



Clear evidence, better decisions, more learning.

# Digital personalised learning in Kenya: findings from a multi-strand implementation research study

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# Research context: digital personalised learning

## Definition

“The use of a digital learning environment that adapts to the individual learner, with the goal of optimising individual and/or collaborative learning processes to enhance cognitive, affective, motivational, metacognitive or efficiency outcomes” (Van Schoors et al., 2021)

## Existing evidence

**Rapid evidence review:** appears to offer significant promise to improve learning outcomes, including potentially ‘out-of-class’ and ‘out-of-school’ learning (Major & Francis, 2020).

**Meta-analysis:** positive impact on learning outcomes (effect size of 0.18), with greater impact when adaptive (effect size of 0.35; Major et al., 2021)

## Evidence gaps

1. **Evidence from LMICs** (majority of research in HICs)
2. **Research on “classroom-integrated” DPL** (as opposed to “supplementary”)

# Research design: a multi-strand study

## Overarching Research Question

How can a classroom-integrated, digital personalised learning tool most effectively support early-grade numeracy and literacy outcomes in Kenya?

### Pedagogical strand:

#### Method:

Design-based research.

#### Pre-primary:

May 2022- Jan 2023

#### Primary:

Jan 2024-March 2025

### Learning outcomes strand:

#### Method:

Randomised controlled trial(s).

#### Pre-primary:

Oct 2022- Nov 2023

#### Primary:

Apr 2024-Nov 2024

### Adaptivity and data feedback strand:

#### Method:

A/B/n testing.

#### Pre-primary:

Jan 2023- Aug 2024

# Research design: a multi-strand study

## Design-based research:

**Sample:** 6 schools (x13 PP1 and PP2 classes), purposively selected in Mombasa.

**Data collection:** two cycles, including x25 interviews/focus group, x107 direct/indirect observations, lesson study with x6 teachers.

## RCT:

**Sample:** 291 schools (1995 learners), randomly assigned treatment/control in Murang'a.

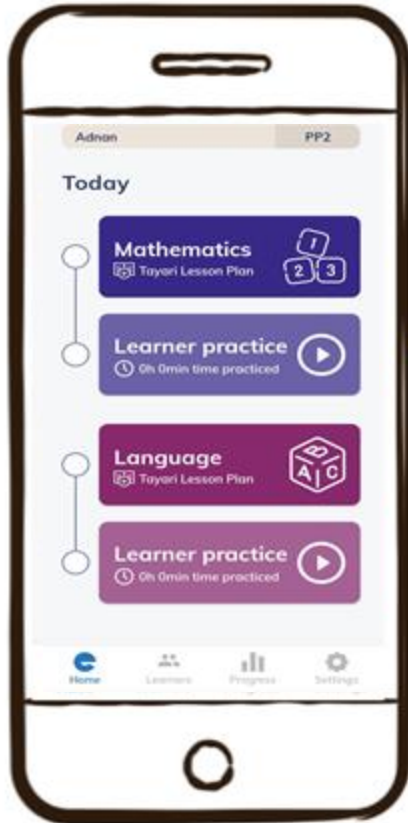
**Data collection:** baseline, midline and endline assessments using International Development and Early Learning Assessment (IDELA).

## A/B/n testing:

**Sample:** over 5,000 schools across multiple Kenyan counties.

**Data collection:** x9 A/B/n tests, randomly assigning participants to different software design groups, assessing the impact of various algorithms, interface features and data feedback mechanisms.

## Digital personalised learning tool:



- **Hardware:** 1-2 low-cost Android devices per classroom.
- **Software:** EIDU application.
- **Curriculum-aligned content:**
  - Teacher interface: digitised lesson plans (Tayari structured pedagogy programme).
  - Learner interface: 348 curriculum-aligned learning units to support pre-primary numeracy and literacy.
- **Personalisation:**
  - Based on each learner's device interaction history.
  - Optimises content sequencing to maximise engagement.
  - Teacher input informs content selection and distribution.
- **Userbase:** 350k active learners monthly, scaling to government pre-primary schools across 46 counties in Kenya (currently in 22).

## Results: statistically significant effect on pre-primary learning outcomes


- Overall standardised effect size of **0.534 SD** (comparing treatment and control across four full school terms) - could be interpreted as an additional **0.80 years** of learning.
- Effect size of **0.450 SD** and **0.449 SD** for numeracy and literacy scores respectively ( $p < 0.001$ ).
- No gendered impact: significant effect for both female and male learners (**0.526 SD** and **0.543 SD** respectively), but absence of a statistically significant interaction between gender and experimental groups ( $p = 0.638$ ).
- Greater numeracy gain scores for the lowest-performing 25% of learners from baseline assessment:  $p = 0.022$ .
- Potential trail-off of effect in the second half of the intervention: baseline-midline = **0.510 SD** vs midline-endline = **0.068 SD**.

## Results: conditions and features of the tool which contribute to impact

A snapshot of findings from other strands of the research:

- **Personalisation:** two different algorithms (maximising for score vs for engagement) benefitted learning in different ways, depending on learning strand in question - both significantly higher impact than no personalisation.
- **Distribution:** key challenge of sharing DPL tool equally amongst learners (“fast learners” perceived to receive the tool more frequently).
- **Teacher-AI collaboration:** providing teachers with the option to override the system-generated content selection significantly improved learners’ digital formative assessment scores ( $p < 0.001$ ).


## Implications: what works?



**This classroom-integrated model of DPL, aligned with the curriculum and teaching practices, is highly promising.**



**We need to avoid broad-brush claims about personalisation when making claims about impact.**



**Investing in and considering the unique contribution of teachers when implementing DPL into existing classroom practice is critical.**



# Thank you

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