Mapping National Digital Learning Platforms
Key trends and themes across 184 countries

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## Abbreviations and acronyms

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tr>
<td>ADT</td>
<td>Accessible Digital Textbook</td>
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<tr>
<td>DIKSHA</td>
<td>Digital Infrastructure for Knowledge Sharing</td>
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<tr>
<td>FLN</td>
<td>Foundational Literacy and Numeracy</td>
</tr>
<tr>
<td>ICT</td>
<td>Information communication technology</td>
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<tr>
<td>LMS</td>
<td>Learning management system(s)</td>
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<tr>
<td>OOSC</td>
<td>Out-of-school children</td>
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<tr>
<td>UNESCO</td>
<td>United Nations Educational, Scientific and Cultural Organization</td>
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<td>UNICEF</td>
<td>United Nations Children's Fund</td>
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Executive summary

At the start of the Covid-19 pandemic, many governments and partners quickly moved to provide learning continuity during school closures. For many, 2020 catalysed an opportunity for change, prompting governments and their partners to set up national digital learning platforms. In some countries, these platforms already existed and were adapted to meet the needs of learners, teachers, and parents. In other countries, such platforms were created for the first time, often in partnership with or driven by other stakeholders.

As the world turns to a different moment, when education systems around the world are facing the compounded effects of the global learning crisis and the pandemic’s impact on learning, with 70% of children aged 10 in low- and middle-income countries unable to read and understand a simple text (up from 57% in 2019 (World Bank et al., 2021), it is vital to reflect on the quality and reach of national digital learning platforms and their potential contribution to addressing this crisis.

Indeed, the quality and equity of public digital learning was one of the central topics of the 2022 Transforming Education Summit (TES). Over 90% of National Statements of Commitment made by UN Member States during the summit mentioned digital learning as a strategic area for the effective transformation of education systems.

To translate these commitments into action, UNICEF and UNESCO launched Gateways to Public Digital Learning, the UN’s flagship initiative to make digital education a public good. Its goal is to ensure equitable and quality digital education by strengthening the accountability of Member States through more robust global monitoring, increased cooperation between governments, and the emergence of norms and standards. The Gateways Initiative will map, describe, and analyse existing public platforms and content, help countries create and strengthen national platforms, identify and share best practices, and establish international norms and standards to guide the development of platforms. This report presents key findings from a global mapping exercise of national digital platforms conducted by EdTech Hub following a Helpdesk request by UNICEF. The report fills a key gap in the literature by capturing key information, including but not limited to the number of platforms available and how platforms are accessed (web-based or mobile?). It looks at whether platforms have working links and updated content, whether they are available offline, and inclusive and accessible to children with disabilities. This global mapping of national digital platforms is

Retrieved on 20 July 2023
one of UNICEF and the EdTech Hub's contributions to one of the key objectives of the Gateways e Gateways Initiative. Key findings from the mapping exercise were already socialised in UNICEF's “Pulse Check on Digital Learning” (UNICEF, 2022). In this report, we provide detail about the methodology, additional findings, and lessons learnt from case studies selected from countries in different regions.

A first of its kind, the mapping exercise focused on examining three key areas of availability, usability, and inclusivity in digital learning platforms available to students and teachers in 184 countries. The mapping exercise covers a wide variety of regions (East Asia and Pacific, Europe and Central Asia, Latin America and Caribbean, Middle East and North Africa, North America, South Asia, and sub-Saharan Africa) and income levels (high, upper middle, lower middle, and low). The exercise identified 471 digital learning platforms owned, developed and/or maintained by governments across 184 UNICEF programme countries (see Annex 1).

Key findings

As summarised in UNICEF’s Pulse Check on Digital Learning report (UNICEF, 2022), the key findings of the global mapping exercise are:

- **Progress on digital learning made during Covid-19 has stalled and even backtracked in some countries** — 32% of identified national digital learning platforms no longer exist, have not been updated since 2020 or have links that do not work. This was especially prevalent for platforms developed by countries based in sub-Saharan Africa and South Asia.

- **Only 33% of platforms had content a student could interact with.** This is the case despite interactivity being a central component of student-focused learning and a core characteristic of the quality of digital learning solutions. Most platforms offered only static content, such as PDFs of textbooks. Where available, interactive content takes the form of quizzes, comments on videos, forums, messaging apps and chatbots.

- **Just 22% of digital learning platforms contained features for accessibility for children with disabilities.** Further, many of the features observed were rudimentary (e.g., closed captions on videos). Notably, most of the platforms that contain accessibility features were also mobile-accessible.

- **Only 30% of platforms offer offline functionality** (e.g., the option to download videos for offline use or to use a mobile app while not
connected to the internet). In terms of equity, this functionality is critical, with almost half of the world’s population still offline. Forty-nine per cent of high-income and 33% of middle-income countries have platforms that offer offline functionality. In contrast, only 18% of low-income countries offer the same — even though this functionality is more critical in low-income countries.

- **Sixty-five per cent of the countries surveyed have more than one platform.** The two most common types of platforms are
  1. Resource hubs that collate existing content from other platforms and sources
  2. Learning management systems (LMS), such as Moodle or the Learning Passport, with digital courses for various grades and subjects.

- **Eighty-five per cent of platforms were accessible on a basic smartphone**— having passed the Google Mobile-Friendly Test and assessed for compatibility on a USD 30–50 Android smartphone. Mobile accessibility continues to be a critical factor for digital learning platforms, as mobile phones are the most common device available for digital learning in low- and middle-income countries.

- **Most digital learning platforms (84%) offered features across all the respective countries’ national languages.**

Findings on the availability, usability, and inclusivity of national digital learning platforms are summarised in Table 1 below.

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2 Basic Android smartphones (screen sizes 360 × 800 or 720 × 1440) were used to test each platform. The platforms were tested using the smartphones and the Google Mobile-Friendly Test.
# Table 1. Key findings from the mapping of 471 national digital learning platforms.

<table>
<thead>
<tr>
<th>Findings</th>
<th>Details</th>
</tr>
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<tbody>
<tr>
<td><strong>Availability</strong></td>
<td><strong>✅ Platforms around the world:</strong> 89% of the 184 mapped countries had at least one national digital learning platform</td>
</tr>
<tr>
<td></td>
<td><strong>✅ Mobile accessible:</strong> 85% of platforms can be accessed via a basic smartphone</td>
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<td></td>
<td><strong>✅ Diversity of languages:</strong> 84% of platforms offered features using all of a country’s national languages</td>
</tr>
<tr>
<td></td>
<td><strong>➡ Limited offline capacity:</strong> 49% of high-income countries had platforms with offline functionality, while only 18% of low-income countries offered the same</td>
</tr>
<tr>
<td><strong>Usability</strong></td>
<td><strong>✅ Easy access:</strong> 68% of platforms could be accessed without an account</td>
</tr>
<tr>
<td></td>
<td><strong>➡ Interactivity:</strong> Only 33% of platforms contained content that users could interact with (e.g., chatbots, forums, games). However, levels of interactivity were higher in South Asia and East Asia and Pacific regions, where 63% of countries had at least one platform that contained interactive content.</td>
</tr>
<tr>
<td></td>
<td><strong>➡ Out-of-date platforms:</strong> Of the identified platforms, 32% no longer exist, have not been updated since 2020 or have links that do not work. Out-of-date platforms are especially prevalent in sub-Saharan Africa and South Asia: 43% of countries in sub-Saharan Africa and South Asia did not have a platform that had been updated after 2020</td>
</tr>
<tr>
<td><strong>Inclusivity</strong></td>
<td><strong>➡ Limited features:</strong> 22% of the identified platforms contained features to support accessibility for children with disabilities (e.g., colour contrast, closed captions). 29% of low-income countries had platforms that were inclusive for children with disabilities, compared to 49% of high-income countries</td>
</tr>
</tbody>
</table>
Lessons learnt

Lessons learnt from case studies (see Section 4) included:

- Ensuring both online and offline functionality in platforms is an important mechanism to reach students now, while simultaneously engaging in longer-term efforts to strengthen a country’s information and communication technology (ICT) infrastructure.

- Chatbots can help create an interactive and personalised user experience for students. Chatbots can directly answer students’ questions and refer them to relevant resources and videos to supplement their learning. Students can access a customised learning path by engaging with a chatbot at their preferred pace.

- Platforms designed to be accessible and engaging for all learners should include both
  1. Content that is inclusive (e.g., reading assignments spotlighting girls).
  2. Features such as playing audio files, adjusting text size, and adjusting brightness levels.

The mapping exercise showcased many noteworthy efforts by governments and partners worldwide to reach learners in the wake of the Covid-19 pandemic. Leveraging what has been done and what already exists, sustained initiatives are now required to ensure that national digital learning platforms remain up-to-date and interactive. The design, implementation, and iteration of such platforms should further consider marginalised learners, including those with limited access to the internet.

We recognise that the landscape of digital learning platforms is constantly changing. This report serves as a snapshot in time of national digital learning platforms around the world. Future mapping exercises and reports may be carried out to expand on this work.
1. Introduction

The start of the Covid-19 pandemic catalysed an opportunity for change within many education systems, prompting governments and their partners to set up digital learning platforms. Similarly, an increase in access to the internet and mobile devices was observed during the pandemic as a part of efforts to provide learning continuity during school closures. As education systems move into a new phase of recovery, strengthening, and resilience, key questions remain about the status of those digital learning platforms. How many platforms are still functional? How are they accessed (web-based or mobile-based)? Are they available offline? Do platforms have working links and updated content? Are platforms inclusive and accessible to children with disabilities?

To answer these questions and as part of the Gateways to Public Digital Learning, the UN’s flagship initiative to make digital education a public good, UNICEF submitted a Helpdesk Request to EdTech Hub to conduct a global mapping of national digital learning platforms. This report presents key findings from the mapping exercise across 184 UNICEF programme countries. This exercise further serves as an advocacy tool to identify critical gaps across platforms as it examines questions of equity such as: “Who cannot learn using these platforms, and why?”

In Section 2, we describe the methodology of the mapping exercise. Key findings are then presented under the subsections of availability, usability, and inclusivity in Section 3. Case studies from Uruguay, Egypt, and France are presented after the findings in Section 4. The report concludes with recommendations for the way forward in Section 5.
2. Methodology

National digital learning platforms were defined as “digital platforms developed, owned and/or maintained by national governments that are designed and used for educational purposes.” The list of mapped countries in this study consisted of UNICEF programme countries. A total of 184 countries across all regions of the world (see Annex 1) were included in the mapping.

A total of 471 digital learning platforms were identified through a web and mobile app search on the Google Play App Store. Annex 2 presents details of the search process and search terms used. UNESCO’s list of national learning platforms and tools (UNESCO, 2020) served as a useful starting point for identifying platforms. National digital learning platforms were included in the initial mapping if they met the following criteria:

- The platform is developed, owned and/or maintained by national governments for educational purposes. Any platform developed in partnership with the government was included in this analysis.
- The platform can be found through an online search of government or other web pages.
- The platform’s target audience encompasses students and/or teachers at the primary and secondary education levels.

All relevant platforms for a country were identified and mapped. In some cases, the mapping exercise revealed that a country had more than one national digital learning platform. Burkina Faso, for example, has two digital learning platforms, Imaginecole and Faso e-education. Alternatively, other countries did not have a national digital learning platform at all; this was also noted during the mapping.

Following the identification of eligible national digital learning platforms, a rubric on Google Sheets with 17 criteria points was filled out. The criteria points and dropdown options are listed in Annex 3.

Data analysis was conducted at both the platform and the country levels. During this process, the research team used Google Sheets pivot tables to analyse data for each of the rubric criteria points. When analysing data across criteria #7–16, we excluded platforms that

1. Were not searchable on the web and no longer had an existing link.

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2. Could not be accessed without a free account or required a unique school or national identifier for an account.

For country-level analysis, we condensed the data for countries with more than one platform, including data points on the number of national digital learning platforms available in each country. If a national digital learning platform was available in both a web-based and mobile-based format, both instances were counted because the mobile apps’ functionality and objectives differed from the web-based format. Counting websites and mobile apps as distinct platforms allowed us to unearth new findings regarding the mobile accessibility of each format (see Section 3.2). We selected ‘yes’ for a criteria point if at least one platform in the country met the ‘yes’ criteria. For example, if a country had three platforms, one that could be accessed without an account and two that could not, we selected ‘yes’ for that criteria point.

Basic Android smartphones (screen sizes 360 × 800 or 720 × 1440) in the USD 30–50 range were used to test mobile accessibility (see details in Annex 3). For a web page, this required opening the platform link using a web browser and confirming that the content was viewable and accessible on a mobile screen. The page also needed to pass the Google Mobile-Friendly Test.\(^5\) For a mobile app, the team checked whether it was available on the Google Play Store (some are only available on the Apple App Store), downloaded the app, and navigated its features on a smartphone.

Countries were examined by regions (East Asia and Pacific, Europe and Central Asia, Latin America and Caribbean, Middle East and North Africa, North America, South Asia, sub-Saharan Africa) and income levels (high, upper-middle, lower-middle, and low). This was done to understand trends and differences across income groups.

While our methodology allowed us to gather valuable data, it also had some limitations. We recognise that the process of identifying national digital learning platforms is limited by what is readily available through a general web search using Google. We did not confirm findings on the number of eligible platforms and available features with governments; as a result, some platforms and / or features may have been missed. In some cases, the search may have been affected by the team’s location (United States, United Kingdom, Jordan, Madagascar, Bhutan). For example, some websites did not load, and certain mobile apps could not be found in the Google Play Store based on a user’s location. Further, other platforms required unique identifiers, such as National IDs or government-provided accounts, to access platform content. In these cases, we could not capture all the platforms’ features. Basic

smartphones were used to test mobile compatibility since they are the type of phones most commonly purchased and used at the household level in most low- and middle-income countries. Whether or not a platform is accessible on a basic smartphone is a good indicator of its equity and potential to scale. However, many households still use low-cost, basic mobile phones. Additional research is needed to investigate how user-friendly (e.g., Can you navigate web pages on a basic mobile phone? Is the text adapted to mobile screens?) these platforms are on low-cost mobile phones. This mapping analysis also only conducted basic mobile compatibility checks of the platforms and content (see details in Annex 3, point 8). Extensive compatibility checks in the future may reveal a lower percentage as being mobile-friendly.

The mapping exercise was conducted between June and July 2022. We also acknowledge that the landscape of digital learning platforms is evolving non-stop. As such, new platforms may have emerged, or existing platforms may have been adapted with new features and functionalities after July 2022. This information would not have been captured in our mapping exercise. Further, some countries with higher populations (e.g., the United States) have several digital learning platforms developed across the national, regional, state, and district levels of government. Given the rapid timeline of this exercise, we mapped no more than ten platforms from each country, prioritising national-level platforms and noting countries with over ten platforms that met the inclusion criteria.
3. Findings

Overall, 471 eligible platforms, including 24 mobile apps, were identified across 184 countries. Of the countries surveyed, 89% had at least one digital learning platform, and 65% had more than one platform. On average, each country had 2.6 platforms available, although this number was higher in high-income countries and dropped in low-income countries (see Figure 1). For countries with more than one platform, we often observed overlaps in and duplication of content across platforms; however, the impact of this trend on a student’s or teacher’s platform experience requires further investigation.

**Figure 1. Average number of platforms per country across income-level groupings**

![Average number of platforms per country across income-level groupings](chart)

Many governments provide digital learning services through global-reaching private providers of platforms and learning management systems such as YouTube, Google, Microsoft, Coursera, and Moodle. Similarities across platforms were observed, especially for countries within the same region. Examples included:

- Countries based in Latin America, the Caribbean, and sub-Saharan Africa were likelier to incorporate WhatsApp\(^6\) messaging into the digital learning platform experience.

- Fifty per cent of countries in South Asia and 44% of countries in the Middle East and North Africa used a YouTube\(^7\) channel to support student learning or embedded YouTube videos into a separate digital learning platform; by comparison, 27% of all mapped countries globally used YouTube.

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\(^7\) [https://www.youtube.com](https://www.youtube.com) Retrieved on 19 August 2022.
Notesmaster\(^8\) provided online courses curated by ministries of education in ten different countries across Latin America and the Caribbean and sub-Saharan Africa (e.g., Trinidad and Tobago, Malawi, Zambia, etc.)

Learning Passport\(^9\), a platform delivered by UNICEF and powered by Microsoft Community Training, was found to be used in countries across all seven regions (East Asia & Pacific, Europe & Central Asia, Latin America & Caribbean, Middle East & North Africa, North America, South Asia, and sub-Saharan Africa)

Despite the high percentage of countries with at least one digital learning platform, sustained progress on digital learning following the Covid-19 pandemic has been uneven. In response to pandemic-related school closures, countries developed new digital platforms for remote learning in 2020. However, since then, numerous national digital platforms have not been maintained. One out of three of the identified national digital learning platforms no longer exist, have not been updated since 2020, or have links that do not work. This is especially true of platforms in sub-Saharan Africa and South Asia.

Additional findings from the mapping exercise are organised by the following areas:

- **Availability**, which we define as the quantity and quality of available platforms in a country and the resources offered by the platform(s).
- **Usability**, which we define as the overarching user experience for a student or teacher navigating the platform.
- **Inclusivity**, which we define as the capacity of platforms to meet the needs of marginalised students, particularly students with disabilities.

### 3.1. Availability

The mapping exercise revealed two main types of platforms:

1. Resource hubs that collate existing content from other platforms and sources.
2. LMS with online courses for various grades and subjects (e.g., Moodle or Learning Passport).

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\(^8\) [https://notesmaster.com/](https://notesmaster.com/) Retrieved on 19 August 2022.

Eighty per cent of mapped platforms were identified as resource hubs and 13% as LMS.\textsuperscript{10} For example, Bahrain's My Digital Library (Maktabati al-Raqmiyya),\textsuperscript{11} is a resource hub that organises learning materials, videos, and PDF assessments for primary and secondary students. Barbados’ Online Learning Centre\textsuperscript{12} is a learning management system that offers free courses from the National Transformation Initiative and Coursera to Barbadian citizens.

The availability of platforms was further examined through four criteria points:

1. Who is the target audience (students, teachers, or both)?
2. Are foundational literacy and numeracy (FLN) resources presented?
3. Are all national languages represented?
4. Does the platform have offline functionality (i.e., resources or features that could be downloaded / synced online and then accessed at a later time offline)?

Out of all the eligible platforms, more than half (56%) targeted both students and teachers. In many cases, the platforms included learning materials that could be used directly by students or repurposed as a lesson plan or curriculum guide for teachers. Although the Covid-19 pandemic drew attention to an increasing need to support teachers and their professional development, only 11% of the platforms were specifically developed for teachers. In addition, the mapping exercise assessed whether platforms offered FLN resources, given the role of FLN as building blocks for children’s learning and later success in life (‘World Bank, 2021a). Forty-seven per cent of low-income countries offered a platform that provided FLN resources (compared to 65% of the countries globally).

Most digital learning platforms (84%) offered features using all of a country’s national languages. For example, the Philippines DepEd YouTube Channel\textsuperscript{13} offered videos in both Filipino and English. Based on a regional analysis of platform languages, we found that fewer countries in sub-Saharan Africa, compared to other regions, had platforms that used all the national languages. Many platforms in sub-Saharan Africa operated with only an English system, making it difficult for non-English-speaking learners to navigate. This trend may be due to the diversity of local languages observed in the region; for example, Ethiopia has five official languages and more than 90 indigenous languages in the country. The level of effort required to translate

\textsuperscript{10} Around 8% of the platforms were mapped as ‘other’ or ‘unknown,’ where we could not access the content to identify the platform type.


\textsuperscript{13} https://www.youtube.com/c/DepEdTV/videos Retrieved on 18 August 2022.
learning content and system languages may have hindered the development of a platform with multiple languages.

Although almost half of the world's population is still offline (United Nations, 2021), platforms that provided offline features were a rare find. Among all the eligible platforms, over 70% did not offer offline functionality. Further, the gap in access to offline resources persists between low- and high-income countries (see Figure 2). Forty-nine per cent of high-income countries had platforms with offline functionality, while only 18% of low-income countries offered the same.

**Figure 2. Countries with one or more platforms that offer offline functionality across income-level groupings**

For platforms that provided offline functionality, standard features included options to download multimedia content (beyond just PDFs), access to courses or learning content without an internet connection and mobile apps that supported offline learning. For example, Honduras’ Educatrachos offers options to download multimedia content in a zip format; Montenegro’s UCI DOMA allows video downloads for offline viewing; and Nigeria’s Learning Passport enables learning to continue in areas with limited to no internet via a hub device (see Figure 3 below).

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15 http://www.educatrachos.hn/ Retrieved on 19 July 2023
Figure 3. Nigeria’s Learning Passport (Nigeria Federal Ministry of Education, 2021)

Nigeria’s Learning Passport is an online learning platform that enables mobile and offline functionality to ensure continuous access to quality education in places with low and no internet connectivity. The platform can function without an internet connection, with a hub device located in an offline classroom that acts as a local server and can be intermittently synced to an online database. Content and data can be transported with USB flash drives or SD cards.

3.2. Usability

While we observed significant variation across platforms, many national digital platforms were either underdeveloped or lacked a cohesive user experience. We used three criteria for our analysis to understand the usability of national digital learning platforms.

1. Can it be accessed without an account?
2. Can it run on a basic smartphone?
3. Does the platform include content that users can interact with (e.g., chatbots, forums, games)?
Sixty-eight per cent of the platforms could be accessed without an account, although functionality and available content were limited in some cases. Among these platforms, many required users to log in to access additional features. The requirements for accessing platform content varied significantly across platforms, with options including: enter as a guest; create an account with simple information (e.g., name, email address, etc.); create an account using unique identifiers (e.g., National ID, Teacher ID, etc.); or enter using a third-party account from Google, Facebook, and Microsoft.

Eighty-five per cent of platforms were accessible on a basic smartphone. Mobile accessibility continues to be a critical factor for digital learning platforms, as mobile ownership rates have rapidly increased in low- and middle-income countries (Orozco, 2021). For example, India’s DIKSHA (Digital Infrastructure for Knowledge Sharing) platform has a web-based browser and a mobile app version (see Figure 4 below). Of the 471 platforms identified, 16 had mobile-app counterparts to the web page versions. However, having a mobile application does not always guarantee mobile compatibility. We found six mobile apps that failed the mobile-accessibility test but web-based counterparts that did not.

The Digital Infrastructure for Knowledge Sharing platform, or DIKSHA, is a resource hub offering students, teachers, and parents learning materials aligned with school curricula. The platform's open digital content can be accessed using a basic smartphone without an account. DIKSHA has one version based on a web browser and another as a mobile app. The website indicates that yet another desktop app version will be available soon, which will offer access to downloaded digital content to use offline on users' personal computers.

Despite interactivity being a central component of student-focused learning, only 33% of platforms contained content students could interact with. On the regional level, interactivity was more commonly observed in platforms developed for countries in the South Asia, East Asia, and Pacific regions. More than 60% of the countries in these regions had at least one platform containing interactive content or resources. Globally, however, more than half
of the countries (52%) did not have platforms with interactive features. Most platforms offered only static content, such as textbooks in a PDF format and lecture videos.

For platforms where interactivity was observed, they often contained quizzes where students could receive feedback on their answers, forums where students could pose questions to each other or to moderators, and messaging via WhatsApp and chatbots. For instance, New Zealand's AnyQuestions platform connects students to librarians over live chats. Students can ask questions about different topics, and in response, the librarian provides links to books and other resources of interest. Online courses on Rwanda's REB E-Learning Platform offer forums for learners to post questions and discuss with each other. Saint Vincent and the Grenadines' Education Alive offers quizzes, games, and options to submit questions or comments (see Figure 5 below).

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**Figure 5.** Saint Vincent and the Grenadines’ *Education Alive* (*Education Media Unit, no date*)

Education Alive, developed by the Saint Vincent and the Grenadines Ministry of Education’s Media Unit, provides educational resources for students across the pre-primary to secondary education levels. The platform offers various interactive features, such as games to review educational content and a form to submit questions to the Curriculum Development Unit in the Ministry of Education. Users are provided with an option called “submit your own resource”, enabling the platform to crowdsourcing learning resources from users.

3.3. Inclusivity

Learners with disabilities were among the most vulnerable and excluded groups in remote learning during the Covid-19 pandemic (*World Bank, 2020*). We primarily focused our analysis on inclusivity for students with visual and hearing impairments, while also acknowledging the range and intersectionality of marginalisation and variety of special educational needs and disabilities for students.

Our mapping exercise revealed that most of the existing digital learning content remains out of reach for students with disabilities. Only 22% of the...
mapped platforms contained features that supported accessibility for children with disabilities (e.g., colour contrast, captions, audio content, and text size adjustments). Notably, most of these platforms were also mobile-accessible. Although these platforms include features for a specific disability, additional work is still needed to cover the complete range of features required for them to be fully accessible to children with different types of disabilities. Resources on inclusive education for teachers were more commonly observed than resources directly designed for students with disabilities. For instance, Peru Educa\textsuperscript{21} includes content on how to approach teaching children with disabilities.

Despite this limited offering, a select number of platforms excelled in terms of accessibility and inclusivity. One example is Colombia’s INSOR Educational portal,\textsuperscript{22} which was specifically developed to support learning for deaf students, teachers, and others in Colombia (see Figure 6 below). Another example is the Accessible Digital Textbooks for All initiative\textsuperscript{23} supported by UNICEF and partners.

\textsuperscript{21} https://www.perueduca.pe/#/home Retrieved on 19 August 2022.
\textsuperscript{22} https://educativo.insor.gov.co Retrieved on 19 August 2022.
Figure 6. Colombia’s INSOR Educational portal (‘National Institute for the Deaf, no date)

Created by the National Institute for the Deaf in Columbia, the INSOR Educational portal provides learning content in Colombian sign language for deaf students, teachers, and parents. The platform contains educational resources across science, language, and maths, a dictionary of terms in Colombian Sign Language and Spanish, and a WhatsApp service to send short video and audio messages between deaf and hearing people. Each of the platform’s tabs includes instructions in sign language, making it easier for deaf learners to navigate.

Figure 7. Description of UNICEF’s Accessible Digital Textbooks, an innovative solution to make textbooks accessible for children with disabilities

UNICEF and its partners are driving an innovative solution called Accessible Digital Textbooks (ADTs) to make textbooks available, affordable, and accessible for children with and without disabilities. By adding specific features to digital formats (such as sign language and audio) and following Universal Design for Learning principles, textbooks can be made accessible to students who are blind or have low vision, are deaf or hard of hearing, or have intellectual, developmental, or learning disabilities, among others. ADTs have been piloted successfully in nine countries in Africa and Latin America.
and have been shown to improve teaching and learning in classrooms among children with or without disabilities.

In Jamaica, sign language, voice-overs, music, and interactive activities are the features that will be available in the digital versions of the ADTs. UNICEF is working with the Ministry of Education, Youth and Information, the Jamaica Library Service, the Jamaica Association for the Deaf, the Salvation Army School for the Blind, and Bookfusion, an open e-book platform. The goal is that between 2021 and 2023, Jamaica will have adapted a core set of 12 picture books that the Ministry of Education, Youth and Information uses in primary Grades 1, 2, and 3. The books are part of the national curriculum and aim to be accessible for every child and adolescent by ensuring narration, sign language, interactive activities, and audio descriptions of images.
4. Case studies

This section presents three case studies showcasing national digital learning platforms in different regions of the world, including Plan Ceibal from Uruguay, E-Learning Portal from Egypt, and Jules from France. These case studies were selected by the research team among platforms that perform well in terms of availability, usability, and inclusivity (see criteria points in Annex 3). With the purpose of showcasing a few examples from different regions, the three case studies below illustrate different approaches governments have taken towards developing public digital learning platforms.

4.1. Uruguay’s Plan Ceibal

To address challenges around school retention rates of economically disadvantaged students, Uruguay invested in equitable and inclusive incorporation of digital technologies through Plan Ceibal. Plan Ceibal is Uruguay’s national education policy, which started in 2007 with the objective of developing technological and educational innovations. It focuses on public primary and secondary education and stands out for its strategic implementation process, which strongly emphasises equalising access to digital infrastructure.

Phase 1 of the implementation process focused on decreasing the digital divide by distributing devices and no-cost internet to all students and teachers. Phase 2 provided the recipients of the digital devices with digital skills training. Phase 3 focused on new educational initiatives that leverage the strengthened technological infrastructure. The Plan Ceibal platform\(^\text{24}\) was created to host initiatives and tools to provide targeted digital resources for both students and teachers and gamification of learning resources.

A one-stop shop for digital resources

The Plan Ceibal platform hosts two targeted portals for disseminating digital learning resources, one for students and another for teachers. The student portal\(^\text{25}\) hosts a range of grade-specific digital resources and educational applications for students to engage with independently. The teacher portal\(^\text{26}\) provides innovative educational resources and tools supporting teaching and learning.
learning. Both portals act as a one-stop shop for all of Plan Ceibal’s content offerings, organised in an interactive and user-friendly manner.

**Figure 8.** Plan Ceibal login page for teacher and student portals

![Login page for Plan Ceibal](Image)

**Gamification and educational apps for students**

Plan Ceibal strongly emphasises gamified learning and offers a range of features and services that leverage technology to enhance learning through playing. Plan Ceibal’s open-access video game website, Domo, provides a safe, multiplayer space for children aged 9–14. The platform observes strict selection criteria that screen for high-quality and violence-free content. Domo users also have access to a range of audiovisual content. Additionally, to support accessible offline content, educational applications designed to support classroom teaching and learning can be downloaded from the platform onto tablets or mobile devices and operate without an internet connection.

**Figure 9.** A selection of applications and games available on Domo

![Applications and games available on Domo](Image)

**Lessons learnt**

Plan Ceibal’s keen attention to user experience and functionality contributes to the platform’s success. From having targeted user portals to providing offline application functionality, the platform ensures high levels of

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interactivity and usability. "ERY", the platform's chatbot, can be accessed using student identification, further enhancing the user experience. This model is replicable and applicable to other learning environments that aspire to motivate and retain users. The success of Plan Ceibal was especially evident during the Covid-19 pandemic, based on high levels of connectivity\(^{28}\) and the prior development of both the EdTech policy and the platform.

4.2. Egypt’s E-Learning Portal

In Egypt, interest in digital learning has been driven by both the need to deliver learning virtually in response to Covid-19-related school closures and the possibility of providing out-of-school children (OOSC) with learning materials through digital platforms. According to the Egyptian Cabinet's Vision for Sustainable Development 2030 (\*Information and Decision Support Center, 2021), “the education system is still unable to accommodate less than half of the population of school age.” In light of existing gaps, the Egyptian Ministry of Education’s E-Learning Portal\(^ {29}\) is one of several national digital learning platforms that the Ministry of Education (MoE) has developed and maintained in the last decade to deliver learning to OOSC. The platform has proved critical as a content repository in the wake of Covid-19.

A repository of varied content

The E-Learning Portal provides educational content covering the curriculum for pre-primary, primary, and secondary levels. The platform also includes some additional resources not covered by the curriculum. These are organised by grade level, making navigation easier for users. The content hosted on the platform includes different types of resources (including digitised books, sample tests, maps, guides for teachers, and programmes). It is presented in a wide range of media formats (PDF, audio, video, games, etc.).

\(^{28}\) In 2020, 86% of the population in Uruguay used the internet (\*World Bank, 2020a).

Figure 10. Materials (objectives, presentation, activities) for a unit on English skills on Egypt’s E-Learning Portal

Accessible content for children with disabilities

The Ministry’s E-Learning Portal is designed to be accessible by all learners and includes inclusive resources. Providing audio resources is a significant step towards ensuring accessible content for deaf and hard-of-hearing students is available. The platform’s content repository includes audio files; however, it is worth noting that not all platform content offers this feature. The website also includes options for different text sizes and different levels of brightness, both of which can help make the content accessible for visually impaired learners.

Figure 11. Options on the E-Learning Platform to change the website’s brightness

Lessons learnt

The E-Learning Portal places concerted effort on providing learning materials with interactive elements to accommodate learners across a range of disabilities. For example, the website includes interactive Adobe Flash-based games for various subjects and grades to meet learners' different learning
styles and interests. Additionally, it offers basic accessibility features to reach hard-of-hearing learners and learners who have low vision.

As of July 2022, many learning resources on the E-Learning Portal are unavailable (or available only after overcoming some difficulties); the platform is one of many we found in our mapping exercise that has not been fully updated since 2020. Additionally, a large amount of content on the E-Learning Portal requires the use of Adobe Flash Player, which Adobe has not supported since December 2020. While it is possible for learners to use a simulator (e.g., Ruffle)\(^{30}\) to run this content online, they will need to be educated about this option and trained in how to use it safely, especially in light of security risks and vulnerabilities (Rudolph et al., 2014). Given the variety and richness of the content available on the platform, it may be worthwhile to upgrade the website’s content so that it uses HTML5 standards in place of Flash.

4.3. France’s Jules

The CNED (Centre national d’enseignement à distance)\(^{31}\) developed and launched Jules,\(^{32}\) a digital learning platform commissioned by the French Ministry of Education, Youth, and Sports. The platform uses a custom-developed AI-enabled chatbot to provide students with quick resources and answers to their questions. With the primary objective of assisting students with homework and educational exercises, Jules offers an innovative approach to enhancing student autonomy and encouraging the development of research skills.

The platform was piloted in 2020 with content for two subjects: French and mathematics. As of 2022, it has grown to include content on history, geography, physics, chemistry, and life and earth sciences. The platform mainly operates in French, with a few features in English.

An interactive chatbot experience

The platform is designed to be an interactive and personalised experience for users. When users first access the platform, the chatbot prompts them to share their grade level and general area of inquiry (based on a list of choices or an open-ended response). The chatbot then provides a wide range of multimedia content, such as videos and audio clips, as well as further branching options tailored to the user’s needs. The chatbot only provides content related to the user's specifications and limits the volume of content

\(^{30}\) https://chrome.google.com/webstore/detail/ruffle/donbcfbmhbcapadipfkeojnmajbakjd
Retrieved on 22 August 2022.

\(^{31}\) https://www.cned.fr/decouvrir-le-cned
Retrieved on 22 August 2022.

\(^{32}\) https://jules.cned.fr/
Retrieved on 22 August 2022.
presented at any given time. The chatbot then nudges the user to dive deeper into any particular topic through prompts. Additional content is provided upon request by the user.

**Figure 12.** Content customised to the student’s educational level (marked in green)

Access to learning support

Jules is provided free of charge so that any French-speaking user can access its resources. Access to Jules does not require creating an account or any authentication. The platform saves user progress based on their IP address to help ensure the continuation of learning. Additionally, with students with visual impairments in mind, the platform offers features such as voice recognition for students to ask questions, oral answers recited by the platform, and enhanced text size, among others (see Figure 13 below).
**Lessons learnt**

The Jules chatbot provides resources based on questions from users and sends prompts to nudge users further along their customised learning path. This design enables students to engage in self-directed learning, going through the content at their preferred pace and creating their own learning path. Jules compares well to other digital learning platforms that frequently present large volumes of resources without organising or associating them with particular questions or topics. By combining its curation of resources with AI (Artificial Intelligence) technology, Jules avoids overwhelming users with too much information at any one time.
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5. Ways forward

As education recovery and transformation efforts progress, it is important to build on existing initiatives and lessons learnt from the Covid-19 pandemic (UNICEF, 2022d). National digital learning platforms remain critical for countries to mitigate learning loss and improve the quality of education by reaching a broader range of students and teachers with timely educational materials and different modalities. Investment in these platforms also increases the resources available to countries to respond to school closures caused by emergencies, strengthening the overall resilience of education systems. We identified four key recommendations for policymakers to inform future iterations of these platforms:

1. Establish alignment across all national digital learning platforms in a country, with particular attention to
   a. Ensuring cohesive content and guidelines
   b. Enabling learners to quickly and easily find and access different learning materials
   c. Linking the platform to government and education ministry priorities to ensure sustainable resource allocation and platform management.

2. Optimise the platform user experience with more interactive features and regularly updated learning resources. The platform should encompass both online and offline functionality to achieve reach and effectiveness.

3. Make sure that the platform is accessible for students with disabilities. Provide content that can be readily adapted to the needs of different marginalised learners, such as girls, minority groups, and refugees. For countries with multiple spoken languages, ensuring digital learning platforms are available in all languages is also critical.

4. Develop platforms for teachers and their professional development to support teachers across education levels. Empowered, motivated, and effective teachers are essential to education recovery (World Bank, 2021b), yet only 11% of platforms examined in this study were specifically developed for teachers.

Our mapping exercise was conducted between June and July 2022. Moving forward, future studies and phases of mapping could, for example, expand on additional factors and research questions in the following areas:
Is the content open source and / or has a Creative Commons licence?

Of the platforms identified, which are best suited for which audience groups (e.g., age, income levels, access to the internet)?

Which countries are using print materials in combination with digital learning platforms? How effective is this hybrid approach?

Furthermore, the inclusion criteria of our mapping exercise could be expanded horizontally to encompass:

1. Additional countries
2. Platforms developed for pre-primary and high education levels
3. Platforms with a target audience of parents and caregivers
4. Platforms used for education administration.

Given that the digital learning landscape is constantly changing, we recommend conducting a follow-up study over the next 1–2 years. For now, this current mapping exercise and report can serve as a benchmark for availability, usability, and inclusivity across national digital learning platforms. In the future, a similar mapping exercise of this kind can further complement ongoing initiatives and their monitoring mechanisms, such as the ones envisioned by UNICEF and UNESCO in the Gateways to Public Digital Learning Initiative (United Nations, 2023). Increased awareness and transparency will help to ensure that transforming education through digital means is equitable and sustainable for all.

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This bibliography is available digitally in our evidence library at https://docs.edtechhub.org/lib/HPWRQP7M


The mapping exercise covered 184 UNICEF programme countries.

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<td>173</td>
<td>Ukraine</td>
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<td>174</td>
<td>United Arab Emirates</td>
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<td>175</td>
<td>United Kingdom</td>
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<td>176</td>
<td>United States</td>
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<td>Uruguay</td>
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<td>Uzbekistan</td>
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<td>Vanuatu</td>
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<td>180</td>
<td>Venezuela, RB</td>
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<td>181</td>
<td>Vietnam</td>
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<td>182</td>
<td>Yemen, Rep.</td>
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<td>Zambia</td>
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<td>184</td>
<td>Zimbabwe</td>
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</tbody>
</table>
Annex 2. Methodology: Search terms and process

The following search terms were used to identify eligible digital learning platforms:

- [country name] digital learning platform
- [country name] educational platform
- [country name] e-learning platform
- [country name] online education platform
- [country name] learning management system
- [country name] digital learning app
- [country name] educational app
- [country name] e-learning app
- [country name] Ministry of Education learning app

In addition to a general web search on Google, the team also searched in Google within government and Ministry of Education web domain names. For countries where English is not the official language, the search was conducted in the country’s official language(s). The mobile app search was limited to Android apps, given their ability to typically run on low-cost phones.
# Annex 3. Rubric criteria, dropdown options, and notes

<table>
<thead>
<tr>
<th>#</th>
<th>Rubric criteria</th>
<th>Rubric dropdown options</th>
<th>Notes</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td><strong>Country name</strong></td>
<td>Open-ended</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td><strong>Platform name</strong></td>
<td>Open-ended</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td><strong>Website</strong></td>
<td>Open-ended</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td><strong>App link</strong></td>
<td>Open-ended</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td><strong>Target audience</strong></td>
<td>students, teachers, students and teachers</td>
<td>The scope of this initial mapping did not include parents / caregivers or education administrators.</td>
</tr>
<tr>
<td>6</td>
<td><strong>Can it be accessed without an account?</strong></td>
<td>yes, no, unknown</td>
<td>Platforms that offered some features that were accessible without an account, but required a user to create an account to access additional functionality were marked as ‘yes.’</td>
</tr>
<tr>
<td>7</td>
<td><strong>Does it have offline functionality?</strong></td>
<td>yes, no, unknown</td>
<td>For web pages and mobile apps, we looked for any functionality that could be downloaded / synced online but then accessed at a later time offline. PDFs that could be downloaded were not counted as offline functionality; multimedia content (including audio, videos, games, and simulations) that could be downloaded were counted.</td>
</tr>
<tr>
<td>8</td>
<td><strong>Does it run on a basic smartphone?</strong></td>
<td>yes, no, unknown</td>
<td>Basic Android smartphones (screen sizes 360 × 800 or 720 × 1440) were used to test each platform. The platform was tested using the smartphones and the Google mobile-friendly test (Google, no date). We selected ‘yes’ for platforms that were accessible via a smartphone and successfully passed the mobile-friendly test.</td>
</tr>
<tr>
<td>9</td>
<td><strong>Available languages</strong></td>
<td>Open-ended</td>
<td></td>
</tr>
</tbody>
</table>
10 **Are all national languages represented?**

<table>
<thead>
<tr>
<th>yes</th>
<th>no</th>
<th>unknown</th>
</tr>
</thead>
</table>

If some, but not all, national languages are represented within a platform, the team selected ‘no.’

11 **Working links?**

<table>
<thead>
<tr>
<th>yes</th>
<th>no</th>
<th>unknown</th>
</tr>
</thead>
</table>

We checked if the majority of links were working on a platform and linked to live pages.

12 **Regularly updated?**

<table>
<thead>
<tr>
<th>yes</th>
<th>no</th>
<th>unknown</th>
</tr>
</thead>
</table>

We selected ‘yes’ if two or more recently published resources (within the past year) were identified and / or if the platform was dated 2021 or 2022.

13 **Content a user can interact with? (i.e., beyond a collection of PDFs)**

<table>
<thead>
<tr>
<th>yes</th>
<th>no</th>
<th>unknown</th>
</tr>
</thead>
</table>

We selected ‘yes’ if the platform offered at least one interactive feature (quizzes, assessments, games). Animations and videos were not counted as interactive.

If the platform is not hosted on YouTube, and it offers functionality for a user to comment on a video or post, we selected ‘yes.’

14 **Foundational literacy and numeracy (FLN) resources?**

<table>
<thead>
<tr>
<th>yes</th>
<th>no</th>
<th>unknown</th>
</tr>
</thead>
</table>

We looked for resources, content and / or activities on foundational literacy and numeracy (FLN; meaning literacy and numeracy skills are typically acquired during the early years of primary school (Evans & Hares, 2021)).

15 **Inclusive and accessible for children w/ disabilities?**

<table>
<thead>
<tr>
<th>yes</th>
<th>no</th>
<th>unknown</th>
</tr>
</thead>
</table>

We selected ‘yes’ if the platform included at least one of the following features:

- provides audio content
- colour-blind friendly (i.e., colour contrast)
- provides inclusive content-curriculum
- provides captions; text to speech
- allows the user to adjust text size

16 **Platform type**

<table>
<thead>
<tr>
<th>resource hub</th>
<th>LMS</th>
<th>other</th>
<th>unknown</th>
</tr>
</thead>
</table>

The response options were defined as follows:

- resource hub: a platform that collates and organises learning resources and existing content from one or more source(s)
LMS: a learning management system that includes asynchronous and/or synchronous courses for various grades and subjects. Moodle is one example of an LMS that some governments have used for their national digital learning platform.

- Other: this option was selected if the above two platform types did not apply.

| 17 | Other notes | Open-ended |