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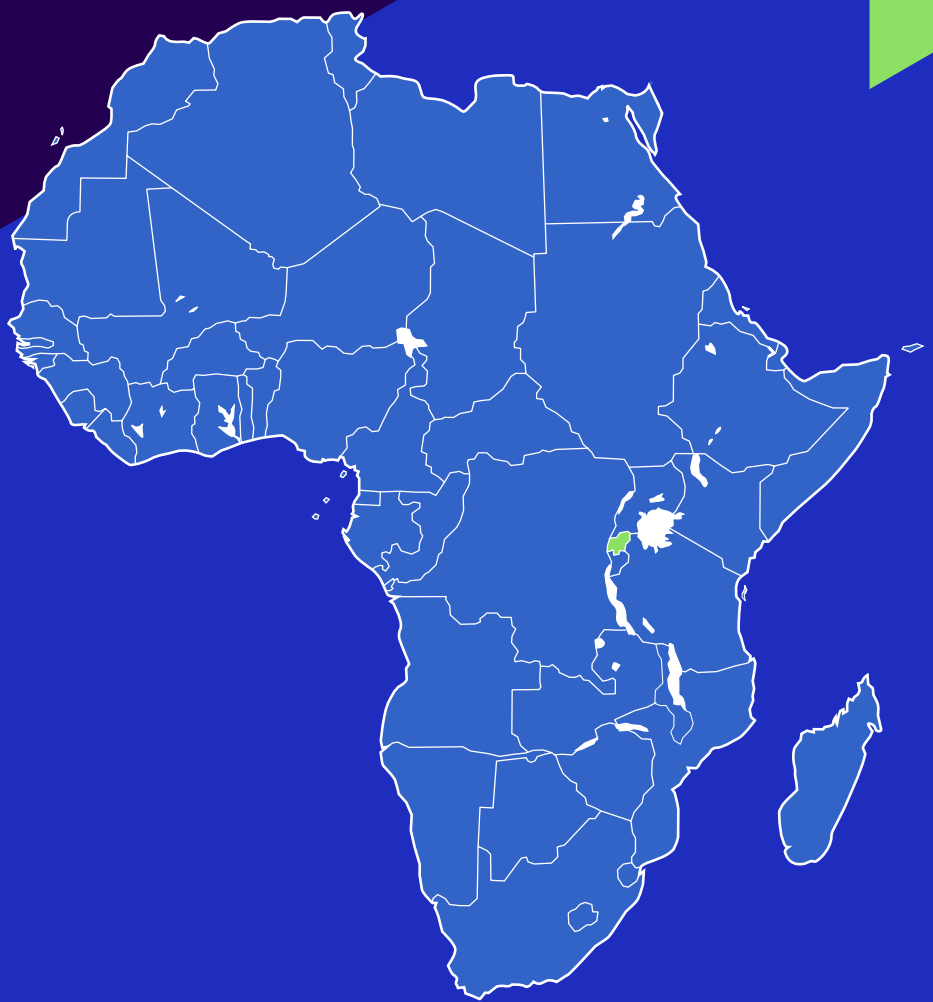
Background report

Digitalization in teaching and education in Rwanda

Digitalization, the future of work and the teaching profession project

Jean Pierre Mugiraneza



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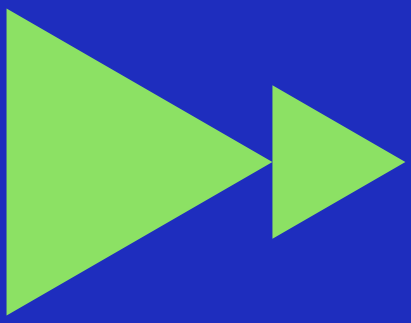
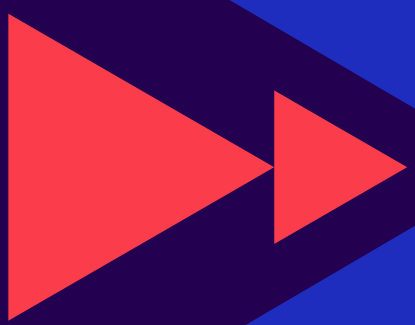
Abbreviations

CPD	continuous professional development
DFID	Department for International Development
EMIS	Education Management Information System
ESSP	Education Sector Strategic Plan
ICT	information and communication technology
KOICA	Korea International Cooperation Agency
REB	Rwanda Education Board
SNER	Rwanda National Union of Teachers (Syndicat National des Enseignants au Rwanda)
STEM	science, technology, engineering and mathematics
TMIS	Teacher Management Information System
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development





1. Key findings

Rwanda has endorsed many policies and strategies to strengthen the teaching profession, with the overall aim of improving learning outcomes in primary and secondary education. However, gaps can be identified in the implementation of those strategies. Despite the framework that is in place to strengthen pre- and in-service teacher development, thousands of teachers in primary and secondary schools teach without the required training and qualifications, with negative consequences for learning outcomes. The professional competence of teachers is critical for effectively implementing any reform agenda, including enhancement of teaching and learning using information and communication technology (ICT). Many teachers face challenges in ensuring English as the language of instruction and in integrating ICT in their work. Rwanda's annual budget reports have shown financial gaps in funding key education activities. Teachers' salaries and other fringe benefits are not sufficient to improve their socio-economic welfare.

Rwanda has established a Teacher Management Information System (TMIS) to improve teacher management, properly validate and control teacher information and promote capacity development. However, the system faces some challenges. Though the TMIS is intended for access by all education stakeholders, the reality is rather different. Many teachers are not able to access the TMIS because of limited internet connectivity, lack of access to ICT devices and gaps in ICT skills.

Improving teachers' digital skills is part of Rwanda's ambitious plan to become a knowledge-based, middle-income economy. However, reports show that there is a significant shortage of teachers trained to use ICT in the teaching and learning process. A number of teachers are not aware of the opportunities available for their professional development using existing digital materials and technology. In Rwandan schools, including technical and vocational education and training colleges, teachers do not have appropriate digital content for use in the classroom. Rwanda needs to increase investment in planning and delivery of continuous professional development (CPD) activities and increase availability of technology and digital content for teaching and learning. CPD will help scale up good practices in digital skills and support the professional development of teachers.

2. Introduction

Rwanda's education system aims to promote equitable and quality learning, including through the use of technology for teaching and learning. Enhancing teachers' competency in the use of digital devices for pedagogical purposes is a key goal. This study sets out to describe the Government of Rwanda's initiatives to integrate technology in education, the challenges that are hindering progress and the good practices currently in place.

Analysis of different policies, strategies and frameworks shows that the Rwandan education system has undertaken reforms that require teachers to adopt improved practices. However, there are still concerns about the quality of teaching, which are exacerbated by significant gaps in appropriate facilities, inadequate ICT infrastructure and lack of appropriate training and professional development opportunities. Rwanda recognizes that the move towards a knowledge-based economy will require the development of scientific and technological skills across all levels of education. It will also require, as stipulated by the Education Sector Strategic Plan (ESSP) 2018/19–2023/24, that teachers be provided with a conducive working environment that helps them to embrace and impart twenty-first century skills.

3. Methodology

The study conducted a country-level document review to understand challenges and good practices in relation to digitalization in education. The review sought to gather evidence on promising response initiatives used to address issues related to the integration of ICT in education. The document analysis was supported by interviews with parents and caregivers, focus group discussions with teachers and school administrators and interviews with teachers' union representatives and Rwanda Education Board (REB) officials.

For the in-country review, the following types of documents were examined: (a) reports from quantitative surveys or other research studies; (b) evaluation reports examining the impact of digitalization initiatives in education in Rwanda; (c) documents that contain information about relevant national laws or policies; and (d) documents that contain information about legislation, laws, strategies, policies and procedures being implemented in schools to respond to the work of teachers.

4. Brief overview of the education sector

4.1 Teacher data

In the last decade and a half, the Rwandan education system has undergone a number of different reforms, including the adoption in 2008 of a fee-free schooling policy for the first nine years of basic education, which was later extended to the 12 years of basic education. In this regard, all children have free basic education at primary and secondary school levels.[1] Implementation of the policy required an increase in the number of primary and secondary teachers. Table 1 shows the number of teachers in primary and secondary education, according to Rwandan education statistics.

Table 1. Number of basic education teachers by school category

School category	Public		Government-aided		Private		Total
	Male	Female	Male	Female	Male	Female	
Primary	5 589	6 441	10 869	15 169	2 532	1 473	42 073
Secondary	5 158	2 108	8 530	3 635	2 881	724	23 036
Total	10 747	8 549	19 399	18 804	5 413	2 197	65 109

Source: Rwanda Statistical YearBook, 2019.

Table 1 shows that government-aided schools employ more teachers than public or private schools. Government-aided schools are mostly owned by religious-based organizations, which are widespread across the country. The Government of Rwanda provides these schools with teacher salaries at the same rate as for public schools. Primary schools employ more teachers than secondary schools. Classrooms in primary schools are particularly overcrowded, resulting in high pupil-teacher ratios. In 2018, the pupil-teacher ratio in primary education was 56:1 and in secondary education was 22:1. The pupil-qualified teacher ratio was 57:1 and 28:1, respectively (NISR 2019). There is a need for additional recruitment of teachers in primary schools. Many teachers in primary and secondary schools teach without the required training and qualifications, with negative impacts on learning outcomes.

In order to improve education quality, the Government of Rwanda set target pupil–qualified teacher ratios of 48:1 and 29:1 at primary and secondary schools, respectively. Primary school classrooms, however, continue to be overcrowded due to infrastructure shortages and high rates of repetition in early grades. The government estimates that an additional 28,000 classrooms are needed (World Bank 2018).

4.2 Teacher training and professional development

Quality teacher pre-service and in-service training are key to improving the quality of education in Rwanda. Prospective teachers are trained on pedagogical content, which they will use during their professional careers. The ESSP 2018/19–2023/24 establishes the introduction of a competency-based curriculum for the 12 years of basic education, which involves developing lifelong learners prepared for today's digital and knowledge-based economy (Government of Rwanda 2018a).

To improve pre-service training, the ESSP defines newly qualified teachers for nursery schools (three grades) and primary schools as those who have completed their studies in teacher training colleges and are qualified

1 Rwanda operates on a 6-3-3-4 system: primary school (6 years); junior secondary school (3 years); senior secondary school (3 years); and university bachelor's degree (4 years).

to teach different subjects, including ICT and science. Newly qualified teachers for secondary education are those who have been trained by the University of Rwanda's College of Education. Pre-service training for primary and nursery teachers lasts for three years after junior secondary school. Pre-service training for secondary teachers is set for four years of tertiary education.

To improve in-service teacher development, the Government of Rwanda uses several strategies, including school-based mentoring, structured CPD and on-the-job training. The Rwandan Teacher Statute (renewed in 2020) recommends that CPD of teachers should focus on the following areas: pedagogical and instructional practices; learning measurement and assessment; strategies for promoting inclusive education; guidance and counselling techniques; integration of ICT in the teaching and learning process; self-awareness and value formation; and strategies for mentoring and coaching (Government of Rwanda 2020a).

The professional competence of teachers is critical for effectively implementing any reform agenda into practice. Since 2000, the number of teachers in Rwanda has grown by 1.5 times in primary and 4.6 times in secondary education, the latter among the fastest rates in sub-Saharan Africa. The expansion has helped to staff schools with additional teachers to accommodate increasing student enrolments. However, its rapid pace has adversely affected the quality of the workforce. Until 2012, no more than a third of the primary school teacher workforce had diploma-level qualification. Training on the new competency-based curriculum needs additional resources. As an example, during establishment of the baseline for pedagogical practices for the 2017 Building Learning Foundations programme, when 751 lower primary lessons were observed, it was found that only 28 per cent of teachers met the benchmark set for competence (REB 2018).

In addition, many teachers face difficulties ensuring English as the language of instruction from grade 4 onwards. Using English as the language of instruction has presented significant challenges for both students and teachers, negatively impacting literacy and learning outcomes. Most children have not yet mastered reading in Kinyarwanda by grade 4, and a large proportion of teachers are not sufficiently well equipped with English proficiency to teach at the grade 4 level, or with the appropriate pedagogical skills to effectively teach English under the competency-based curriculum. The switch at primary grade 4 to English as a medium of instruction is a critical impediment to pupils' learning, which will be further aggravated with the recent decision to now teach English from primary grade 1 (World Bank 2019).

4.3 Financing

The Rwandan Ministry of Finance and Economic Planning put in place a budget framework for the 2017/18 and 2019/20 fiscal years. The framework provides high-level details about the Rwandan annual budget, including the proposed financing of education sector activities. Specifically, it was projected that, in fiscal year 2019/20, the Government of Rwanda would spend over 94 billion Rwandan francs (14 per cent of the total budget) on education-related activities, including teacher training, construction of classrooms, purchasing computers (and laptops for students), provision of smart classrooms equipped with adequate ICT infrastructure, construction of science laboratories and assessment and research on such matters as student dropout and repetition in primary schools (Government of Rwanda 2017a).

Though the funding of education features in Rwanda's annual budget, reports have shown financial gaps in funding key education activities. The costing of the ESSP reported a financing gap of between 13 and 24 per cent for funding needed to implement all ESSP activities related to improving learning outcomes in schools (Government of Rwanda 2018a). To bridge the gap, the Government of Rwanda accesses loans from different institutions and development partners. For example, through the US$200 million project funded by the World Bank – the Quality Basic Education for Human Capital Development project. The project includes, among other interventions, activities to promote the use of ICT in the teaching and learning process. For example, the loan will support school construction and provision of ICT facilities and teaching and learning materials in teacher training colleges (World Bank 2019).

The Government of Rwanda works with different development partners toward improving the quality of education, including teacher training and development. One of those partners includes the Mastercard Foundation, which funds a number of initiatives in education. In partnership with the African Institute for Mathematical Sciences, the Mastercard Foundation equips selected secondary schools with tools for

mathematics and science and smart classrooms. With the Inspire, Educate, and Empower Rwanda programme, the Mastercard Foundation provides a mentorship programme for science and mathematics students in some schools. With the Research for Equitable Access and Learning Centre at the University of Cambridge, the Mastercard Foundation conducts research on teachers' performance and students' learning. With the University of Rwanda College of Education, the Mastercard Foundation provides a quality practicum for pre-service teachers. The Building Learning Foundations programme, funded by the United Kingdom Department for International Development (DFID),[2] supports the improvement of teaching and learning of mathematics in primary schools and trains head teachers in instructional leadership of mathematics and English in all public and government-aided schools in Rwanda. Other partners include VVOB–Education for Development and the United States Agency for International Development (USAID), which have funded projects supporting teacher development.

4.4 Terms and conditions of employment

The terms and conditions of Rwandan teacher employment are defined by the Rwandan Teacher Statute, which governs teachers at nursery, primary and secondary levels of education. Teacher recruitment involves a joint effort by three administrative organs: the Ministry of Education, the Ministry of Local Government and districts. The decentralized level (districts) informs the centralized level (Ministry of Education) about the number of vacant posts, including qualifications needed, and the ministry will recruit the required number of teachers. A candidate to the post of teacher must achieve a cumulative grade of 70 per cent in a written examination to be considered for the post (Government of Rwanda 2020b). However, head teachers are appointed by a committee at district level (Government of Rwanda 2020c). Teacher management, including teacher performance appraisal, is the responsibility of districts (Government of Rwanda 2020a).

Teachers' salaries and fringe benefits are determined in accordance with the job classification in Rwanda (Government of Rwanda 2016). In 2017, the Ministry of Education introduced an updated salary structure for teachers, according to their grades (Government of Rwanda 2017b). According to the updated structure, a primary teacher (A2, holder of a primary school teacher certificate) earned 41,573 Rwandan francs per month (US$44), and a secondary teacher (A0, holder of a university certificate) earned 125,000 Rwandan francs (US$131) (Ngabonziza 2019; Government of Rwanda 2017b).

In 2019, the Government of Rwanda increased the salaries of teachers by 10 per cent. Currently, a newly recruited certificate-holding teacher (A2, primary school teacher) earns 44,000 Rwandan francs per month (about US$50), a diploma holder (A1) earns 90,000 Rwandan francs (about US$100), while a graduate (A0) earns 120,000 Rwandan francs (about US$135). Though this increase was significant in the context of the national budget, the amount added remained insufficient to alleviate the hardships of many teachers (Magnus 2019). However, while the increase in salary was relatively small, it was a motivation for teachers and provided them with hope that the government would continue to increment their salaries as more resources become available (Ngabonziza 2019).

4.5 Existing policy frameworks

The latter half of the 2010s was marked by education reforms and the introduction of new frameworks. Following the approval of the ESSP 2018/19–2023/24, further documents were endorsed, including the Teacher Development and Management Policy (under development), Special Needs Education and Inclusive Education Policy (2018) and Teacher Statute Policy (2020). Development continues on an education policy[3] that will be considered as the overarching document for all policies, frameworks and laws governing the principles and practices that apply to Rwanda's education system.

2 The Department for International Development (DFID) closed on 2 September 2020 and merged with the Foreign and Commonwealth Office (FCO) to create the Foreign, Commonwealth and Development Office.

3 The existing Education Sector Policy was passed in 2003.

Other recently endorsed policies and frameworks in education include: (a) the ministerial instructions regulating the promotion, repetition, dismissal and transfer of students (Government of Rwanda 2020d); (b) the ministerial instructions determining modalities for temporary teacher replacement and the management of substitute teachers (Government of Rwanda 2019); (c) the presidential order determining the Teacher Statute (Government of Rwanda 2020a); (d) the law determining the organization of education in Rwanda (Government of Rwanda 2018b); (e) the ministerial instructions regarding determination of the pass mark for teacher recruitment (Government of Rwanda 2020b); (f) the ministerial instructions establishing a committee at district level for the appointment of head teachers (Government of Rwanda 2020c); and (g) the ministerial instructions determining appeal strategies for teacher recruitment (Government of Rwanda 2020e).

5. Technology and teacher management

The REB established TMIS, with financial support from the United Nations Children's Fund (UNICEF), to improve teacher management and introduce new terms and conditions of employment, codes of conduct and a system for licensing teachers. The TMIS was instituted by a presidential order establishing special statutes governing teachers in nursery, primary and secondary education (Government of Rwanda 2016). It serves as a database of pre-primary, primary and secondary teachers that is easily accessed, managed and updated. The TMIS is user friendly, as teachers can log in using their national identity card, while non-nationals can use their passport for access. The system provides information on teachers' personal data, education, professional details, qualifications, special training attended and other relevant matters (REB 2019a).

At the centralized level, the TMIS is accessed by REB staff, who use the information for planning purposes. At the decentralized level, the TMIS is intended for access by directors of primary and secondary education in all districts, the teams responsible for incentives and training, teachers (in pre-primary, primary and secondary schools, both public and private), and stakeholders in the education sector with an interest in teacher development (REB 2019a).

The TMIS enables education authorities to properly manage teachers' data, while providing information that can be analysed and interpreted to inform decision-making for improvement in the education sector. For example, the education authorities at the decentralized level can make requests, through the system, related to such matters as the required number of new teachers, teacher incentives and teacher training. Those requests can be reviewed at the central, REB level for possible approval. The TMIS, and the Education Management Information System (EMIS) in general, help in timely and effective planning for proper teacher management in such areas as teacher placement, thus improving the efficiency of delivery of education services. The TMIS allows tracking of teachers' needs for their professional development, while the EMIS tracks information on teachers' qualifications, supporting the delivery of lifelong learning and facilitating monitoring and evaluation.

The Rwanda TMIS, however, is not fully operative, as such the education system is not able to provide accurate, current statistics on teachers. For example, most reports refer to the secondary data provided by the Statistical YearBook, which is published in the year following data gathering. When fully operational, the TMIS will be able to provide more updated data and information, thereby improving the quality of planning in the education sector.

Limited internet connectivity, insufficient access to ICT devices and lack of ICT skills are major challenges facing the use of TMIS in all Rwandan schools. The TMIS requires that end users have an internet connection to be able to access the related interface. However, the internet penetration in Rwandan schools is still below 100 per cent, and many teachers still face challenges registering in the system. The Government of Rwanda is aiming to establish smart classrooms equipped with internet connection in every school, which will enable teachers and other staff to access the TMIS (Atieno 2017). The Rwandan Ministry of Education is establishing an online School Data Management System (SDMS) that will be able to collect monthly data on school leaders and teachers and on student performance.

6. Digital skills training and development for teachers

The Rwandan education system is being shaped to assist the country to become a middle-income, knowledge-based economy. It is recognized that the move towards a knowledge-based economy will require the development of scientific and technological skills across all levels of education. It will also require, as stipulated by the ESSP 2018/19–2023/24, that primary and secondary education teachers provide students with foundational skills in literacy and numeracy, as well as transferable skills such as problem solving and competence in ICT. Different frameworks and reports have identified challenges related to the training and development of teachers. Though ICT is considered as a core priority for improving the relevance of education, there is a significant shortage of teachers trained to use ICT in the teaching and learning process (Government of Rwanda 2018a).

Despite Rwanda's demonstrated capacity in developing policy on digital skills, there are potential gaps in implementation. The last assessment of the Work Bank's Digital Economy for Africa initiative found that while Rwanda had a very strong policy on developing digital skills, the absence of operational plans for developing those skills was a potential gap. Remedying the situation calls for a comprehensive digital skills country action plan, including costing of activities. The Ministry of Education and other partners should identify, and remedy, potential barriers to putting in place digital skills training and development for teachers. Generally, digital skills planning should address such issues as adapting digital tools to local languages and devising courses that can help improve and update the skills of teachers (Choi, Dutz, and Usman 2020).

A number of teachers are not aware of the opportunities available for their professional development using existing digital technology. Interviews with teachers showed that the lack of role models in the use of technology for individual professional development has hindered its uptake. Also, limited skills in using existing ICT devices and services is an obstacle to teachers' online professional development.

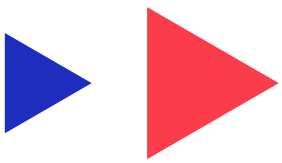
Studies of the Rwanda education system have found significant gaps in teachers' digital skills. The 2018 ICT profile published by the Rwandan Ministry of ICT and Innovation, which looked at ICT in the education sector, indicated that 84 per cent of schools had computers installed and utilized, and the ratio of students to computers was reduced from 23 in 2016 to 8 in 2018 (Government of Rwanda 2018c). The United Nations Educational, Scientific and Cultural Organization (UNESCO) 2019 report on improving the quality and relevance of education through mobile learning in Rwanda states that while data are unclear on the proportions of teachers currently meeting required ICT competencies, 2016 data show that 17,791 teachers have been trained on basic ICT skills, while 5,584 have had training on ICT-enhanced pedagogy, representing approximately 26 per cent and 8 per cent of all primary and secondary teachers, respectively. Data on proportions of teachers meeting required ICT competencies remain unclear. The report also indicates that more than 692 smart classrooms have been set up in schools across the country to improve the quality of ICT-enhanced teaching and learning (Wallet and Kimenyi 2019).

In Rwandan schools, including TVET colleges, teachers do not have appropriate digital content to use with students. The 2019 midterm review and evaluation of ICT in education policy found 56.4 per cent of the 40 sampled schools (both primary and secondary) had access to digital content (online teaching and learning materials), while another 42.3 per cent said that they did not know about it. To understand the extent to which ICT devices were available in schools, the midterm evaluation assessed availability through sample questions on the presence of given tools. However, the evaluation solely relied on the responses provided by school head teachers and ICT teachers, without physical verification or factual checks. Of these sampled, 44.2 per cent said that they were aware that different ICT devices were available in their respective schools, while 51.4 per cent reported that they were not aware of their presence.

Increased investment in planning and delivery of remote CPD activities, and increased availability of digital materials for CPD, will support adoption of good practices and scalability of digital skills training and development among teachers. The use of ICT in education has a positive impact on teaching and learning. It provides a rich environment and motivation for the teaching and learning process, which can in turn have

a profound impact on student performance and achievement. The Education Sector Policy (2003) stipulates the integration of ICT at all levels of education. Despite the growing trend to integrate ICT into teaching and learning, there is still insufficient ICT literacy among teachers. For effective integration of ICT in Rwanda, therefore, there is a need to train and support teachers to improve their ICT literacy with respect to content, pedagogy and technology (Government of Rwanda 2003).

Many teachers have reported that the Government of Rwanda has focused on distributing ICT devices in schools without providing teachers with the necessary skills to use them. Research has shown that online CPD courses can help teachers to master ICT content and integrate it into their teaching. Also, teachers should show more openness towards the use of technological innovations and practices in their work (Ndayambaje and Ngendahayo 2014).



7. Pedagogical uses of technology

The Government of Rwanda is committed to providing a learning environment that promotes the use of ICT in schools and can contribute to the growth of a technologically advanced economy. Different national and international stakeholders have provided training support on ICT in education to both pre- and in-service teachers. However, pedagogical use of technology is still facing such problems as inadequate infrastructure, insufficient teacher training on using ICT and lack of digital content aligned with the competency-based curriculum.

Teachers' use of ICT for pedagogical purposes is constrained by inadequate infrastructure, including computers and other devices. Where REB has provided computers, some classrooms cannot use them because of the lack of electricity.

The Government of Rwanda works with its partners to train teachers on the pedagogical use of technology in the teaching and learning process. For example, REB is working with the Korea International Cooperation Agency (KOICA) to improve teachers' skills in using ICT for teaching and learning purposes. KOICA has engaged with the Ministry of Finance and Economic Planning to work through a UNESCO framework to train all teachers in Rwanda using a blended learning mode. However, this project could be affected by the low or lack of internet connectivity in some Rwandan schools. A proposed solution is to create ICT centres of excellence – schools fully equipped with ICT capacity where teachers can meet to attend online courses through the Moodle open-source learning platform. REB will facilitate access to the Moodle platform so that staff can take advantage of the KOICA training on ICT.

A limited budget has affected REB's capacity to provide sufficient digital content for all subjects, including digital content that is aligned with the current competency-based curriculum. REB has started working with an Indian company – Hicommands Pvt Limited – to develop digital content aligned with the competency-based curriculum.

Research commissioned by the African Institute for Mathematical Sciences and the Mastercard Foundation revealed the following situation related to ICT in Rwanda.

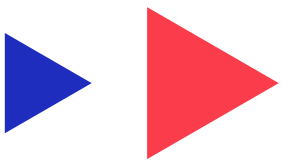
- Many teachers of science, technology, engineering and mathematics (STEM) and ICT, and subject leaders, expressed a lack of confidence in their abilities, a need for additional training on the new curriculum and a desire to upgrade their ICT skills. Only a minority of secondary school STEM/ICT teachers and subject leaders owned computers and were likely to use computers to prepare lessons.
- Almost half of secondary school classrooms are not connected to electricity.
- Only 14 per cent of secondary schools had access to the internet. In these schools, the majority of students could only access the internet in computer laboratories.
- About 61 per cent of secondary schools had computers at the disposal of students and slightly more than half had ICT rooms (the majority without an internet connection); only 1.8 per cent of secondary schools had fully equipped smart rooms.

In 2017, the ICT Transforming Education in Africa project, under the UNESCO–Republic of Korea Funds-in-Trust cooperation, conducted a mapping of ICT for teacher training activities in Rwanda. The report revealed the following support for pre-service and in-service training.

- With regard to pre-service training, the University of Rwanda College of Education offers different ICT in education courses to prospective secondary school teachers. These courses include: introduction to information technology (undergraduate); e-learning resource development and student support (postgraduate); integration of ICT in mathematics education; and integration of ICT in science education. Also, in teacher training colleges, prospective primary school teachers are trained on basic skills of computer use in the teaching and learning process. The main focus in these colleges is on improving the technology literacy of prospective teachers. It is expected that by the end of three years, students in teacher training colleges will be fluent in using the internet.

- With regard to in-service training, REB trains teachers in ICT for education, integration of ICT in the teaching and learning process, efficient use of ICT in classrooms and use of children's laptops in schools. A number of different organizations – including DFID, UNICEF, VVOB, the Aegis Trust, KOICA and the Global e-Schools and Communities Initiative – have trained or are training in-service teachers on different aspects of ICT in education, such as e-teaching, using internet-based resources, digital content evaluation and basic computer literacy.

Based on interviews with teachers, some of the key issues in relation to the use of technology in teaching and learning include: reluctance to the uptake of technology; lack of relevant skills for the use of technology for pedagogical purposes; lack of sufficient ICT devices in relation to the number of teachers and the large class sizes; limited access to the internet; and limited exposure to good practices in the use of technology in pedagogical activities.



8. Teaching ethical and critical use of digital technology

A document review found that no guidelines are provided on teaching ethical and critical use of digital technology. This is therefore highlighted as an area for improvement.

One REB staff member who was interviewed emphasized the lack of such guidance in the system, including on the use of online materials:

> Given the open source of information at the hand of teachers and other school personnel, rules and regulations are needed to set boundaries on information to be shared with pupils, considering their needs, age and understanding capacity. Data protection regulations need to be established and communicated to school personnel for effective use of digital information in teaching and learning activities as well as professional development. Continuous and timely sensitization is needed to ensure that technology and digital information are properly used.

9. Relevant regulatory or policy frameworks in relation to digitalization and education

9.1 Status of legislation

The Government of Rwanda enacted Law No. 23/2012 of 15/06/2012 governing the organization and functioning of nursery, primary and secondary education in Rwanda. This law provides guidance on school management, including the functioning of the school general assembly committee, school audit committee and sector and district education council. Members of these bodies should meet regularly to discuss and report on issues related to school governance (school general assembly committee) and to prepare the audit report (school audit committee) (Government of Rwanda 2012).

Presidential Order No. 24/01 of 24/11/2016, which establishes special statutes governing teachers in nursery, primary and secondary education, explains salaries and other fringe benefits for teachers and head teachers. Though the order establishes salaries for teachers, it is not clear on the matter of teachers' incentives. This has produced concerns regarding the practice of schools collecting money from families to pay teachers' incentives, thereby increasing the dropout rate of students whose families cannot afford the cost (Laterite 2017).

In 2020, the Government of Rwanda published Presidential Order No. 064/01 of 16/03/2020, establishing special statutes governing teachers in nursery, primary, secondary and technical and vocational schools (Government of Rwanda 2020a). As recommended by Law No. 23/2012 of 15/06/2012, the Teacher Statute should determine government obligations regarding the practice of the teaching profession. In addition, it should provide guidance on teacher management.

The Government of Rwanda has also published Order No. 006/2016 of 08/01/2016, determining the curriculum, teaching hours and language of instruction in primary, secondary and specialized schools. While the order determines the number of teaching hours, per subject, in primary and secondary education, it does not determine the number of hours to be taught per teacher per week. In some schools, primary teachers teach between 30 and 40 hours per week, and secondary teachers may teach between 40 and 50 hours per week (interview with key informant). Among their other functions, districts have to determine the teachers' workload depending on the available budget. Various reports on Rwanda's education system have shown that teachers, especially those in primary schools, experience high workloads and do not have time to attend to professional development opportunities.

9.2 Status of relevant policies

The Government of Rwanda is committed to increasing the use of ICT in teaching and learning processes to drive the continued social and economic transformation of the country and support its ambition to become a globally competitive, knowledge-based economy.

To achieve this ambitious goal, the government has approved and set in motion a series of strategies, policies, plans and interventions, many of which underpin the digitalization of education in Rwanda. Developed policies and strategies include the National Strategy for Transformation, 2017–2024; the Education Sector Strategic Plan (ESSP), 2018/19–2023/24; the National Skills Development and Employment Promotion Strategy, 2019–2024; the ICT in Education Policy, 2016; the Education Sector Policy, 2003; the Teacher Development and Management Policy, 2007; the Local Digital Content Promotion Strategy and Implementation Plan, 2018–2022; the ICT Sector Strategic Plan, 2018–2024; the ICT Hub Strategy 2024; and the Smart City Rwanda Master Plan.

Two key initiatives moving Rwanda in the direction of a competitive knowledge-based economy have involved the strengthening and promotion of (a) an ICT-enabled, conducive environment for the teaching and

learning process across all levels of education; and (b) provision of digital devices that will enable learners and teachers to access online materials. The conducive learning environment, in particular, has involved implementation of a competency-based curriculum and increasing the capacity of teachers in integrating ICT in the teaching and learning process. To provide access to digital devices in schools, Rwanda has established smart classrooms that digitalize the teaching and learning process by providing students with access to computers and basic education software platforms as well as internet access.

9.3 Status of social dialogue mechanisms

The Rwanda National Union of Teachers (Syndicat National des Enseignants au Rwanda, SNER) was established in 1996 to protect teachers' interests and rights. It represents teachers from the nursery to the secondary level in public and government-aided schools. SNER is organized to participate in political and administrative decisions pertaining to its teachers towards improving the quality of education. The extent of their involvement in decision-making and policy development is unclear, although there have been concerns raised about a lack of consultation and engagement. Syndicat des Enseignants et Autres Personnels de l'Education (SYNEDUC) organizes teachers in the private sector and engages in negotiations with employers on behalf of its members.

The enforcement of Law No. 23/2012 of 15/06/2012 requires that the school community and parents have opportunities to engage in forums where education stakeholders can share, consult and negotiate on education-related matters. There are, however, gaps in the involvement of the community and parents.

10. Support frameworks for teachers

The Government of Rwanda has established various frameworks to support teachers. For example, the government has enacted legislation to improve teachers' salaries by a certain percentage. In 2019, the salary of teachers was increased by 10 per cent compared to 2017. Many teachers, however, claimed that the increment was still inadequate compared to their hardship levels, though there was acknowledgement that it represented some appreciation of their efforts.

The Government of Rwanda recognizes that teachers' salaries remain inadequate. Ministerial Order No. 43/15.00/06, issued on 21 June 2006, established a credit and saving cooperative for Rwandan teachers. This cooperative, known as Umwalimu Sacco, is intended to improve teachers' socio-economic welfare and contribute to social and economic development in the communities where teachers live. Approved by the National Bank of Rwanda, Umwalimu Sacco operates as a microfinance institution that can provide teachers with loans at very low interest (11 per cent) compared to that charged by commercial banks (19 per cent). Other products offered by Umwalimu Sacco include emergency loan, overdraft loan, salary advance loan, school fees loan, medical loan, one-laptop-per-teacher loan and mortgage loan. The Government of Rwanda finances Umwalimu Sacco at around 5 billion Rwandan francs per year.

In addition to salary augmentation and helping teachers to access bank loans at low interest, the Government of Rwanda supports highly performing teachers with incentives of different types. For example, it has been a practice that, every year, the best performer in the education sector be given a cow, laptop and other gifts in recognition of good service and contribution to the Rwandan teaching workforce. The selection of the best performer is based on a number of criteria, including demonstrated competencies in improving classroom practices and their behaviour as they engage with school staff and members of the wider school community.

In 2014, the Government of Rwanda provided 800 cows to 800 teachers who had performed excellently during the 2013 school year (Mwai 2014). It is important to note that in the Rwandan culture and context, cows have a high social, cultural and economic value, and the resulting improvement in a teacher's socio-economic welfare would have a strong motivational value.

Supporting teachers with relevant training can increase teachers' motivation. The Government of Rwanda has established frameworks to improve teaching practices through CPD. The competency-based curriculum framework focuses on supporting teachers to shift from a teacher-centred approach to a more learner-centred approach, thus enabling children to develop the required competencies. Several projects, including projects funded by the Government of Rwanda, DFID and USAID, have provided evidence of teachers acquiring new skills. However, many teachers do not yet have the skills needed to do justice to the competency-based curriculum. Teacher training has generally tended to be top-down, relying on trainers with limited experience with a competency-based curriculum, and there is insufficient time allocated to out-of-school training. REB has provided support through training to improve teachers' autonomy, relatedness and performance.

Adopting international good practices, the Government of Rwanda is aiming to avoid a top-down approach and follow research demonstrating that CPD is most effective when it is school-based and sustained, has a strong focus on knowledge of subject matter as well as teaching competence, is supported by school leadership, focuses on student learning outcomes, and involves external and in-school mentoring and coaching. On that basis, REB, in collaboration with its partners (including UNICEF), developed the National Teacher CPD Framework in 2019 (REB 2019b).

The National Teacher CPD Framework was established to address four challenges hindering quality improvement among the teaching profession in Rwanda: (a) lack of detailed, practical descriptions of quality and inclusive teaching to inform teacher CPD, appraisal and the planning, monitoring and evaluation of teacher CPD; (b) lack of guidance on how teachers improve their performance, and the roles of other stakeholders in supporting and supervising teacher CPD at school, sector, district and national levels; (c) disconnect between teacher competencies and career development; and (d) lack of practical tools to help teachers and others assess teacher performance and plan for CPD activities.

Guided by the National Teacher CPD Framework, the Government of Rwanda and its education partners are working to support teachers to improve their classroom practices, including creating a positive learning environment, improving planning and assessment, supporting effective communication in the classroom and ensuring proper use of teaching resources. In addition, the framework provides guidance on how teachers can improve their behaviour at school as they engage with their professional development activities and work with the community (REB 2019b).

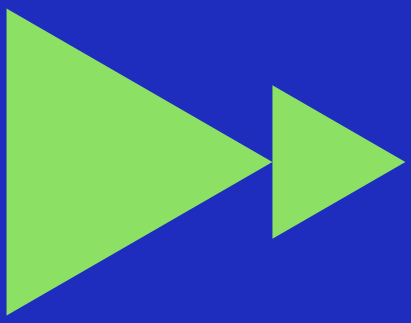
11. Analysis of positive contributions and challenges

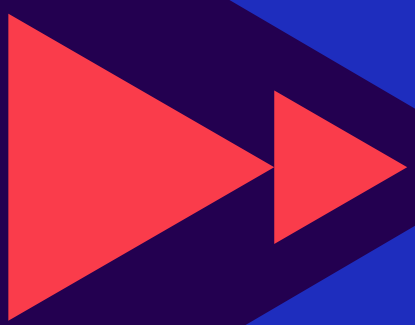
Rwanda has developed quality policies to move the country towards a knowledge-based economy. The Ministry of Education has prepared policies and plans to enhance the quality of education, such as the 2019 National Teacher CPD Framework, and to support ICT integration in education, including the ICT in Education Policy, 2016. The ESSP 2018/19–2023/24 outlines clear objectives for the education sector and is well-regarded among development partners and the Ministry of Education. Educational data is collected through EMIS and annual statistical reports are produced to inform planning and decision-making.

However, despite training opportunities provided for teachers, there remains a need for more qualified teachers in key areas, including science and ICT. Furthermore, teaching continues to involve lecture-driven rather than student-centred pedagogy that integrates ICT. The preparedness of teachers is not at a level where they can respond to government expectations of ICT use for teaching and learning. Developing the digital literacy of teachers needs to be supported by investments to develop infrastructure, including internet connectivity, and provide access to devices and equipment (World Bank 2018). Digital skills development needs to begin at the pre-service level and be supported with continuous training and development, especially given rapid technological advancements and new developments in pedagogy. Similar opportunities should be afforded to teacher trainers, school principals and other education workers.

In order to achieve the objectives of ESSP 2018/19–2023/24, the funding allocated to education will need to be substantially increased. Currently, around 14 per cent of total government expenditure is allocated to education, which is below international benchmarks (Government of Rwanda 2018a). Additional investments will be needed to improve teachers' salaries and integrate ICT in teaching and learning.

Decision-making and policy formulation in the education sector can greatly benefit from the input of teachers and their representatives through social dialogue mechanisms that ensure their meaningful participation in education reform, including on digitalization efforts.





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