



STAR WAVES

# DRM Digital Radio Distance Learning

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STARWAVES / DRM Consortium

eLearning Africa – Extended Slide Deck  
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## Africa has a massive problem and so have we all!



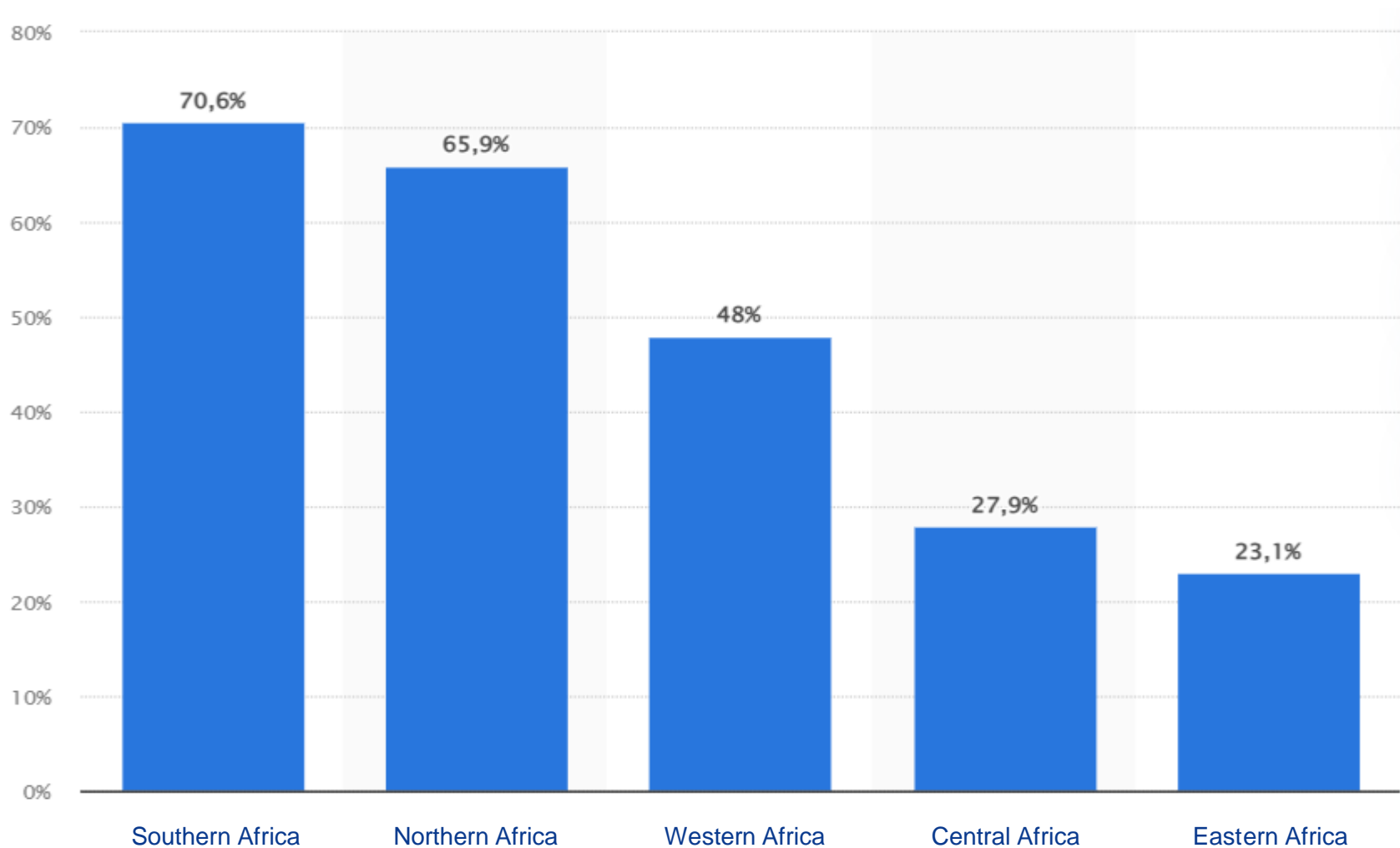
- **122 Million Children in Africa are out of school!**
- This equals the population of
  - **Entire Japan** or
  - **80% of Russia** or
  - **More than 1/3 of the U.S.** or
  - **Italy plus France**
- Also, Sub-Saharan Africa alone is short of 17 million teachers
- There is no turning point visible in this negative trend.

## E-Learning is fun! Unfortunately it is not there for Everyone.



- Since COVID, the answer to many challenges is to be found in IT solutions and the internet.
- Instead of traveling, people meet online, and many work from home entirely.
- Also the education sector has made big progress in the field of e-learning.
- In classrooms as well as at home, many children worldwide enjoy the advantages of electronic devices that simplify learning processes and assist teachers in efficient teaching.
- **Unfortunately the majority of African children are excluded from this opportunity** as they do not have network access or cannot afford the costs of internet. Let numbers talk for themselves:

## Internet Penetration Rate per Citizen in Africa 2023

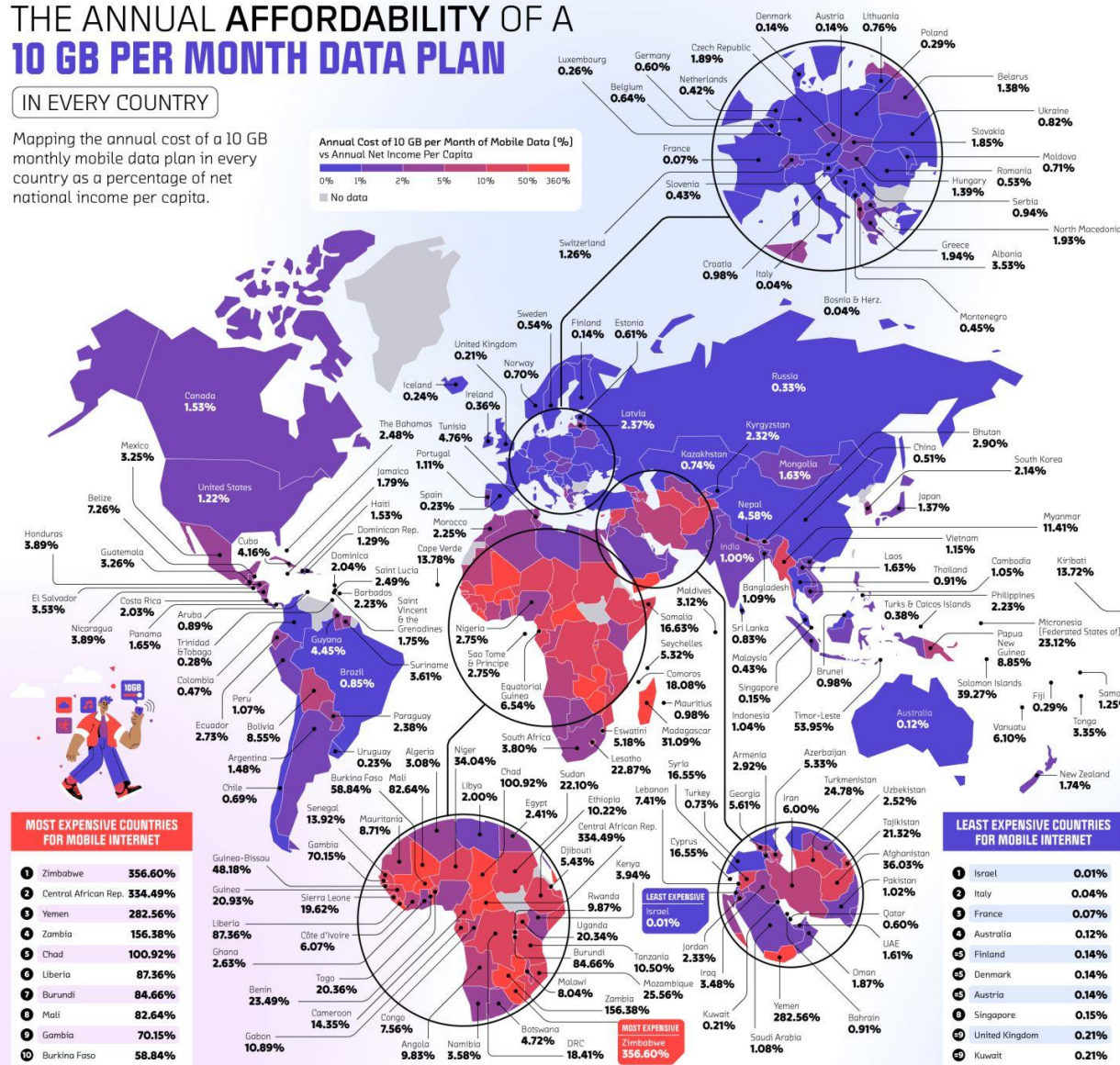
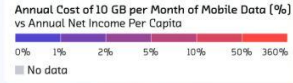




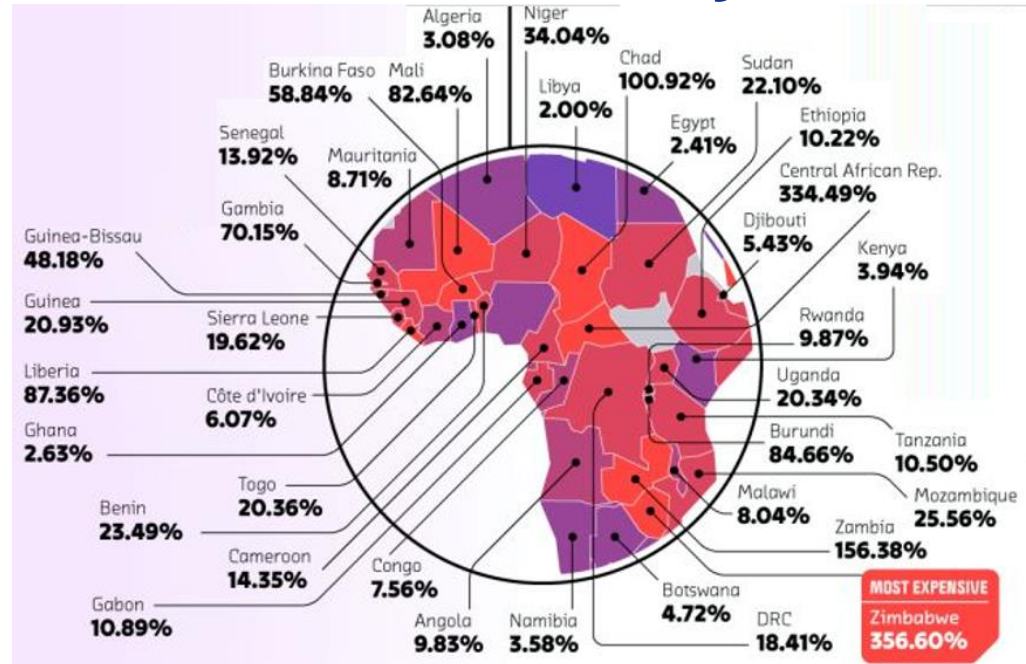
# THE ANNUAL AFFORDABILITY OF A 10 GB PER MONTH DATA PLAN

IN EVERY COUNTRY

Mapping the annual cost of a 10 GB monthly mobile data plan in every country as a percentage of net national income per capita.



# Affordability of Internet per Country



- Based on average income, a person in Zimbabwe or Central African Republic has to work over 3 years to earn enough to pay internet for 1 year.

Methodology: Using data from Cable.co.uk and the World Bank, we ranked countries based on the local annual cost of a 10 GB monthly mobile data plan as a percentage of net national income per capita.

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## Specifically Rural Places are not Connected

- E-Learning is mainly dependent on internet connectivity. This is generally provided by broadband networks (3G, 4G...)
- There are still many rural areas in Africa and elsewhere without broadband network coverage (underserved communities – but also crisis, disaster, in case of illness or missing transport, pandemics etc.)
- Therefore it is challenging to provide e-Learning content to such communities and in such situations.
- These communities are largely affected by the so-called **digital divide**.



## Internet via Satellite is Possible – But Costly

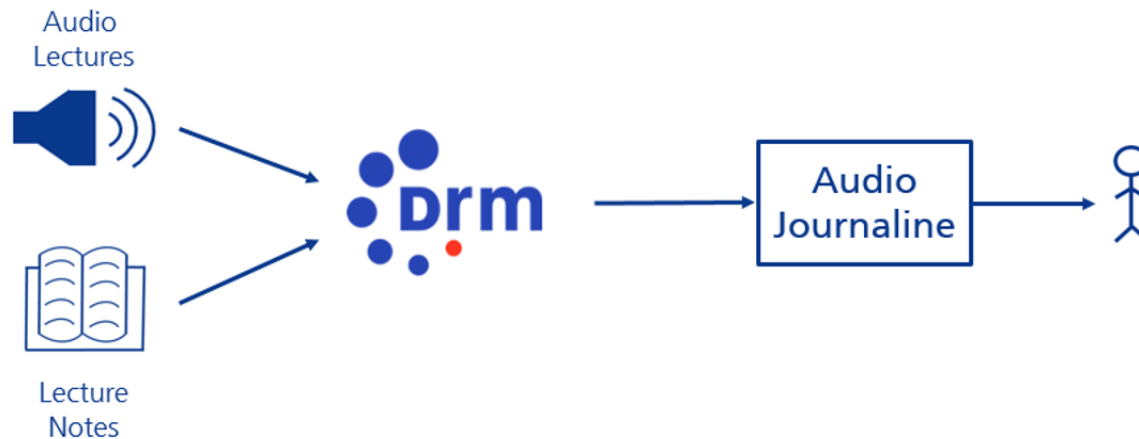
- In the past, internet services via satellite were mainly provided for B2B use. For private households it was too expensive.
- Starlink is a modern Satellite internet platform that offers such services for private or small business use from around 60 USD per month (plus equipment – still expensive).
- The required equipment is still complex, bulky (not convenient to carry around) and not affordable for the targeted audience.
- Additionally, in most African countries these services are not yet available, and the rollout is also delayed by licensing issues.





## Our Solution: E-Learning via Digital Radio!

- DRM (Digital Radio Mondiale) offers a solution to deliver educational material **without the need for any Internet** connectivity to any spot on the planet.
- Simply by using the rich features of DRM digital radio, it can transmit one or multiple audio lessons along with text and graphics information via a radio broadcast transmitter.



- These can be delivered either by local community radio services (FM Band) or via efficient large-area services using the short wave (HF, see picture) or medium wave (MF) bands.



## Why Use DRM Digital Radio for Education?

- Radio enjoys wide coverage
- DRM Digital Radio offers both conventional audio and data services
- DRM can provide education and other information
  - To people wherever they are
  - To remote areas
  - During a pandemic or crisis
- DRM offers education/information free-to-air to everybody, **without the need for Internet.**
- DRM receivers can **cache information** for convenient **access at any time** (e.g. schooling documents collected over night)



## DRM Distance Learning

### How it works:

- Lessons and textbook-content via **Journaline**  
→ Always available on-demand, also for self-study
- At specific times, with **live teacher** (audio service)  
→ Scheduled by language / class level / subject  
(up to 3 in parallel per channel → **scalable!**)  
→ Referencing the current textbook location
- Options for student **interactivity**:  
Journaline Quiz, Q&A re-broadcast, USSD back channel etc.



Please check out this video: <https://s.drm.org/video-education>



## How to Receive (from a Student's Perspective) – Example 1

- The **digital broadcast signal** will be received by a digital radio receiver that also contains storage (e.g. SD Card) and a Wi-Fi host chipset.
- This radio receiver will then act as **Wi-Fi hotspot** with integrated webserver, and students can connect to this device with entry level smart or feature phones, cheap tablets or laptops;
- Smart TV's can connect and serve as classroom whiteboards.
- There is **no internet or satellite link required** as the data are received via terrestrial broadcast.



FM-Band  
100 km  
0110101101

or

Short Wave  
> 2000 km  
0110101101

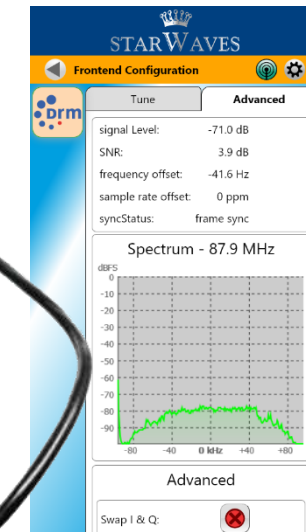
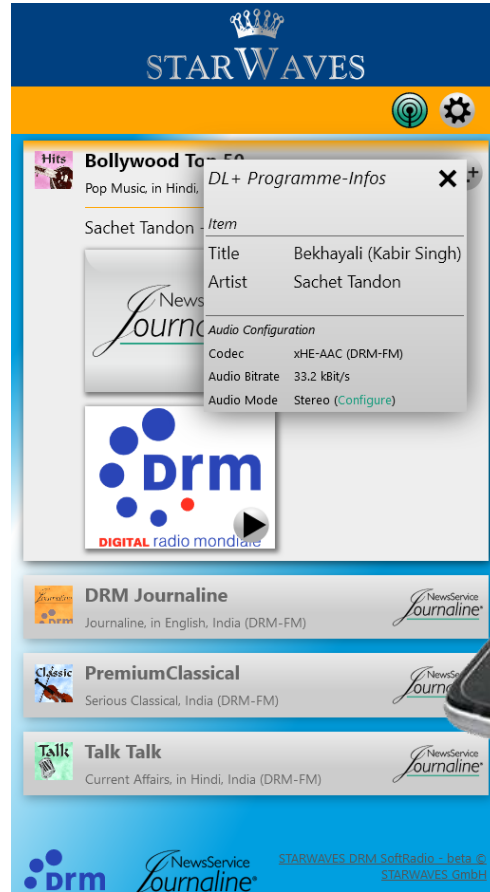


WiFi



# How to Receive (from a Student's Perspective) – Example 2 STAR WAVES DRM Softradio App

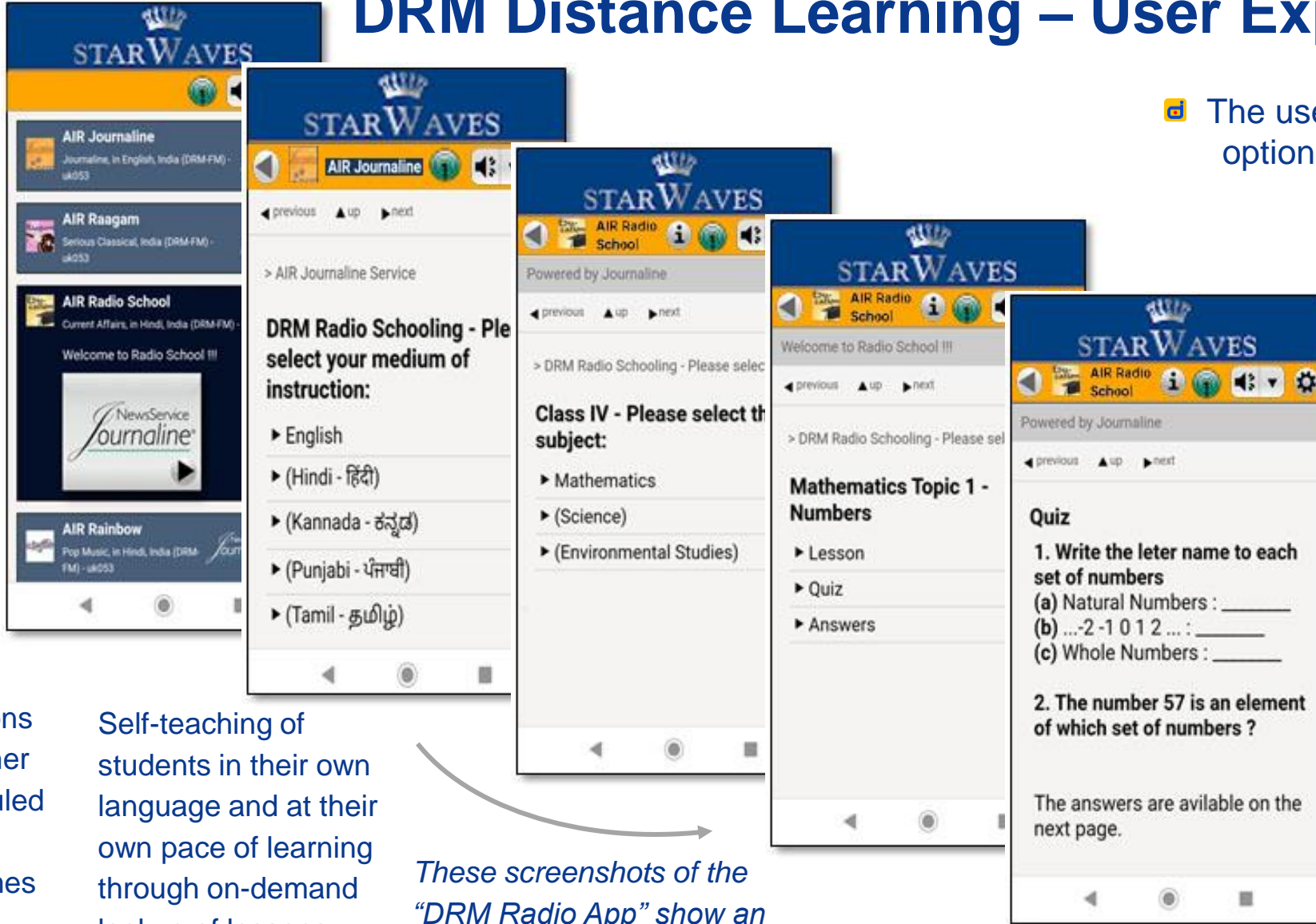
- Listen to DRM live broadcasts and view pictures and textbooks on your **Android phone or tablet** simply by connecting an external **RF dongle** to the USB port of your device





# DRM Distance Learning – User Experience

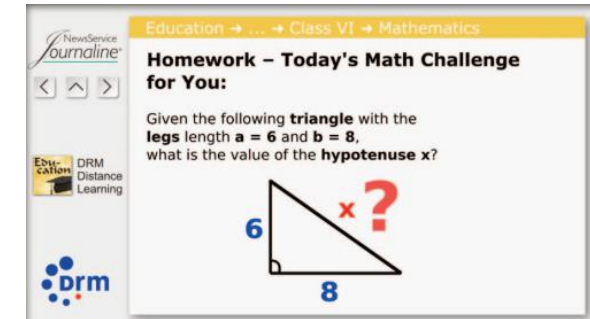
The user experience is identical for both options (app or Wifi-radio and browser)



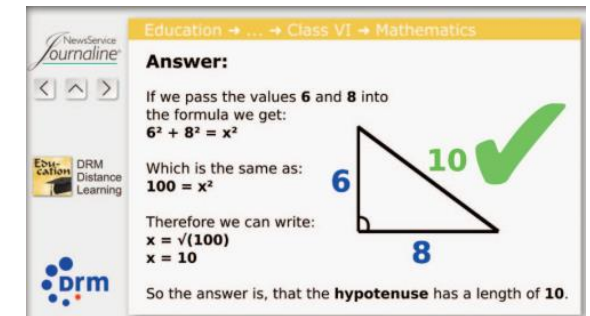
Live lessons with teacher as scheduled audio programmes

Self-teaching of students in their own language and at their own pace of learning through on-demand lookup of lessons

These screenshots of the "DRM Radio App" show an example for a radio schooling service.



This Journaline generated graph shows a set task



This graph shows the answer

## Why we do this

### Our Vision:

Our vision is that students in Africa have equal access to quality education, including them in a world of opportunities and wealth.

### Our Mission:

Our mission is to cover the African continent with quality education content via digital broadcasting and equip every student in need with a receiving device.

### Our Ambition:

Our ambition is to reach at least 10 million learners within the next 5 years.

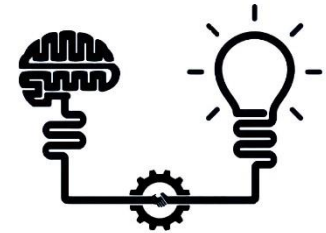


### Our Values:

- Bridge the Digital Divide!



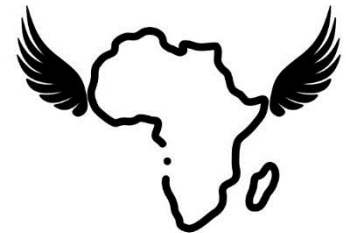
- Be Innovative!



- Learner First!



- Africa Fly!





## Budgetary Example for 1 Year @ 2 hours Transmission per day

Item	Unit Price	Qty.	Total Price
Transmission / hour	\$ 150	500	\$ 75,000
Content conversion / day	\$ 800	250	\$ 200,000
Playout / day	\$ 400	250	\$ 100,000
Communication costs	\$ 50	500	\$ 25,000
Travel costs	\$ 5,000	10	\$ 50,000
DRM WiFi Receiver	\$ 70	100,000	\$ 7,000,000
Logistics *	\$ 60	100,000	\$ 6,000,000
Android Tablet	\$ 50	500,000	\$ 25,000,000
Logistics *	\$ 40	500,000	\$ 20,000,000
Project costs			\$ 8,167,500
<b>Total Price</b>			<b>\$ 62,617,500</b>
Price per Child	(500,000 children)		\$ 125.44
<b>Price per Child per Day</b>	(250 school days)		<b>\$ 0.50</b>

\*) Shipment, duties, insurance, distribution etc.

### Assumptions:

- 5 students will share one DRM receiver by connecting their tablets via Wi-Fi.
- Short Wave transmission e.g. from Doha relay site at 100kW DRM power level
- 2 hours per day containing data (digital content updates) and one audio program.
- The year has 250 school days as summer holidays are included so children who missed lessons can catch up.

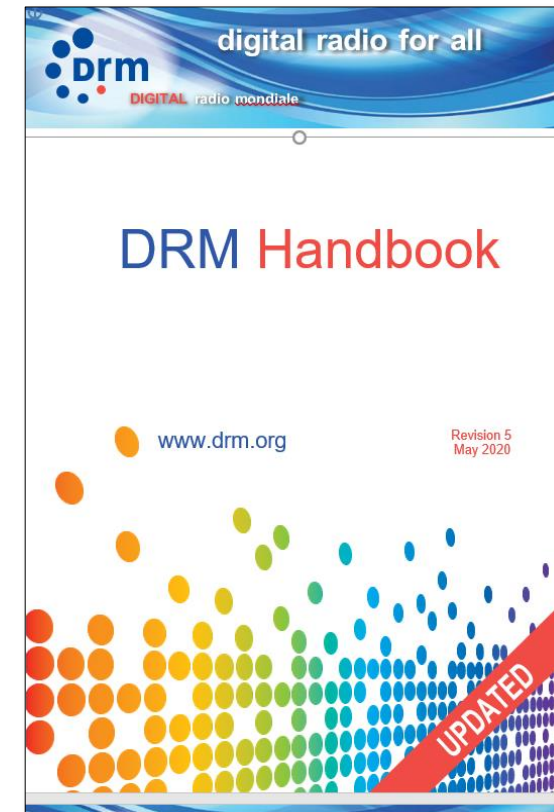
# All you need to know about DRM Digital Radio

## DRM Handbook Version 5

Free download from:  
[handbook.drm.org](http://handbook.drm.org)

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All DRM Information  
at your fingertips:  
[pocket.drm.org](http://pocket.drm.org)





# At a Glance: DRM Distance Learning for Students without Internet



DISTANCE LEARNING **WITHOUT INTERNET** OR SATELLITE - JUST VIA DIGITAL BROADCAST!

- ☺ Works in Rural Areas
- ☺ No Tracking/Tracing
- ☺ Cost Efficient
- ☺ Serves Classrooms and Homes Directly



> 2000 km!



Wi-Fi



## Your STARWAVES Team @ eLearning Africa 2024





**Please contact us for further Information!**



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**DRM Handbook**  
[handbook.drm.org](http://handbook.drm.org)

**Quick DRM Info**  
[pocket.drm.org](http://pocket.drm.org)

