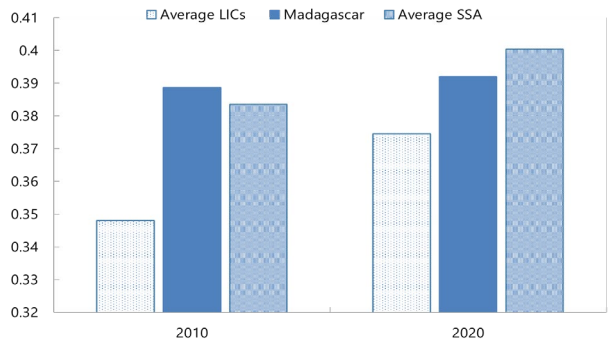
IMPROVING EDUCATION QUALITY—THE RETURNS TO TEACHER TRAINING IN MADAGASCAR[1]

The Malagasy education system is today at a critical crossroads. With a significant number of Malagasy children still outside of the education system, a poor and declining level of academic proficiency among students, as well as low primary school completion rate, urgent and bold reforms are needed. In line with the new Orientation Law for Madagascar's Education System (LOSEM)[2], the Malagasy Ministry of National Education (MEN) identified three strategic pillars as key to strengthening basic education in the country: i) availability of well-trained, motivated, and competent teachers, ii) effective learning time (in terms of hourly volume) and quality (in terms of an effective teaching approach and academic remediation), and iii) learning conditions favorable to the development and fulfillment of learners. This paper focuses on the first strategic axis. After an overview of education attainment in Madagascar, it examines the link between education and growth with an emphasis on teachers' training It finds that doubling the share of qualified primary school teachers could raise per capita real GDP growth by around 2.5 to 3.1 percentage points in Madagascar. The paper then quantifies the spending needs for recruiting and training primary school teachers, with focus on current unqualified teachers, to meet the country's projected needs over the next 6 years and finally draws some policy implications.

A. Education in Madagascar: Background and Recent Developments

1. Madagascar is among the countries with low human capital development. Its Human Capital Index (HCI) was estimated at 0.39 in 2020[3], implying that a child born at that time will reach only 39 percent of her/his potential productivity as she/he grows into adulthood based on the quantity and quality of health care and education received during her/his childhood. According to this metric, the level of human capital has stagnated over the last decade, and it was in 2020 slightly below the

Figure 1. Human Capital Index
(2010, 2020)



Source: Human Capital Index DataBank, world Bank

[1] Prepared by Kodjovi Eklou, Ialy Rasoamanana and Joanne Tan (IMF), Mamy Andrianarilala, Rolland Andrianjaka and Chrystelle Tsafack (UNICEF), and Almedina Music (World Bank). The analysis benefitted from helpful comments from staff from the Ministry of Education.

[2] LOI n°2022 - 018 portant orientation générale du système éducatif à Madagascar.

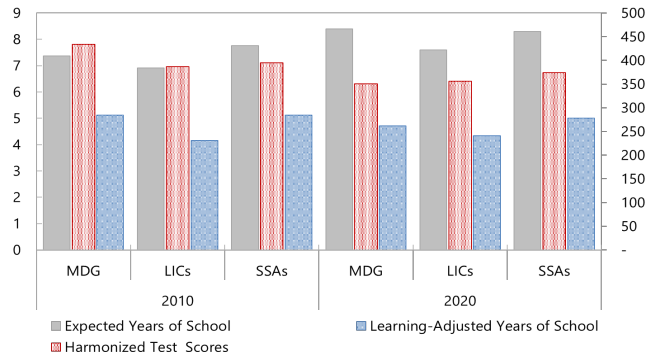
[3] The Human Capital Index (HCI) is measured at the country-level by the World Bank and ranges from 0 (lowest) to 1 (highest).

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average in Sub-Saharan Africa (SSA) region (0.40), although moderately above those of low-income countries (0.37) (Figure 1).

2. The education component of the HCI deteriorated notably between 2010 and 2020. Indeed, HCI sub-indicators aimed at measuring the quality of education, such as standardized tests scores or learning adjusted years of schooling (LAYS), have significantly decreased in the past decade.[4] The number of expected years of schooling[5] has however improved and remained above the performance of the two groups of countries mentioned earlier (Figure 2). In contrast, standardized test scores have declined by about 19 percent between 2010 to 2020 and are barely above the minimum score of 300[6].

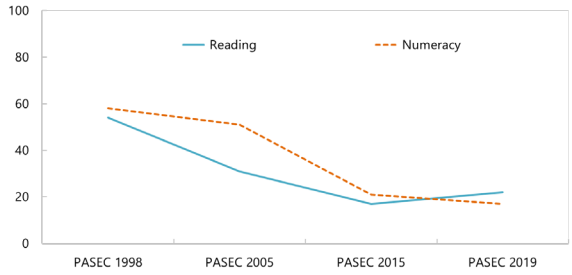
Figure 2. Human Capital Index – Education Components
(2010, 2020)



Source: Human Capital Index DataBank, world Bank

3. Many students finish primary school without acquiring basic numeracy and reading skills. The "learning poverty" indicator, jointly developed by the World Bank and UNESCO, reveals an alarming situation. Indeed, 24 percent of children of primary school age are out of school; and 97 percent of the Malagasy children aged ten are classified as "learning poor", meaning that they could not read and understand a simple text. Compared to peer countries in the region (SSA) or of the same income level (LIC), learning poverty is respectively 10 points and

Figure 3. Students with the Minimum Skills at the End of Primary School
(In percent)



Source: PASEC Reports

[4] The LAYS combines quantity and quality of schooling into a single metric of progress that is it accounts for how much students learn for each year they are in school. LAYS is an index obtained as the product of the average years of schooling for a relevant cohort of students and a measure of learning relative to a benchmark (top performer based on test scores).

[5] Expected years of schooling is the number of years a child of school entrance age is expected to spend at school, or university, including years spent on repetition. It is the sum of the age-specific enrolment ratios for primary, secondary, post-secondary non-tertiary and tertiary education.

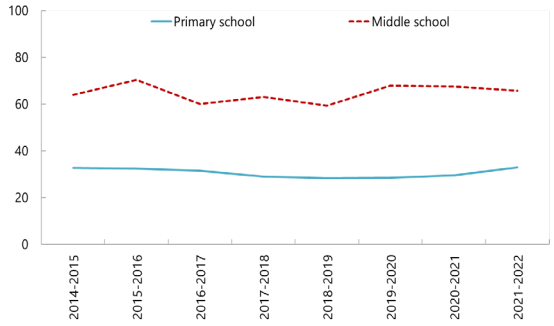
[6] The standardized score ranges between 300 (minimum level) to 625 (advanced level). The Covid-19 pandemic and the related lockdown has led to learning losses in many emerging and developing countries.

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6.8 percentage points higher in Madagascar[7]. Likewise, according to PASEC2019, 83 percent and 78 percent of students reached the end of primary school without basic numeracy and reading skills respectively, compared to 42 percent and 46 percent in 1998, suggesting a significant deterioration of academic competencies (Figure 3).[8]

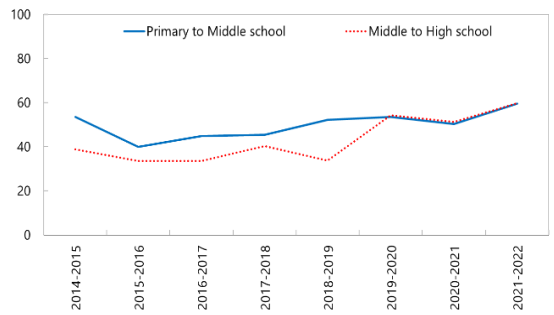
4. The internal efficacy of the education system has stagnated. The retention and transition rates at the primary and lower secondary levels have showed no substantial improvement over the past ten years. Only 1 in 3 students completes primary school, and only 60 percent of these students then continue to middle school. Furthermore, only 60 percent of students entering middle school eventually complete it, and of these graduating students, just under 60 percent go on to start high school. Taken together, these retention and transition rates (Figures 4 and 5) imply that out of every 100 children entering primary school, only 7 eventually reach high school).

Figure 4. Retention Profile
(2014–2022, in percent)



Source: Ministère de l'Education Nationale (MEN)

Figure 5. Transition Profile
(2014–2022, in percent)



Source: Ministère de l'Education Nationale (MEN)

5. Access to quality education remains a major challenge. Madagascar continues to face challenges e to provide both quantity and quality education. Indeed, apart from the net primary school enrollment rate (97.9 percent in 2022) and the literacy rate (80 percent in 2021), other indicators of education quality remain below the levels required to achieve the Sustainable Development Goals (SDGs). For instance, the completion rates of the first cycle of secondary education and the rate of participation in pre-primary learning remained respectively at 30.2 percent and 39.5 percent in 2023.

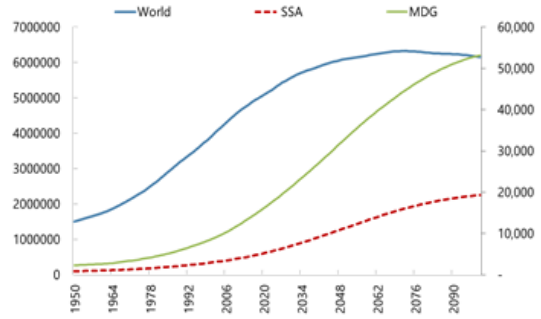
[7] Fighting poverty with education: Why school reforms are urgently needed in Madagascar, World Bank, February 2024.

[8] The Program for the Analysis of Educational Systems of the Conference of Ministers of Education of French-speaking States and Governments (PASEC) evaluates the performance of the education systems of 24 member Francophone countries.

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6. Investing in education could allow Madagascar to benefit from its demographic dividend. In 2050, the world population is projected to reach 9.7 billion individuals including 2 billion from Sub-Saharan Africa[9]. According to these estimates, SSA countries will account for more than 20 percent of the global workforce at this time. Madagascar is projected to almost double its population over the same period from 27 to 52 million between 2018 and 2050. The demographic dividend in Madagascar will more than double the number of its working-age population, which will go from 15 to 33 million (Figure 6).

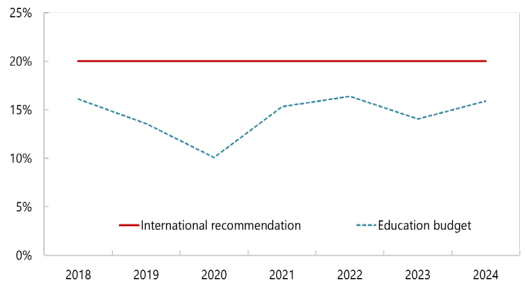
Figure 6. Evolution of Working Age Population in Madagascar (LHS), SSA and the World (RHS)
(In thousands)



Source: UN population projections

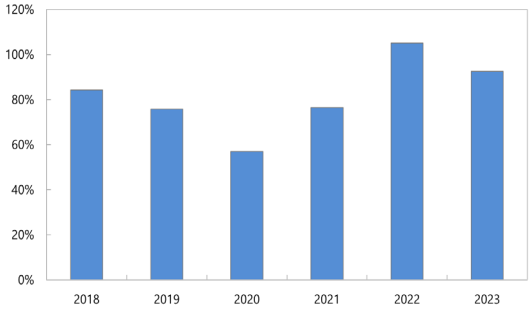
7. Yet public spending on education remains low. In Madagascar, public spending on education remains well below both the LIC and SSA average (Figure 7). Over the period 2010-2022, the government of Madagascar devoted about 2.7 percent of GDP on average to education while over the same period, this ratio stood at 4.1 percent and 13.4 percent for SSA countries and LICs respectively. The country's spending on education is also far below the level required to reach the SDG on education by 2030, with a gap of about 8 percentage points between the current and the needed level of spending (4.4 percent in 2020 against 12.3 percent in 2030).[10] Similarly, spending

Figure 7. Budget Allocation to the Education Sector in Madagascar
(As a percent of total budget)



Source: Lois de règlements (2018-2020); Budget. execution report (2021-2022) ; Loi des finances (2023-2024). UNICEF staff estimates.

Figure 8. Budget Execution Rate in Madagascar
(In percent)



Source: Ministry of Economy and Finance

[9] Source: UN World Population Projections.

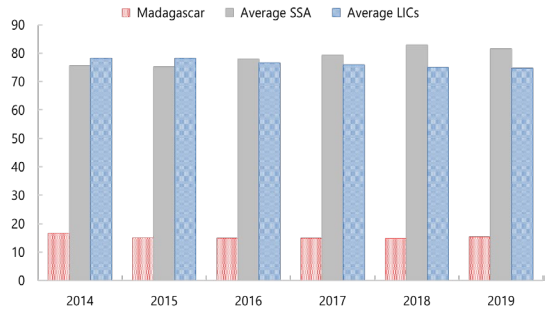
[10] These estimates are based on the 3rd edition of the IMF SDG Costing tool (2022). The tool assesses the additional spending needed to achieve a strong performance in selected SDGs, including education (SDG4). Specifically, the 8-percentage point of GDP increase in education spending is estimated to cover full access to two years of pre-primary education, five years of primary education, six years of secondary education, and two years of tertiary education.

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per student shows a gap of about US$123 (US$79.3 in 2020 versus US$ 201.9 in 2030) (Figure 8).[11] Even as a share of total government budget, the budget allocated to education is low. In addition, that budget is not always fully executed (Figure 10). As a result, the share of the executed government budget to education has barely increased since 2018 and remains below the 20 percent recommended by UNICEF (Figure 9).

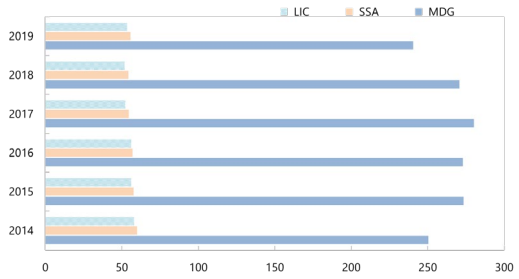
8. The number of qualified teachers is severely inadequate. A quick comparison with peer countries at the same level of development shows an alarming situation. Indeed, the proportion of teachers with the minimum required qualifications at the primary school level remains low and has stagnated over the years.[12] Over the period 2014-2019, it stood at around 15.2 percent on average, well below the average in SSA countries (79.4 percent) and in LIC countries (76.1 percent) (Figure 11). Little improvement was also observed in the ratio of students to qualified teachers (Figure 12), which stood at 240:1 in Madagascar, far above the LIC and SSA average, in 2019.

Figure 9. Proportion of Teachers with the Minimum Qualifications Teaching in Primary School
(In percent)



Source: UNESCO Institute for Statistics (UIS)

Figure 10. Ratio of Pupils to Qualified Teachers
(Headcount basis)



Source: UNESCO Institute for Statistics (UIS)

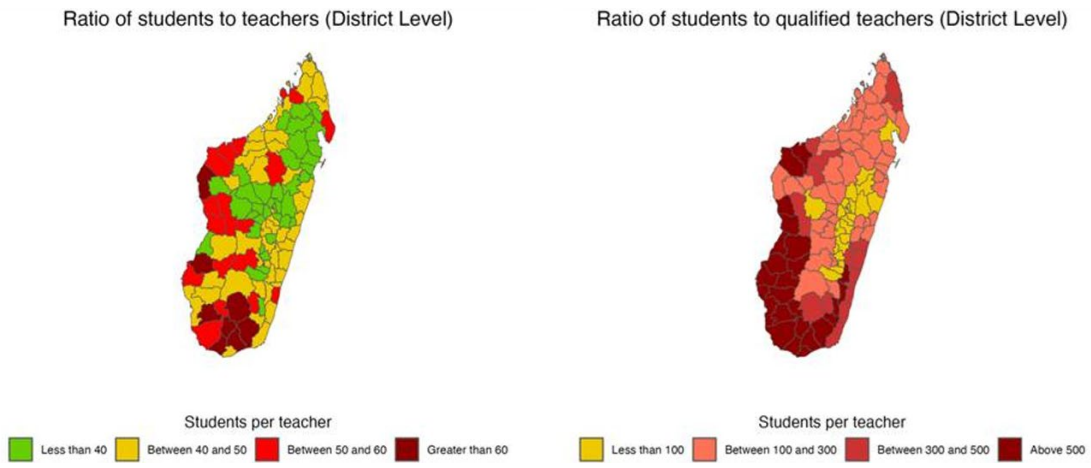
9. Large regional disparities exist in terms of both the quantity and quality of teachers. As shown in Figure 13, there is significant heterogeneity across districts in student-teacher ratios, notably with poorer districts in south-west of Madagascar having substantially higher student to teacher ratios than wealthier districts around the capital and in the north-east. The gap between districts widens when considering the ratio of students to qualified teachers. The student to qualified teacher ratio falls below 100 in only 28 districts around the capital and exceeds 500 in 24 districts in the south and western parts of the country.

[11] Here, spending per student refers to average public spending per student, including students from the last two years of pre-primary to the first two years of tertiary education.

[12] The share of teachers meeting the minimum required qualifications is estimated by UNESCO Institute for Statistics (UIS). This refers to the share of teachers who have received at least the minimum organized pedagogical teacher training required for teaching at the relevant level, out of all teachers at that given level, for a given country. To improve comparability between differing minimum training requirements across countries, the UIS developed an international classification of teacher training programs as a basis for the construction of this indicator.

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Figure 11. Student-to-Teacher (LHS) and Student-to-Qualified Teacher Ratios (RHS) at the District Level in Madagascar



Source: World Bank based on data from the *Institut National de Formation Pédagogique* (INFP) and Annuaire Statistique Nationale. Qualified teachers are defined as teachers who hold a teacher training certificate.

B. Education and Economic Growth: Potential Gains for Madagascar

10. As an input to production, a more educated workforce is expected to boost economic growth. Descriptive evidence suggests that among LICs, real GDP per capita growth is positively correlated with the share of the working-age population with at least primary school education (Figure 14). With under 20 percent of the working-age population having completed primary school, Madagascar (in red) has a working age population with one of the lowest primary school completions in the sample.

11. A large body of literature has provided evidence of the impact of both the quantity and the quality of education on economic growth. For instance, Barro (2000) argues that higher human capital, through education (especially at the secondary and higher levels), generates higher economic growth by facilitating the absorption of technology from more advanced economies. Consistently, Hanushek and Kimko (2000) show that the quality of the labor force, that is the quality of education measured by test scores is a stronger determinant of economic growth compared to the quantity of education (years of schooling).[13] More recently, Glewwe, Maiga, and Zheng (2014) presents a review of the evidence on the contribution of education to economic growth with a specific focus on implications for sub-Saharan Africa. They argue that the lack of education progress in Sub-Saharan Africa compared to East Asia, explains at least partly the difference in the average economic growth performance between these regions from 1980 to 2000 (real GDP per capita declined by 0.6 percent in the former region while it grew by 4.9 percent in the latter region over the

[13] See also Hanushek and Woessmann (2008).

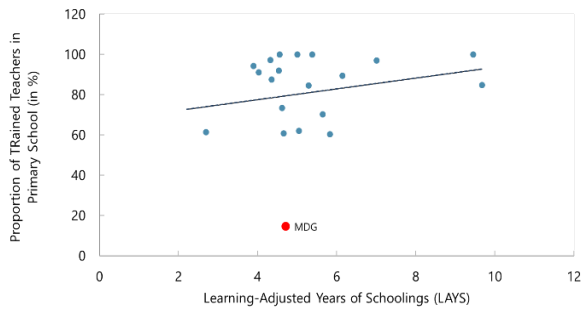
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same period).[14] Glewwe et al. (2014) find that the low education quality in Sub-Saharan African countries may have a sizeable negative effect on economic growth in these countries.

12. Training teachers could be critical to improve education quality in Madagascar. Glewwe et al. (2014) claim that the rapid increase in school enrollment since 2000 may have reduced school quality as schools became over-crowded and existing resources are under pressure (e.g. higher teacher-to-student ratio). Teacher quality is widely recognized as an important input in the production of education (see for instance Hanushek, 1986). A recent study by Bietenbeck et al. (2023) shows that teacher subject knowledge has a large positive impact on student achievements in francophone Sub-Saharan Africa, including in Madagascar. They find that 37 percent of the variation in the average student achievement across countries is due to teacher subject knowledge, suggesting an important role for training teachers. This finding is particularly concerning given that in 2023, only 3.6 percent of teachers in Madagascar mastered their subject content, according to World Bank.[15] Other studies on the positive impact of teacher quality on student performance in Africa include for instance Buhl-Wiggers et al (2017) using data from a randomized control trial in Uganda.[16] More recently, using data from over 200 impact evaluations spanning 52 countries, Angrist et al. (2024) find that interventions targeting the productivity of schooling, including training, monitoring and raising pedagogical standards among teachers are the most cost effective ways of raising a country's LAYS.

13. Education quality is positively correlated with the share of qualified teachers in SSA countries. Consistent with the fact that the quality of teachers is an important input in enhancing education quality, the data depicts a positive correlation between the proportion of qualified teachers in primary school and the learning adjusted years of schooling in sub-Saharan Africa (Figure 15). Further, as discussed previously, Figure 15 shows Madagascar as an outlier with both relatively low education quality and teacher qualification.

Figure 12. Learning-Adjusted Years of Schooling vs. Proportion of Trained Teachers in Primary School Among SSA Countries
(2018)



[14] From 1980 to 2000 the primary school gross enrollment rate in Sub-Saharan Africa declined, from 80 percent to 77 percent while the primary gross enrollment rate increased, or held steady at a high level, in East Asia at 111 percent in both years (Glewwe et al, 2014).

[15] Estimates from World Bank (2023). Education Service Delivery Indicator – Round II and Global Education Policy Dashboard -Round II 2021.

[16] Other studies include for instance Angrist and Lavy (2001) who find that training teachers provided a cost-effective means to improve test scores in Jerusalem public schools and, Metzler and Woessmann (2012) in Peru with a focus on the impact of teacher subject knowledge on student achievement.

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14. In addition, increasing primary education attainment among the working-age population could amplify the impact of the demographic dividend on economic growth. Following Kotschy et al. (2020) and IMF (2024), our estimates show that greater primary school education attainment raises economic growth mainly via its positive interaction with the share of working-age population (see Text Box 1 for more details). This complementarity between primary school attainment and the share of working-age population can be viewed in two ways. First, countries with a greater share of working-age population enjoy larger economic gains from improvements in primary education attainment. Second, countries with a higher share of primary education reap a larger demographic dividend. From Text Box 1, this complementarity between primary school attainment and the share of working age population is statistically significant only for LICs, and not for higher-income countries.

15. Despite a relatively low share of working-age population, the returns to economic growth of improving primary school attainment in Madagascar could be sizeable. Text Box 1 presents the estimates of the effect of primary school attainment on growth in real GDP per capita. The impact of educational attainment on growth is expected to mediate through two channels. First, a greater share of primary school attainment may raise economic growth directly, via its impact on worker productivity. Second, educational attainment may have an indirect impact on growth, by increasing the returns from a larger working age population. The regression table in Text Box 1 displays the estimates for all countries, non-LIC countries and LIC countries. In line with the findings from IMF (2024), primary school attainment has a significant impact on growth among LIC countries, notably by boosting the demographic dividend. From the regression estimates, the expected gains to raising primary school attainment can be calculated for Madagascar. Given that the share of working-age population as share of the total population in Madagascar is expected to increase from 53 percent in 2023 to 63 percent in 2050, the regression estimates imply that a 1 percentage point increase in primary education attainment would yield an additional 0.6 percentage point rise in real GDP per capita by 2050. Otherwise put, our estimates show that, at current levels of primary school completion among the working age population (around 20 percent), the rise in share of working-age population in the next two decades would have no significant impact on growth. However, if primary school attainment among the working age population were to meet the SSA average (around 60 percent), the projected 5 percentage points increase in working age population in Madagascar would raise annual real GDP per capita growth by 4 percentage points.

Box 1. Primary Education Attainment and Economic Growth

The empirical specification follows Kotschy (2020) and IMF (2024) as follows:

$$\Delta log(y_{it}) = \alpha_0 + \alpha_1 \Delta log(k_{it}) + \alpha_2 \Delta log(working_age_{it}) + \alpha_3 share_educ_{it} + \alpha_4 log(working_age_{it-1}) + \alpha_5 log(y_{it-1}) + \alpha_6 share_educ_{it} \times log(working_age_{it-1}) + \psi_i + \rho_t + \epsilon_{it}$$

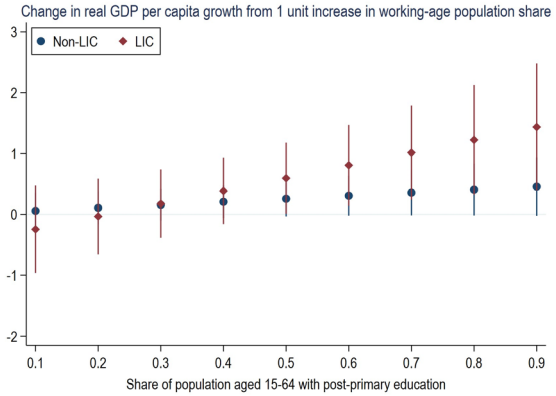
Where y_{it} refers to real GDP per capita of country i *at time* t, k_{it} to per capita capital stock, $working_age_{it}$ to the share of working age population, $share_educ_{it}$ refers to the share of the working age population with at least primary school education. ψ_i refers to country fixed effects, ρ_t to time effects and ϵ_{it} is the error term. The marginal impact of raising the share of primary education is given by $\alpha_3 + \alpha_6 \log(\text{working_age}_{it-1})$. We run the above regression using data from Kotschy et al. (2020), which spans from 1950 to 2015.
The regression results, for all countries, non-LICs and LICs separately, are presented below.

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Box 1. Primary Education Attainment and Economic Growth (concluded)

	(1) All	(2) Non-LIC	(3) LIC
Growth of capital per worker	0.54***	0.62***	0.37***
	(0.05)	(0.07)	(0.06)
Growth of share of working age population	0.22	0.27	-0.04
	(0.23)	(0.26)	(0.47)
Primary education share	0.25	0.22	0.99
	(0.15)	(0.17)	(0.62)
L. share of working age population	0.06	0.02	-0.47
	(0.16)	(0.17)	(0.42)
L. log income per capita	-0.20***	-0.21***	-0.19***
	(0.02)	(0.03)	(0.06)
Primary education share × L. share of working age population	0.56*	0.49	2.14**
	(0.29)	(0.33)	(0.87)
Country FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
R^2	0.50	0.55	0.43
N	1510	1051	459

α_6 is postive and statistically significant, particulary for the sample of LICs, implying that LICs with larger share of working-age population benefit more from being educated.



Using the regression estimates for non-LICs and LICs, the figure above plots the marginal impact on growth of the share of working-age population, at different levels of primary school attainment. While the marginal return from a larger share of working age population in non-LICs is not statistically different from 0, regardless of the level of primary school attainment, one can observe that, for LICs, the marginal gain from a higher share of working age population increases with the level of primary school attainment.

Source: IMF Staff Estimates, Kotschy et al (2020), IMF (2024).

16. Consistent with the literature, we find that the quality of education has a positive impact on economic growth in LICs and in SSA. Independent of the demographic dividend, we find that improvements in the quality of education, measured via LAYS and HCI, have a positive and statistically significant effect on real GDP per capita growth, particularly in lower income countries. From the estimates in Text Box 2, a 1-year increase in LAYS, for instance, raises economic growth by 7 percentage points among LICs and countries in SSA. Likewise, among LICs, a 0.1 unit increase in HCI raises economic growth by about 0.2 percentage point. At 4.7 years in 2018, Madagascar's LAYS lies below that average among countries in SSA (5.1 years) and LICs (5.5 years). Raising the country's

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LAYS to the SSA average would imply a 2.8 percentage points increase in real GDP per capita growth relative to the baseline.

Box 2. Quality-Adjusted Education Attainment and Economic Growth

To estimate the impact of quality-adjusted educational attainment on economic growth, the empirical specification below is used.

$$\Delta log(y_{it}) = \alpha_0 + \alpha_1 quality_educ_{it-1} + \alpha_2 log(y_{it-1}) + \psi_i + \rho_t + \epsilon_{it}$$

Where y_{it} refers to real GDP per capita of country i *at time* t, $quality_educ_{it-1}$ refers to the quality-adjusted education in country i at time t. ψ_i refers to country fixed effects, ρ_t to time effects and ϵ_{it} is the error term.[1] We focus on a sample of LICs and countries in SSA including Madagascar.Two measures of quality-adjusted education are used LAYS and HCI. The estimation results are presented below.

	LAYS		HCI	
	LIC	SSA	LIC	SSA
L. log income per capita	-0.23***	-0.23***	-0.21***	-0.20**
	(0.06)	(0.06)	(0.07)	(0.09)
L.LAYS	0.07***	0.07***		
	(0.03)	(0.03)		
L.HCI			1.51**	0.87*
			(0.73)	(0.49)
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
R^2	0.23	0.23	0.17	0.12
N	105	105	105	97

1/ The regression is based on data from UNESCO. We kept a parsimonious specification, to inform on the correlation between

17. We show that raising the share of qualified teachers would significantly increase quality-adjusted educational attainment and thus real GDP per capita growth in Madagascar. We estimate that a 10-percentage point increase in the share of qualified teachers in primary school level would significantly raise LAYS by about 0.3 years (Text Box 3) among both LICs and countries in SSA. Combining the estimates from Text Boxes 2 and 3, a simple back-of-the-envelope calculation ($\frac{\partial GDP}{\partial Teacher} = \frac{\partial GDP}{\partial educ} \times \frac{\partial educ}{\partial Teacher}$), suggests that doubling the share of trained teachers in primary school (from current level at 15.2 percent to reach about half of the levels seen in SSA and LICs) would raise the LAYS by about 0.4 year and thus boost growth by between 2.5 to 3.1 percentage points in Madagascar.

Box 3. Teacher Training, Quality-Adjusted Educational Attainment, and Economic Growth

The following regression specification is adopted to measure the impact of primary school teacher training on quality-adjusted educational attainment.

$$quality_educ_{it} = \beta_0 + \beta_1 quality_educ_{it-1} + \beta_2 share_qualified_{it-1} + \psi_i + \rho_t + \epsilon_{it}$$

Where $quality_educ_{it}$ refers to quality-adjusted educational attainment at time t and $share_qualified_{it-1}$ refers to the share of primary school teachers who have a minimum level of qualifications at year $t-1$. ψ_i refers to country fixed effects, ρ_t to time effects and ϵ_{it} is the error term.[1] We focus on a sample of LICs and

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Box 3. Teacher Training, Quality-Adjusted Educational Attainment, and Economic Growth
(concluded)

countries in SSA including Madagascar. Two measures of quality-adjusted education are used - LAYS and HCI. The estimation results are presented below.

	LAYS		HCI	
	LIC	SSA	LIC	SSA
L.LAYS	0.037	-0.019		
	(0.082)	(0.078)		
L.HCI			0.096	0.058
			(0.083)	(0.045)
L.Share of qualified primary school teachers	0.028***	0.026***	0.001***	0.001***
	(0.004)	(0.005)	(0.000)	(0.000)
R^2	0.47	0.40	0.59	0.50
N	32	28	32	28

Interpreting the estimates from column 1 in the table above, a 10-percentage point increase in the share of qualified primary school teachers would raise LAYS by about 0.3 years. Together with the finding in Text Box 2 that a 1-year increase in LAYS would raise growth by 7 percentage points, the estimation results suggest that increasing the share of qualified teachers by 10-percentage points would boost per capita real growth by 2.1 percentage points.

1/ The regression is based on data from UNESCO. We kept a parsimonious specification, to inform on the correlation between the quality of education and growth, given the limited number of observations owing to the availability of data on LAYS and HCI.
Source: Staff estimates using data from UNESCO and the World Bank.

C. Improving Teaching Quality in Madagascar

18. Multiple bottlenecks constrain the quality of teaching in Madagascar. These include the insufficient number of qualified teachers (as discussed earlier) given lack of resources dedicated to training, a non-transparent and non-competitive recruitment process of teachers, and poor support and supervision of teachers. 41 percent of civil servant teachers and 64 percent of FRAM[17] teachers surveyed in a World Bank study reported that they did not participate in a competitive recruitment process. Moreover, both entry-level and continuous training fail to remedy the low level of academic and pedagogical competence among teachers. The quality of initial training is weakened by insufficient and ill-adapted training structures while continuous training and qualification opportunities are irregular due to lack of resources and has little impact on improving teachers'

[17] Fikambanan'ny ray amandrenin'ny mpianatra (parents association). FRAM teachers are therefore teachers hired by the parents association.

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pedagogical practices. [18] Moreover, just over half of teachers are adequately supervised, according to the PASEC2019 survey, and teacher job satisfaction is low, particularly among FRAM teachers.[19]

19. Teacher training in Madagascar is inadequate, partly due to the increasing reliance on largely unqualified FRAM teachers. This category of teachers emerged in 1975, with the wave of public primary school construction and a subsequent shortage of teachers. FRAM teachers are hired and remunerated by local parent associations, with only some being subsidized by government. From 2004 to 2024, their numbers rose from 13,000 to 90,180, and they now represent more than 50 percent of teachers in the public education.[20] Figure 16 shows the breakdown of teachers by status and teaching level. At the primary school level for instance, FRAM teachers (subsidized and unsubsidized) make up 51 percent of teachers, while contractual and civil servant teachers hired and paid by the state form only 41 percent of the teaching force.[21] According to the INFP database, over 85 percent of FRAM teachers are not qualified i.e., lack a pedagogical diploma (Figure 17). More generally, recent data shows that the skill level of Malagasy teachers is extremely low. Indeed, according to the PASEC2019 survey, only 11 percent of Malagasy teachers reach the highest level of the skills scale in reading comprehension and 24 percent do so in mathematics. Further, according to the results of the 2021 SDI survey, the proportion of teachers with minimum knowledge and skills is only 3 percent in French and 8 percent in mathematics[22]. The inadequate level of teacher competence is a significant constraint of education quality.

[18] Findings are drawn from the report APPRENDRE (2022). APPRENDRE is a joint program from the French Development Agency (AFD) and Francophony University Agency (AUF) which stands for: Support for the professionalization of teaching practices and resources development (Appui à la professionalisation des pratiques enseignantes et au développement des ressources).

[19] From the PASEC2019, 55 percent of teachers are not satisfied with their salary level, 37 percent of them complain about the irregularity of their pay and 24 percent find that professional training opportunities are lacking. A representative survey conducted by UNICEF in 2023 showed that compared to their civil servant counterparts, contractual and subsidized FRAM teachers are 14 percentage points less likely to be satisfied and unsubsidized FRAM teachers 24 percentage points less likely to be satisfied with their job.

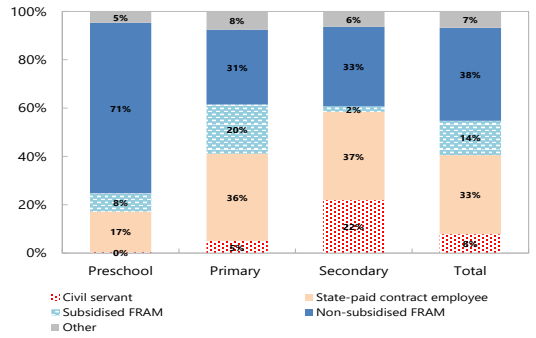
[20] These numbers are obtained from the 2024 INFP data. In 2003, a category of "subsidized FRAM teachers" was created, partly paid by the state for 9 months in a year, for a wage 60 percent lower on average compared to their civil servant counterparts. FRAM teachers that are unsubsidized are compensated according to the financial capacity of the families and the parents' association. Many suffer up to 8 months of late salary payments.

[21] Private sector teachers make up the remaining 8 percent of the primary school teaching force.

[22] The Service Delivery Indicators (SDI) are indicators developed by the World Bank to measure the quality of social sector services (health and education). SDI data help to identify gaps, track change over time, benchmark progress, stimulate evidence-based debate, and ultimately, influence policies design and interventions to accelerate progress in human capital areas.

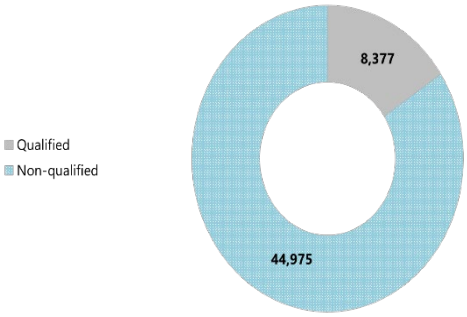
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Figure 13. Breakdown of Teachers by Level and Status in Madagascar
(2023)



Source: Ministère de l'Education Nationale (MEN)

Figure 14. Share of FRAM Teachers with Qualifications
(2023)



Source: Institut National de Formation Pédagogique (INFP)

20. Education spending, including on teachers, remains low, poorly executed, and subject to leakages (Text Box 4). According to the 2021 PETS survey, the budget execution rate on resources allocated to the decentralized technical, coaching and supervision support to teachers in schools stood at a mere 47 percent (2019) [23]. The lack of resources, coupled with a difficulty in executing the allocated resources, hinder the implementation and monitoring of teacher work plans as well as the support and control of school facilities.

21. Infrastructure and basic classroom inputs remain a major challenge for quality learning in Madagascar. According to a 2021 World Bank Service Delivery Indicators (SDI) report on education, an average school has access to only 34 percent of the infrastructure essential for learning. Only 0.4 percent of schools have access to electricity, 2 percent have internet and 8 percent have access to functional and clean toilets. Only 50 percent of schools have potable water sources, which greatly impacts the health and well-being of students. Furthermore, the availability of crucial learning tools in classrooms is insufficient. While 83 percent of schools have blackboards, only 4 percent have enough textbooks, only 23 percent have access to educational technologies, 16 percent to stationery and 23 percent to furniture.[24]

[23] The Public Expenditure Tracking Survey (PETS) survey allows to track the financial flows going to both the health and education sectors. It helps government to assess if the funds allocated to a specific sector reach their intended recipients or if there are leakages along the way.

[24] There is considerable variation from region to region in terms of infrastructure availability.

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Box 4. Education Spending in Madagascar – A Strained and Leaky Pipeline

Weak financial governance, characterized by numerous inefficiencies and leaks, further compromises the already stretched financial resources of the public education sector. The Public Expenditure Monitoring Survey of National Education (UNICEF 2021) identified issues in terms of financial governance in three areas of expenditure flows in the public education sector: (i) compensation for civil servant teachers and community teachers; (ii) school funds; and (iii) school kits. The survey employed a rigorous methodology of monitoring flows, supported by maps of the financial information system of National Education and its decentralized structures including regional directorates, colleges, and schools.

The survey found that resource leakages between the central government, schools and colleges were significant. Regarding compensation for civil servant teachers, the loss rates were estimated at about 11.8 percent (2018) and 8. 8 percent (2019), while they were respectively assessed at 28.5 percent (2018) and 23.7 percent (2019) for community teachers. The same is true for school funds with loss rates respectively valued at 19.1 percent (2018) and 18.4 percent (2019). In addition to flow losses, teacher absenteeism represents an additional indirect loss. The survey estimated that 46.4 percent of civil servant teachers in 2018 and only 13.4 percent in 2019 have provided teaching services in line with their paid teaching hours. Among community teachers, the proportion was respectively estimated at 47.8 percent (2018) and 54.3 percent in 2019.

Source: UNICEF.

22. Raising the number of qualified teachers would require increased spending on education. According to UNICEF calculations (Text Box 5), the number of primary school students tripled between 1998 and 2023 and is projected to increase at an annual rate of 3 percent thereafter. At this rate, the number of pupils at primary level is expected to increase from about 4.2 million in 2023 to about 5.4 million in 2031. To reach the standard of 40 students per qualified teacher, UNICEF staff estimate that a total of about MGA 181.7 billion (US$ 40.4 million) is needed per year until 2031. This estimate includes the total cost of primary school teacher training at MGA 15.7 million (US$ 3.5 million) per year and cumulative additional salaries at about MGA 71.8 billion (about US$ 16 million). Text box 5 further details the methodology used to project teacher training costs, including the assumptions. While estimates may vary depending on assumptions, the above can be interpreted as a lower bound of actual cost.[25]

Box 5. Projecting the Cost of Teacher Training in Madagascar

The following assumptions were adopted to project the cost of teacher training in Madagascar. The estimates include the continuous as well as initial entry-level training of teachers and the assumptions include:

- Primary school enrollment increasing at an annual rate of 3.02 percent, in line with demographic projections.
- A target of student to qualified teacher ratio of 40:1, implying that 14,500 teachers require continuous training annually and 2000 require initial training at the INFP annually.

[25] World Bank estimates for instance that the initial cost of qualifying a teacher with a high-school certificate would be at least 900 US dollars and even higher for a teacher without a high-school certificate. This estimate of initial training cost is far above the UNICEF estimate of 133 US dollars used in Text Box 5.

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Box 5. Projecting the Cost of Teacher Training in Madagascar (concluded)

- The number of civil servants and contract teachers currently in post remains constant, i.e. if there are civil servant/contractual teachers who retire or otherwise, they will be numerically replaced in the state budget.
- The INFP continues the production of 2,000 teachers every two years (in line with current practice), who are then absorbed into the public sector over the next 12 months after graduation.
- All qualified teachers from continuing education will be recruited as contractual teachers.
- The unit cost of initial training is estimated at MGA 600,000 (US $ 133) per teacher-student without teacher salary.
- The unit cost of continuous training is estimated at MGA1,000,000 (US$222) per teacher.
- Given the unit training cost and the number of teachers to be trained annually, the total annual cost of training is estimated at around US$3.5 million. Further, using the average gross monthly salary of civil servant and contract teachers, estimated at MGA 932,000 (US$ 207) and MGA 651,000 (US$ 145) respectively and the additional number of qualified teachers needed to attain the 40:1 student to qualified teacher ratio, the annual additional salary cost of the reform can be calculated, as shown in the table below.
- Summing the training and salary costs, an estimate of the total additional annual cost of the reform can be obtained.

(In US$)

	2025	2026	2027	2028	2029	2030
Total cost of training	3,488,889	3,488,889	3,488,889	3,488,889	3,488,889	3,488,889
Total additional salary cost	2,551,889	4,609,556	6,996,556	9,094,222	11,481,222	13,578,889
Total additional cost of reform	6,040,778	8,098,445	10,485,445	12,583,111	14,970,111	17,067,778

- Given that the above simulation only takes into account the additional training and salary costs of the reform, the estimates can be interpreted as a lower bound of the total cost of attaining the 40:1 student to qualified teacher ratio.

Source: UNICEF staff estimates

D. Conclusion and Policy Recommendations

23. Educational outcomes are declining in Madagascar. Most indicators of the education efficiency indicate that the country is undergoing a learning crisis with students lacking the minimum skills needed at the required age, especially in reading and mathematics. The low quality of education, and thus the decline in skill acquisition, reflect the lack of qualified teachers.

24. Consequently, the country is losing out on its growth potential from a more qualified labor force. Empirical evidence has shown that both the quantity and quality of education have sizeable positive effects on growth and may explain the difference in growth performance across countries. In the case of Madagascar, our empirical investigations suggest that, based on the projected growth in working age population, improving primary education could add 0.6 percentage point to economic growth by 2050.

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25. Increasing the number of qualified teachers will be critical to improve the quality of education and maximize Madagascar's growth potential. We find that increasing the number of qualified teachers to the average level among its peers, could raise per capita real GDP growth by around 2.5 to 3.1 percentage points in Madagascar.

26. In the longer term, boosting the attractiveness of the teaching profession is key to raising the number of qualified teachers in Madagascar. As emphasized in a 2023 World Bank report, "Making Teacher Policy Work", the professional development of teachers extends beyond teacher training and includes the alignment of career incentives with professional development goals and follow-up support even after teachers are initially qualified. This could be achieved with effective human resource policies including increasing the competitiveness of teacher compensation, improving career progression structures, and alleviating job precarity and improving medical benefits. Such measures could raise the recruitment, retention, and job satisfaction among teachers.[26] In addition, promoting the meritocratic selection and effective deployment of teachers would lift teaching standards.

27. Apart from measures targeting teacher quality, a broader program on education reform is needed. Indeed, teacher's qualification is only one input of the education system. However, other elements such as adequate infrastructure, availability of teaching materials, or a school feeding program (in the case of Madagascar) are also important and all contribute to a good learning environment. For the country to reap the economic gains from its youthful population, addressing the various bottlenecks to quality education in Madagascar is key.

[26] In its report released in 2023, the UNICEF finds that job satisfaction partly determines teachers' behaviors, the efforts invested in teaching, commitment within the school and the probability of continuing to teach. These elements influence the learning process of students either directly, for example with activities adapted for each student, which require sustained investment from the teacher, or indirectly by facilitating the functioning of the school.

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