

Testing Digital Timer Tools to Support Early Grade Lesson Delivery

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At a glance

Research question ?

How does introducing a timer alongside digitised lesson plans impact teachers' lesson plan usage?

The A/B test

219 pre-primary schools allocated into two experiment groups: one where teachers received a timer alongside digitised lesson plans, and a control (without the timer).

Key findings

No significant impact was observed on teachers' usage of digitised lesson plans (although this test only used a proxy for measuring actual length of lesson delivery).

About the Evidence Briefs

EdTech Hub has been co-designing and testing software interventions to explore how DPL tools might be optimised to support learning and teaching in early grade classrooms. *Designing DPL Software for Classrooms* is a series of evidence briefs which share results from four A/B/n software tests conducted as part of this research partnership with EIDU—a provider of digital personalised learning technology (DPL) in Kenya. This is Evidence Brief #2.

Other briefs in this series

#1: *Optimising Session Duration on Digital Personalised Learning Tools for Early Grade Learners*. DOI: [10.53832/edtechhub.1046](https://doi.org/10.53832/edtechhub.1046).

#3: *Investigating the Impact of Content Repetition on Digital Personalised Learning Tools for Early Grade Learners*. DOI: [10.53832/edtechhub.1048](https://doi.org/10.53832/edtechhub.1048).

#4: *Designing Digital Notifications to Support Teacher Uptake of Data Dashboards*. DOI: [10.53832/edtechhub.1049](https://doi.org/10.53832/edtechhub.1049).

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Introduction

The Evidence Brief series reports on four A/B/n software tests, which explore how digital personalised learning (DPL) tools can be enhanced using data generated by digital assessments to optimise personalisation and inform teachers' lesson planning and instruction. These tests are part of the multi-strand EdTech Hub study '[Digital Personalised Learning to Improve Literacy and Numeracy Outcomes in Kenyan Classrooms](https://edtechhub.org/evidence/edtech-hub-research-portfolio/improve-literacy-and-numeracy-outcomes-in-kenyan-classrooms/)'.¹ This is the second of four briefs in the series.

What question does this brief ask?

The following research question informed the design of the A/B test reported on in this brief:



How does introducing a timer alongside digitised lesson plans on a digital personalised learning tool impact upon teachers' lesson plan usage?

What do we know about providing teachers digital tools to support lesson delivery?

Research about designing technology tools which can support lesson delivery is sparse. Papers which focus on factors which might inform technology design include:

- [↑An et al.'s \(2017\)](#) qualitative study, which recommends that developers might try to reduce the amount of attention required from teachers to interact with technologies, given that they are frequently occupied with monitoring their learners.
- [↑Moore's \(2004\)](#) performance analysis, which highlights that the school environment is critical to determining successful technology implementation.

¹ To find out more about the study, see <https://edtechhub.org/evidence/edtech-hub-research-portfolio/improve-literacy-and-numeracy-outcomes-in-kenyan-classrooms/>. Retrieved 16 December 2024.

SEARCHING FOR EVIDENCE



We used different combinations of key search terms, including “education technology”, “digital tools”, “technology for teachers”, “lesson delivery”, “timer”, “clock”, “classroom technology design”, and “teachers”. This brief provides an overview of some of the most relevant returns rather than a comprehensive literature review.

What is digital personalised learning?

Personalisation is a common feature of everyday school practice, as teachers and learners continuously adjust to each other’s shifting needs, aims, and preferences ([↑Beetham, 2010](#); [↑Holmes et al., 2018](#)).

Advancements in technology have led to an expansion of tools which aim to support different aspects of a personalised learning approach ([↑UNICEF, 2022](#)). Following [↑Van Schoors et al. \(2021\)](#), we define *Digital Personalised Learning* (DPL) as tools which feature a digital learning environment that adapts to the individual learner, aiming to optimise individual and/or collaborative learning processes to enhance cognitive, affective, motivational, metacognitive, or efficiency outcomes.

[EIDU](#) is a provider of a DPL tool in Kenya. The EIDU tool comprises an application with both a teacher-facing and learner-facing interface for early grade teaching and learning. This application is pre-installed on a low-cost Android device, with one to two devices distributed per classroom and used during the school day. Learners access digital content for numeracy and literacy and assessment exercises (aligned with the Kenyan curriculum) via individual user profiles, with the software personalising content sequencing for each user. The tool also offers teachers access to digitised lesson plans and a dashboard indicating learners’ weekly usage time and digital curriculum progress.

A/B/n test design

This study has employed A/B/n testing — a controlled experimental approach randomly assigning participants to different software versions to assess each design’s comparative effectiveness ([↑Friedberg, 2023](#)). This section provides an overview of the methods employed for the A/B test, which focused on testing the impact of introducing a timer alongside digitised lesson plans.

WHY A/B/n TESTS?



The A/B/n testing method is particularly useful for evaluations of different software versions: the randomised approach can both minimise bias to ensure comparability and avoid direct interruptions to regular teaching activities ([↑Savi et al., 2018](#)). It also enables an at-scale approach to education technology research, whereby software design is optimised through continuous iterations and refinements involving a large dataset ([↑Friedberg, 2023](#)).

Sample

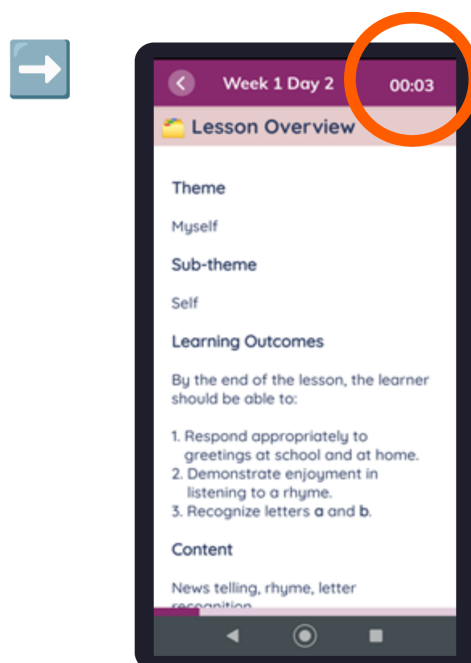
The test involved 219 schools across 2 counties in Kenya (Mombasa and Nairobi). This sample comprised 419 pre-primary 1 classes (PP1, aged 4–5) and 438 pre-primary 2 classes (PP2, aged 5–6).

A/B groups

There were two groups in the experiment: ‘timer’ and ‘no timer’. The experimental group received a timer, which was displayed on the screen where teachers viewed the digitised lesson plans. The timer automatically began when teachers opened a new lesson plan each day. The control group did not receive the timer, but had access to the same set of digitised lesson plans. Each school was randomly assigned to one of the two partitions, with a final distribution of 1112 schools in the experimental group and 107 in the control.

Figure 1. Image showing the visualisation of the automatic timer, displayed alongside lesson plans for the experimental group.

Image credit: EIDU & EdTech Hub



Duration

A Beta test took place in October 2022 among a small sample of 20 schools with teachers who had been trained in providing feedback to EIDU on software changes. Following analysis of user feedback, the software experiment was released to the full sample, lasting for 13 weeks from 23 January to 21 April 2023—during the first term in the Kenyan academic year.

Data collected

Teachers' lesson plan usage was measured as the total number of minutes per class spent viewing a digitised lesson plan on the EIDU tool. Usage per class was measured as the sum of all lessons conducted during the 13-week experiment, divided between literacy and numeracy lessons.

Analysis

Simple regression models were run to analyse the differences in usage data between the experimental groups by predicting teachers' total lesson

plan usage (in minutes) per class. Analysis was conducted separately for each lesson domain (literacy and numeracy) and each grade (PP1 and PP2).

Ethical considerations

Consent was obtained from teachers for anonymous learning data to be collected by the EIDU tool, for A/B/n testing on the tool, and for the data to be shared with third-party research groups to improve the software and the learning experience. Teachers gave consent by signing a data usage policy, both on their own behalf and as gatekeepers for the students in their classrooms. The research was also approved by national and institutional ethical approval bodies.

Key findings

The effects of providing a timer on teachers' lesson plan usage

The A/B test revealed that the provision of a timer did not influence how much time teachers used the digitised lesson plans. While, on average, teachers in the 'timer' group tended to spend less time on lesson plans for literacy and more for numeracy, this was not statistically significant.

Usage of literacy lesson plans

Results indicate that a timer does not influence teachers' average usage of literacy lesson plans:

- On average, PP1 and PP2 teachers in the 'timer' group tended to view the lesson plans for less total time than those in the 'no timer' group (12.43 minutes less in PP1 and 10.09 minutes less in PP2).
- However, these mean differences were found to be not statistically significant.

Table 1. Mean total literacy lesson plan usage per class (in minutes) and simple regression results of two A/B test groups by grade

Literacy		PP1	PP2
Mean total lesson plan usage per class (mins)	Timer	281.55 (321.06 SD)	435.50 (476.92 SD)
	No timer	293.97 (327.74 SD)	445.59 (464.42 SD)
Simple regression model		$\beta = -12.42$ $p = 0.704$	$\beta = -10.09$ $p = 0.826$

Usage of numeracy lesson plans

Results indicate that a timer may influence teachers' usage of numeracy lesson plans, although this was not consistent across both grades:

- On average, PP1 and PP2 teachers in the 'timer' group tended to view the lesson plans for slightly more total time than those in the 'no timer' group (0.73 minutes more in PP1 and 1.01 minutes more in PP2).

- However, these mean differences were found to be not statistically significant.

Table 2. Average total literacy lesson plan usage per class (in minutes) and simple regression results of two A/B test groups by grade

Numeracy		PP1	PP2
Average total lesson plan usage per class (mins)	Timer	178.32 (200.07 SD)	257.84 (287.86 SD)
	No timer	177.59 (203.48 SD)	256.83 (267.34 SD)
Simple regression model		$\beta = 0.73$ $p = 0.972$	$\beta = 1.01$ $p = 0.971$

What next?

Evidence should inform decision-making. This section outlines:

1. How this A/B test led to changes in the implementation of EIDU's DPL tool.
2. Recommendations for other DPL providers and/or researchers.

Iterating the EIDU tool

While the results of this A/B test did not provide a significant indication of impact, the perceived usefulness of the timer was assessed through complementary qualitative research (conducted by EIDU). Since teachers reported the timer feature to be helpful, it was incorporated into all lesson plans.

Recommendations for other DPL providers and researchers

Interpreting these results for other contexts

We recommend considering the following points:

- Measuring the amount of time teachers spent viewing the digitised lesson plans is a useful indication of teacher engagement, but only a digital proxy for assessing the impact of a timer on the length of actual lesson delivery (for which in-person observation to measure lesson length is likely required). It is important to consider how alternative research methods might complement and add nuance to data collected by digital tools.

Conducting future research

The evidence base on this topic could be further strengthened by investigating:

- Teachers' perceptions of the kind of digital tools and/or software features that would help them deliver high-quality lessons (i.e., researching through using co-design methodologies).
- Whether the use of digital or paper-based lesson plans has an impact on teachers' lesson delivery.

References

These references are available digitally in our evidence library at <https://docs.edtechhub.org/lib/UZRIG2V8>

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Front cover photo: A teacher passes the device with the EIDU platform to a learner. Photo credit: Juozas Cernius / EIDU.

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