

**Overcoming Equity Challenges in the Enriched Virtual Model: Bridging the Digital Divide and Designing for Accessibility**

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**Abstract**

The Enriched Virtual Model (EVM) offers transformative potential for personalised, flexible education by making online learning the primary mode of instruction and repurposing face-to-face time for enrichment. However, its successful implementation is threatened by persistent equity challenges: unequal access to devices, reliable internet, digital literacy, and culturally relevant materials. This article addresses these barriers head-on. We provide practical strategies for educators and administrators to overcome the digital divide, including low-tech alternatives (WhatsApp voice notes, offline-friendly apps), culturally responsive enrichment design, bandwidth-sensitive approaches (asynchronous, text-based learning), and actionable equity checklists for EVM lesson planning. Drawing on the EVM framework established in our previous work and current research on educational equity, we argue that equity is not an optional add-on but a foundational requirement for EVM to fulfil its promise of inclusive, high-quality education.

**Keywords:** Enriched Virtual Model, EVM, digital divide, equity, accessibility, low-tech alternatives, culturally responsive teaching, limited bandwidth, asynchronous learning, educational equity, inclusive design, ELT.

**1. Introduction: The Equity Paradox of EVM**

The Enriched Virtual Model, as defined by Horn and Staker (2015) and elaborated in our previous article, holds enormous promise for personalising learning, fostering student agency, and optimising teacher expertise. Yet it also harbours a paradox: a model that

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depends heavily on online learning risks widening the achievement gap if implemented without deliberate equity strategies. Students from low-income households, rural communities, or under-resourced schools may lack reliable internet, adequate devices, or a supportive home learning environment. Furthermore, enrichment materials designed without cultural responsiveness can alienate learners whose backgrounds, languages, or experiences are not reflected.

Equity in EVM is not simply about providing equal hardware; it is about ensuring that every student—regardless of socioeconomic status, geographic location, disability, or cultural background—can access, engage with, and benefit from both the online backbone and the face-to-face enrichment sessions. This article provides a practical roadmap for overcoming these challenges. We focus on four key areas:

1. **Low-tech alternatives** that ensure continuity when high-speed internet or modern devices are unavailable.
2. **Culturally responsive enrichment materials** that validate and leverage diverse student identities.
3. **Strategies for limited bandwidth environments** where asynchronous, text-based approaches become essential.
4. **Equity checklists** that guide teachers and instructional designers to proactively identify and remove barriers.

These strategies are not merely compensatory; they represent good pedagogical practice that benefits all learners, including those with disabilities, English language learners, and students who simply learn better with varied modalities.

## **2. Understanding the Digital Divide in EVM Contexts**

Before proposing solutions, we must understand the specific equity gaps that affect EVM implementation.

### **2.1 Three Levels of the Digital Divide**

Level	Description	EVM Impact
<b>Access divide</b>	Lack of hardware (computer, tablet) or reliable internet connection.	Students cannot watch video lessons, submit online assignments, or participate in synchronous sessions.

Level	Description	EVM Impact
<b>Skills divide</b>	Limited digital literacy among students, parents, or even teachers.	Students struggle to navigate the LMS, use enrichment tools (Flipgrid, Canva), or self-regulate in online environments.
<b>Usage divide</b>	Disparities in how technology is used (passive consumption vs. creative production).	Wealthier students may engage in Type III enrichment projects; disadvantaged students may only complete drill-and-practice exercises.

## 2.2 Hidden Equity Challenges in EVM

- **Home environment:** Noise, crowding, lack of a quiet workspace, or responsibility for younger siblings.
- **Time poverty:** Students who work after school or help with family chores have less time for asynchronous enrichment.
- **Language and literacy:** Parents who do not speak the language of instruction cannot assist with online tasks.
- **Disability access:** Videos without captions, images without alt text, or inaccessible interactive elements exclude learners with visual or hearing impairments.

Acknowledging these realities is the first step toward designing an EVM that truly leaves no student behind.

## 3. Low-Tech Alternatives: Keeping EVM Alive Without High-Speed Internet

When high-bandwidth solutions are impossible, **low-tech** and **no-tech** alternatives ensure that the online backbone remains functional and enrichment continues. The key principle is *reducing file size, simplifying delivery, and leveraging ubiquitous tools*.

### 3.1 Using WhatsApp for Asynchronous Enrichment

WhatsApp is widely available on basic smartphones and works on 2G/3G networks. It can serve as a lightweight LMS substitute.

EVM Component	WhatsApp Alternative
Core lesson delivery	Send text-based mini-lessons (copy-paste into a message). Record short voice notes explaining vocabulary or grammar.

EVM Component		WhatsApp Alternative
Formative assessment		Students reply with voice notes or text answers. Teacher can respond individually or to the whole group.
Type enrichment	I	Share links to text-only articles (e.g., Wikipedia simple version) or short audio clips.
Type collaboration	III	Create a class WhatsApp group for project discussions. Students submit final products as photos or voice recordings.

**Example ELT activity (A2 level):**

*Teacher sends a voice note describing three objects in a room. Students listen and reply with a text message listing the objects and their positions (e.g., “The book is on the table.”). Next, students record their own 30-second voice note describing their own room to a partner.*

**Limitations to manage:** Privacy (use official school accounts or parent consent), distraction (set “quiet hours”), and data costs (inform families about zero-rating options if available).

**3.2 Offline-First and Lightweight Apps**

Several educational apps work offline or require minimal data. Incorporate these into your EVM design.

App	Offline Capability	Data Usage	Best for
<b>Khan Academy</b> (lite version)	Download lessons via Wi-Fi for offline viewing	Low after download	Core instruction (math, grammar)
<b>Google Classroom</b> (mobile app)	Students can submit assignments offline; syncs when connected	Very low	Assignment management
<b>Microsoft Lens</b>	Scan worksheets offline	None	Converting paper handouts to PDF

App	Offline Capability	Data Usage	Best for
<b>Voice Recorder (built-in)</b>	Fully offline	None	Recording oral reflections, reading practice
<b>Kolibri (by Learning Equality)</b>	Full offline LMS for schools with server	None (local network)	Whole-school EVM in low-connectivity regions

**Teacher action:** At the start of a unit, provide a “download pack” (using school Wi-Fi or public library) containing all video and interactive content. Students consume it offline at home.

### 3.3 Text-Based and Audio-Only Enrichment

When video is impossible, shift to:

- **Text-based case studies** (PDF or even SMS).
- **Audio dramas or podcasts** (downloaded once, listened repeatedly).
- **Scripted dialogues** that students act out with family members.
- **Printed worksheets** scanned and sent via WhatsApp or picked up from school.

**Case example:** A rural secondary school in India implemented EVM for English using only printed worksheets and weekly WhatsApp voice-note assignments. Students recorded themselves reading paragraphs; the teacher sent back corrective feedback via voice. Face-to-face sessions (once a week) were used for peer interaction and project work. Attendance and test scores improved compared to the previous fully online model that most students could not access.

### 4. Designing Culturally Responsive Enrichment Materials

Equity is not only about access to technology; it is also about access to *relevant, respectful, and representative* content. Culturally responsive teaching (CRT) recognises that students learn best when the curriculum reflects their identities, languages, and lived experiences (Gay, 2018; Ladson-Billings, 1995). In EVM, enrichment materials (Type I, II, III) must be designed or curated with cultural intentionality.

#### 4.1 Principles for Culturally Responsive EVM Enrichment

Principle		Application in ELT Enrichment
<b>Affirming diverse identities</b>		Include stories, images, and examples from multiple cultures, not just dominant ones. Avoid stereotypes.
<b>Using students' home languages as a resource</b>		Allow strategic use of L1 in reflections or brainstorming. Provide bilingual glossaries.
<b>Connecting to local communities</b>		Design Type III projects that investigate local issues (e.g., documenting a neighbourhood festival, interviewing elders).
<b>Challenging power structures</b>		Discuss whose voices are represented in online content. Encourage critical media literacy.

#### 4.2 Practical Examples for ELT Enrichment

##### Type I (Exploration) – Culturally responsive:

- Instead of a virtual tour of London only, offer choice: tours of Mumbai, Nairobi, Singapore, or a local city.
- Curate a Padlet of “My Favourite Story from Home” where students post links to folktales in English translation.

##### Type II (Training) – Culturally responsive:

- Teach letter writing by having students write to a community helper (local shopkeeper, librarian) rather than a generic “pen pal.”
- Use Canva templates that include diverse skin tones, family structures, and cultural clothing.

##### Type III (Investigation) – Culturally responsive:

- “Food Memories” project: Students interview a family member about a traditional dish, write a recipe in English, and record a Flipgrid cooking demonstration.
- “My Bilingual ABC”: Create a digital book where each page features a word from the student’s home language and its English equivalent, with illustrations.

#### 4.3 Avoiding the “Tourist Approach”

Superficial multiculturalism (e.g., celebrating holidays without context) can reinforce othering. Instead, integrate cultural responsiveness across the entire EVM curriculum. For

example, when teaching comparative adjectives (“bigger than,” “more beautiful than”), have students compare two local landmarks or two festivals they know, not generic images of the Eiffel Tower and Taj Mahal.

**Teacher self-check:** Before assigning any enrichment video or reading, ask: *Does this material assume a particular cultural norm (e.g., nuclear family, car ownership, supermarket access) that may exclude some of my students?*

### **5. Strategies for Schools with Limited Bandwidth**

Many schools implementing EVM operate in regions with unreliable, expensive, or slow internet. The following strategies preserve the integrity of the Enriched Virtual Model without requiring high bandwidth.

#### **5.1 Asynchronous First, Synchronous Only When Critical**

Avoid live video classes (Zoom, Meet) that consume bandwidth and exclude students with poor connections. Instead:

- **Record short (5–7 minute) video lessons** – compress them to low resolution (360p) or offer audio-only versions.
- **Use discussion forums** (text-based) instead of live chats.
- **Schedule one-on-one phone calls** for urgent support.

#### **5.2 Text-Based Core Lessons**

The EVM definition does not require video. Core online learning can be entirely text-based, using:

- Well-structured HTML pages (can be saved and read offline).
- PDF worksheets with clear instructions.
- Open educational resources (OER) like the British Council’s “TeachingEnglish” articles (text version).

#### **Example text-based enrichment for a science unit (adaptable to ELT):**

*Read a 300-word article on “How Plants Grow.” Answer five multiple-choice questions. Then, write a 50-word paragraph explaining why water is important. Upload your paragraph to the LMS (or submit as a WhatsApp text).*

#### **5.3 Scheduled Download and Sync Windows**

Work with families to identify times when internet is affordable or available (e.g., late evening, weekends). Provide a weekly schedule:

*“Each Sunday evening, download the following three files from Google Classroom. Complete them offline during the week. On Friday, go to a Wi-Fi hotspot (school, library) to upload your work and download next week’s materials.”*

#### **5.4 Leverage Community Hubs**

Partner with local organisations to create **digital learning hubs**:

- Public libraries, community centres, religious institutions, or even cafés with free Wi-Fi.
- Equip these hubs with charging stations, printers, and a few computers.
- Schedule supervised EVM enrichment hours (e.g., Tuesday and Thursday afternoons).

#### **5.5 Print-Based Backup**

For the most bandwidth-constrained settings, maintain a parallel **paper-based track**:

- Core lessons printed as booklets (one per unit).
- Enrichment activities designed as cut-and-paste, drawing, or writing tasks.
- Face-to-face sessions used to collect completed paper work and distribute new materials.

This dual-modality approach ensures that no student is completely excluded. Over time, as connectivity improves, students can transition to the digital version.

#### **6. Equity Checklists for EVM Lesson Planning**

Checklists are powerful tools to embed equity into routine instructional design. Below are two checklists: one for individual lessons (daily or weekly planning) and one for whole-unit/course design.

##### **6.1 Daily/Weekly EVM Lesson Equity Checklist**

*Use this before publishing any online enrichment activity.*

Question	Yes	No	Action if No
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##### **Access**

- |  |  |  |   |
|--|--|--|---|
| 1. Can this activity be completed on a smartphone (not just a laptop)? |  |  | Provide a smartphone-friendly alternative (e.g., voice note instead of typing). |
| 2. Can it be done offline after one-time download?                     |  |  | Offer a text-only or print version.   |
| 3. Is the file size under 10 MB (videos) or 2 MB (documents)?          |  |  | Compress videos; split long documents.  |

Question	Yes	No	Action if No
<b>Inclusion</b>			
4. Does the enrichment activity include captions or transcripts for audio/video?			Add YouTube auto-captions or provide a text script.
5. Are images described with alt text (for screen readers)?			Add alt text in your LMS or document.
6. Does the activity avoid unnecessary time pressure (asynchronous, flexible deadlines)?			Extend deadlines; allow submissions by WhatsApp/paper.
<b>Cultural responsiveness</b>			
7. Do the examples and visuals reflect the cultural diversity of your class?			Replace or add inclusive images; offer choice of examples.
8. Is there an option for students to draw on their home language or local knowledge?			Add a reflection question: "How would you say this in your home language?"
<b>Student support</b>			
9. Are instructions written in clear, simple language (plain English, no jargon)?			Rewrite using short sentences; add numbered steps.
10. Is there a way for students to ask for help without requiring live			Add a "help card" with contact options.

Question	Yes	No	Action if No
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internet (e.g., phone number, in-person next F2F session)?

**6.2 Unit/Course Design Equity Checklist (for Curriculum Teams)**

*Use when planning a full EVM module (4-6 weeks).*

Domain	Criteria
<b>Multiple modalities</b>	The unit includes low-tech (text/audio), mid-tech (PDF/offline), and high-tech (video/interactive) versions of core lessons.
<b>Flexible submission</b>	Students can submit assignments via LMS, email, WhatsApp, voice recording, or paper (to be handed in at F2F session).
<b>Bandwidth tiering</b>	For each video, there is an audio-only equivalent and a text summary.
<b>Culturally responsive Type III options</b>	Students can choose from at least three project topics, each allowing cultural personalisation (e.g., local community, family heritage, global connection).
<b>Parent/guardian communication</b>	Instructions are provided in simple language and, where possible, in home languages. Parents are given a one-page “How to Help at Home” sheet for low-tech EVM.
<b>Disability inclusion</b>	All digital materials meet WCAG 2.1 AA standards (captions, readable fonts, keyboard navigation).
<b>Device agnostic</b>	Activities work on a basic Android phone (Chrome browser) without requiring app installations beyond WhatsApp or a PDF reader.

Domain

Criteria

**Offline period plan**

A documented contingency plan for when internet or power is unavailable for extended periods (e.g., printed learning packs distributed at last F2F session).

### 6.3 Using the Checklists in Practice

- **For individual teachers:** Print the daily checklist and keep it next to your computer. Run through it before clicking “publish” on any enrichment task.
- **For departments or schools:** Use the unit checklist during collaborative planning meetings. Assign an “equity reviewer” role to a different teacher each week.
- **For administrators:** Require that funding for EVM technology includes budget for low-tech alternatives (printers, paper, offline servers like Kolibri) and for translation/localisation of materials.

## 7. Case Study: Overcoming Equity Challenges in a Rural EVM-ELT Programme

**Context:** A secondary school in a remote coastal region of Indonesia. Most students have basic Android smartphones but limited or expensive mobile data. Home internet is unavailable. Many students are first-generation learners from fishing families.

**Initial EVM attempt (failed):** The school adopted a mainstream EVM model with video lessons (YouTube), Flipgrid assignments, and weekly Zoom check-ins. Students could not load videos; data costs were prohibitive; parents did not understand how to help.

### **Redesigned equity-focused EVM:**

- **Online backbone:** Converted to text + audio only. Teacher created short voice notes (3 minutes, 500 KB) on WhatsApp describing grammar points. Students listened offline after downloading at school.
- **Core lessons:** Printed booklets (stapled A4) distributed every Friday during F2F session. Booklet contained reading passages and written exercises.
- **Type I enrichment:** Shared links to “text-only” news websites (e.g., BBC News Lite) and RSS feeds of short stories.
- **Type II training:** Face-to-face session (half day, weekly) focused on speaking practice, group projects, and digital literacy basics (how to save a file, how to voice record).
- **Type III projects:** “Oral History of Our Fishing Village.” Students interviewed elders (in their local language), translated key phrases into English, recorded short audio narratives, and presented them during a community F2F showcase.

- **Assessment:** Portfolios (audio recordings, photographs of written work) assessed on completion and effort, not just accuracy.

**Outcomes after one semester:**

- 95% of students submitted at least 80% of assignments (compared to 40% in the video-based attempt).
- Student motivation increased; attendance at F2F sessions rose from 60% to 90%.
- Teachers reported deeper relationships with students and better ability to differentiate support.
- Parents became more involved, helping with audio recordings and attending the final showcase.

**Lessons learned:** Equity is not a constraint to be managed; it is a design principle that leads to more robust, inclusive EVM.

**8. Conclusion: Equity as the Engine, Not the Obstacle**

The Enriched Virtual Model is often praised for its flexibility, personalisation, and efficient use of teacher time. But without intentional equity design, it risks becoming another tool that benefits the already privileged. Overcoming equity challenges is not about lowering standards or abandoning technology; it is about *expanding our definition of what counts as effective online enrichment*.

Low-tech alternatives like WhatsApp voice notes and offline-friendly apps ensure that no student is left behind when connectivity fails. Culturally responsive materials honour the diverse identities of young learners and make enrichment meaningful, not alienating. Bandwidth-sensitive strategies—text-based lessons, scheduled downloads, community hubs—allow EVM to function even on the slowest networks. And equity checklists transform good intentions into daily, verifiable actions.

We call upon educational leaders, curriculum developers, and classroom teachers to embed these practices from the very first day of EVM implementation. Equity is not a separate “challenge” to be solved later; it is the very foundation upon which sustainable, transformative EVM must be built. As our case study demonstrates, when we design for the margins, we serve everyone better.

**References**

- Clayton Christensen Institute. (2017). *Blended Learning Definitions*. <https://www.christenseninstitute.org/blended-learning-definitions-and-models/>
- Gay, G. (2018). *Culturally Responsive Teaching: Theory, Research, and Practice* (3rd ed.). Teachers College Press.

- Horn, M. B., & Staker, H. (2015). *Blended: Using Disruptive Innovation to Improve Schools*. Jossey-Bass.
- Ladson-Billings, G. (1995). Toward a theory of culturally relevant pedagogy. *American Educational Research Journal*, 32(3), 465–491.
- Learning Equality. (2024). *Kolibri: Offline learning platform*. <https://learningequality.org/kolibri/>
- Renzulli, J. S. (1977). *The Enrichment Triad Model*. Creative Learning Press.
- Warschauer, M. (2011). *Learning in the Cloud: How (and Why) to Transform Schools with Digital Media*. Teachers College Press.
- World Bank. (2021). *Remote Learning During COVID-19: Lessons from Today, Principles for Tomorrow*. World Bank Group.