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EdTech Hub

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# About the EdTech Hub Helpdesk

The Helpdesk is the Hub's rapid response service, available to FCDO advisers and World Bank staff in 70 low- and lower-middle-income countries (LMICs). It delivers just-in-time services to support education technology planning and decision-making. We respond to most requests in 1–15 business days. Given the rapid nature of requests, we aim to produce comprehensive and evidence-based quality outputs, while acknowledging that our work is by no means exhaustive. For more information, please visit https://edtechhub.org/helpdesk/.

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# 1. Purpose of this document

This document was produced in response to a request from the Foreign, Commonwealth and Development Office (FCDO) Rwanda team that was submitted to the EdTech Hub Helpdesk in August 2020. The FCDO Rwanda team requested a curated list of nine EdTech initiatives related to the following focus areas:

1. classroom software

2. teacher education

3. school administration.

Section 3 of this document presents general criteria that decision-makers can use to analyse an EdTech initiative. Section 4 of this document covers nine EdTech initiatives, based on the criteria set out in Section 3. For the purposes of this document, an initiative is defined as the application of an EdTech tool to a particular setting (e.g., the use of an educational app in a specific country).

This list is not exhaustive. It does not aim to cover every leading and innovative EdTech initiative with relevance to the Rwandan context. Rather, this document presents a framework with which to analyse EdTech organisations and initiatives and offers examples of how this analytical framework can be put into practice.

# 2. Education and EdTech in Rwanda

Since the 1994 Rwandan genocide against the Tutsi, where more than one million people lost their lives (↑United Nations General Assembly, 2018), Rwanda has made steady progress to stimulate social and economic development (↑Williams, 2016). In education, equity has improved, with increased girls' attendance at school, improved learning outcomes, and lower repetition rates when comparing girls with boys. However educational challenges remain, including pedagogical constraints related to teacher competencies, limited capacity to track education quality, and a lack of coordination amongst public and private sector partners towards educational delivery (↑Kimenyi, et al., 2020).[1] Further pedagogical challenges relate to the country's recent shift to English as the medium of instruction, due to the deficit of Rwandan teachers that are proficient in English (↑Edwards, 2019).

The following table summarises access to various education technologies in Rwanda, adapted from ↑Kimenyi, et al. (2020).

**Table 1. Percentage of households in Rwanda who own a radio, television, fixed-line telephone, mobile phone, and computer and that have access to the internet at home.**

| Technology | Ownership Percentage |
|---|---|
| Radio (2012) | 64% |
| Television (2012) | 8% |
| Telephone — fixed lined (2018) | 0.11% |
| Telephone — mobile (2018) | 79% |
| Computer (2012) | 3.38% |
| Access to the internet at home (2012) | 29.8% |

(Source: ↑NISR, (2012; ↑World Bank, (no date).

Table 1 demonstrates relatively high ownership of radio and mobile phones, while the ownership of televisions or computers is low. This contextual data will be referenced throughout the document in relation to the EdTech initiatives discussed. However, it is noted that most of the data listed in Table 1 is from the 2012 Rwandan Population and Housing Census. This is the most recent national census conducted and was selected due to its systematic approach to gathering and recording demographic, social, and economic data from the entire population. More recent data on telephone ownership has been included.

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[1] This context setting is drawn from Kimenyi et al.'s (2020) rapid scan of EdTech in Rwanda. You can access this EdTech Hub piece here.

# 3.  Methodology and criteria

We screened EdTech initiatives for inclusion in this list using the following characteristics based on guidance provided by the FCDO Rwanda team:

- Addressing requested focus areas of classroom software, teacher education, and school administration;

- Targeting primary and secondary education;

- Holding Rwandan presence or a regional presence in sub-Saharan Africa;

- Demonstrating a track record of working with government entities, or demonstrating potential to do so;

- Where applicable, providing English language support given the shift in language of instruction to English in primary schools as described above.

After developing a preliminary longlist of 20 EdTech initiatives, two Rwanda-based colleagues from the EdTech Hub with EdTech and country expertise provided feedback on the initiatives. Based on their input, we narrowed down the longlist to 12 initiatives that were scored using the framework set out in Table 2. We developed this framework by adapting various criteria stemming from:

- The EdTech Hub Innovation sphere's criteria for reviewing EdTech tools submitted to its COVID-19 call for ideas (↑EdTech Hub, no date).

- A rubric used for rapid EdTech product evaluations from the EdTech Lab (↑Sampson, et al., 2019).

- '6 Ps' that can be used to assess tech-based interventions in an education system (people, provision, place, policy, practices, and product).

- Principles for Digital Development, a set of general principles for digital work across the development sector.[2]

Of the 12 assessed initiatives, nine are presented in Section 4 and the remaining three are presented in the Appendix.

**Table 2. A framework for analysing an EdTech initiative.**

| Criteria | Key elements may include: |
|---|---|
| **1. Evidence of impact**<br><br>The initiative has evidence of its effectiveness, ideally through real-life use or testing with users. | ■ Quantitative and qualitative data showing positive results and evidence from product testing, pilots, or scaled-up programmes.<br><br>■ Impact data from a third-party evaluation.<br><br>■ Evidence that shows the main assumptions behind the idea have been validated. |
| **2. Potential to operate at national scale in Rwanda** | ■ Evidence of growth thus far, i.e., from pilot to implementation or from local to national level. |

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[2] For more information regarding the Principles for Digital Development, see: https://digitalprinciples.org/

| | |
|---|---|
| The initiative has the potential to reach scale in Rwanda. | ■ A clear path to scale that lists the necessary stages to reach mainstream rollout.<br><br>■ The initiative builds on existing assets or partnerships (e.g., through open standards, open data, and open-source materials).<br><br>■ A replicable and adaptable model. |
| **3. Focus on LMICs and marginalised communities**<br><br>The initiative is either designed or has been implemented for low- and middle-income countries and/or marginalised communities (such as women and girls, learners with disabilities, learners from minority groups, etc.). | ■ Evidence of operating and having impact in LMICs, particularly in rural areas.<br><br>■ Participatory and inclusive programming reflects a focus on LMIC stakeholders with a specific focus on marginalised communities. For example, targeting settings that have infrastructure constraints (power or connectivity) or ensuring accessibility is addressed for learners with disabilities.<br><br>■ The initiative has been tested by the target audience in the targeted contexts and the initiative has been found to address specific needs.<br><br>■ Linguistic relevance and, particularly, inclusion and acknowledgement of minority languages, where relevant. |
| **4. Strengthening systems**<br><br>The initiative has the potential and overall objective to strengthen education systems in the long term. | ■ Contributions to the wider context of the 'learning crisis' (↑World Bank, 2018), particularly in the medium and long term (24 months+).<br><br>■ Potential to strengthen systems as well as directly benefit the intended beneficiaries. A consideration of the broader educational ecosystem in which the initiative operates.<br><br>■ The initiative is aligned with the local, regional, and national education policies and priorities.<br><br>■ Alignment with existing technological ownership in the country. Devices are readily accessible and have an existing user base. |
| **5. Cost effectiveness and financial sustainability**<br><br>There are published details of costs that denote feasibility to roll out and scale up an initiative. | ■ A transparent breakdown of an initiative's costs.<br><br>■ Inclusion or consideration of often 'hidden' costs such as airtime or data bundles (↑Kingori, 2015).<br><br>■ Transparency is provided as to how the initiative is funded. |

**6. Educational design (where applicable)**

The initiative should be aligned with insights on the impact on educational outcomes.

■ The initiative should promote teaching and learning practices that are known to be impactful for the respective target audiences.

■ Factors contributing to such impact include: teacher education, lesson planning, reflection, teacher group meetings, curriculum alignment, and adequate resourcing with teaching and learning materials.

■ Pedagogical practice should focus on the practices recognised as being associated with high learning outcomes (e.g., feedback, self-regulation, group work, questioning, assessment for learning).

■ The initiative addresses user privacy and security, considering how data is collected, used, and shared.

# 4. A list of EdTech initiatives analysed using the developed framework

## 4.1. EdTech initiatives focused on classroom software

### 4.1.1. Defining 'classroom software'

Acknowledging the breadth of initiatives that fall under 'classroom software', we have defined the term as: any initiative that can be used to support pupil learning in a classroom or school, encompassing hardware and learning applications. We focused on initiatives that were targeted towards or have been rolled out in classrooms, rather than those focused on distance learning. For the purposes of this Helpdesk request, the target audience of 'classroom software' is pupils.

### 4.1.2. Enuma

With offices in the U.S. and Korea, Enuma[3] offers a product called Kitkit School to build literacy and numeracy skills through a game-based learning app and learning tools. Designed for hard-to-reach communities, Kitkit School has been implemented in Rwanda, Bangladesh, Tanzania, and Kenya. In 2018, the product was tested with Grade 4 pupils in Rwanda, who demonstrated positive learning outcomes after four months of participation.

**Table 3. Analysing Enuma (Kitkit School).**

| Criteria | Analysis of the initiative |
|---|---|
| **1. Evidence of impact** <br><br> The initiative has evidence of its effectiveness, ideally through real-life use or testing with users. | ↑Yoon, et al.'s (2018) study, conducted in partnership with Good Neighbors Rwanda at Kagina Hope School, enrolled 684 pupils in the Kitkit School session. Field data included: play log data, oral evaluation of literacy and numeracy (for a sample of pupils), and digital evaluation of literacy and numeracy. The study demonstrated improvements in pupil performance and links between intervention time and achievement. Additional field testing was conducted as part of an IRC feasibility study in Bangladesh. |
| **2. Potential to operate at national scale in Rwanda** <br><br> The initiative has the potential to reach scale in Rwanda. | Kitkit School has been implemented in Bangladesh, Tanzania, Kenya, and Rwanda with over 1,400 children. Enuma's partners include the Korea International Cooperation Agency (KOICA), Good Neighbors Rwanda, Xavier Project, International Rescue Committee, and XPRIZE.[4] There is currently limited information available online regarding a path to scale across Rwanda, following the 2018 study that was based in Kagina. |

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[3] For more information on Enuma, see: https://enuma.com/kitkitSchool
[4] For more information on XPRIZE, see: https://www.xprize.org/

| | |
|---|---|
| **3. Focus on LMICs and marginalised communities**<br><br>The initiative is either designed or has been implemented for low- and middle-income countries and/or marginalised communities (such as women and girls, learners with disabilities, learners from minority groups, etc.). | The platform was designed to empower pupils with special educational needs and disabilities (SEND), refugee children, and children in low connectivity settings. It offers accessibility functions and does not require continuous internet connection. As Kitkit School is tablet-based, limited access to this hardware across Rwanda may limit some marginalised pupils from benefiting from the initiative. |
| **4. Strengthening systems**<br><br>The initiative has the potential and overall objective to strengthen education systems in the long term. | Kitkit School has potential to provide supplementary English literacy support to pupils. In this way, it supports the country's switch to English as the language of instruction as of December 2019. The initiative also aligns with the 2016 national ICT in Education policy that promotes the use of ICT infrastructure in afterschool activities (↑Ministry of Education, 2016). |
| **5. Cost effectiveness and financial sustainability**<br><br>There are published details of costs that denote feasibility to roll out and scale up an initiative. | No transparent breakdown of costs was readily available online.<br><br>Kitkit School was the Grand Prize Winner of the Global Learning XPRIZE in 2019, receiving USD $5 million of funding. Given that it is a tablet-based platform, there may be hidden costs, including tablet maintenance fees and data bundles. |
| **6. Educational design (where applicable)**<br><br>The initiative should be aligned with insights on the impact on educational outcomes. | The learning app offers interactive and scaffolded activities for pupils, with a total of 2,400 learning activities. Content is designed to be culturally appropriate and was developed in partnership with Ubongo, an African edutainment company known for interactive content and evidence of effectiveness (↑Watson, 2020).[5] |

### 4.1.3. O'Genius Priority

Based in Rwanda, O'Genius Priority[6] offers a learning tool for pupils to conduct laboratory experiments with a computer or mobile device, providing an alternative to schools without physical labs. The platform (O'Genius Panda) includes the following features: virtual lab simulations, online evaluations, e-library, and resources for teachers.

**Table 4. Analysing O'Genius Priority (O'Genius Panda).**

| Criteria | Analysis of the initiative |
|---|---|

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[5] For more information regarding Ubongo, see: https://www.ubongo.org/
[6] For more information on O'Genius Priority, see: https://www.opanda.xyz/

## 1. Evidence of impact

The initiative has evidence of its effectiveness, ideally through real-life use or testing with users.

There was no evidence of impact available on O'Genius Panda's website or through a general web search. However, a lack of evidence is a constraint for many start-ups. Though we were unable to find evidence, that does not mean the initiative has no impact.

## 2. Potential to operate at national scale in Rwanda

The initiative has the potential to reach scale in Rwanda.

The company currently serves 8,000 pupils and has a partnership with the Rwandan Ministry of Education. There is currently limited information available online regarding a path to scale across Rwanda.

## 3. Focus on LMICs and marginalised communities

The initiative is either designed or has been implemented for low- and middle-income countries and/or marginalised communities (such as women and girls, learners with disabilities, learners from minority groups, etc.).

O'Genius Panda is a Rwandan company focused on complementing the Rwandan national curriculum. However, as the platform is computer-based, limited access to this hardware across Rwanda may limit some marginalised pupils from benefiting from O'Genius Panda.

## 4. Strengthening systems

The initiative has the potential and overall objective to strengthen education systems in the long term.

O'Genius Panda can be used to supplement teaching and learning in Rwanda, specifically for ICT and STEM skills. It aligns with the Rwandan Education Sector Plan 2018–2024 to strengthen STEM knowledge across primary, secondary, and tertiary education (↑Ministry of Education, no date).

## 5. Cost effectiveness and financial sustainability

There are published details of costs that denote feasibility to roll out and scale up an initiative.

In response to the COVID-19 pandemic, the company is currently offering free access to O'Genius Panda's platform.[7] In February 2020, the Mastercard Foundation's Centre for Innovative Teaching and Learning in ICT announced that O'Genius Priority was selected as a member of Mastercard's first cohort of EdTech Fellows (↑Mastercard Foundation, 2020).

## 6. Educational design (where applicable)

The initiative should be aligned with insights on the impact on educational outcomes.

The platform supports hands-on and interactive learning for pupils through virtual experiments. It is also curriculum-aligned and enables pupils to engage in self-assessments on science subjects.

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[7] To access the O'Genius Panda platform, visit: https://www.opanda.xyz/

### 4.1.4. eKitabu

Based in Kenya, eKitabu[8] offers over 350,000 e-books plus digital content to 14 African countries. The organisation offers an app and e-library that are usable offline and apply open standards. eKitabu also organises an annual digital essay competition in partnership with the Kenyan Ministry of Education.

**Table 5. Analysing eKitabu.**

| Criteria | Analysis of the initiative |
| --- | --- |
| **1. Evidence of impact**<br><br>The initiative has evidence of its effectiveness, ideally through real-life use or testing with users. | A ↑Digital Literacy Trust (2018) report included insights from surveys and interviews on content and device utilisation during an e-Kitabu initiative. After the completion of the pilot, each pupil spent 2 hours per week reading (compared to 0 hours at the beginning of the pilot as they previously did not have access to any storybooks) and reported high enthusiasm for reading. |
| **2. Potential to operate at national scale in Rwanda**<br><br>The initiative has the potential to reach scale in Rwanda. | eKitabu partners with local and international publishers (e.g., African Storybook, Cambridge University Press, Gallup Press)[9] to deliver content to over 1,500 schools across Kenya and 13 other countries in Sub-Saharan Africa, including Rwanda. eKitabu has reached scale across all 47 counties of Kenya. |
| **3. Focus on LMICs and marginalised communities**<br><br>The initiative is either designed or has been implemented for low- and middle-income countries and/or marginalised communities (such as women and girls, learners with disabilities, learners from minority groups, etc.). | eKitabu is geared towards building literacy in contexts with limited access to infrastructure such as power and connectivity (for example, through a library that can be accessible offline). The organisation also launched the initiative Studio KSL[10] (Kenyan Sign Language) to create accessible KSL video storybooks, supporting literacy skills for deaf children. |
| **4. Strengthening systems**<br><br>The initiative has the potential and overall objective to strengthen education systems in the long term. | eKitabu's theory of change outlines challenges (low literacy, lack of teaching materials), inputs (e-books, e-library, devices), outputs (books delivered, essay submissions), and outcomes (access to books, improvements to school exam scores, engaged and equipped teachers). It holds long-term implications for improving literacy across education systems. eKitabu's theory of change additionally has the potential to address barriers to implementation of Rwanda's |

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[8] For more information on eKitabu, see: https://www.ekitabu.com/
[9] https://www.ekitabu.com/index.php/our-publishers/
[10] For more information on Studio KSL, see: https://www.ekitabu.com/index.php/community/studio-ksl/

| | revised Special Needs and Inclusive Education Policy (↑Ministry of Education, 2018). |
|---|---|
| **5. Cost effectiveness and financial sustainability**<br><br>There are published details of costs that denote feasibility to roll out and scale up an initiative. | eKitabu offers several collections of e-books for free and for purchase on its website. It has both public and private partners.<br><br>Studio KSL is supported by All Children Reading: A Grand Challenge for Development (ACR GCD)[11] partners (USAID, World Vision, the Australian government). eKitabu is also a 2020 grant recipient of the EdTech Hub.[12] |
| **6. Educational design (where applicable)**<br><br>The initiative should be aligned with insights on the impact on educational outcomes. | eKitabu provides reading materials approved by the Kenya Institute of Curriculum Development (KICD) and is aligned to the Kenyan curriculum. Teacher education on how to access and use the e-books to supplement lessons is also offered. |

## 4.2. EdTech initiatives focused on teacher education

### 4.2.1. Defining 'teacher education'

Teacher education is defined in this piece as consisting of both initial teacher education (ITE) and continuous teacher professional development (TPD). ITE refers to education for pre-service teachers, whilst TPD refers to education for in-service teachers (↑Haßler, et al., 2020). For the purposes of this Helpdesk request, the primary target audiences of 'teacher education' are pre-service and in-service teachers.

### 4.2.2. OER4Schools

Open Education Resources (OER) are defined as educational content which is legally, technologically, and socially free (↑Haßler and Mays, 2015). OER can take the form of text, images, and/or audio-visual content. While most OER are used digitally, an OER does not have to be delivered digitally. In order to serve the most marginalised, it is likely that OER may be printed (↑Koomar, 2020).

OER4Schools' Professional Learning Resource[13] provides an openly available, structured set of materials for school-based TPD. The materials support lesson planning, designing learning objectives, and developing activities for 28 teacher-led workshops. The programme also provides video examples of interactive teaching in African schools to stimulate debate and reflection. This approach is based on established characteristics for effective and sustainable TPD (↑Hennessy, et al., 2016; ↑Haßler, et al., 2018).

**Table 6. Analysing OER4Schools.**

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[11] For more information on All Children Reading: A Grand Challenge for Development, see: https://allchildrenreading.org/
[12] The EdTech Hub awarded eKitabu a small grant in 2020 to support country-level COVID-19 response initiatives. eKitabu was included on this list based on its relevance to Rwanda and the scope of this brief. The authors of this brief do not have any direct connections with eKitabu.
[13] OER4Schools (2020), available at http://oer.educ.cam.ac.uk/wiki/OER4Schools

| Criteria | Analysis of the initiative |
|---|---|
| **1. Evidence of impact**<br><br>The initiative has evidence of its effectiveness, ideally through real-life use or testing with users. | Data was collected from a qualitative study conducted in Zambian primary schools. The study found that participating teachers increasingly adapted lessons to the skill level of pupils and incorporated more practical group work into their classes (↑Hennessy, et al., 2016). Meanwhile, the study found that the programme supported pupils to actively engage in activities and develop a deeper subject knowledge (ibid.). Teacher interviews carried out 18 months after a year-long intervention in one Zambian school showed that the initiative became self-sustaining without any external support. |
| **2. Potential to operate at national scale in Rwanda**<br><br>The initiative has the potential to reach scale in Rwanda. | OER4Schools offers a toolkit that can be adapted to local contexts and translated into different languages. Materials have been used in Zambia, Kenya, Uganda, Rwanda, South Africa, and Sierra Leone. Educators need to spend time preparing sessions to ensure they are as effective as possible. |
| **3. Focus on LMICs and marginalised communities**<br><br>The initiative is either designed or has been implemented for low- and middle-income countries and/or marginalised communities (such as women and girls, learners with disabilities, learners from minority groups, etc.). | The programme has been designed and implemented in various LMICs in sub-Saharan Africa, inclusive of ↑Hennessy, et al.'s (2016) detailed study in Zambia. The nature of OER denotes that content can be localised to suit specific contexts; this means that linguistic adaptations can be made to existing content. |
| **4. Strengthening systems**<br><br>The initiative has the potential and overall objective to strengthen education systems in the long term. | Materials can be used with or without additional technological components such as laptops and tablets. The content can be adapted to ensure alignment with the Rwandan national curriculum and the published impact data can contribute to lessons learned when implementing such a programme at scale. |
| **5. Cost effectiveness and financial sustainability**<br><br>There are published details of costs that denote feasibility to roll out and scale up an initiative. | Although OER4Schools entails no upfront cost, education providers will need to pay for the printing and distribution of materials. As an initiative that follows open standards, there is no specific business model to speak of. The content is available in a repository for use by anyone. |
| **6. Educational design (where** | The initiative has a distinct focus on developing pedagogical capacity in schools. Particular features of |

**applicable)**

The initiative should be aligned with insights on the impact on educational outcomes.

OER4Schools include: covering interactive teaching principles, group work, questioning, dialogue, assessment for learning, and enquiry-based learning (↑OER4Schools, no date).

### 4.2.3. Transforming Teacher Education and Learning

Transforming Teacher Education and Learning (T-TEL)[14] is an initiative put in place by the government of Ghana to ensure that pre-service teachers are equipped to deliver high-quality teaching in schools (↑Koomar, et al., 2020).

To achieve this goal, T-TEL seeks to reform:

- The curriculum

- The management of Colleges of Education

- Ghanaian educational policy

- Local institutional development.

T-TEL especially targets the professional development of Colleges of Education tutors, in order to ultimately enhance teaching practice.

**Table 7. Analysing T-TEL.**

| Criteria | Analysis of the initiative |
|---|---|
| **1. Evidence of impact**<br><br>The initiative has evidence of its effectiveness, ideally through real-life use or testing with users. | ↑Coffie's (2019) recent study found that Physics teachers believed that T-TEL's professional development programme had a positive impact on their teaching practice. ↑T-TEL's (2017) midline survey had also previously found that 65.9% of tutors interviewed demonstrated pupil-focused teaching methods compared to a baseline of 26.1%. |
| **2. Potential to operate at national scale in Rwanda**<br><br>The initiative has the potential to reach scale in Rwanda. | T-TEL's professional development resources, available as OER, support teaching in 46 of Ghana's Public Colleges of Education. Although they were developed for Colleges of Education, the resources can also be used within schools and communities of practice by in-service teachers.<br><br>As T-TEL's materials were developed with the structure of the Ghanaian Colleges of Education in mind, investment would be required to adapt T-TEL's resources to be contextually-appropriate for roll-out in Rwanda. |

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[14] T-TEL (n.d.), available at https://www.t-tel.org/home

| | |
|---|---|
| **3. Focus on LMICs and marginalised communities**<br><br>The initiative is either designed or has been implemented for low- and middle-income countries and/or marginalised communities (such as women and girls, learners with disabilities, learners from minority groups, etc.). | The programme has been designed and implemented across Ghana. T-TEL's theory of change specifically highlights gender-responsive pedagogy as an outcome indicator that is consistently referenced in the midline survey (↑T-TEL, 2017). However, there is a limited focus on rural areas of Ghana. |
| **4. Strengthening systems**<br><br>The initiative has the potential and overall objective to strengthen education systems in the long term. | T-TEL's seven core areas (Policy and Institutional Development; Leadership and Management; T-TEL Funds; Tutor Professional Development; School Partnerships and Teaching Practice; Curriculum Reform; and Gender and Inclusion) reflect an appreciation of 'systems thinking' to enhance teaching practice in the long term (↑T-TEL, no date; ↑RISE, no date). |
| **5. Cost effectiveness and financial sustainability**<br><br>There are published details of costs that denote feasibility to roll out and scale up an initiative. | Information about the cost of integrating the T-TEL initiative into national teacher education systems is not readily available. |
| **6. Educational design (where applicable)**<br><br>The initiative should be aligned with insights on the impact on educational outcomes. | T-TEL's resources are organised into twelve pedagogical themes, which include questioning, group work, and assessment for learning. Within each theme, a number of teaching strategies (for example, roleplay or storytelling) are introduced. |

### 4.2.4. International Computer Driving Licence (ICDL)

The International Computer Driving Licence (ICDL) targets the improvement of digital literacy skills. In 2015, ICDL Africa signed a Memorandum of Understanding (MoU) with the Ministry of Youth and ICT (MYICT) in Rwanda; part of this agreement specified ICDL's offering of support in the development of a National Digital Literacy Policy in Rwanda (↑ICDL, no date). An ICDL Africa Office has since been set up in Kigali, along with several test centres established in the Rwandan capital.[15]

**Table 8. Analysing ICDL.**

| Criteria | Analysis of the initiative |
|---|---|
| **1. Evidence of impact**<br><br>The initiative has evidence of its | There was no evidence of impact available on ICDL's website or through a general web search. Though we |

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[15] To see the contact details of each test centre, see: https://icdlafrica.org/find-a-test-centre/rwanda/

| | |
|---|---|
| effectiveness, ideally through real-life use or testing with users. | were unable to find evidence, that does not mean the initiative has no impact. |
| **2. Potential to operate at national scale in Rwanda**<br><br>The initiative has the potential to reach scale in Rwanda. | To date, more than 15 million people have engaged with the ICDL programme, in over 100 countries and 40 languages (↑ICDL, no date). ICDL Africa has set up offices across the continent, including in Rwanda. However, the test centres all seem to be concentrated in Kigali at present. |
| **3. Focus on LMICs and marginalised communities**<br><br>The initiative is either designed or has been implemented for low- and middle-income countries and/or marginalised communities (such as women and girls, learners with disabilities, learners from minority groups, etc.). | Teachers have been trained to ICDL standards in Ethiopia and Zimbabwe (↑SITA, 2019). As mentioned previously, the programme exists in over 100 countries overall. The extent to which ICDL targets marginalised communities is not clear. |
| **4. Strengthening systems**<br><br>The initiative has the potential and overall objective to strengthen education systems in the long term. | The ICDL has supported sectors outside of education in Rwanda, including strengthening the Rwanda Revenue Authority's digitisation and service delivery and evaluating the National Bank of Rwanda's digital skills levels (↑ICDL, 2018; ↑ICDL, 2017). |
| **5. Cost effectiveness and financial sustainability**<br><br>There are published details of costs that denote feasibility to roll out and scale up an initiative. | There is no readily available information on cost in Rwanda. It is stated that exact costs are available from accredited test centres. However, in South Africa, the cost of a Skills Log Book is R250.00 (14487.05 RWF) and the examination fee is R150.00 (8692.23 RWF) per module (↑CECS, 2017); participants can decide how many modules they take. |
| **6. Educational design (where applicable)**<br><br>The initiative should be aligned with insights on the impact on educational outcomes. | As the ICDL targets users beyond educators, there is no specific educational design outlined outside of the improvement of digital skills. |

## 4.3. EdTech initiatives focused on school administration

### 4.3.1. Defining 'school administration'

EdTech initiatives focused on school administration support the management and administration of a school or schools (e.g., attendance tracking, automatic generation of report cards, data collection and analytics). For the purposes of this Helpdesk request, the primary target audiences of 'school administration' are school administrators and head teachers; however, many of the school administration products analysed also offer functionality for teachers, pupils, and parents.

### 4.3.2. Kytabu

Based in Kenya, Kytabu[16] offers various services, including an educational app, a content access library, an online content repository, a remedial teachers app, and a school management system. The Kytabu Super School System (KS3)[17] is a school management system with features including accounting tools, attendance, online exams, a fee paying system, and an online library with learning resources. KS3 also includes both the Kytabu Parents' App and Students' App.

**Table 9. Analysing Kytabu.**

| Criteria | Analysis of the initiative |
|---|---|
| **1. Evidence of impact**<br><br>The initiative has evidence of its effectiveness, ideally through real-life use or testing with users. | Data from the ↑Global Innovation Exchange (2016) suggests that provision of Kytabu devices enabled schools to save around 71% on the cost of textbooks. There is no readily available impact data on the KS3 itself. |
| **2. Potential to operate at national scale in Rwanda**<br><br>The initiative has the potential to reach scale in Rwanda. | ↑Global Innovation Exchange (2016) states that Kytabu has benefitted between 1,298 and 4,120 individuals. It has also been implemented in the Democratic Republic of the Congo (DRC), Tanzania and Uganda. |
| **3. Focus on LMICs and marginalised communities**<br><br>The initiative is either designed or has been implemented for low- and middle-income countries and/or marginalised communities (such as women and girls, learners with disabilities, learners from minority groups, etc.). | Developed and implemented in Kenya, Kytabu targets existing user devices and systems, such as mobile money micropayments, in order to widen access to low-income communities. Kytabu has also been rolled out in rural areas, refugee communities and other settings of fragility, conflict and violence. Kytabu has a distinct focus on accessibility. |
| **4. Strengthening systems** | Kytabu targets learners, teachers, parents and school administrators. In this way, it adopts a systems |

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[16] For more information on Kytabu, see: https://kytabu.africa/about-us/
[17] For more information on KS3, see: https://kytabu.africa/kytabu-super-school/

| | |
|---|---|
| The initiative has the potential and overall objective to strengthen education systems in the long term. | approach to strengthening education. Furthermore, the range of services Kytabu provides, from a parent app to an online content repository, offers a broad set of options for users. |
| **5. Cost effectiveness and financial sustainability**<br><br>There are published details of costs that denote feasibility to roll out and scale up an initiative. | As part of its Covid-19 response, Kytabu offered KS3 for free between May and July 2020. As of December 2020, KS3 will cost KSH 2,500 (22337.94 RWF) per month per school for the base product, which includes: the Complete School Management System, the Parents' App, the Students' App, Customer Support, and Hosting on kytabu.com. The system has harnessed the 'ubiquitous mobile money revolution in Kenya' (↑Kytabu, no date). ↑Global Innovation Exchange (2016) estimates a cost per unit of $1. Kytabu references aggressive marketing as a means to expand its user base and follows an iterative model to learn, adapt, and scale (↑Global Innovation Exchange, 2016). |
| **6. Educational design (where applicable)**<br><br>The initiative should be aligned with insights on the impact on educational outcomes. | The KS3 focuses on school administration. However, Kytabu is soon to release further services to support teachers. The ability for users to create their own content is also supportive of good pedagogical practice. |

### 4.3.3. 'Allo École

A World Bank pilot, 'Allo École connects parents, teachers, and policymakers in order to promote accountability in primary education in the DRC (↑World Bank, 2017). Specifically, 'Allo École was devised to address the:

1. lack of effective communication between national-level primary education policymakers/administrators and provincial and district level departments of education;

2. lack of transparency and accountability of service providers (e.g., teachers and school directors) to parents and pupils, which prevents citizens from being able to provide feedback on education quality and advocate for improved service delivery (↑World Bank, 2017).

The pilot employed the use of an educational questionnaire for parents and teachers to answer questions on: textbooks, school construction, and teacher and pupil absenteeism. The platform captured responses to the questions and results were aggregated by question across respondent category and response content. A dashboard provided visualisations to the Ministry of Education to help facilitate the analysis of results (ibid.).

**Table 10. Analysing 'Allo École.**

| Criteria | Analysis of the initiative |
|---|---|
| **1. Evidence of impact**<br><br>The initiative has evidence of its | There was no evidence of impact available on 'Allo École's website or through a general web search. However, 'Allo École helped to monitor the impact of a |

| | |
|---|---|
| effectiveness, ideally through real-life use or testing with users. | $100 million Bank-funded Project (in French, Projet de Soutien à l'Education de Base), which closed in February 2017 (↑World Bank, 2017). Though we were unable to find evidence, that does not mean the initiative has no impact. |
| **2. Potential to operate at national scale in Rwanda**<br><br>The initiative has the potential to reach scale in Rwanda. | 'Allo École was introduced to 311 schools in total through training sessions and other resources such as posters. In the first month the platform was available, 1,465 parents and 1,230 teachers provided feedback. It took a total of six months for the platform to become operational. |
| **3. Focus on LMICs and marginalised communities**<br><br>The initiative is either designed or has been implemented for low- and middle-income countries and/or marginalised communities (such as women and girls, learners with disabilities, learners from minority groups, etc.). | 'Allo École ensured the questionnaires were accessible on basic mobile phones either via SMS or IVR (interactive voice response). The use of basic mobile phones aligns with high levels of mobile phone ownership in Rwanda (see Table 1). Linguistically, 'Allo École voice callers choose from one of four locally-appropriate languages — French, Lingala, Tshiluba and Swahili — by pressing buttons on their keypad. Though English (the Rwandan official language of instruction) was not included within this programme, the use of multiple languages demonstrates linguistic adaptability. |
| **4. Strengthening systems**<br><br>The initiative has the potential and overall objective to strengthen education systems in the long term. | Following the pilot, the DRC's Ministry of Education has since assumed responsibility for the ongoing costs of 'Allo École's platform and back-end management. Integration with government institutions suggests a positive contribution to systems strengthening. The programme also focuses on promoting accountability, transparency, and communication across the education sector. |
| **5. Cost effectiveness and financial sustainability**<br><br>There are published details of costs that denote feasibility to roll out and scale up an initiative. | For full details of 'Allo École's running costs, please see Figure 2 of ↑Blest and Koomar's (2020) paper on using EdTech to support effective data monitoring. |
| **6. Educational design (where applicable)**<br><br>The initiative should be aligned with insights on the impact on educational outcomes. | As this initiative focused on school administration, educational design is not applicable. However, the platform's usability, use of local languages and use of existing technologies is of note. |

### 4.3.4. Academic Bridge

Based in Rwanda, Academic Bridge[18] developed a school management system with a presence in Rwanda, Kenya, and Burundi. Academic Bridge enables data collection through an Android app, monitoring of pupil data, and communication between parents and the school. The company received an award from the International Telecommunication Union (ITU) in 2016 (↑ITU Telecom World, 2016).

**Table 11. Analysing Academic Bridge.**

| Criteria | Analysis of the initiative |
|---|---|
| **1. Evidence of impact**<br><br>The initiative has evidence of its effectiveness, ideally through real-life use or testing with users. | There was no evidence of impact available on Academic Bridge's website or through a general web search. However, a lack of evidence is a constraint for many start-ups. Though we were unable to find evidence, that does not mean the initiative has no impact. |
| **2. Potential to operate at national scale in Rwanda**<br><br>The initiative has the potential to reach scale in Rwanda. | Academic Bridge has started to scale across Rwanda and in the region. In 2016, nine schools used Academic Bridge with 6,300 pupils in the system (↑kLab, no date). As of March 2019, this number has grown to 100 schools across Rwanda, Kenya, and Burundi (↑Atieno, 2019). Additional information is needed on potential pathways to scale in Rwanda. |
| **3. Focus on LMICs and marginalised communities**<br><br>The initiative is either designed or has been implemented for low- and middle-income countries and/or marginalised communities (such as women and girls, learners with disabilities, learners from minority groups, etc.). | Academic Bridge is a school management system based in Rwanda and designed for the local context. It is a web-based and Android phone-based platform that can be accessed offline. The information a teacher or school administrator inputs is uploaded when the user re-connects to the Internet.<br><br>While it can be used by school administrators and teachers, as well as parents and pupils, limited access to devices may prevent some marginalised users from accessing Academic Bridge. |
| **4. Strengthening systems**<br><br>The initiative has the potential and overall objective to strengthen education systems in the long term. | In 2019, a representative from the REB highlighted plans to introduce Academic Bridge in more schools to help with monitoring of pupils and teachers (↑Atieno, 2019). This feature would support the strengthening of accountability across all levels of education, as stated in the Education Sector Plan 2018–2024. |
| **5. Cost effectiveness and financial sustainability** | There is currently limited information available online regarding Academic Bridge's costs. |

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[18]For more information on Academic Bridge, see: https://academicbridge.xyz/

There are published details of costs that denote feasibility to roll out and scale up an initiative.

| | |
|---|---|
| **6. Educational design (where applicable)**<br><br>The initiative should be aligned with insights on the impact on educational outcomes. | As this initiative focused on school administration, educational design is not applicable. However, the platform's usability and use of existing technologies is of note. |

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# 6. Appendix: Additional EdTech initiatives analysed using the developed framework

## 6.1. EdTech initiatives focused on classroom software

### 6.1.1. BRCK

Based in Kenya, BRCK's[19] objective is to make the Internet accessible across sub-Saharan Africa. One of its divisions, BRCK Education, offers hardware, software, and connectivity tools to support learning, including a product called the Kio Kit or 'classroom in a box'. The kit helps build a digital classroom, including 40 Kio tablets, a microserver, and wireless tablet charging. When the Kio Kit is turned on, the microserver (i.e., an offline version of the internet) enables pupils to access web content without high data costs (↑Shapshak, 2015).

**Table 12. Analysing BRCK (Kio Kit).**

| Criteria | Analysis of the initiative |
|---|---|
| **1. Evidence of impact**<br><br>The initiative has evidence of its effectiveness, ideally through real-life use or testing with users. | Independent studies on the use and perception of Kio Kits in Zanzibar and Ghana demonstrated mixed evidence (↑Ahmada, et al., 2019; ↑Dotse, 2019). When surveyed, STEM teachers in Zanzibar reported that Kio Kits enhanced teaching, learning, and 21st century skills (↑Ahmada, et al., 2019).<br><br>A quantitative and qualitative evaluation of 20 primary school pupils in Ghana showed improvements in mathematics scores when using the tablets. However, the evaluation also acknowledged that other studies did not find a significant difference between use of the Kio Kit and traditional teacher-led instruction (↑Dotse, 2019). |
| **2. Potential to operate at national scale in Rwanda**<br><br>The initiative has the potential to reach scale in Rwanda. | The BRCK Education website reports that they have reached "thousands of students in over 100 locations across 17 countries" (↑BRCK, no date). In 2018, BRCK reported that they sold over 200 Kio Kits for use in 14 countries (↑ITU, 2018). Given that the Kio Kit is introducing new devices (e.g., the Kio tablet) into a country's EdTech ecosystem, its path to scale across Rwanda is less clear. |
| **3. Focus on LMICs and marginalised communities** | The BRCK team conducted classroom observations in Kenya to identify pupil and teacher needs that would |

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[19]For more information on BRCK, see: https://www.brck.com/education/

| | |
|---|---|
| The initiative is either designed or has been implemented for low- and middle-income countries and/or marginalised communities (such as women and girls, learners with disabilities, learners from minority groups, etc.). | inform the design of the Kio Kit. The product caters toward schools in rural areas with low connectivity. However, it is dependent on the availability of electricity for charging the tablets, which have a limited battery life of about 8 hours (↑ITU, 2018).<br><br>Furthermore, there was no mention of accommodations for pupils with special educational needs and disabilities (SEND) on BRCK's website. |
| **4. Strengthening systems**<br><br>The initiative has the potential and overall objective to strengthen education systems in the long term. | The Kio Kit aligns well with a strategic objective listed in the national ICT in Education policy (↑Ministry of Education, 2016), to "increase ICT penetration and usage at all educational levels." However, the potential of the Kio Kit to strengthen education systems in the future is highly dependent on how the tablets and microserver are used to improve learning outcomes for pupils and supplement teaching activities. A problem-based, not device-based, approach is needed. |
| **5. Cost effectiveness and financial sustainability**<br><br>There are published details of costs that denote feasibility to roll out and scale up an initiative. | The Kio Kits cost about USD $5,000 and the individual Kio tablets cost about USD $100. Between 2014 and 2020, BRCK has received a total of USD $4.2 million of funding from the Case Foundation, TED, and others (↑BRCK, no date; ↑Shapshak, 2015). |
| **6. Educational design (where applicable)**<br><br>The initiative should be aligned with insights on the impact on educational outcomes. | The Kio tablets contain pre-loaded content from four Kenya-based suppliers and Pearson (↑Shapshak, 2015). Given that the Kio Kit is primarily focused on hardware and connectivity tools, there was limited information available related to its educational design. |

### 6.1.2. Tech Avenue 137

Based in Rwanda, Tech Avenue 137[20] is a software company that specialises in learning through gamification of content. One of their apps is Sakwe Sakwe, a game that encourages Kinyarwanda language learning for young pupils.

**Table 13. Analysing Tech Avenue 137 (Sakwe Sakwe app).**

| Criteria | Analysis of the initiative |
|---|---|
| **1. Evidence of impact**<br><br>The initiative has evidence of its effectiveness, ideally through | There was no evidence of impact available on Tech Avenue 137's website or through a general web search. However, a lack of evidence is a constraint for many start-ups. Though we were unable to find evidence, |

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[20] http://www.techavenue137.rw/

| | |
|---|---|
| real-life use or testing with users. | that does not mean the initiative has no impact. |
| **2. Potential to operate at national scale in Rwanda**<br><br>The initiative has the potential to reach scale in Rwanda. | There is currently limited information available online regarding a path to scale across Rwanda. |
| **3. Focus on LMICs and marginalised communities**<br><br>The initiative is either designed or has been implemented for low- and middle-income countries and/or marginalised communities (such as women and girls, learners with disabilities, learners from minority groups, etc.). | Tech Avenue 137 is a Rwandan company focused on developing mobile applications and websites for the local context. Sakwe Sakwe is a mobile app that helps build literacy in Kinyarwanda for children through games. As the platform is mobile-based, limited access to this hardware across Rwanda may limit some marginalised pupils from benefiting from the app. |
| **4. Strengthening systems**<br><br>The initiative has the potential and overall objective to strengthen education systems in the long term. | Tech Avenue 137 promotes understanding of Kinyarwanda, not English (the official language of instruction). However, research supports that mother tongue instruction helps pupils learn better and faster and reduces repetition and drop-out (↑Global Partnership for Education, 2019). Sakwe Sakwe has potential to contribute to foundational Kinyarwanda literacy skills at home for younger pupils, which may ultimately support their transition to English-based instruction at school. |
| **5. Cost effectiveness and financial sustainability**<br><br>There are published details of costs that denote feasibility to roll out and scale up an initiative. | There is currently limited information available online regarding Tech Avenue 137's costs. |
| **6. Educational design (where applicable)**<br><br>The initiative should be aligned with insights on the impact on educational outcomes. | The app uses riddles and puzzles to engage with pupils. Incorporating metaphors and structural parallelism, the app can enable both pupil learning and enthusiasm for languages. |

## 6.2. EdTech initiatives focused on school administration

### 6.2.1. Urubuto

Based in Rwanda, Urubuto[21] is a school management software owned by BK TecHouse. Some of its features include: pupil attendance tracking, report cards, staff management, finance and accounting, and analytics.

**Table 14. Analysing Urubuto.**

| Criteria | Analysis of the initiative |
|---|---|
| **1. Evidence of impact**<br><br>The initiative has evidence of its effectiveness, ideally through real-life use or testing with users. | There was no evidence of impact available on Urubuto's website or through a general web search. However, a lack of evidence is a constraint for many start-ups. Though we were unable to find evidence, that does not mean the initiative has no impact. |
| **2. Potential to operate at national scale in Rwanda**<br><br>The initiative has the potential to reach scale in Rwanda. | There is currently limited information available online regarding a path to scale across Rwanda. |
| **3. Focus on LMICs and marginalised communities**<br><br>The initiative is either designed or has been implemented for low- and middle-income countries and/or marginalised communities (such as women and girls, learners with disabilities, learners from minority groups, etc.). | Urubuto is a school management system based in Rwanda and designed for the local context. However, limited access to devices may prevent some marginalised users from viewing insights in the Urubuto platform. |
| **4. Strengthening systems**<br><br>The initiative has the potential and overall objective to strengthen education systems in the long term. | By monitoring pupil and teacher attendance, school administrators can identify individuals that require personalised follow-up and/or assistance. This would potentially increase retention rates for both pupils and teachers. This feature would support the strengthening of accountability across all levels of education. |
| **5. Cost effectiveness and financial sustainability**<br><br>There are published details of costs that denote feasibility to roll | There is currently limited information available online regarding Urubuto's costs. |

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[21] For more information on Urubuto, see: https://www.urubutoschools.ac.rw/

out and scale up an initiative.

| **6. Educational design (where applicable)** | As this initiative focused on school administration, educational design is not applicable. However, the platform's usability and use of existing technologies is of note. |
|---|---|
| The initiative should be aligned with insights on the impact on educational outcomes. | |