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# SWOT Analysis of the Kenya Education Cloud


**Date** January 2021

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# About this document

**Recommended citation**

Groeneveld, C., Kimenyi, E., and Kaye, T. (2021). *SWOT Analysis of the Kenya Education Cloud*. EdTech Hub. https://doi.org/10.5281/zenodo.4742327 Available at https://docs.edtechhub.org/lib/UMJTLGUE. Available under Creative Commons Attribution 4.0 International.



**Notes**

EdTech Hub is supported by UK aid and the World Bank; however, the views expressed in this document do not necessarily reflect the views of the UK Government or the World Bank.

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# Abbreviations

| | |
|---|---|
| **CBC** | Competency-Based Curriculum |
| **CMS** | Content Management System |
| **CPD** | Continuous Professional Development |
| **EMIS** | Education Management and Information System |
| **ICT** | Information Communication Technology |
| **KEC** | Kenya Education Cloud |
| **KICD** | Kenya Institute of Content Development |
| **KNEC** | Kenya National Examination Council |
| **KPI** | Key Performance Indicator |
| **LCBEP** | Learning Continuity in Basic Education Project |
| **M&E** | Monitoring and Evaluation |
| **OER** | Open Educational Resources |
| **SWOT** | Strengths, Weaknesses, Opportunities, and Threats |
| **TSC** | Teachers Service Commission |

# Executive summary

Since August 2020, EdTech Hub has supported the Kenya Institute of Curriculum Development (KICD) to implement activities under the Learning Continuity in Basic Education Project (LCBEP). As part of this technical assistance, the KICD asked EdTech Hub to conduct a rapid strengths, weaknesses, opportunities and threats (SWOT) analysis of the Kenya Education Cloud (KEC), focusing predominantly on the content platform. While the SWOT analysis has been undertaken independently by EdTech Hub, this report would not have been possible without significant collaboration between the two teams. The insights in the report were generated through two intensive interactive workshops and frequent discussions.

The purpose of this analysis is two-fold. First, to help the KICD identify both the ways in which the KEC is functioning well, as well as areas that require further focus and strengthening. Second, the analysis provides concrete recommendations and actions to address these areas.

The report achieves the first purpose by examining key aspects of the KEC. The report examines the following:

- KEC overarching design and development.
- Usability.
- Content organisation and performance.
- Monitoring and data collection.
- Value proposition.
- Legal framework.
- Partnerships and collaboration.

These analyses are summarised in matrices at the end of each subsection which highlight the strengths, weaknesses, opportunities, and threats in each area.

The second purpose is achieved in the final section of the report, which contains three recommendations. In summary these are:

- **Develop a long-term strategic plan for the KEC:** In recent times, much of the KEC's evolution has happened organically. New platforms have been developed as and when needed, many of which have

dependencies on other modules that are incomplete or not functioning. When doing this, the KICD should specifically consider:
    - Collaborating with a firm with experience in deploying virtual learning environments to design the strategic plan.
    - Designing the strategic plan so it can be implemented using an iterative and agile approach.
- **Identify ways to rapidly add relevant content for the KEC.** The current platform does not have sufficient content and only provides one method to add additional content. When doing this, the KICD should specifically consider:
    - Collaborating with an experienced organisation to design a robust content curation strategy that can be rapidly implemented.
    - Proactively curating existing open educational resources.
- **Reconsider the current commercial approach for the KEC.** In practice, the commercial approach does not yield sufficient content, nor does it generate revenue or attract students. When doing this, the KICD should specifically consider:
    - Making the platform free for students.
    - Bearing the cost of licensed content.
    - Creating a business plan that identifies past and future costs and helps understand which costs and efforts are justified.
    - Engaging local, smaller content providers and large, international content providers.
    - Curating free open educational resources.

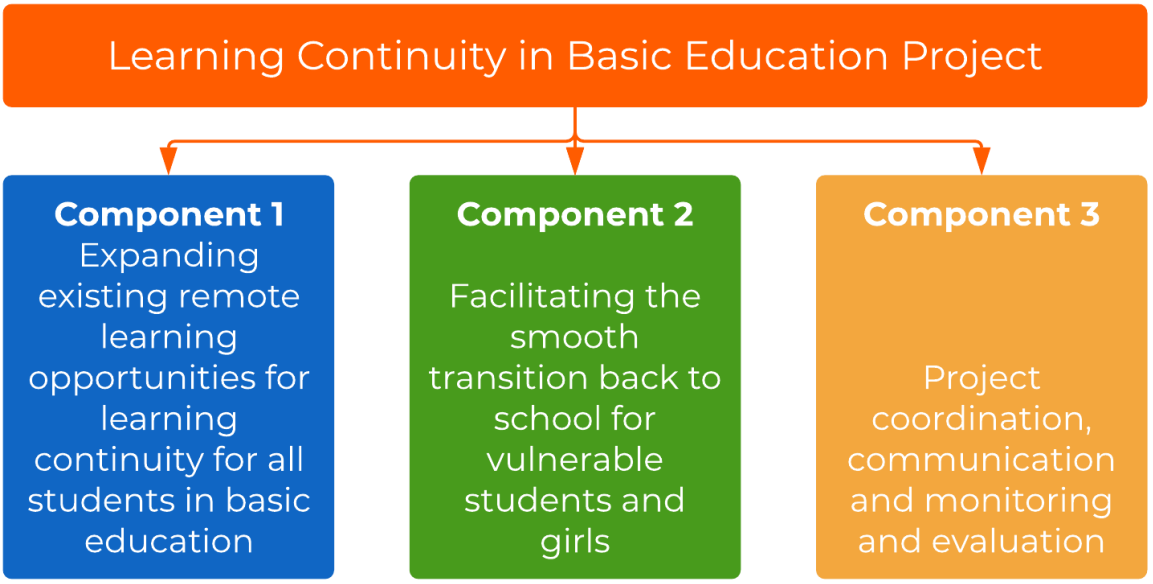
# 1. Introduction

This rapid SWOT analysis was performed as part of EdTech Hub's collaboration with the KICD. This introduction describes the context of this collaboration, the background and purpose of the KEC, and the nature, purpose, and limitations of the current analysis.

## 1.1. Report context

In response to school closures starting in March 2020, Kenya's Ministry of Education worked with partners to design the Learning Continuity in Basic Education Project (LCBEP) (↑Global Partnership for Education, 2020). The US$ 11 million project, funded by the Global Partnership for Education ↑Global Partnership for Education (2021), focuses on increasing access to distance education for Kenya's primary and secondary students. It is also supporting a smooth return to school for the most vulnerable students. To achieve this, the project comprises the three components shown in Figure 1.

**Figure 1.** *Components of the Learning Continuity for Basic Education Project.*



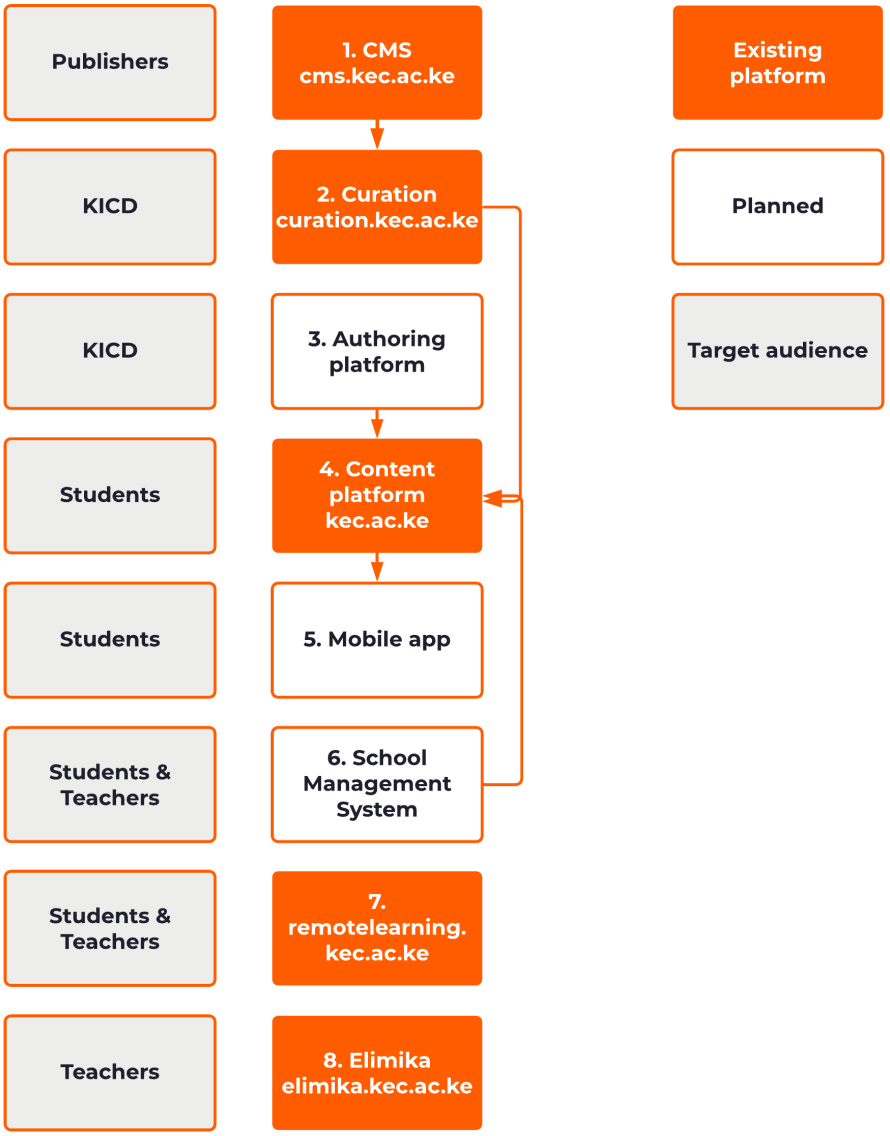

One of the activities under Component 1 is the execution of a Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis of the Kenya Education Cloud (KEC).

## 1.2. The Kenya Education Cloud

The KEC is an online platform designed to deliver content to Kenya's students. First initiated in 2018, the KICD has been working to improve access to and the quality of content on the KEC to support high quality learning opportunities.

The KEC comprises several platforms, some of which are developed while others are planned. Some are interdependent, while others are stand-alone. A schematic of the existing and planned platforms is provided in Figure 2, with a brief description of each module below the diagram.

**Figure 2.** *Existing and planned KEC platforms and their intended audiences.*



**1. Content Management System (cms.kec.ac.ke)**

The content management system (CMS) allows publishers to suggest or upload content for review. Once uploaded, content moves into the KICD content curators' platform.

**2. Curation platform (curation.kec.ac.ke)**

The curation platform is used by KICD content curators to select and approve content uploaded through the CMS. If approved, content is moved to the content platform to be used by students.

**3. Authoring platform (planned)**

The KICD plans to create its own authoring platform to design content. This content will then move to the content platform.

**4. Content platform (lms.kec.ac.ke)**

The content platform is where students and teachers find content. Currently, students can access the content for free, but are required to create additional logins for some content. Before Covid-19, this included an e-commerce module where students could purchase content; after Covid-19, the plan is to add such an e-commerce module again.

**5. Mobile app (planned)**

An app is planned to allow students to log in, buy and download content for offline usage.

**6. School management system (planned)**

A school management system (SMS) is planned to allow schools to support learning and generate analytics on learner performance. It will support communication between students and teachers. User data and analytics will be displayed in a dashboard integrated with the content platform.

**7. Remote learning platform (remotelearning.kec.ac.ke)**

The remote learning platform platform pilot is a collaboration with Microsoft. It supports synchronous online classes and offers collaborative tools. It does not have an interdependence with the other platforms .

**8. Elimika (elimika.kec.ac.ke)**

The Elimika platform supports teachers' professional development including using the content platform in their teaching. It contains courses which include a Competency-Based Curriculum (CBC) course, CBC learning areas, technology integration, health Literacy and financial literacy.

## 1.3. What is a SWOT Analysis?

A SWOT Analysis is a Strengths and Weaknesses; Opportunities and Threats analysis (↑Mind Tools Content Team, no date). It tries to identify what works well, what does not, and where opportunities or threats may lie. In its simplest form, a SWOT matrix looks something like the diagram presented in Figure 3.

**Figure 3.** *The contents of a SWOT matrix.*

## 1.4. KEC SWOT analysis - Scope, process and structure

In November 2020 the KICD requested EdTech Hub conduct an independent SWOT analysis of the content platform of the KEC. While the KICD intends to conduct a comprehensive SWOT analysis of the entirety of the KEC, this analysis was limited by time (findings were required by the January 2021), so the analysis subsequently focused on the content portal for students and takes other portals into account insofar as they are relevant for this portal.

On 1 December 2020, the KICD team shared a draft work plan with the EdTech Hub team and presented it in an online session. The EdTech Hub team worked with the KICD team to refine and finalise this plan in a session on 3 December 2020. The final version of the plan can be found in Annex 1.

Two co-working sessions were held on 4 and 11 December 2020, in which the EdTech Hub team requested information and data on all aspects of the KEC — both from an organisational and a product point of view — and discussed them with the KICD team. These sessions were split into two groups. A planned third working session was not convened after the teams agreed that the information that had been provided to date was the best that would be available in the short time period allocated for this task.

This SWOT analysis consists of two, interconnected parts. First, a narrative analysis is provided describing strengths, weaknesses, opportunities, and threats of the content. The identification of these often depends on information provided verbally or data shared. Where relevant, more data has been added to the Annexes. Then, based on this analysis, the main findings are used to inform the recommendations and next steps.

## 1.5. KEC SWOT analysis - Limitations

This rapid analysis was conducted in a short period of time. The period from planning the process to producing a draft took less than one month. The time period meant that the focus of the analysis needed to be narrowed to an adequate scope. The KICD requested EdTech Hub to focus on an analysis of the content platform, with other platforms considered where relevant.

While the analysis presented within this report is robust, the short time period allocated means that access to information was limited in a number of ways. First, while the KICD was able to quickly produce a large amount of data and

provide insights into the KEC, some insights could not be gained in the time period allocated. For example, a rigorous assessment of the existing human and technical capacity could not be conducted. As such, this means that an analysis of these areas has not been included in this report. Second, no focus group discussions with stakeholders outside of the KICD could be conducted. It is recommended that the KICD organise feedback sessions with key stakeholders, including students and teachers, to gain further insights.

Given the above, this analysis is based on two types of data: verbal information provided during the two work sessions and over e-mail and direct messaging platforms, and datasets shared by the KICD. Still, the commitment and dedication of the KICD's team members meant that the information provided was comprehensive, valuable, and sufficient.

Finally, this SWOT analysis report should not be viewed as a judgement of the KEC, but rather as a document designed to support the KICD's ambition to strengthen and increase the reach and effectiveness of the KEC.

# 2. Analysis of the Kenya Education Cloud

This section contains a SWOT analysis of the KEC. The section examines the following aspects of the KEC to gain insights from various perspectives:

- KEC overarching design and development
- Usability
- Content organisation and performance
- Monitoring and data collection
- Value proposition
- Legal framework
- Partnerships and collaboration

## 2.1. KEC Overarching design and development

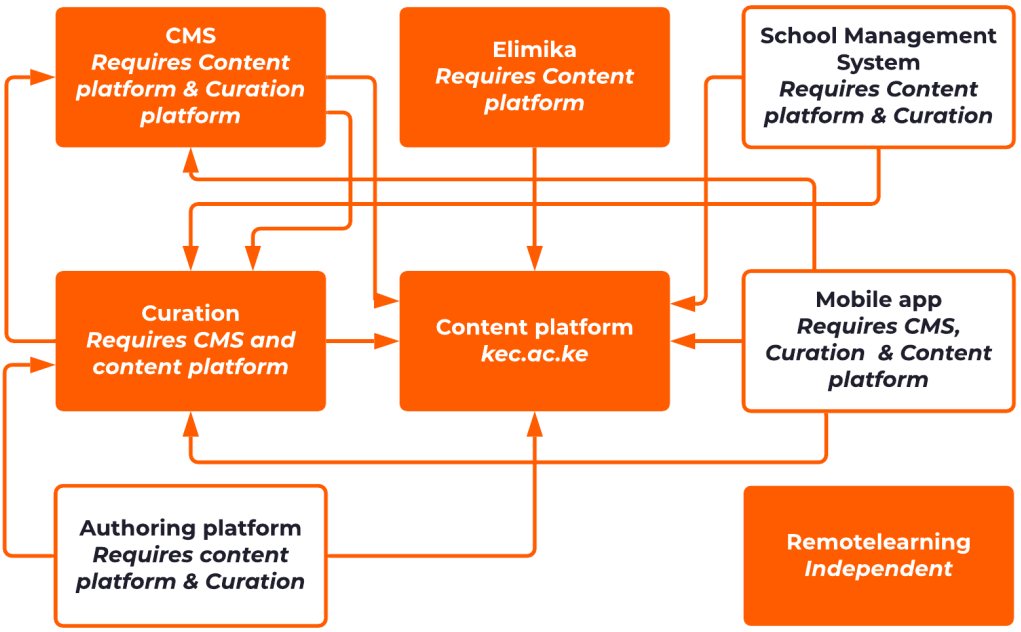
The KEC consists of multiple platforms, each of which has a discrete task and targets different stakeholders. The different platforms comprising the KEC are, individually, clearly defined and aim to perform distinct roles making them suitable for their precise tasks. The various platforms have the potential to cumulatively form a robust system to support online, remote learning.

It seems, however, that new platforms are being added as the vision for the platform evolves. It is unclear whether there is an overarching, integrated plan for the development of the entire KEC. Instead of such a roadmap, different platforms are being developed based on a discrete need. For example, two more platforms are planned by the KICD: a school management system and a content authoring platform, though it is unclear when or why these were included. Finally, after developing the school management system, a smartphone app allowing students to download content is planned.

Not having an overarching plan carries a risk of misalignment between platforms. Developing too many platforms simultaneously, particularly when one platform depends on another, can make it challenging to design and build both in parallel. In addition to creating new platforms, there are plans to integrate the content platform with the national Education Management and Information System (EMIS), which is not part of the KEC. While not insurmountable, the lack of an overarching plan results in several significant threats that require acknowledgement. When a platform relies on the successful co-development and implementation of other platforms, there is a

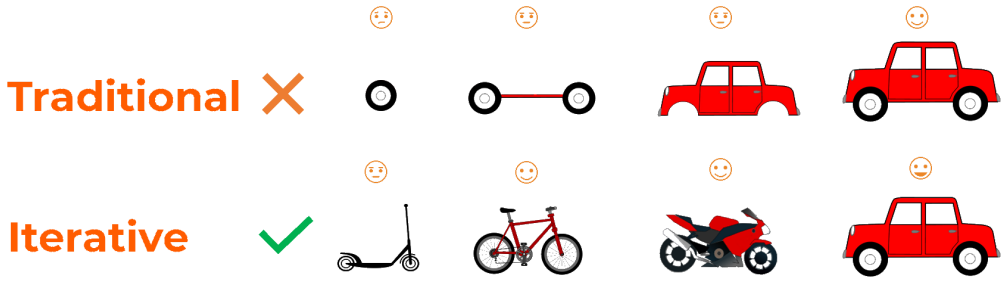
large risk of failure: if one platform is not delivered successfully or on time, the contingent module is also significantly impacted. Figure 4 shows the complexity of many interdependent platforms.

**Figure 4.** *A large number of interdependent platforms carries risks.*




To mitigate this threat, an agile, iterative process could be adopted where each step in the process creates a viable product and moves iteratively towards a more complex solution (↑Adam, et al., 2020). The two approaches are shown in Figure 5.

**Figure 5.** *A traditional versus an iterative approach (Source: ↕**Adam, et al., 2020**, Creative Commons Attribution 4.0).*




Besides the number of platforms that are planned, the KICD plans to design, build and manage these platforms in-house. The decision to pursue an in-house approach seems to be based on assumptions that have not been tested. For example, in addition to the need to develop an overarching plan, there is no clear overview of expected investments in the platform. If this approach is pursued, it should be done with a clear, long-term vision and adequate resources in place. It is unclear why an in-house approach is being prioritised. For most, if not all, platforms that the KEC has planned or developed, existing platforms are available. For instance, in the content platform, commercial providers such as Instructure's Canvas[1] or open source platforms such as Moodle[2] provide mature and widely used platforms. Authoring tools such as GoAnimate or Articulate360 are commonly used. Some of these, such as the learning management system Kolibri, are available as open-source software and have been trialled in Kenya and similar settings.

Such existing platforms provide the KICD with options to more effectively deliver on its mandate. These platforms have generally had many iterations and refinements following investments of millions of dollars. Developing these platforms in-house is a formidable expense, will take several years, and requires significant expertise and capacity; in addition to the development effort, there will be expenses for maintaining, updating, and further developing the platforms to keep them current. There may well be a case for developing platforms in-house; however, the advantages and disadvantages can only be determined after an in-depth market analysis of available

[1] Information available at https://www.instructure.com
[2] Information available at https://moodle.org

platforms and costs, including customisations if necessary. Table 1 provides an overview of the identified strengths, weaknesses, opportunities and threats.

**Table 1.** *SWOT analysis of KEC's overarching design and development.*

| | |
|---|---|
| **Strengths**<br>■ Multiple platforms already developed and operational<br>■ Clear purpose to each platform | **Weaknesses**<br>■ Lack of a single, overarching strategic plan<br>■ Multitude of platforms loses focus<br>■ Platforms are added as the vision evolves<br>■ No analysis of suitability of platforms available on the market |
| **Opportunities**<br>■ Existing platforms can be procured with higher maturity and at lower cost<br>■ An agile, iterative approach may yield more effective platforms when built in-house | **Threats**<br>■ Developing several platforms simultaneously may risk having no one platform performing as intended<br>■ The interdependence of platforms makes the success of the content platform contingent on the success of other platforms<br>■ The absence of a roadmap may lead to ad hoc platforms that are not justified |

## 2.2. Usability

In the previous sub-section, we reviewed the design and development of the broader KEC. This sub-section focused solely on the content and Elimika platform's usability. We focus on features impacting user experience, specifically the platform design, layout and features, errors observed during platform use, user testing, and bandwidth requirements.

### 2.2.1. Design

The content platform and the Elimika platform both have a responsive design. This means the websites automatically adjust their functionality and layout depending on whether the device used is a smartphone, tablet, or computer screen. Feature phones — mobile phones without smartphone functionality and typically with a small screen and buttons — may use some features of the platforms, however these features have not been tested. Designing access to

feature phones, or at least providing access to certain content on feature phones, is an opportunity worth pursuing.

### 2.2.2. Layout and features

The content platform has a clear and straightforward layout. This makes it easy for users to navigate through the system and engage with the content. This is an excellent starting point, as often platform designers overcomplicate the interface, which distracts students from learning.

However, the platform contains a number of additional features which may be unnecessary. When students log in, they find a calendar, messaging services, grades and other features. While a calendar has a potential benefit when it shows courses and can be integrated with existing calendars that learners use, in practice, the calendar does not contain any information and does not integrate with existing systems. Likewise, options for grades and messages are there, but do not contain information. Students are asked to enrol in courses, but cannot actually enrol. In general, designing features in a platform that already exist and are used outside the platform, such as a calendar, makes it less likely that these features will be used in the new platform.

Finally, students can access content from any grade, but the system does not remember the grade they accessed previously. Currently, there seems to be no advantage to logging in to the system as opposed to accessing it as a guest user. Moreover, for this analysis, a user account was shared, but students in Kenya cannot currently log in to the system and can only use it as a guest.

The Elimika platform also has a simplified layout and this can be attributed to the fact that it is designed using Moodle. This makes it easy to design using a drag-and-drop approach and also easy for users to locate different features.

The Elimika platform has additional essential features which include a dashboard that displays progress of the teacher in training, a calendar that can be used to set and schedule events, certificates of courses successfully completed, and a tab for private files for teachers to upload and save their files.

### 2.2.3. Errors

A number of pages and links do not work. The link to ‘Learn more’ on the landing page does not work. Clicking on ‘Dashboard’ gives a non-informative

error message ('invalidparameter / Invalid parameter value detected'). Also, right-clicking and viewing the HTML source of the pages are disabled.

### 2.2.4. Usability and user testing

The KICD has conducted two surveys on remote learning and the KEC:

1. 'A rapid survey on the uptake of educational broadcasts for learners during the "stay at home" period' (no date)
2. 'Survey of remote learning through the Kenya Education Cloud' (completed in August 2020)

The first survey focused on remote learning through radio and television and falls outside the scope of this analysis.

The survey on remote learning tried to map the online communication platforms currently being used in the country, rather than getting feedback on the KEC's content platform, or on other content repositories used in the country. The results of this survey strengthened the KICD's decision to pilot with Office365 in their remotelearning.kec.ac.ke platform. However, with 463 respondents (285 teachers and 178 learners) the response was modest and limited to students already using online platforms.

No other student surveys, focus groups, user observations, or other data gathering exercises focused on end-users have been conducted.

Since the Elimika platform was only recently created, there is currently no information on usage. However, going through the different accessible courses on the platform shows that there are not more than 9 users as of 19 January 2021, with the earliest access time to modules being 7 days before.

### 2.2.5. Bandwidth

The KEC has high bandwidth needs but does not offer options to download content and save it for later use, for example through a public hotspot. Content items range from 10 MB for items such as radio lessons and PDFs to 900 MB for EDU TV lessons. The KICD team reported an average content size of 500 MB. In 2017, more than half of the users in Kenya purchased data plans that were 350 MB or smaller, keeping the average file size out of reach for the average user (↑Gemeda & Thakur, 2017). This threat to usage comes with an opportunity. The government can negotiate agreements with telecom operators and make the educational content provided by the KEC available

without cost to the user, so-called zero-rating (↑McBurnie, et al., 2020). Table 2 gives an overview of the identified strengths, weaknesses, opportunities, and threats for the KEC's usability.

**Table 2.** *SWOT analysis of usability.*

| | |
|---|---|
| **Strengths**<br>■ The portal has a responsive design, catering to smartphones, tablets, and computers | **Weaknesses**<br>■ The portal has many dead links and contains content that is not displayed correctly<br>■ The interface contains features that do not work and do not add value |
| **Opportunities**<br>■ Including access for feature phones in the design may broaden the user base<br>■ The platform design is expandable and can include features for learners with disabilities<br>■ Zero-rating the platform may increase its usage<br>■ Undertaking user testing will provide an opportunity to learn about user needs and strengthen the system | **Threats**<br>■ Average users in Kenya have data bundles that are not sufficient to the platform's bandwidth requirements<br>■ The lack of content, the features that cannot be used and the errors within the content may lead users to lose trust in the platform |

## 2.3. Content

Whether inside or outside of the classroom, access to high-quality content is key to supporting learners to achieve their potential. This subsection examines content in the context of the KEC's content platform, as well as the ELimika teacher training platform. It looks at content availability, content organisation, and content performance.

### 2.3.1. Content availability

The KICD has acknowledged the importance of content by developing a robust system to ensure that only high-quality content is available on the platform. All content that is accessible on the platform is either created by the KICD, or approved by the content curation team. External content is subject to a comprehensive quality assurance process to ensure content quality. The trust that the KICD has built among students, and the government-endorsed

curriculum-aligned content are clear strengths for the KEC and potentially make it the best starting platform for any student looking for content online.

While these processes mean that only high-quality content is uploaded on the platform, one of the largest threats to the usefulness of the KEC is a lack of content. Currently, there is not enough content for students to follow the entire curriculum. The lack of content is often mentioned as a major limitation of the platform by the KICD team members. As of early October 2020, the KEC contained 663 content items, covering pre-primary to Form 4 and comprising five main types of content and some other content (Table 3).

**Table 3.** *Number of content items in the KEC in October 2020.*

| Type of content | Content items per content type |
|---|---|
| Interactive content | 52 |
| E-books (epub) | 62 |
| Storybooks (English) | 85 |
| Storybooks (Swahili) | 59 |
| Radio content | 162 |
| TV content | 160 |
| Other content | 83 |

With 11 grades of content, there are on average circa 60 content items per grade, divided over all subjects. This number of content items illustrates the KICD team's observation that in its current form, the KEC has insufficient content to comprehensively support students' remote learning needs.

The process of offering, selecting, and approving content — illustrated in Annex 4 — is likely inadequate to fill the KEC with the required content in the short term. A search on the content upload and approval portals shows that they are hardly being used. The publishers' portal shows 10 content items

created by the KICD, but no items in any other sections. The KICD content curators' portal shows no content awaiting approval. Additionally, there appears to be no monitoring process in place to track production or curation. It remains unclear how fast the progress is or what targets are.

A side effect of the KICD's current process seems to be that many promising content providers in Kenya, such as eLimu or Ubongo, seem to be excluded from the curation process. International open resources are also excluded. In 2020, UNHCR supported an effort to map mathematics content for Forms 1 and 2 with Khan Academy and other content. While this could have added close to 400 content items to the content base — an increase in the content base of over 60% — this content is not offered in the current LMS. It did not become clear during the drafting of this report why this content was not added.

The KEC's portal contains some content that caters to students with special needs, such as materials containing sign language. However, this is limited and appears only available for a few grades. Aside from a lack of content for students with disabilities, the lack of user data means it is unclear if students with disabilities can find the portal, access it, or use content. Through its accessibility settings, the Elimika platform has the ability to change from a default font to a dyslexia-friendly font.

The Elimika platform currently contains 5 modules: the *CBC course*, *CBC learning areas*, *ICT integration*, *health literacy* and *financial literacy*. The *CBC course* contains 6 modules and 18 sessions or chapters while the CBC learning areas contains various subjects including:

- Mathematics
- Science and Technology
- Agriculture
- Arabic
- Art and Craft
- Christian Religious Education
- English
- French
- German
- Hindu Religious Education
- Indigeneous Languages
- Islam

- Music
- Social Studies
- Kiswahili
- Hygiene and Nutrition

Within each of the subjects mentioned above there are four sessions which are:

1. Essence statement and learning outcomes
2. Pedagogy
3. Resources
4. Assessment

The first two sessions on learning outcomes and on pedagogy all contain the same information while the other sessions on resources and assessment contain information related to how to identify and improve learning resources as well as information on how to identify the specific assessment methods, tasks and rubrics in grading the performance of learners.

Under the various subject links for the four sessions, there is a repetition of the same content, which displays information for either *mathematics* or *science and technology,* apart from the languages and the religious subjects, which also all display the same content.

The *ICT integration* course contains three main modules which contain further sub-modules: *leadership in ICT integration in education* with seven sub-modules, *effective application of ICTs in education* with eight sub-modules and *ICT integration in teaching and learning* with four sub-modules. The *leadership in ICT integration in education* module contains sub-modules that cover areas ranging from leading and managing change in ICT integration, visions and policies, resource mobilisation and sustainability, and monitoring and evaluation. The *effective application of ICTs in education* module contains sub-modules which cover operating systems, assistive technologies, support and maintenance, and ethical use of ICTs in teaching and learning. The *ICT integration in teaching and learning* module contains sub-modules which cover areas on leading and managing change in ICT integration, 21st century learning, development of ICT integrated lessons, and teacher CPD.

### 2.3.2. Content organisation

A choice has been made to organise content first by grade, then by format (interactive digital content; e-books; radio lessons; and the 'educhannel') and then by subject. After selecting the subject, all content in that format for that grade is displayed. In Table 4 (Content organisation options) below, this choice is the 'Format-centric' organisation option . While there may be good reasons for organising the content in that way, no rationale for this choice was provided, and no user feedback sessions or usage observation sessions have been held with students that support this organisation above others. Other options might include those where content is organised by subject, then by format (the subject-centric option), or according to the chapters (the chapter-centric option). Besides the grade levels, in the Home screen, there are links to 'General Knowledge' and 'Open Education Resources (OER)'. Since they are not placed in a grade, it is less likely that students will find them.

**Table 4.** *Content organisation options.*

| Organisation options | Step 1 | Step 2 | Step 3 | Step 4 |
|---|---|---|---|---|
| **Format-centric** | Grade level | Format | Subject | All content for grade is shown that matches format and subject |
| **Subject-centric** | Grade level | Subject | Format | All content for grade is shown that matches subject and format |
| **Chapter-centric** | Grade level | Subject | Chapter | Appropriate content regardless of format |

Within the Elimika platform, the content is organised per subject but instead of a focus on the grades, it has a generalised approach.

### 2.3.3. Content performance

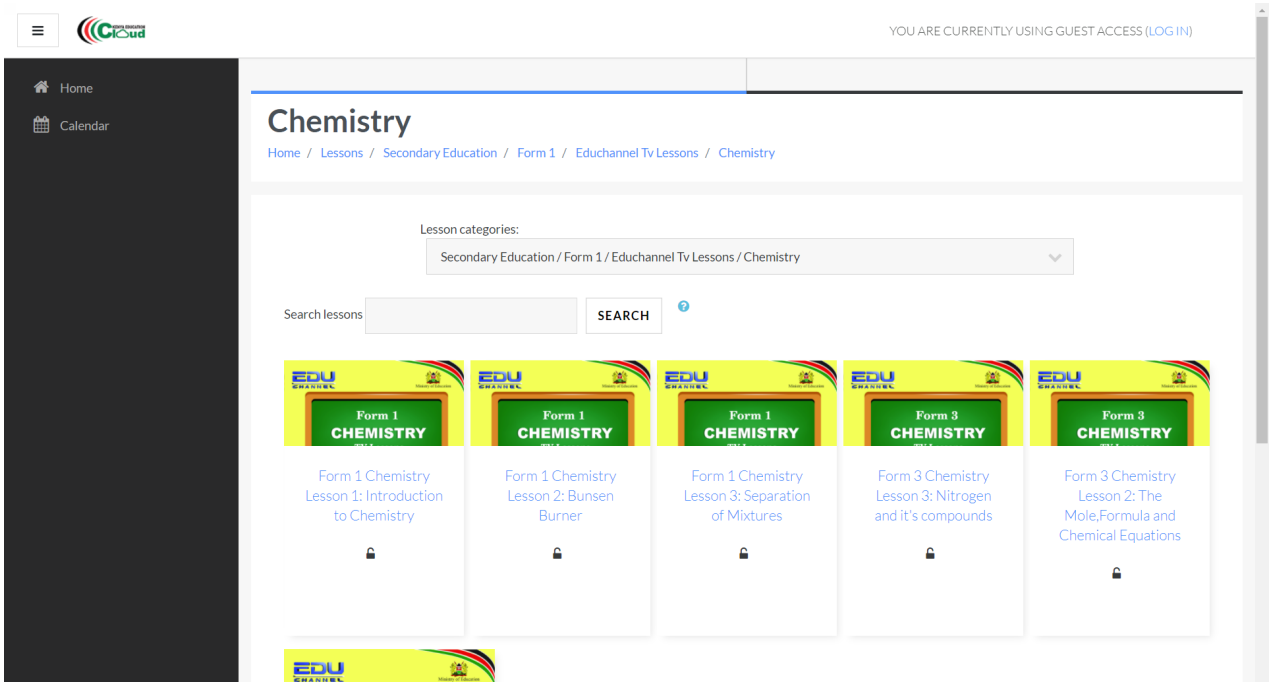
When accessing content on the content platform we encountered problems with display, missing information, and dead links. These problems are a sign of a lack of monitoring and risk eroding user trust. Table 5 gives an example of some errors encountered on the KEC. This list is by no means exhaustive but is meant to illustrate that there are problems in the usability of the platform.

**Table 5.** *Examples of problems encountered in content on the KEC.*

| Types of content | Types of problem |
|---|---|
| **Interactive digital content (Form 1)** | ■ Content frame was too big for the frame, making it impossible to click on the menu on the left<br>■ Content was too big for the frame, making it impossible to do the exercises or quizzes<br>■ Some image links are broken, showing 'missing image' icons instead of images |

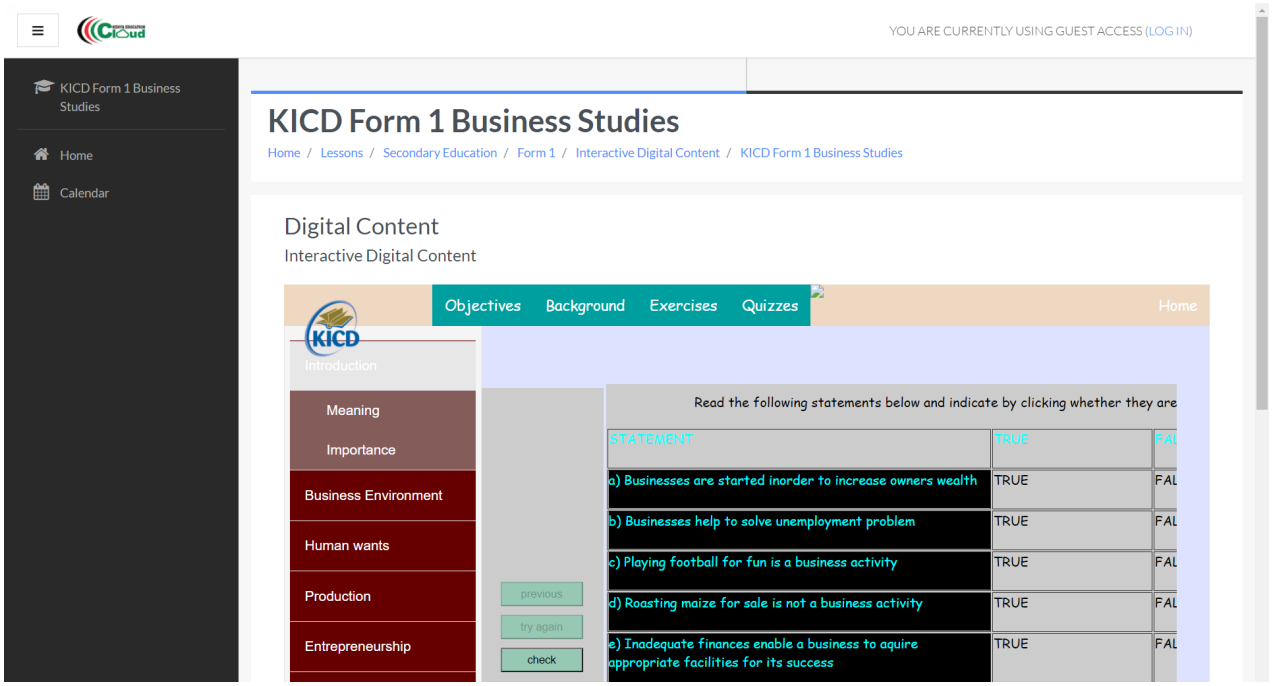
| | |
|---|---|
| **Educhannel TV Lessons (Form 1)** | • The only two lessons for *mathematics* are organised with Lesson 3 first, followed by Lesson 2, which is confusing for students<br>• *Chemistry* content includes lessons for Form 3, also in non-successive order (Figure 6)<br>• A link to Kiswahili exists, but does not contain any content |
| **Ebooks (Form 1)** | • A link to Ebooks exists, but does not contain any content |
| **Interactive digital content (Form 2)** | • Interactive Digital Content for Form 2 *English* actually contains Interactive Digital Content for Form 1 *chemistry*. Content is placed in the wrong form and the wrong subject |
| **Binogi content** | • Students are required to create a Binogi account and log in to Binogi each time it is accessed |
| **Binogi content** | • Binogi content is offered in several languages, but not in Swahili |
| **Binogi content** | • Binogi content marks answers without the unit as incorrect. It also only marks the European convention for decimal notations as correct (110,3 mL instead of 110.3 mL), potentially confusing and frustrating students. |
| **BrainPop Jr. content** | • Some BrainPop Jr. content in the OER section requires a login (e.g., 'Creative Coding') or gives an error message (e.g., 'Make-a-Map'). |

**Figure 6.** *Educhannel content for* Chemistry *Form 1 on a computer screen which includes Form 3 content.*




Having dead links stems from a lack of a proper monitoring and feedback mechanism to regularly identify and solve technical problems. This type of problem may cause users to lose trust in the website. Visitors who try to access content but encounter errors may not return to the website and may look for alternative sources instead. Regaining trust from users may prove more difficult than getting users to use the platform in the first place. A quick scan of the first 4 out of 14 subjects (*English*, *business studies*, *agriculture* and *biology*) in interactive digital content for Form 1 showed that none of the 4 subjects had interactive digital content that worked well, neither on phones nor on a computer screen. Figure 7 shows an example from *business studies* with a missing image icon, colour choices that make the text hard to read and quiz options falling off the screen.

**Figure 7.** *Interactive* business studies *content on a computer screen.*




The content of the modules in the Elimika platform are generally text rich but contain certain links to additional internal and external resources and contain descriptive images explaining different concepts. The modules also have discussion forums where different tasks have been set to help initiate discussions during the CPD sessions. An overview of the strengths, weaknesses, opportunities, and threats for content is provided in Table 6.

**Table 6.** *SWOT analysis of content.*

| | |
|---|---|
| **Strengths**<br>■ Content is government approved and curriculum-aligned<br>■ Users have faith in the quality of the content on the portal<br>■ Needs of students with disabilities has been considered for the portal design | **Weaknesses**<br>■ There is a lack of content on the portal<br>■ The content organisation on the website does not seem aligned with how students use content<br>■ The envisioned process of offering content, curating it and moving it to the content platform does not seem operational<br>■ The amount of content aimed at students with disabilities is limited |
| **Opportunities**<br>■ The KICD has access to teachers and can mobilise them to help create content | **Threats**<br>■ The lack of content risks losing students to competing platforms<br>■ There is no tracking mechanism for |

| | |
|---|---|
| | the amount and source of content on the platform<br>■ There are no targets on content curation or production<br>■ It is unclear if students with disabilities can access the site or find appropriate content |

## 2.4. Monitoring and data

Gathering regular data through robust monitoring processes is a key step in understanding the success of any distance education initiative. There are four main elements when monitoring distance education: availability, access, usage, and learning (↑Kaye, et al., 2020). Elements related to availability have been discussed in the previous section on content to some degree. Monitoring learning goes beyond the scope of this SWOT analysis. In this subsection we will look at the monitoring of the middle two elements — access and usage.

As part of the SWOT analysis, the KICD team shared data generated through Google Analytics (Annex 3). Using Google Analytics makes the data easy to obtain, read, explain, and compare. Google Analytics generates data on generic access information, such as the number of visitors per month and the types of content that have been accessed.

However, since students cannot log in, no data exists on usage. Not knowing who the visitors are or understanding their behaviour has several threats. First, it is not clear whether students are able to find content that is appropriate for them and their grade level. In other localities, students were known to access content that was not suitable for their level. Nor is it clear how frequently students return to the website. For example, do students only visit once and not come back, or do they come back regularly once they have found the portal? Answers to such questions can inform refinements to the portal.

A monitoring dashboard or monthly reporting system containing KPIs is also not in place. Had there been KPIs on content curation, the platform would not be able to show if these KPIs were met. However, there is a monitoring and evaluation officer whose task can be expanded to create and publish structured monthly reports on predetermined indicators and metrics.

The Elimika platform contains a dashboard that displays progress and the system provides teachers with the option of enrolling for the different available courses on the platform. Since it is only available to registered users, the platform is able to remember the courses which the different users enrolled for. This is an advantage for the training process of the teachers as they can always pick up from previous online training sessions.

Strengths, weaknesses, opportunities, and threats for monitoring and data are displayed in Table 7.

**Table 7.** *SWOT analysis of monitoring and data.*

| | |
|---|---|
| **Strengths**<br>■ Google Analytics provides some statistics on platform usage | **Weaknesses**<br>■ There is no data on individual users<br>■ It is not clear if users access grade appropriate content or if users return<br>■ The amount of monitoring data is limited and difficult to obtain<br>■ No user sessions have been held with students and teachers on usability |
| **Opportunities**<br>■ There is a Monitoring and Evaluation (M&E) officer in place who can take ownership of monitoring needs<br>■ Tracking usage and content per KPI through monthly reports gives control over the platform's performance | **Threats**<br>■ The lack of monitoring data prevents the KICD from identifying and addressing problems |

## 2.5. The value proposition

In order to consider the value proposition of the KEC, we look at two elements. First, we examine current levels of access. We then review the e-commerce model of operationalising the content platform adopted by the KICD.

### 2.5.1. Current access

On average, there are between 300 and 400 visitors to the platform per day, though this number has gradually fallen towards the end of 2020. With an average session duration of five and a half minutes, this usage translates to one school with 10 grades and one class per grade accessing the content for less than six minutes per day. These numbers can be put in perspective by comparing them with other providers in Kenya. Eneza education, a

feature-phone-based commercial solution targeting primary and secondary learners, has a reach of 5 million students in Kenya. Ubongo, which provides pre-primary and primary content on TV and YouTube, has a reach of 2 million students. E-Limu, also targeting primary learners, had half a million users in 2020 and averages 4,000 users per day (↑Otieno & Taddese, 2020).

A more in-depth analysis of all players in Kenya, number of daily users, session times and learning outcomes is recommended, An analysis on the return on investment, where the investment and hosting costs are divided by the number of learners or hours of usage would also be useful.

Since no target number of visitors is defined and no KPIs were identified, it is difficult to decide whether the number of visitors is satisfactory, or at which point an intervention is needed. This might include changes in the platform itself or marketing efforts to make the KEC better known. With 18 million students in Kenya, of whom 43% have internet at home (↑Otieno & Taddese, 2020), it is up to the KICD to define the proportion of students it wants to reach every day and the daily minimum required to consider the platform a success.

### 2.5.2. e-Commerce platform

Prior to the Covid-19 crisis, the KICD built a platform where students could access content for a fee. The KICD refers to this platform as an e-commerce platform. The rationale for creating an e-commerce platform was two-fold:

- Commercial publishers objected to the KICD being both a regulator and a competitor. A free platform would compete with commercial partners.
- The KICD decided that an e-commerce platform would be more sustainable in the longer term without government help. This could help shield the KEC from political changes.

The e-commerce platform was developed and launched and a profit-sharing model agreed with publishers. However, the platform had not yielded any revenue prior to Covid-19 and is currently not operational.

When Covid-19 struck, publishers allowed their content to be used for free on the KEC. However, this agreement is temporary (though no end date has been set). Once Covid-19 passes and schools reopen, access to commercial content will no longer be free. The KICD plans for the KEC to once again become an e-commerce platform or a platform with a freemium model — that is, a platform with some free content and some content that requires a fee.

Any learning platform requires a solid plan, and an e-commerce platform requires a business plan that can include aspects such as:

- A market and competitive analysis
- Projected revenue
- Projected costs (a cost-benefit analysis)
- A break-even point
- Metrics and indicators on content, users, etc.
- Indicators that define when problems are escalated and interventions are necessary

However, in the case of the KEC there is no such plan. As a result, there is no clear idea on the amount of content needed per grade and subject, the revenue needed to sustain the initiative, or the number of users needed per month with a specified fee per month. Nor are there mechanisms to trigger interventions in case the targets are not met. Moreover, there is no clear view on the investments that have been made so far in the platforms. The hosting costs of the platform, which do not include any HR costs or investments, are estimated at Ksh 10,000,000 per year.

The lack of an up-to-date market analysis is a case in point. Prior to launching the e-commerce platform, the KICD performed a market analysis showing that there was a lack of comprehensive solutions on the market. However, such a market analysis has not been repeated, although Covid-19 has shaken the market considerably and new competitors may have arisen since.

A major threat to the e-commerce model is that the KEC will not attract paying students. Without defining and projecting the necessary number of fee-paying students and identifying an expected break-even point, an e-commerce platform may end up incurring high costs on sustaining and developing the platform, while denying the vast majority of students in Kenya access, especially those students who are most in need of content. If, in practice, the KEC is mainly a content sharing platform without other benefits to subscribing, content may be downloaded and shared through other platforms. A plan ought to be in place where the KICD formulates alternative scenarios and will reconsider moving from a fee-based to a public and free model if certain targets are not met.

The plan to build an e-commerce platform also carries opportunities. First, there is the stated intention that the platform sustain itself. While it will need a

proper business model, it could be effective in the longer run. Second, the e-commerce model that has been chosen — collaboration with commercial publishers who make their content available in return for a proportion of the revenue — means that potential competitors become collaborators. This has the potential to increase the amount of content available while at the same time removing potential competitors from the market. As noted above, however, the amount of content that has been curated is limited. Third, Kenya's school system is a model for neighbouring countries. Several neighbouring countries have a similar curriculum and the same languages, with Swahili in primary and English in secondary grades. It would be comparatively easy to adjust the KEC's content platform in such a way that the KEC could expand to these countries and increase its user base.

The end of Covid-19 carries several risks for the KEC. Publishers will not continue to allow free access to their content. The government's revenue has gone down during the Covid-19 crisis and priorities may shift away from the KEC. The KICD is aware of that risk and is considering several approaches post-Covid-19. One strategy is to have two platforms: an e-commerce platform and a free platform. Another idea is to create a freemium model, where students can access some content for free, but would have to pay for other content. Such a two-pronged approach impels us to highlight the threat, identified earlier, of having too many platforms and losing focus. Currently, however, there is no plan for the scenario where the platform cannot sustain itself and the e-commerce approach does not work. The value proposition's strengths, weaknesses, opportunities, and threats are shown in Table 8.

**Table 8.** *SWOT analysis of the value proposition.*

| | |
|---|---|
| **Strengths**<br>■ The e-commerce platform locks in potential competitors<br>■ The e-commerce approach is designed to help ensure sustainability in the long term | **Threats**<br>■ There is no business plan for the e-commerce platform<br>■ There is no clear understanding of new competition developments<br>■ There is no clarity on whether students can pay the fee or are willing to<br>■ There is no roadmap that identifies deliverables and times<br>■ No KPIs or targets have been identified<br>■ There is no cost-benefit analysis prior to developing the platforms in-house, compared to procuring them |
| **Opportunities**<br>■ The e-commerce platform might insulate the KEC from political realities and make the KEC self-sustainable<br>■ An e-commerce platform might be scaled for use by neighbouring countries<br>■ The e-commerce platform may lock in competition through a collaborative approach<br>■ The KICD's authority may make it the standard for online content in the country | **Threats**<br>■ When the Covid-19 situation ends, commercial content requires a fee structure or may be removed<br>■ The e-commerce platform may end up with little revenue while denying students access<br>■ There is no clear approach to change of implementation after Covid-19 ends<br>■ Scenarios for the situation where the e-commerce platform does not work have not been developed<br>■ Other content developers and publishers may develop competing platforms<br>■ The absence of KPIs makes it difficult to find the right moment to intervene<br>■ The e-commerce platform may deny access to those students most in need |

## 2.6. Legal framework

Online platforms saving user data will need to comply with legal frameworks, especially when these platforms cater to vulnerable people such as children. Kenya has recently enacted a data protection law, which was operationalised in 2020 (↕Republic of Kenya, 2019). At this moment it is not clear to what extent this law affects the operations of the platform, especially since the platform

plans on tracking more learner data. For example, currently, data is hosted in Azure's cloud computing solutions. The law may require that data is hosted locally, which could greatly increase the cost and might make the current technological approach untenable.

Not complying with a legal framework makes the KEC vulnerable to competitors. Even when the government decides not to enforce compliance, competitors may sue and argue that their investments in compliance give an unfair advantage to the KEC. Further, laws in other countries can form a barrier to entry in those markets. Table 9 sums up the strengths, weaknesses, opportunities and threats of the legal framework.

**Table 9.** *SWOT analysis of the legal framework.*

| | |
|---|---|
| **Strengths**<br>■ The KICD designs the national curriculum to which content in schools must be aligned | **Weaknesses**<br>■ It is not clear if the KEC complies with legal frameworks |
| **Opportunities**<br>■ Complying with new regulations may give KEC a competitive edge | **Threats**<br>■ Lack of compliance with legal frameworks leaves the KEC vulnerable to litigation |

## 2.7. Partnerships and collaboration

The KICD's success in establishing many partnerships is a clear strength. The KICD has successfully established various partnerships with publishers, with established, international technology companies, and with large international organisations. This ability has two advantages:

- The participation of commercial partners reduces the threat of commercial partners as competitors by making them part of the KICD's initiatives.
- It lets the KICD benefit from any content, expertise, and products that the various partners have developed.

A partnership with commercial publishers was established through the Kenya Publishers Association (KPA). This partnership has resulted in a revenue sharing agreement that allowed for the publishers' portal to be developed.

The content platform within the KEC has been set up with assistance from Microsoft, who assisted with its Azure cloud and first developed a proof of

concept. It established the current cloud infrastructure where all platforms are hosted. Intel supported the e-commerce platforms and the KEC apps for Android and Windows.

UNESCO has helped create content for teachers on health and health education for learners and partnered in developing material for students with special needs. UNICEF helped with selecting and mapping content for the KEC and with the initial curation process.

The telecom provider Safaricom partnered with the KICD to provide a free daily 100MB data bundle that had to be redeemed through a short code service. This data bundle enabled learners to access the KEC content and content from other educational platforms like Shupavu Web, Viusasa E-learning, and Longhorn's E-learning portal through the Safaricom network for free. Table 10 provides an overview of the strengths, weaknesses, opportunities, and threats of the KICD's approach to partnerships and collaboration. The usage of the data bundles is shown in Annex 2.

**Table 10.** *SWOT analysis of partnerships and collaboration.*

| | |
|---|---|
| **Strengths**<br>■ The KICD benefits from content and expertise from many partners<br>■ The KICD managed to establish partnerships with both publishers, Microsoft and Intel, Safaricom, and UNESCO and UNICEF | **Weaknesses**<br>■ KICD does not position itself as an institution that is open to collaboration |
| **Opportunities**<br>■ Inclusion of commercial partners in its design reduces the threat of competition<br>■ Existing partnership with Safaricom may make zero-rating easier to bring into practice | **Threats**<br>■ Not building new partnerships with publishers and other content developers could lead to unnecessary competition instead of collaboration |

# 3. Recommendations and next steps

Based on the analysis presented above, we propose three recommendations. All three focus on a core purpose: how to develop a lasting and sustainable KEC that provides quality learning content to all Kenyan students. The three recommendations are:

1. Develop a long-term strategic plan.
2. Identify ways to rapidly add relevant content.
3. Reconsider the commercial approach.

## 3.1 Develop a long-term strategic plan for the KEC

While this SWOT analysis identified that the parts required for the KEC to be a high-quality, distance education platform are beginning to emerge, this is happening organically rather than systematically. The current development approach, in which eight interdependent platforms are being either developed or planned in a siloed approach, has meant that none of the platforms are currently generating significant benefits to children's learning.

A clear, strategic long-term plan that builds on the KICD's strengths will help identify essential activities. This plan should focus on the KICD's strengths: authority on the curriculum, access to students and teachers, and relations with public and private partners. Conversely, developing platforms that may already exist on the market may be better left to others.

When thinking about developing a long-term strategic plan, we propose the following concrete next steps.

**Work with a firm experienced in deploying virtual learning environments to design the strategic plan:** Collaborating with a partner who has experience deploying virtual learning environments will have two benefits. Firstly, the firm can work closely with the KICD staff to develop a specific, achievable plan that will meet the KICD objectives. Second, working closely with this firm will expose the KICD staff to on-the-job capacity development opportunities. Some of the elements that might be considered in this plan include:

- How the total number of platforms can be reduced to align with the KICD's strategic priorities.

- Whether using existing more mature platforms (either paid or free) is more cost-effective and more productive than in-house development.
- How students, teachers and caregivers can be regularly involved to help identify challenges and explore ways to resolve these challenges.
- What capacity development is required to ensure that the KICD staff are equipped with the skills to manage the platforms and processes.

**Design the strategic plan to use an iterative and agile approach:** With innovative developments, it is often impossible to define the precise product from the beginning of the process. Instead, an iterative and agile approach may be more effective. An agile approach will create minimal viable products, which can be assessed, after which the KICD can determine how to proceed.

## 3.2 Identify ways to rapidly add relevant content for the KEC

The current platform has insufficient content to meet the needs of all Kenya's students. Currently, the KEC has one mechanism to add content: by curating publishers' content. This process does not seem to be moving sufficiently fast.

An approach where content is curated from other sources, such as open educational resources, may help increase the amount of content. Further, having clearly defined targets in terms of which chapters, subjects or grades need to be covered, and when, may help show progress or flag problems in the content base.

When thinking about rapidly adding content, we propose the following concrete next steps.

**Work with an experienced organisation to design a robust content curation strategy that can be rapidly implemented:** Content curation is not a simple process. It can take time, practice and process refinements. It is recommended that the KICD partner with an organisation that is experienced in undertaking this process to design a clear content curation strategy. Some of the elements that might be considered in this strategy include:

- Developing targets and timelines for the curation of content (e.g. number of items per grade / subject in a certain time period).
- Creating transparent standards on quality, requirements, applicability and contextualisation of content. This helps both sourcing open resources and content providers developing content.

- Building a detailed taxonomy based on the curriculum, textbooks and schedule to help identify exactly which content is needed where and when in each subject and grade.
- Putting in place mechanisms to monitor the process and escalate potential risks when they are identified.
- Starting with one grade and one subject and comprehensively complete curation for this target group.
- Identifying how to work best with Kenyan and regional private sector providers to rapidly generate content in line with KICD's guidelines.

**Proactively curate open educational resources:** Proactively curating open educational resources that the KICD can assess for free could be a way of both speeding up the process and minimising associated costs. Especially in *mathematics* and *science* subjects, there is an abundance of content that can be added, especially when there is no commercial use of that content.

## 3.3 Reconsider the commercial approach for the KEC

The purpose of the KEC is to enhance learning outcomes by providing high quality teaching / learning content to as many Kenyan students and teachers as possible. While the commercial approach is intended to sustain the platform, in practice it neither yields revenue nor does it meet the KICD's aims. Instead, the KICD ought to consider alternatives that are free for students.

To establish a sustainable platform that caters to all students, we suggest the following steps.

**Make the platform free for students**: The fee-based approach creates a barrier for users who require content. This does not mean that collaboration with commercial providers is not possible, but that the government should bear the costs of any licensed content.

**Create a business plan**: Regardless of the approach that the KICD takes with the KEC, a business plan that identifies costs that have been made, projects development and maintenance costs, and defines specific outputs will help show which activities are justified and when problems occur.

**Look beyond the current commercial providers**: Besides commercial partners, the KICD can invite international publishers and regional content providers to provide content. Especially with small providers, a one-time lump sum for content will keep costs predictable and manageable. Besides

commercial providers, open educational resources can be sourced. These often have as a requirement that they cannot be used commercially.

**Have realistic cost projections**: For a platform to be sustainable, development and management costs should be predictable and clear and it should be possible to calculate a cost-per-student. The planned commercial approach is not effective and other sources of long-term funding are necessary to develop and maintain the platform.

## 3.4. Further reading

There are a number of reports and publications that support implementation of these recommendations. Table 11 provides a list with helpful resources on curriculum alignment with open educational resources, digital content curation, implementation of virtual learning environments, and monitoring of distance learning.

**Table 11.** *Recommended further reading.*

| Document title | Relevance |
|---|---|
| A proposal for open educational resource adoption through a curriculum alignment hub (↑Chandra, 2020) | Curriculum and the adoption of open educational resources |
| *Deploying an e-learning Environment in Zanzibar: Digital Content Curation* (↑Groeneveld, et al., 2020) | A guide on digital educational content curation |
| *Implementing a Virtual Learning Environment: A Short Guide for Zanzibar* (↑Groeneveld, et al., 2020) | A short guide on implementing virtual learning environments |
| *The use of virtual learning environments and learning management systems during the Covid-19 pandemic* (↑McBurnie, 2020) | Implementing virtual learning environments |
| *Monitoring Distance Education: A Brief to Support Decision-Making in Bangladesh and Other Low- and Lower-Middle Income Countries* (↑Kaye, et al., 2020) | Monitoring implementation of distance learning interventions |
| *Are Our Children Learning? The Status of Remote-learning among School-going Children in Kenya during the Covid-19 Crisis* (↑Uwezo, 2020) | Monitoring reports on online usage and preferences among Kenyan learners |

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# Annex 1. Work Plan

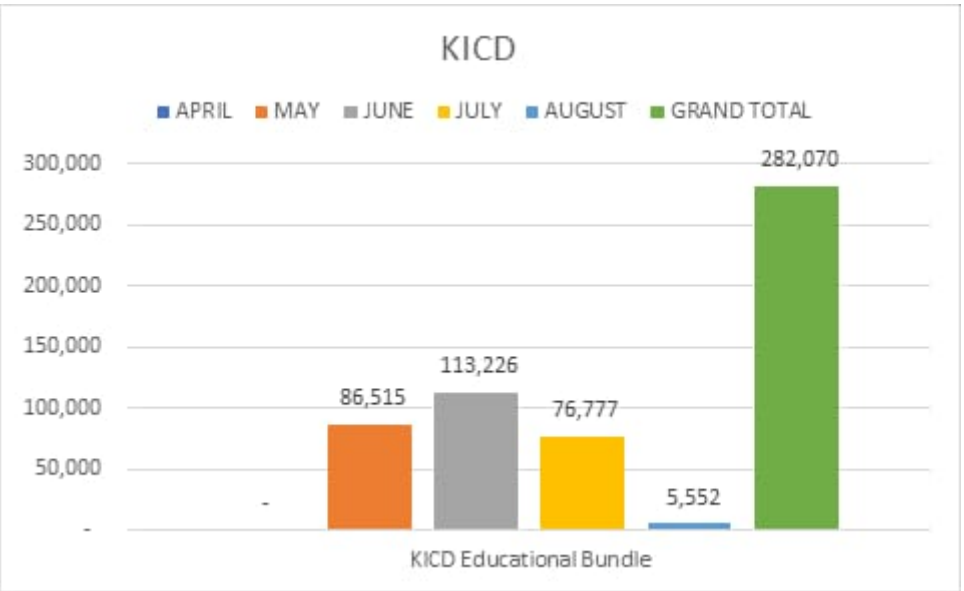
## Work plan for SWOT analysis

| Lead | Activity | Deliverable | Delivery date |
|---|---|---|---|
| **KICD** | Draft work plan | Draft work plan | 30 Nov 20 |
| **KICD** | Present the KEC and the scope of work | Presentation on KEC and scope of work | 01 Dec 20 |
| **Hub** | Review work plan | Reviewed work plan | 02 Dec 20 |
| **KICD / Hub** | Finalise work plan during meeting | Finalised work plan | 03 Dec 20 |
| **Hub** | Conduct work session 1 with KICD; identify priorities, finetune scope of work, discuss expectations, and discuss technical aspects of the SWOT analysis | Work session 1 with KICD | 04 Dec 20 |
| **Hub** | Create SWOT analysis structure for report and questions; include questions that need answer, follow-up | Report structure / outline | 07 Dec 20 |
| **Hub** | Provide questions and requests to KICD on the KEC | Questions | 08 Dec 20 |
| **KICD** | Provide answers and data to the Hub | Data | 10 Dec 20 |
| **Hub** | Conduct work session 2 with KICD | Work session 2 with KICD | 11 Dec 20 |
| **Hub** | Provide questions and requests to KICD on the KEC | Questions | 15 Dec 20 |

| | | | |
|---|---|---|---|
| **KICD** | Provide answers and data to the Hub | Data | 17 Dec 20 |
| **Hub** | Conduct work session 3 with KICD | Work session 3 with KICD | 18 Dec 20 |
| **Hub** | Draft SWOT analysis report including next steps | Draft SWOT analysis report | 24 Dec 20 |
| **KICD** | Provide feedback on draft report and next steps | Reviewed and edited SWOT analysis report | 28 Dec 20 |
| **Hub** | Finalise report and next steps | Final report | 29 Dec 20 |

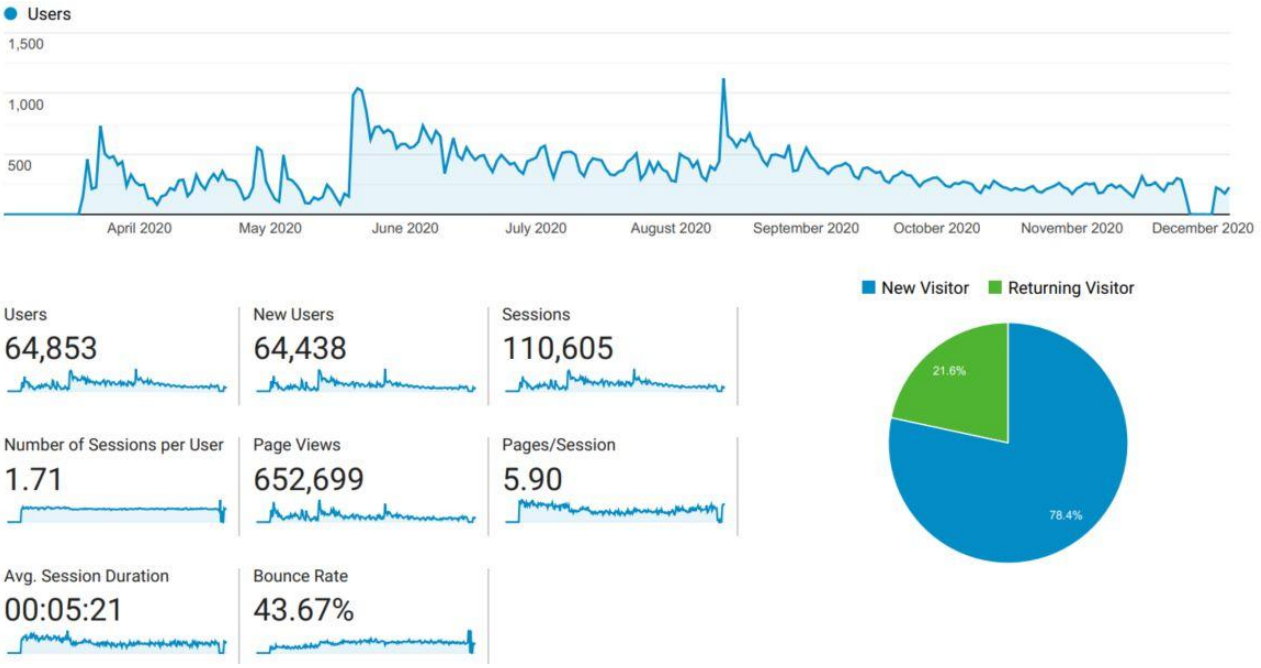
# Annex 2. Bandwidth data

**Figure 8.** *Usage of Safaricom data bundles between April 2020 and August 2020.*



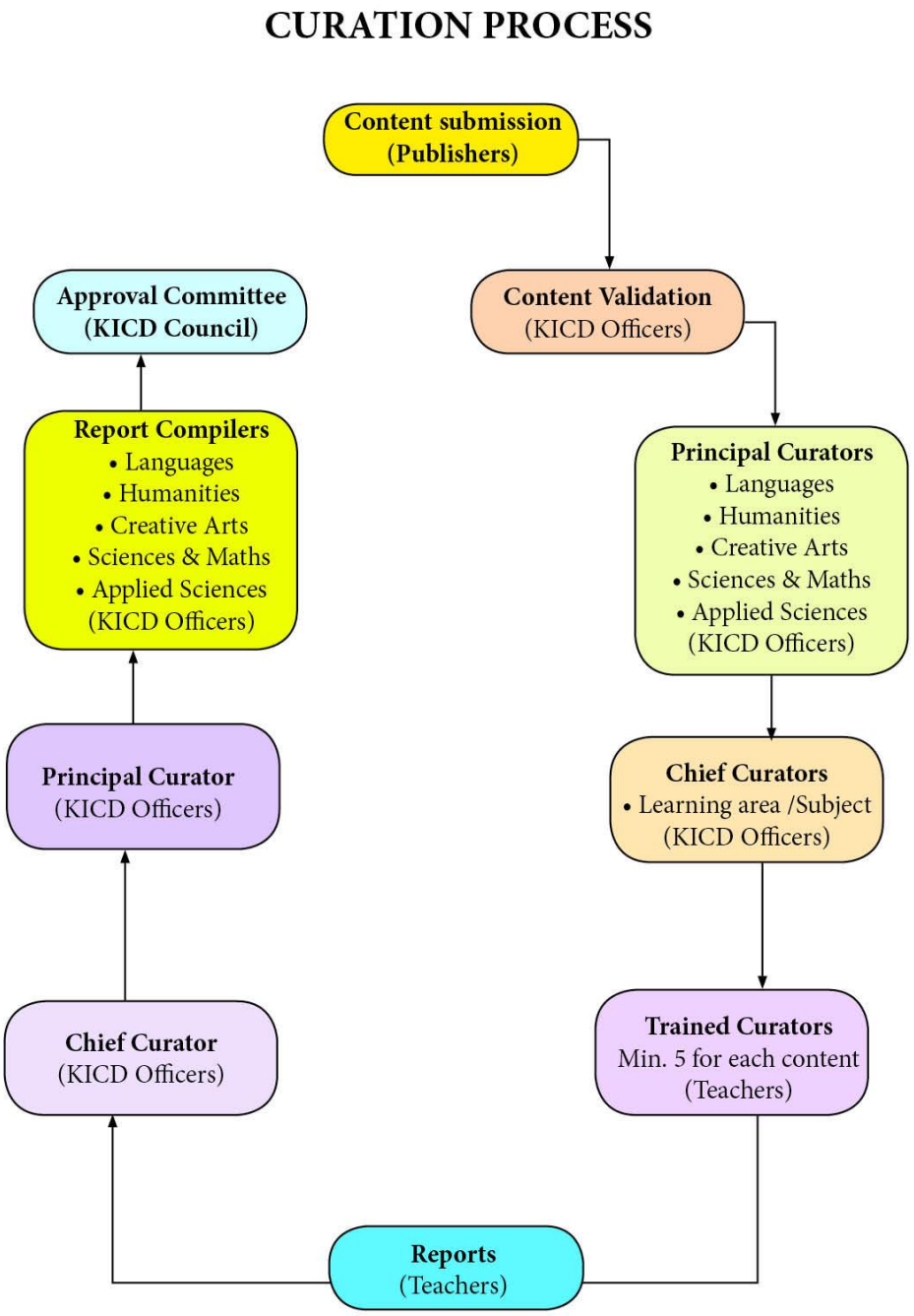
# Annex 3. Usage data

**Figure 9.** *Number of visitors on [lms.kec.ac.ke](lms.kec.ac.ke) in 2020.*



# Annex 4. Workflow of content curation

**Figure 10.** *Workflow of the content curation process (cms.kec.ac.ke and curation.kec.ac.ke).*



# Annex 5. Organogram of the KICD

**Figure 11.** *The organisational structure of the KICD.*