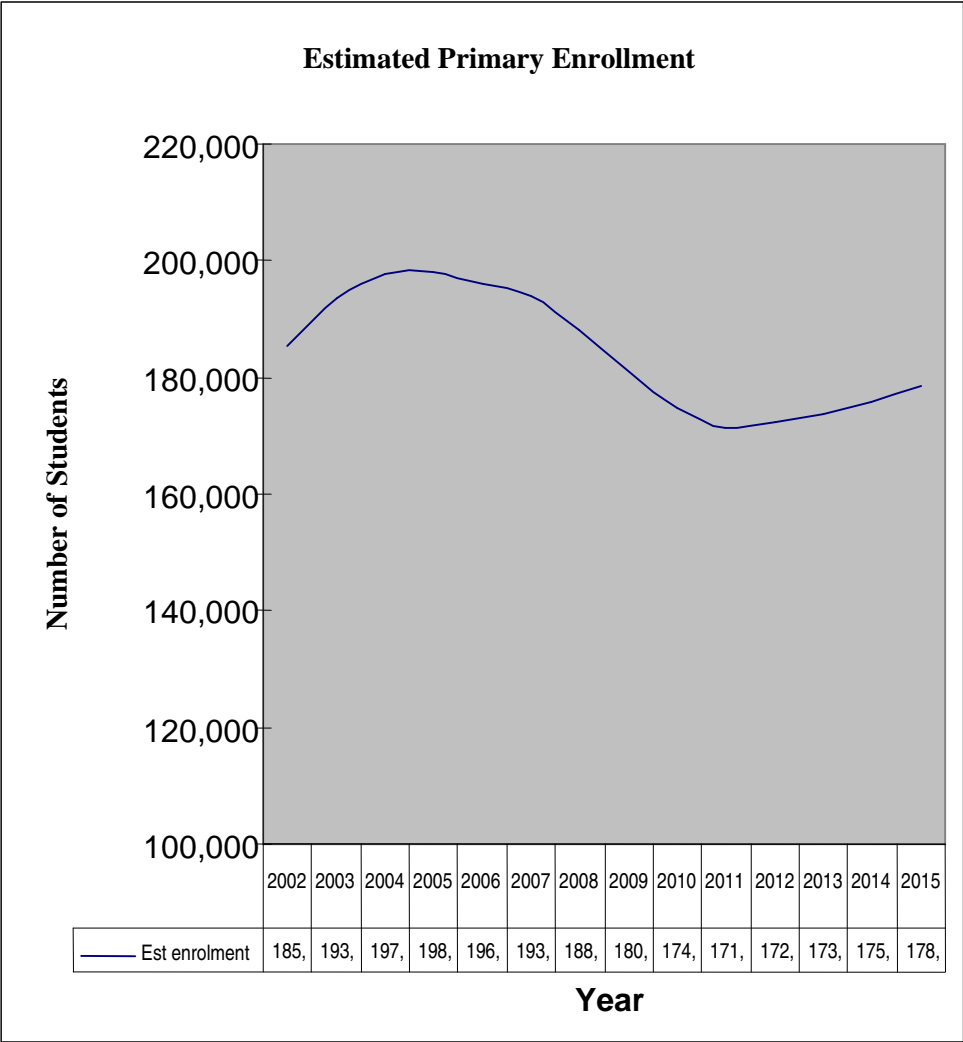
Source: World Bank projection



**Annex 5.4C: Primary Enrollment Projections 2003-2015 with No Change in Repetition or Dropout Rates**

	<b>Grade 1</b>	<b>Grade 2</b>	<b>Grade 3</b>	<b>Grade 4</b>	<b>Grade 5</b>	<b>Grade 6</b>	<b>Total</b>
2002	71,928	34,424	25,234	20,287	17,168	16,337	185,378
2003	51,576	58,080	29,591	21,877	17,713	14,929	193,765
2004	42,280	49,494	46,744	25,186	18,909	14,989	197,601
2005	37,380	41,016	45,108	37,489	21,412	15,797	198,202
2006	34,300	35,618	38,942	39,407	30,257	17,636	196,160
2007	34,705	32,209	33,761	35,746	33,664	23,912	193,997
2008	35,287	31,689	30,173	31,378	32,029	27,528	188,084
2009	36,192	31,971	28,941	27,904	28,710	27,218	180,936
2010	36,614	32,667	28,831	26,227	25,586	24,944	174,869
2011	37,227	33,124	29,277	25,742	23,713	22,378	171,460
2012	39,412	33,657	29,697	25,923	22,938	20,580	172,207
2013	39,510	35,301	30,162	26,248	22,873	19,679	173,773
2014	39,489	35,755	31,394	26,640	23,076	19,442	175,796
2015	40,054	35,848	32,005	27,561	23,387	19,525	178,380

Source: World Bank projection.



Source: World Bank projection.

**Annex 5.5: Projection of Long-term Resource Requirements in Education**

	Assumed Target	Base Year	Projection						
	2015	2002	2004	2006	2008	2012	2016	2017	2018
<b>A. Projected resource envelope for education</b>									
GDP (millions of LCU)		350	386	425	469	570	693	728	764
GDP growth rate (% per annum)	5.0%								
Population, total (in thousands)		825	855	886	918	986	1 059	1 078	1 098
Overall population growth rate (% p.a.)	1.8%								
GDP per capita (LCU)		424	451	480	511	578	654	675	696
Domestically-generated revenues net of grants (millions of LCU)		17	19	21	23	28	34	35	37
Domestically-generated revenues as % of GDP	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%
Total budgeted recurrent public spending on education (millions of LCU)		15	17	18	20	24	30	31	33
% of spending financed through budget support		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
% domestically-financed recurrent spending on education as % of domestic revenues net of grants	88.2%	88.2%	88.2%	88.2%	88.2%	88.2%	88.2%	88.2%	88.2%
Amount of budget support for recurrent spending on education (millions of LCU)		0	0	0	0	0	0	0	0
Amount of domestically-financed recurrent spending on education (millions of LCU)		15	17	18	20	24	30	31	33
<b>Total off-budget recurrent spending on education (millions of LCU)</b>		0	0	0	0	0	0	0	0
As % of total on-budget recurrent spending on education	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Preschool									
Primary education									

**Annex 5.5: Projection of Long-term Resource Requirements in Education**

	Assumed Target	Base Year	Projection						
	2015	2002	2004	2006	2008	2012	2016	2017	2018
Secondary education									
Technical									
Teacher training									
Higher education									
<b>Total recurrent resource envelope for education from all sources (millions of LCU)</b>		<b>15</b>	<b>17</b>	<b>18</b>	<b>20</b>	<b>24</b>	<b>30</b>	<b>31</b>	<b>33</b>
<b>B. Recurrent spending on education</b>									
<b>Preschool</b>									
Annual growth rate of increase in spending	5.0%								
<b>Total spending (in millions of LCU)</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Primary education, Grades 1 to 6</b>									
School-age population ages 6-11		151 604	157 111	162 818	168 732	181 213	194 616	198 120	201 686
Annual growth rate of the school age population (% p.a.)	1.8%								
Population age 6		33 000							
Population age 11		30 000							
New entrants in grade 1		46 383							
Non-repeaters in grade 7		12 252							
Entry rate to grade 1	100%	140.6%	136%	127%	115%	100%	100%	100%	100%
Entry rate to grade 1 excluding multiple cohort effect	100%	71.0%	78%	86%	93%	100%	100%	100%	100%
Target year	2010								

**Annex 5.5: Projection of Long-term Resource Requirements in Education**

	Assumed Target	Base Year	Projection						
	2015	2002	2004	2006	2008	2012	2016	2017	2018
Multiple cohort effect	1.0	2.0	1.7	1.5	1.2	1.0	1.0	1.0	1.0
Target year	2010								
Grade 6 completion rate (non-repeaters in grade 6 as % of cohort at official entry age +6)	100%	41%	50%	59%	68%	86%	100%	100%	100%
Repeaters as % of total enrollments	10%	25.0%	21%	18%	14%	10%	10%	10%	10%
Target year	2010								
Gross enrollment rate		122%	117%	113%	106%	104%	111%	111%	111%
Total number of primary school pupils		185 378	184 222	183 825	179 599	187 603	216 241	220 133	224 095
Number of pupils in non-government schools (i.e. Not government-aided)		30	1 442	2 849	4 160	7 223	10 812	11 007	11 205
% of pupils in non-government schools	5.0%	0.0%	0.8%	1.5%	2.3%	3.8%	5.0%	5.0%	5.0%
Number of pupils in partly government-aided schools		24 099	24 516	25 028	25 006	27 275	32 436	33 020	33 614
% of pupils in partly government-aided schools	15.0%	13.0%	13.3%	13.6%	13.9%	14.5%	15.0%	15.0%	15.0%
<b>Government schools</b>									
Total number of pupils, Std 1 to 6		161 249	158 264	155 948	150 433	153 106	172 992	176 106	179 276
Number of sections in Std 1 and 6		4 000	3 931	3 878	3 745	3 821	4 325	4 403	4 482
Number of pupils per section in grades 1 and 6	40.0	40.3	40.3	40.2	40.2	40.1	40.0	40.0	40.0
Total number of teachers		3 550	3 931	3 878	3 745	3 821	4 325	4 403	4 482
Ratio of pupils to teachers, Std 1 to 6		45.4	40.3	40.2	40.2	40.1	40.0	40.0	40.0

**Annex 5.5: Projection of Long-term Resource Requirements in Education**

	Assumed Target	Base Year	Projection						
	2015	2002	2004	2006	2008	2012	2016	2017	2018
Number of teachers by pay category									
Category 1 (Trained)		3 550	3 931	3 878	3 745	3 821	4 325	4 403	4 482
Category 2 (Untrained)		0	0	0	0	0	0	0	0
Category 3 (Undertrained, category to be discontinued)		0	0	0	0	0	0	0	0
Annual teacher attrition rate (% p.a.)									
Category 1 (Trained)	4.0%								
Category 2 (Untrained)	2.0%								
Category 3 (Undertrained, category to be discontinued)	4.0%								
Teacher remuneration as % of GDP per capita									
Category 1 (Trained)	3.40	3.40	3.4	3.4	3.4	3.4	3.4	3.4	3.4
Category 2 (Untrained)	3.30	3.30	3.3	3.3	3.3	3.3	3.3	3.3	3.3
Category 3 (Undertrained, category to be discontinued)	3.30	3.30	3.3	3.3	3.3	3.3	3.3	3.3	3.3
% of new teachers recruited into pay category 1	100.0%	100%	100%	100%	100%	100%	100%	100%	100%
Average teacher remuneration									
As % of per capita GDP		3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40
In Local Currency Unit (LCU)		1 442	1 535	1 633	1 737	1 966	2 225	2 295	2 367
Total teacher remuneration (millions of LCU)		5	6	6	7	8	10	10	11
Spending on inputs other than teachers as % of total recurrent spending	25.0%	19.7%	20.5%	21.3%	22.1%	23.8%	25.0%	25.0%	25.0%
Share of Central administration in total spending other than teachers	40.0%	62.0%	58.6%	55.2%	51.8%	45.1%	40.0%	40.0%	40.0%
Share of School-level administration in total spending	20.0%	0.0%	3.1%	6.2%	9.2%	15.4%	20.0%	20.0%	20.0%

**Annex 5.5: Projection of Long-term Resource Requirements in Education**

	<b>Assumed Target</b>	<b>Base Year</b>	<b>Projection</b>						
	<b>2015</b>	<b>2002</b>	2004	2006	2008	2012	2016	2017	2018
other than teachers									
Share of Pedagogical materials in total spending other than teachers	<b>40.0%</b>	<b>38.0%</b>	38.3%	38.6%	38.9%	39.5%	40.0%	40.0%	40.0%
Spending on inputs other than teachers (millions of LCU)		1	2	2	2	2	3	3	4
Central administration		1	1	1	1	1	1	1	1
School-level administration		0	0	0	0	0	1	1	1
Pedagogical materials		0	1	1	1	1	1	1	1
<b>Total public recurrent spending in Government schools (millions of LCU)</b>		<b>6</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>10</b>	<b>13</b>	<b>13</b>	<b>14</b>
<b>Public spending per pupil in Government schools as % of per capita GDP</b>		<b>0.09</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>
Support to partly government-aided schools									
Rate of support per student (LCU)	<b>34</b>	<b>34</b>	34	34	34	34	34	34	34
Aggregate amount of support (millions of LCU)		1	1	1	1	1	1	1	1
<b>Total public recurrent spending on primary education (in millions of LCU)</b>		<b>7</b>	<b>8</b>	<b>9</b>	<b>9</b>	<b>11</b>	<b>14</b>	<b>15</b>	<b>15</b>
<b>Lower Secondary, Grades 7 to 9</b>									
Transition rate between primary and Lower secondary	<b>100.0%</b>	180.3%	168.0%	155.6%	143.3%	118.5%	100.0%	100.0%	100.0%
Number of new entrants in Grade 7		14 729	17 387	19 735	21 730	24 469	25 674	26 136	26 607
Non-repeaters in Grade 9		8 070							
Population age 12		20 000	20 726	21 479	22 260	23 906	25 674	26 136	26 607
Population age 14		19 000							

**Annex 5.5: Projection of Long-term Resource Requirements in Education**

	Assumed Target	Base Year	Projection						
	2015	2002	2004	2006	2008	2012	2016	2017	2018
School-age population ages 12-14		58 490	60 615	62 816	65 098	69 913	75 085	76 436	77 812
Annual growth rate of the school age population (% p.a.)	1.8%								
Survival rate to end of Lower Secondary	75%	58%	60%	63%	66%	71%	75%	75%	75%
Repeaters as % of total enrollments	5%	5%	5%	5%	5%	5%	5%	5%	5%
Target year	2005								
Enrollment rate in Form 1 (non-repeaters in Form 1 as % of cohort at official age 11)		74%	84%	92%	98%	102%	100%	100%	100%
Form 4 completion rate (non-repeaters in Form 4 as % of cohort at official age 14)		42%	51%	58%	64%	73%	75%	75%	75%
Gross enrollment rate		64%	71%	79%	85%	92%	92%	92%	92%
Total number of Lower Secondary students		37 525	42 909	49 514	55 411	64 404	69 157	70 402	71 669
Number of students in non-government schools (i.e. Not government-aided)		391	396	624	863	1 336	1 648	1 677	1 707
% of students in non-government schools	5.0%	1.0%	1.7%	2.3%	2.9%	4.1%	5.0%	5.0%	5.0%
Number of students in partly government-aided schools		9 280	10 959	13 048	15 051	18 538	20 747	21 120	21 501
% of students in partly government-aided schools	30.0%	25%	25.5%	26.4%	27.2%	28.8%	30.0%	30.0%	30.0%
Number of students in government schools		27 854	31 950	36 466	40 360	45 866	48 410	49 281	50 168
Ratio of students to teachers in government schools		33.7	33.1	32.5	32.0	30.8	30.0	30.0	30.0
Number of sections in government schools		619	710	810	897	1 019	1 076	1 095	1 115
Students per section in government schools	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0
Weekly instructional hours for students	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0



**Annex 5.5: Projection of Long-term Resource Requirements in Education**

	Assumed Target	Base Year	Projection						
	2015	2002	2004	2006	2008	2012	2016	2017	2018
Teachers' average teaching workload (hours per week)	20.0	22.5	22.1	21.7	21.3	20.6	20.0	20.0	20.0
Number of teachers in Government schools		827	965	1 120	1 262	1 487	1 614	1 643	1 672
Annual teacher attrition rate (% p.a.)									
Teachers in pay category 1	2.0%								
Teachers in pay category 2	2.0%								
Teachers in pay category 3 (category to be discontinued)	4.0%								
% of new teachers recruited into category 1	0.0%	0%	0%	0%	0%	0%	0%	0%	0%
Number of teachers by category									
Teachers in pay category 1		827	794	763	733	676	623	611	599
Teachers in pay category 2		0	171	358	529	811	990	1 032	1 074
Teachers in pay category 3 (category to be discontinued)		0	0	0	0	0	0	0	0
Teacher remuneration as % of GDP per capita									
Teachers in pay category 1	5.0	4.3	4.4	4.5	4.6	4.8	5.0	5.0	5.0
Teachers in pay category 2	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Teachers in pay category 3 (category to be discontinued)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Average teacher remuneration									
As % of per capita GDP		4.3	4.3	4.3	4.3	4.4	4.4	4.4	4.4
In Local Currency Unit (LCU)		1 803	1 941	2 078	2 220	2 530	2 870	2 951	3 034
Total teacher remuneration (millions of LCU)		1	2	2	3	4	5	5	5

**Annex 5.5: Projection of Long-term Resource Requirements in Education**

	Assumed Target	Base Year	Projection							
	2015	2002	2004	2006	2008	2012	2016	2017	2018	
Total spending on inputs other than teachers as % of total recurrent spending	30.0%	28.8%	29.0%	29.2%	29.4%	29.7%	30.0%	30.0%	30.0%	
Share of Central administration in total spending other than teachers	25.0%	33.0%	32%	31%	29%	27%	25%	25%	25%	
Share of School-level administration in total spending other than teachers	20.0%	0.0%	3%	6%	9%	15%	20%	20%	20%	
Share of Pedagogical materials in total spending other than teachers	50.0%	67.0%	64%	62%	59%	54%	50%	50%	50%	
Share of Spending on bursaries and student welfare in total spending other than teachers	5.0%	0.0%	1%	2%	2%	4%	5%	5%	5%	
Total spending on inputs other than teachers (millions of LCU)		1	1	1	1	2	2	2	2	
Central administration		0	0	0	0	0	0	1	1	
School-level administration		0	0	0	0	0	0	0	0	
Pedagogical materials		0	0	1	1	1	1	1	1	
Bursaries and school feeding		0	0	0	0	0	0	0	0	
Total public recurrent spending in Government schools (millions of LCU)		2	3	3	4	5	7	7	7	
Public spending per pupil in Government schools as % of per capita GDP		0.18	0.18	0.19	0.19	0.20	0.21	0.21	0.21	
Support to partly government-aided schools										
Rate of support per student (LCU)	1	68	1	1	1	1	1	1	1	
Aggregate amount of support (millions of LCU)		1	0	0	0	0	0	0	0	
Total public recurrent spending on Lower Secondary (in millions of LCU)		3	3	3	4	5	7	7	7	

**Annex 5.5: Projection of Long-term Resource Requirements in Education**

	Assumed Target	Base Year	Projection						
	2015	2002	2004	2006	2008	2012	2016	2017	2018
<b>Upper Secondary, Grade 10 – Grade 12</b>									
Transition rate between Lower and Upper Secondary	75%	107.3%	102%	97%	92%	82%	75%	75%	75%
Number of new entrants to Upper Secondary		6 837	8 052	9 080	9 889	10 744	10 831	11 026	11 225
Non-repeaters in Grade 12		5 312							
Population age 15		15 000	15 545	16 110	16 695	17 930	19 256	19 602	19 955
Population age 17		14 000							
School-age population ages 15-17		44 463	46 078	47 752	49 486	53 147	57 078	58 105	59 151
Annual growth rate of the school age population (% p.a.)	1.8%	#							
Survival rate to end of Upper Secondary	95%	83%	91%	95%	95%	95%	95%	95%	95%
Repeaters as % of total enrollments	5%	5.0%	5%	5%	5%	5%	5%	5%	5%
Target year	2005								
Enrollment rate in Year 10 (non-repeaters in Year 10 as % of cohort at official age 15)		46%	52%	56%	59%	60%	56%	56%	56%
Year 12 completion rate (non-repeaters in Year 12 as % of cohort at official age 17)		38%	47%	54%	56%	57%	53%	53%	53%
Gross enrollment rate		47%	52%	58%	61%	62%	58%	58%	58%
Total number of Upper Secondary students		20 869	24 005	27 624	30 084	32 686	32 951	33 544	34 148
Number of students in non-government schools (i.e. Not government-aided)		51	234	472	734	1 276	1 648	1 677	1 707
% of students in non-government schools	5.0%	0.2%	1.0%	1.7%	2.4%	3.9%	5.0%	5.0%	5.0%

**Annex 5.5: Projection of Long-term Resource Requirements in Education**

	Assumed Target	Base Year	Projection						
	2015	2002	2004	2006	2008	2012	2016	2017	2018
Number of students in partly government-aided schools		6 775	7 887	9 183	10 119	11 249	11 533	11 741	11 952
% of students in partly government-aided schools	35.0%	32%	32.9%	33.2%	33.6%	34.4%	35.0%	35.0%	35.0%
Number of students in government schools		14 043	15 884	17 969	19 232	20 161	19 771	20 127	20 489
Ratio of students to teachers in government schools		33.3	32.6	31.7	30.4	26.8	23.3	23.3	23.3
Number of sections in government schools		200	245	303	356	467	565	575	585
Students per section in government schools	35.0	70.2	64.8	59.4	54.0	43.1	35.0	35.0	35.0
Weekly instructional hours for students	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Teacher weekly hours of teaching workload	20.0	14.2	15.1	16.0	16.9	18.7	20.0	20.0	20.0
Number of teachers in government schools		422	487	567	633	751	847	863	878
Annual teacher attrition rate (% p.a.)									
Teachers in pay category 1	2.0%								
Teachers in pay category 2	2.0%								
Teachers in pay category 3 (category to be discontinued)	4.0%								
% of new teachers recruited into category 1	0.0%	0%	0%	0%	0%	0%	0%	0%	0%
Number of teachers per category									
Teachers in category 1		422	405	389	374	345	318	312	305
Teachers in category 2		0	81	178	259	407	529	551	573
Teachers in category 3 (category to be discontinued)		0	0	0	0	0	0	0	0
Teacher remuneration as % of GDP per capita									

**Annex 5.5: Projection of Long-term Resource Requirements in Education**

	Assumed Target	Base Year	Projection							
	2015	2002	2004	2006	2008	2012	2016	2017	2018	
Teachers in category 1	5.0	4.3	4.4	4.5	4.6	4.8	5.0	5.0	5.0	
Teachers in category 2	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Teachers in category 3 (category to be discontinued)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Average teacher remuneration										
As % of per capita GDP		4.3	4.3	4.3	4.4	4.4	4.4	4.4	4.3	
In Local Currency Unit (LCU)		1 803	1 943	2 079	2 223	2 532	2 863	2 943	3 027	
Total teacher remuneration (millions of LCU)		1	1	1	1	2	2	3	3	
Spending on inputs other than teachers as % of total recurrent spending	40.0%	39.0%	39.2%	39.3%	39.5%	39.8%	40.0%	40.0%	40.0%	
Share of Central administration in total spending other than teachers	20.0%	38.0%	35.2%	32.5%	29.7%	24.2%	20.0%	20.0%	20.0%	
Share of School-level administration in total spending other than teachers	20.0%	0.0%	3.1%	6.2%	9.2%	15.4%	20.0%	20.0%	20.0%	
Share of Pedagogical materials in total spending other than teachers	50.0%	62.0%	60.2%	58.3%	56.5%	52.8%	50.0%	50.0%	50.0%	
Share of Spending on bursaries and student welfare in total spending other than teachers	10.0%	0.0%	1.5%	3.1%	4.6%	7.7%	10.0%	10.0%	10.0%	
Total spending on inputs other than teachers (millions of LCU)		0	1	1	1	1	2	2	2	
Central administration		1	0	0	0	0	0	0	0	
School-level administration		0	0	0	0	0	0	0	0	
Pedagogical materials		2	0	0	1	1	1	1	1	
Bursaries and school feeding		0	0	0	0	0	0	0	0	

**Annex 5.5: Projection of Long-term Resource Requirements in Education**

	Assumed Target	Base Year	Projection							
	2015	2002	2004	2006	2008	2012	2016	2017	2018	
Total public recurrent spending in Government schools (millions of LCU)		1	2	2	2	3	4	4	4	
Public spending per pupil in Government schools as % of per capita GDP		0.21	0.22	0.23	0.24	0.27	0.31	0.31	0.31	
Support to partly government-aided schools										
Rate of support per student (LCU)	77	77	12	24	36	59	77	77	77	
Aggregate amount of support (millions of LCU)		1	0	0	0	1	1	1	1	
Total public recurrent spending on Upper Secondary (in millions of LCU)		2	2	2	3	4	5	5	5	
		85	69	78	89	117	150	153	157	
Non-formel Education										
Annual growth rate of total public spending on non-formal education (% p.a.)	5.0%									
Total public recurrent spending on non-formal education (in millions of LCU)		0	0	1	1	1	1	1	1	
Technical Education										
Number of students in public institutions	5 000	1 471	2 014	2 557	3 100	4 186	5 000	5 000	5 000	
Total salary bill (millions of LCU)		0	1	1	1	1	2	2	2	
Total non-salary spending (millions of LCU)		0	0	0	0	0	1	1	1	
Cost of personnel per student (LCU)		309	316	322	328	342	356	359	363	
Annual growth rate (% p.a.)	1.0%									

**Annex 5.5: Projection of Long-term Resource Requirements in Education**

	Assumed Target	Base Year	Projection						
	2015	2002	2004	2006	2008	2012	2016	2017	2018
Cost of non-personnel inputs per student (LCU)		89	93	96	100	109	118	120	122
Annual growth rate (% p.a.)	2.0%								
<b>Total public spending (millions of LCU)</b>		<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>
<b>Teacher Training</b>									
Annual production of graduates (base year=first year of projection)									
Average cost of teacher production as multiple of GDP per capita									
Trained									
<b>Total government recurrent spending on TT (millions of LCU)</b>									
<b>Higher Education</b>									
Number of students in public institutions	10 000	6 250	6 827	7 404	7 981	9 135	10 000	10 000	10 000
Unit cost per student in public higher education excluding bursaries and student welfare (LCU)		139	142	145	148	154	160	162	163
Annual growth rate of unit cost in public higher education excluding bursaries and student welfare (% p.a.)	1.0%								
Total spending on public higher education excluding bursaries and student welfare (in millions of LCU)		1	1	1	1	1	2	2	2
Bursaries and student welfare per student (LCU)		0	0	0	0	0	0	0	0
Annual growth rate of bursaries and student welfare (% p.a.)	2.0%								

**Annex 5.5: Projection of Long-term Resource Requirements in Education**

	<b>Assumed Target</b>	<b>Base Year</b>	<b>Projection</b>						
	<b>2015</b>	<b>2002</b>	2004	2006	2008	2012	2016	2017	2018
Total spending on bursaries and student welfare (in millions of LCU)		0	0	0	0	0	0	0	0
<b>Total public recurrent spending excluding studies abroad (millions of LCU)</b>		<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>2</b>
<b>Public spending per student in government institutions as multiple of GDP per capita</b>		<b>0.33</b>	<b>0.31</b>	<b>0.30</b>	<b>0.29</b>	<b>0.27</b>	<b>0.24</b>	<b>0.24</b>	<b>0.23</b>
Number of students in subsidized institutions	10 000	0	1 538	3 077	4 615	7 692	10 000	10 000	10 000
Subsidies per student in subsidized institutions as % unit cost per student in public inst. excluding burs. And student welfare	10.0%		10%	10%	10%	10%	10%	10%	10%
<b>Total subsidies to subsidized institutions (in millions of LCU)</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Total spending on studies abroad (in millions of LCU)			0	0	0	0	0	0	0
Annual growth rate of spending on studies abroad	5.0%								
<b>Total public recurrent spending on higher education (millions of LCU)</b>		<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>
<b>Summary of total recurrent spending by level (millions of LCU)</b>									
Preschool		0	0	0	0	0	0	0	0
Primary cycle		7	8	9	9	11	14	15	15
Secondary 1		3	3	3	4	5	7	7	7
Secondary 2		2	2	2	3	4	5	5	5
Non formal education		0	0	1	1	1	1	1	1



**Annex 5.5: Projection of Long-term Resource Requirements in Education**

	<b>Assumed Target</b>	<b>Base Year</b>	<b>Projection</b>						
	<b>2015</b>	<b>2002</b>	2004	2006	2008	2012	2016	2017	2018
Technical education		1	1	1	1	2	2	2	2
Teacher Training		0	0	0	0	0	0	0	0
Higher education		1	1	1	1	2	2	2	2
<b>Total recurrent spending on education</b>		<b>14</b>	<b>15</b>	<b>17</b>	<b>19</b>	<b>24</b>	<b>31</b>	<b>32</b>	<b>33</b>
<b>Summary of recurrent spending by level (% distribution)</b>									
Preschool		1.2	1.2	1.2	1.2	1.1	1.1	1.1	1.1
Primary cycle		52.4	55.5	51.5	47.8	44.3	45.2	45.5	45.8
Secondary 1		19.8	17.4	19.1	20.7	22.0	21.5	21.6	21.7
Secondary 2		12.9	10.9	12.5	14.0	15.7	16.0	16.0	16.0
Non formal education		3.1	3.1	3.0	3.0	2.8	2.7	2.8	2.8
Technical education		4.3	5.4	6.2	6.9	7.7	7.7	7.5	7.3
Teacher Training		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Higher education		6.3	6.5	6.5	6.5	6.3	5.7	5.5	5.4
<b>Total</b>		<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
<b>C. Classroom construction</b>									
<b>Primary</b>									
Cost per furnished and equipped classroom (thousands of LCU)	<b>20</b>								
Number of teachers without classroom									

**Annex 5.5: Projection of Long-term Resource Requirements in Education**

	<b>Assumed Target</b>	<b>Base Year</b>	<b>Projection</b>						
	<b>2015</b>	<b>2002</b>	<b>2004</b>	<b>2006</b>	<b>2008</b>	<b>2012</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
Number of teachers per classroom	1.00								
Number of classrooms		3 550	3 931	3 878	3 745	3 821	4 325	4 403	4 482
Number of new classrooms per year (average between base year and 2015)			56	56	- 2	- 2	116	116	79
<b>Total annual cost of classroom construction (millions of LCU)</b>			1	1	0	0	2	2	2
<b>Secondary 1</b>									
Cost per furnished and equipped classroom (thousands of LCU)	20								
Number of sections per classroom	1.10								
Number of classrooms		563	645	737	815	927	978	996	1 013
Number of new classrooms per year (average between base year and 2015)			43	43	30	30	14	14	18
<b>Total annual cost of classroom construction (in millions of LCU)</b>			1	1	1	1	0	0	0
<b>Secondary 2</b>									
Cost per furnished and equipped classroom (in thousands of LCU)	20								
Number of sections per classroom	1.10								
Number of classrooms		182	223	275	324	425	514	523	532
Number of new classrooms per year (average between base year and 2015)			24	24	25	25	20	20	9
<b>Total annual cost of classroom construction (in millions of LCU)</b>			0	0	1	1	0	0	0

**Annex 5.5: Projection of Long-term Resource Requirements in Education**

	Assumed Target	Base Year	Projection						
	2015	2002	2004	2006	2008	2012	2016	2017	2018
<b>D. Overall summary</b>									
<b>Cost and resource availability (in millions of LCU)</b>									
Recurrent cost		14	15	17	19	24	30	32	33
Capital cost		3.7	2	2	1	1	3	3	2
<b>Total cost</b>		17.7	<b>17</b>	<b>20</b>	<b>20</b>	<b>25</b>	<b>33</b>	<b>35</b>	<b>35</b>
<b>Resource envelope</b>		17.7	<b>17</b>	<b>18</b>	<b>20</b>	<b>24</b>	<b>30</b>	<b>31</b>	<b>33</b>
<b>Funding gap = resource envelope - total cost (in millions of LCU)</b>									
Recurrent account			1	1	1	0	- 1	- 1	- 1
Capital account		-	- 2	- 2	- 1	- 1	- 3	- 3	- 2
<b>Total gap</b>		-	- 1	- 1	- 0	- 1	- 4	- 4	- 3
Base year data (green)									
Assumption (yellow)									
Target year (blue)									

Source: World Bank Projection

## **TECHNICAL NOTES ON THE ANALYSIS OF PRIMARY SCHOOL ACHIEVEMENT SURVEY**

## **NOTE 1: THE TRAINING PROCESS AND THE FIELDWORK OF THE PRIMARY SCHOOL ASSESSMENT SURVEY (PSAS)**

### **Training Process**

To undertake the first Primary School Assessment Survey (PSAS) required extensive training to ensure following of the appropriate procedures and to assure the data quality. Building on the experience of an USAID funded pilot study in 2001, the PSAS of 2003 began with training interviewers in November and December of 2002.

MOEYCS collaborated with the statistics Office of the Ministry of Planning in this undertaking, in large part because the statistics Office had experience in conducting surveys, including the Suco Survey of 2000 and TLSS of 2001. On the recommendation of the Statistics Office, 57 Timorese interviewers were selected to participate in the training program; all of them were used as enumerators to collect data in the field.<sup>49</sup> All were being considered for use in the forthcoming population census (2004/5). They had varied educational and employment backgrounds; some were university graduates. All had indicated they would be available for extensive periods in the field, away from home. Also participating were senior staff of the MOEYCS. It is important to appreciate that getting 55 to 60 good enumerators/interviewers in East Timor was not an easy task. There were few sources where this number of adequate people could be obtained. Certainly the MOEYCS did not have anywhere near this number of skilled people.

On the basis of training provided and pilot data collection, the interviewers demonstrated that they were able to collect the required data. The unknown factor during pilot fieldwork was the ability of principals/head teachers to provide the extensive enrollment and financial data sought from schools. Because of the complexity and length of the Principals Questionnaire, it was decided that this questionnaire would be administered by Team Leaders of groups that go into the field. The Team Leaders had received extra training on this questionnaire. Training was conducted over the course of about 10 days, from 21 November to 2 December 2002, in the large auditorium in the MOEYCS offices in Vila Verde.

The chief trainers were the consultant, assisted by a translator/interpreter (Mr. Aderito Punef) and senior members of the Statistics office (Mr. Elias dos Santos Ferreira, Ms. Lelinha Tilman, Mr. Manuel Mendonca). Training covered the following topics:

1. Overview of the Primary School Achievement Survey and what it was attempting to do.
2. Principals of survey work and the need to obtain quality data.
3. Processes for gathering and recording survey data.
4. Processes for visiting schools and interviewing various respondents.
5. Examination of structure and purpose of each of the questionnaires and test.

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<sup>49</sup>

All the questionnaires were in Bahasa Indonesia. This was done because all interviewers were proficient in Indonesian and few were proficient in Portuguese. The questionnaires were of the interview type. That is, an interviewer would read out a question and then record the response of the interviewee. In cases where the interviewee could not properly understand Indonesian, interviewers were at liberty to verbally translate into a language that interviewee could understand (eg, tetum or other local language). The survey revealed that few people in the sampled populations were sufficiently proficient in Portuguese to have used this language as the medium for gathering information and data. Tetum could not be used either as not all sampled people were proficient in this language.

6. Consideration of improvement to layout and wording of questionnaires
7. Role-playing practice in administering the questionnaires.
8. Mechanics of the proposed field work, including structure of teams, responsibilities of team members, transport, security of survey materials, monitoring of practice in the field.
9. The pilot study.
10. Practice in interviewing and collection of data through the pilot study.
11. Examination of problems encountered during the pilot study (e.g. ambiguity of questions)

### **Field Teams**

There were 13 teams, each one consisting of a team leader (interviewer) plus 3 additional interviewers and a driver.

Each team visited about 6 to 8 schools, coinciding as much as possible with district boundaries. However some teams will have to visit schools in more than one district. Each school visited over 2 days as follows:

#### **Day 1:**

1. Team arrived school at beginning of school day (e.g. 7:30 am).
2. Team met the principal/head teacher.
3. Team and principal/head teacher randomly selected from the enrolment list 20 students in Grade 3 and 20 students in Grade 4. The students might come from a number of classes in a large school. However many rural schools were small and would have only one classroom at each grade. In some very small one-teacher schools, all grades were in one classroom.
4. Selected students placed in suitable area for testing and interview. Principal/head teacher and the team leader decided this, but the decision depended on the resources available at the school.
5. Selected Grade 3 and Grade 4 students administered the mathematics test. If there were two classrooms, the team leader and one interviewer supervised Grade 3, and the other two interviewers supervised Grade 4.
6. After completion of the test, team leader and interviewers interviewed the students based on the questionnaire and wrote down their answers to the questions. To assist in the process, the class teacher was asked to be present to control students while they were being interviewed.
7. After completing interviews of students, supervisors of each grade interviewed the class teachers of the students who took the test.
8. Team leader interviewed the principal/head teacher (and randomly selected teacher).

#### **Day 2:**

1. Team arrived school at beginning of school day (e.g. 7:30 a.m.)
2. Team leader met principal/head teacher to conclude interview for principals' questionnaire.
3. While this was being done, other team members tried to eliminate any missing data by re-interviews.
4. After final checking, the team moved on to the next school on their list.

## **Monitoring of Fieldwork**

During fieldwork, George Morgan (Consultant), Mr Elias dos Santos Ferreira and Mr Aderito Punef, visited teams to inspect data collection practices and quality of data being collected. A team was prepared to recollect data, if data were unrealistic or missing. This drastic action turned out to be unlikely, because team leaders were counseled that they were responsible for the quality of the data their teams collected, and that there could be a financial penalty for poor field work.

## **Data Entry**

Data entry forms were designed for the CSPro program, produced for the US Census Bureau, which was the engine for data entry. The program is specifically designed for survey work and complex questionnaires and is well suited for computerising field data. Data entry began as soon as data started arriving at MOEYCS from the field. UNICEF provided fifteen computers to MOEYCS for training purposes, many of which were not being utilized very much for this purpose. As a result, MOEYCS provided a number of these computers for data entry.

To undertake the extensive data entry, six or seven people were required on a relatively full-time basis for about two months. MOEYCS provided two or three staff and additional personnel were engaged by FSQP to cover the shortfall. All scripts were stored in a FSQP office, and maintained there by clerical staff from the project. Data were checked both before and during data entry. Data entry people were able to seek assistance of the consultant and MOEYCS staff to resolve ambiguous responses.

## **Non-Response to Questions**

Training of interviewers stressed the importance of minimizing non-response errors during data collection. Team leaders were aware perception of their performance would be affected by the amount of missing data produced by their team. In addition there was field monitoring.

At the same time, it was necessary to be realistic as missing data were unavoidable, particularly on the complex and long principals' questionnaire. Many principals/head teachers did not have the data (e.g. enrollments and financial) for before 2000, because this data was destroyed during 1999.

Non-response on the test in the pilot was found to be high because of very poor learning, language problems (many students have not learned Portuguese sufficiently well), and because of the widespread practice of not trying to guess an answer. In fact the pilot data for the test replicated the findings found in the earlier AusAid funded survey of in 2001.

It was not deemed possible to make the test easier because Timorese educators considered the standard reasonable. Efforts were made to minimize missing responses on the test by instructing students to improve their test-taking strategy, by doing the easy questions first, then going back to the harder ones later, and finally making some good guesses when running out of test time. But this effort was not very effective, since students were not taught in this way.

Even though non-response was high, the range of student performance was very large. Many students performed poorly, but some did reasonably well. There appeared to be sufficient discrimination of student performance to be able to show relationships between performance and other variables. So long as a good measure of relative performance could be obtained (high test reliability), the problem of non-response might not be that crucial in picking up relationships.

Note that patterns of non-response were also valuable in identifying curriculum areas that have not been covered or taught well.

## **Results of the Pilot Study**

The pilot study was conducted in six Dili primary schools (EP No3 Bidau, EP No.8 Hera, EP Catholic No.5 Comoro, EP No.2 Farol, EP No.4 Bemori, and EP Culuhun). The pilot study had two aims:

1. To trial the test and questionnaires and make corrections, in preparation for the field work in January 2003;
2. To provide interviewers practice in administering the test and questionnaires.

About 55 interviewers, selected by the Statistics Unit of the Ministry of Planning and Finance, attended training sessions (9 days) and participated in the trials. Since only a small number of schools were selected for the pilot study, approx 8 – 9 interviewers were assigned to each school. The interviewers were grouped into 13 field teams, with one of the interviewers in each team acting as team leader. All interviewers had practice in administering the test, and the student, teacher and parent questionnaires. Team leaders had practice in administering the Principals Questionnaire and the District Education Officials Questionnaire.

Approx 20 students were selected randomly at each of Grade 3 and Grade 4 in each school and tested with the mathematics test, and interviewed. Teachers of these students were interviewed, as well as the principal and a few parents, some of whom were parents of dropout students (left Grade 3 in 2001-2002 school year and did not proceed to Grade 4, or left Grade 3 or Grade 4 in current 2002-2003 school year.)

Fourteen officials in the Dili District Education Office were interviewed.

## **Mathematics Test (in Portuguese)**

The test contained 26 items and took 25 minutes to complete. Item analysis indicated most items discriminated student achievement well; some items were less discriminating than others, particularly the more verbal items, 17, 18 and 19, because of their difficulty. It was decided to retain the small number of more verbal items, as they test important word problem solving skills, challenging more able students, and also enhance the validity of the test. Rasch scores were compiled to ensure that the test items could be used for the full scale test.

## **Accompanying Questionnaires (in Bahasa Indonesia)**

The sample responses to questionnaires by students, teachers, principals, and district officials in the pilot study were examined. The wording of some questions in Bahasa Indonesia was improved to provide more clarity.

The most difficult questionnaire for interviewers was the one for principals. The meaning, layout/flow of some questions in this questionnaire required improvement, particularly those dealing with school finances and parents association. Team leaders, also needed further briefing to stress that they take more care to check all relevant parts before departing schools. Some of the missing data in the pilot was due to principals not being able to provide the required data and because of somewhat constrained visits to schools, since transport to and from schools was



dependent on availability of MOEYCS buses and drivers. This was not a problem in January, when each team had its own vehicle and driver.

Wording of problematic questions was being improved and additional training/briefing sessions were held in December and January before full-scale fieldwork commenced.

## **Conclusion**

Based on the training and results of the pilot study, the teams set up for the fieldwork in January accomplished data collection as intended. Senior staff of the Statistics Unit and George Morgan monitored fieldwork in January and February 2003 as planned, with occasional participation of Kin Bing Wu.

## **NOTE 2: ITEM RESPONSE MODEL SCALE FOR THE MATHEMATICS TEST**

In the PSAS an attempt was made to assess the amount of learning (achievement) of students in these grades by administering a common mathematics test written in Portuguese. The test consisted of 26 multiple-choice items<sup>50</sup>, with four alternatives per item. Although use of such a test across all learning domains was questionable, the test was taken as a suitable instrument for indicating student achievement within the current climate of transition to Portuguese as the language of instruction. Mathematics is one of the more important components of schooling; in addition the test was purposely designed so that students with minimal Portuguese language proficiency could respond to most items.

Of the 26 items in the test, 11 items (e.g.,  $9 - 3 + 5 =$ ) were non-verbal arithmetical items, and the remainder required some minimal proficiency in Portuguese. The most challenging items were three word problems, each requiring a translation from Portuguese into numerical form for solution.

The distribution of items in the mathematics test by content and the cognitive behavior (Bloom's taxonomy) is briefly summarized in the Table below. In classifying items the highest Bloom's taxonomy level appropriate to the item and grades was used. Most items assessed understanding and application skills in numbers, particularly the ability to apply operational/arithmetical rules involving numbers.

**Distribution of Mathematics Items by Content and Cognitive Behavior**

Content Area	Knowledge	Comprehension	Application	Analysis	Total
Number	1	3	12	3	19
Space/Geometry	1		3		4
Measurement	1		1	1	3
Total	3	3	16	4	26

Note that the confounding of mathematical knowledge and skills with Portuguese language skills in some of the questions could not be disentangled in any meaningful way. Therefore it is important to remember that some questions tested not only mathematics but also familiarity with the Portuguese language.

### **Rasch Measurement Scale for Items and Students**

All mathematics items were scored dichotomously: 0 (wrong response) and 1 (right response). Since both Grade 3 and Grade 4 students took the same mathematics test, a common achievement scale could be constructed directly from the items in the test. That is the constructed mathematics

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<sup>50</sup> Four items were TIMSS items – see the document *TIMSS Pop1 Maths Released Items.pdf* available from the internet site at <http://timss.bc.edu>.

scale directly applied to both grades without any need for scale adjustment. The mathematics scale constructed is known as a Rasch measurement scale, and derives from application of a Rasch measurement model, that may be viewed as a particular form of item response model (Adams & Khoo, 1994).

Students did best on the easiest number items in the test, and performance tailored-off markedly with the harder items in number and with the items in the other mathematics content areas, such as measurement. In general Grade 4 students performed better than the Grade 3 students.

The following Figure displays the relative performance of the two grades in maths on the common maths scale. This plot is derived from an item response theory analysis using the *Partial Credit Model* (Adams and Khoo, 1993)<sup>51</sup>. Although the Partial Credit Model allows for partial scores, in the present analysis all items were scored dichotomously. The model contains a person parameter, representing ability/achievement on the underlying unidimensional latent scale supposed to characterize performance on the set of items in the test. In addition the model models item difficulty through a set of parameters called thresholds. For example, if an item has three score categories, 0, 1 and 2, it has two 'steps'. The first step is the transition from 0 to 1, and the second is the transition from 1 to 2. The 'difficulty' of each of these steps can be estimated. The threshold for an item step 'is the ability level that is required for an individual to have a 50 per cent chance of passing that step'. Note that item steps are ordered in terms of location on the scale. Since items were scored dichotomously in the present analysis, only one threshold was defined and estimated for each item

The plot in the Figure shows the relative performance of the Grade 3 and Grade 4 students on the mathematics scale constructed. The vertical arrow with the attached scale represents the underlying mathematics continuum of performance, which is an interval scale, for the tests. The numbers are in units called 'logits' but this is not important for the purposes of discussion that follows.

The vertical histograms show the distribution of student achievement along this scale for Grade 3 and Grade 4 students separately. These show that there was considerable overlap in performance of the two groups, with mean performance of the Grade 4 students a little higher on the scale than the mean performance of the Grade 3 students. Note that the difference in mean raw scores of the grades was shown to be statistically significant earlier in the report.

Also shown are the item thresholds—one for each item in the test. Note that this plot is a translation of line plots from a computer program and so there has been some inaccuracy in matching the locations of student distributions and item thresholds. Nevertheless the plots shown are sufficient to show the relative performance of students and items. The intention is not to provide a definitive set of yardsticks through these plots.

Items located higher up the scale were more difficult than those located lower down on the scale. In addition, persons (in the distributions) located higher up the scale were more able (higher performance) than persons located lower down on the scale.

Some of the item labels have been annotated to describe the nature of the item and its assessment focus. The two hardest items were numbers 19 and 21. The former was a word problem involving the determination of how long it would take to complete a certain journey at given speed. The

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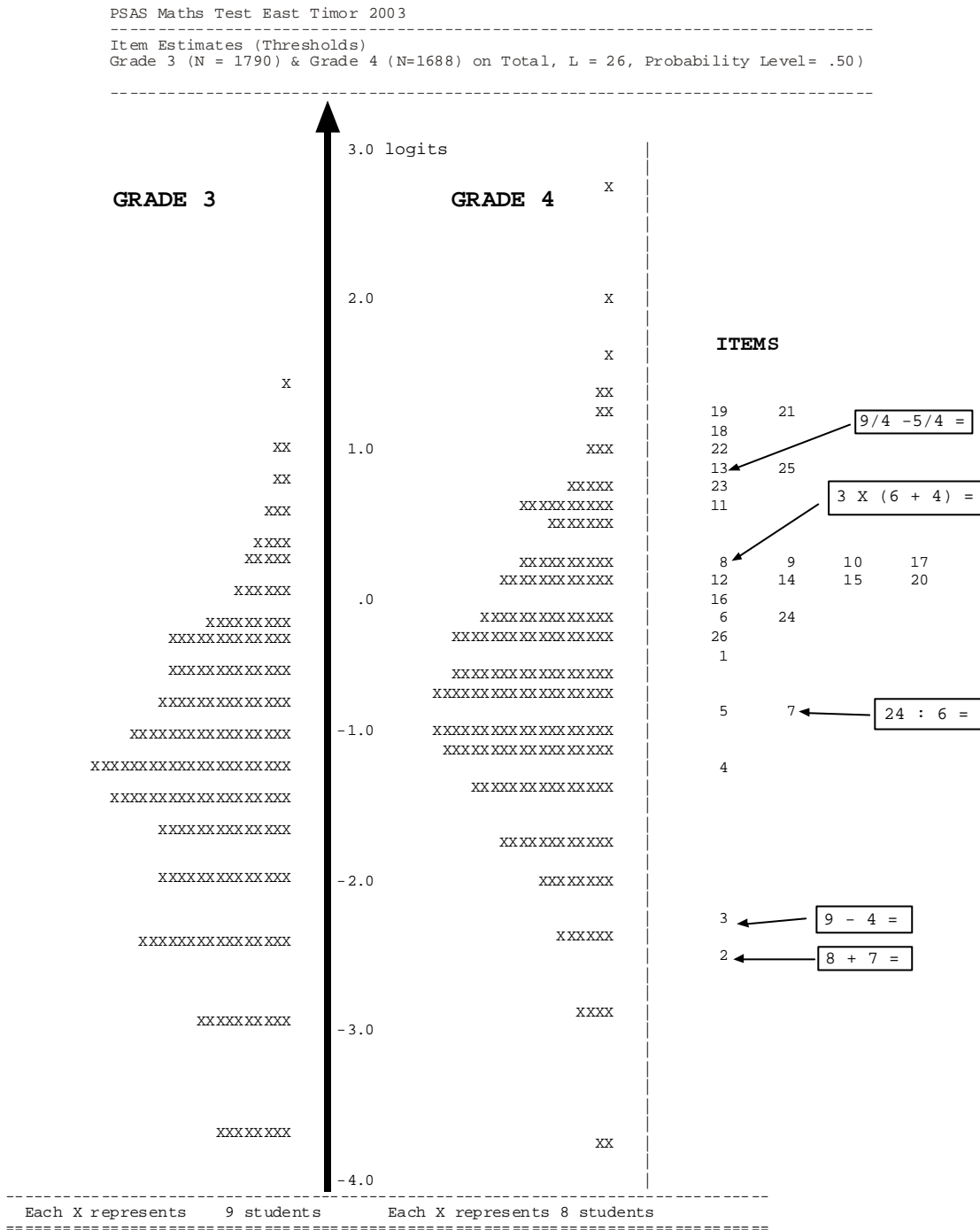
<sup>51</sup> Adams, R. J. & Khoo, S-K. (1993). *Quest: The Interactive Test Analysis System*. Camberwell, Vic, Australia: Australian Council for Educational Research.

latter was a word-geometrical problem requiring the determination of the kind of planar figures into which a given hexagon is divided. Items 2 and 3 were the easiest items. The former was a simple addition of two single digit numbers ( $8 + 7 =$ ), and the latter was a simple subtraction of two single digit numbers ( $9 - 4 =$ ).

Note that there were gender differences on some items but this is not examined here. Interestingly, males performed much better than females on item 3 ( $9 - 4 =$ ) and females performed much better than males on item 11 ( $1/5 + 2/5 =$ ).

A final comment is needed on the fit of the items to the Partial Credit measurement model and the error of the parameter estimates of student achievement and item thresholds. The large amounts of missing data (non-response by students to items), which were coded as wrong responses, affected the fit of some items. As for measurement error, the threshold parameter estimates have a standard error of about 0.05 logit and the standard error of measure of achievement on the maths scale is about 0.5.

**Figure A: Relative Performance of Grade 3 and Grade 4 Students in Terms of a Common Mathematics Scale**



### NOTE 3: HIERARCHICAL LINEAR MODELING

Hierarchical Linear Models (HLMs) are used to analyze the determinants of student achievement in Timor-Leste. HLMs (also known as multilevel models) are most appropriate to analyze data that present a clustered structure—unequal sampling probabilities, in statistical terms. These data are commonly found in educational systems, where students are typically nested within classrooms and/or schools (Raudenbush & Bryk, 2002). In such cases, using traditional Ordinary Least Squares regression techniques constitutes a *unit of analysis* problem, which can lead to errors in interpreting effects (Burstein, 1980) which has been shown to result in underestimation of the size of the standard errors of estimates, and therefore in false significant results.

A multilevel analytical approach underlies the results presented in Table 14 in the text which aims to examine whether similar students might have different learning outcomes if they attended schools with different characteristics. It involves the following steps.

Unconditional Models. The first step is to estimate the fully unconditional model:

$$Y_{ij} = \beta_{0j} + r_{ij}, r_{ij} \sim N(0, \sigma^2), \quad (\text{Equation 1}) \quad (\text{Level 1})$$

$$\beta_{0j} = \gamma_{00} + u_{0j}, u_{0j} \sim N(0, \tau_{00}). \quad (\text{Equation 2}) \quad (\text{Level 2})$$

where  $Y_{ij}$  is the test score for student  $i$  in school  $j$ ;  $\beta_{0j}$  is the mean test score at school  $j$  and  $\gamma_{00}$  is the grand mean of the test score. The  $r_{ij}$  is the student-level random components in school  $j$ . The  $u_{0j}$  is the school-level random components in school  $j$ . The  $\sigma^2$  is the error term (residual) of the variance in test scores between students. The  $\tau_{00}$  is the error term of the total variance in test scores between schools.

This unconditional model provides estimates of (a) the total variance in test scores between students (within schools), and (b) the total variance in test scores between schools (within departments). In addition, it allows for calculation of the intra-class correlation:

$$\rho = \sigma^2 / (\tau_{00} + \sigma^2) \quad (\text{Equation 3}) \quad (\text{Level 1, between students})$$

$$\rho = \tau_{00} / (\tau_{00} + \sigma^2) \quad (\text{Equation 4}) \quad (\text{Level 2, between schools})$$

where  $\rho$  is the intra-class correlation. The unconditional estimates of the errors in Equations 1 and 2 provide the basis for computing the proportion of variance in test scores explained by introducing additional variables at each of the two levels into the model.

Conditional Models. The next step is to specify a conditional model with random effects (equivalent to analysis of covariance, or ANCOVA) for each level. At level 1, the model uses student-level variables, and allows the intercept and slopes to vary across schools (Level-2). The model is as follows:

$$Y_{ij} = \beta_{0j} + \beta_{1j} (X_{ij} - \bar{X}_j) + r_{ij}, r_{ij} \sim N(0, \sigma^2) \quad (\text{Equation 5}) \quad (\text{Level 1})$$

where  $X$ 's are background characteristics of student  $i$  in school  $j$ ; and  $r_{ij}$  is the student-level random effect. In this case, the  $X$ 's will be centered on the school mean (the average value of a given variable of school  $j$ ). The intercept term of the conditional model is therefore similar to that in the unconditional model, except the mean is now adjusted for the covariates (student-level variables). Centering allowed  $\beta_{0j}$  to be interpreted as the mean test scores of students in school  $j$ , adjusted for differences among schools in student characteristics.

The intercept and slope parameters are subscripted by  $j$ , indicating that each school could have a different intercept and slope(s). If there is significant variation in intercepts and slopes between schools, these can in turn be modeled by including predictors at the school level (either school characteristics, or student characteristics aggregated by school). Thus the student-level intercepts and slopes become outcomes, and the school-level ANCOVA model is as follows:

$$\beta_{0j} = \gamma_{00} + \gamma_{01} (W_j - \bar{W}_{..}) + u_{0j}, u_{0j} \sim N(0, \tau_{00}) \quad (\text{Equation 6}) \quad (\text{Level 2})$$

where  $W$ 's are school characteristics;  $u_{0j}$  is the school-level random effect. The  $W$ 's are here centered around the grand sample mean. The interpretation of  $\beta_{0j}$  would be the adjusted school mean outcome affected by the school-level characteristics (the  $W$ 's). Similarly, the slope coefficients could be described as being affected by  $W$ 's, given  $X$ 's.

HLM does not generate R-squared statistics. The explanatory power of a model is indicated by the proportion of variance (at each level) in the outcome additional variables account for. Computation of proportion of the variation in  $\beta$ 's which is explained by school-level variables will use information from the unconditional and the conditional models:

$$[\tau_{11}(\text{unconditional}) - \tau_{11}(\text{conditional})] / \tau_{11}(\text{unconditional}) \quad (\text{Equation 7})$$

*Cross-level Model.* To analyze whether school variables have effects on student-level variables, it is necessary to examine cross level interactions, or the mediating effect of context. For example, the SES parameter estimate,  $\beta_{1j}$  can be modeled as a function of the group (school) effect of SES to see whether the individual effect of being a low SES student is exacerbated by attending a school where the average school SES is low. Both these level two variables can be included in the model. ↗ Pete: how is this different from the conditional models above?

The final two-level models for the PSAS data are as follows:

#### Level-1 Model

$$Y = B0 + B1*(SEX) + B2*(ATKINDER) + B3*(H\_TBOOKS) + B4*(TABSLW) + B5*(PARRNEWS) + B6*(ABILITY) + B7*(OVERAGE) + B8*(MOTHPORT) + B9*(MOTHMAM) + B10*(MOTHMAK) + B11*(MOTHOTH) + B12*(GRADEDUM) + B13*(SES) + B14*(REPET) + B15*(LI\_PORT) + B16*(LI\_TET) + B17*(LI\_PTOT) + R$$

## Level-2 Model

$$\begin{aligned}
 B0 &= G00 + G01*(MULTGRAD) + U0 \\
 B1 &= G10 \\
 B2 &= G20 + G21*(ATKIND\_1) + G22*(DAYSAB\_1) \\
 B3 &= G30 \\
 B4 &= G40 \\
 B5 &= G50 \\
 B6 &= G60 \\
 B7 &= G70 \\
 B8 &= G80 \\
 B9 &= G90 \\
 B10 &= G100 \\
 B11 &= G110 \\
 B12 &= G120 + G121*(ABILIT\_1) + G122*(TP\_RAT3) + G123*(CHGPT34) + U12 \\
 B13 &= G130 \\
 B14 &= G140 \\
 B15 &= G150 \\
 B16 &= G160 \\
 B17 &= G170
 \end{aligned}$$

*Multi-level Logistic Models.* This model is applied to examine whether the determinants of student performance are different if a model is used that separates students scoring below 50% correct from those scoring 50% correct or above. The new student outcome is dichotomous (scoring above 50% or not), and since data at both the student and the school levels are included, the method employed is a multilevel logistic regression, where the probability of the event, E, occurring, conditional on student characteristics (the  $X_c$ 's), is denoted as

$$P(E = 1 | X_c, \dots, X_C) = P(\mu_{ij}), \quad (\text{Equation 8})$$

where  $X_c$  to  $X_C$  are student-level independent variables posited to affect the likelihood of scoring above 50% correct ( $E=1$ ). The logistic function is:

$$f(z) = 1/[1+e^{-z}], \quad (\text{Equation 9})$$

and has the property of returning values in the range of 0 to 1 (Kleinbaum, 1992). Again, these models are used to estimate the probabilities of an event (e.g. scoring 50% or above) conditional on independent variables posited to have an effect on the likelihood that the event occurs. The logistic model assumes

$$z = \beta_{0j} + \beta_{cj}X_{cij} + \dots + \beta_{Cj}X_{Cij} \text{ and} \quad (\text{Equation 10})$$

$$P(\mu_{ij}) = f(z). \quad (\text{Equation 11})$$

Then applying equation 4 and 3 to 2:

$$P(\mu_{ij}) = 1/[1+e^{-(\beta_{0j} + \beta_{cj}X_{cij} + \dots + \beta_{Cj}X_{Cij})}]. \quad (\text{Equation 12})$$

The next step is to formulate odds of scoring 50% or above. This is defined as:

$$\phi = P(\mu_{ij})/(1 - P(\mu_{ij})) \quad (\text{Equation 13})$$

Finally, using equations 5 and 6, and taking the natural log (ln) of  $\phi$ , the logit of  $P(\mu_{ij})$  is:



$$\ln(\varphi) = \beta_{0j} + \beta_{cj}X_{cij} + \dots + \beta_{Cj}X_{Cij}. \quad (\text{Equation 14})$$

Which is convenient to work with because it is simply a linear sum of the explanatory variables. For logistic analyses that require multilevel models, equation 7 is expanded to include a school level (level two) component:

$$\beta_{0j} = \gamma_{00} + \gamma_{0d}W_{dj} + \dots + \gamma_{0Dc}W_{Dcj} + u_{0j}, \text{ with } u_{0j} \sim N(0, \tau_{00}), \quad (\text{Equation 15})$$

for the proportion of students scoring 50% or above at school  $j$ , where  $W_{dj}$  are independent school-level variables posited to affect this school proportion. Similarly, for the student level effects,

$$\beta_{cj} = \gamma_{c0} + \gamma_{cd}W_{dj} + \dots + \gamma_{cDc}W_{Dcj} + u_{cj}, \text{ with } u_{cj} \sim N(0, \tau_{cc}), (\text{Equation 16})$$

where  $u_{0j}$  and  $u_{cj}$  are the school level random components, and  $c = 1 \dots C$ ,  $d = 1 \dots D$ . Unlike ordinary least squares regression coefficients, the intercept and slope parameters are subscripted by  $j$ , indicating that each school can have a different intercept and slope(s). The level-one coefficients can be specified as being either fixed, non-randomly varying, or randomly varying (Bryk & Raudenbush, 1992). A model with several student level explanatory variables can have any combination of the three specifications. The final two-level model is as follows:

#### Level-1 Model

$$\text{Prob}(Y=1|B) = P$$

$$\begin{aligned} \log[P/(1-P)] = & B0 + B1*(SEX) + B2*(ATKINDER) + B3*(H\_TBOOKS) + \\ & B4*(TABSLW) + B5*(PARRNEWS) + B6*(ABILITY) + B7*(OVERAGE) + \\ & B8*(MOTHPORT) + B9*(MOTHMAM) + B10*(MOTHMAK) + B11*(MOTHOTH) + \\ & B12*(GRADEDUM) + B13*(SES) + B14*(REPET) + B15*(LI\_PORT) + B16*(LI\_TET) + \\ & B17*(LI\_PTOT) \end{aligned}$$

#### Level-2 Model

$$\begin{aligned} B0 &= G00 + G01*(MULTGRAD) + U0 \\ B1 &= G10 \\ B2 &= G20 + G21*(ATKIND\_1) + G22*(DAYSAB\_1) \\ B3 &= G30 \\ B4 &= G40 \\ B5 &= G50 \\ B6 &= G60 \\ B7 &= G70 \\ B8 &= G80 \\ B9 &= G90 \\ B10 &= G100 \\ B11 &= G110 \\ B12 &= G120 + G121*(ABILIT\_1) + G122*(TP\_RAT3) + G123*(CHGPT34) + U12 \\ B13 &= G130 \\ B14 &= G140 \\ B15 &= G150 \\ B16 &= G160 \\ B17 &= G170 \end{aligned}$$

$$\text{Level-1 variance} = 1/[P(1-P)]$$

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