Reproducible Research Repository

From Chalkboards to Chatbots: Evaluating the Impact of Generative AI on Learning Outcomes in Nigeria

Second Submission: RR_NGA_2025_349

Luis Eduardo San Martin, Nihaa Sajid
reproducibility@worldbank.org
December 03, 2025

This review verifies the reproducibility of the exhibits included in the paper *"From Chalkboards to Chatbots: Evaluating the Impact of Generative AI on Learning Outcomes in Nigeria"*.

Contents in this review:

Main findings

- **Every exhibit has been reproduced accurately.**
- The code was successfully executed on a new computer after:
  1. Opening the RStudio project file *replication_package.Rproj*
  2. Running the main script
- The output demonstrates consistent stability across multiple runs. Specifically, executing the code two times consecutively yielded identical results.
- The code takes approximately 5 minutes to run.
- We conducted our reproducibility analysis based on the paper shared by the authors via OneDrive on October 23, 2025.
- **Verification Process and Data Handling**:
  - The reproducibility package relies on 1 type of data: open data.
  - Open data is included in the public reproducibility package.
  - *data_hash_report.csv* lists the SHA256 hashes of all files in the Data folder to support data integrity checks.
- **Reproducibility Summary**:
  - **Data**: All data sources are publicly available and included in the reproducibility package.
  - **Code**: All code files (from cleaning to analysis) are included in the reproducibility package.

- **Outputs**: All outputs are generated by code included in the reproducibility package.
- **Reproducibility verification**: Reviewers had access to the same materials in the public reproducibility package. The reviewers did not verify if publicly available data matches the data in the reproducibility package.
- **Dependencies environment**: The reviewers created a new environment using the latest versions of dependencies available at the moment of the review.

List of exhibits and reproducibility status

Results in the Main Section of the Paper

- **Table 1** Reproduced.
- **Table 2** Reproduced.
- **Table 3** Reproduced.
- **Table 4** Reproduced.
- **Table 5** Reproduced.
- **Table 6** Reproduced.
- **Table 7** Reproduced.
- **Table 8** Reproduced.
- **Table 9** Reproduced.
- **Table 10** Reproduced.

- **Table 11** Reproduced.
- **Table 12** Reproduced.
- **Table 13** Does not show analysis results.
- **Table 14** Does not show analysis results.
- **Figure 1** Reproduced.
- **Figure 2** Reproduced.
- **Figure 3** Reproduced.
- **Figure 4** Reproduced.
- **Figure 5** Reproduced.
- **Figure 6** Reproduced.
- **Figure 7** Reproduced.
- **Figure 8** Does not show analysis results.

Results in the Annex

- **Figure 9** Does not show analysis results.
- **Figure 10** Does not show analysis results.
- **Figure 11** Does not show analysis results.

Reproduction Environment

Paper exhibits were reproduced on a computer with the following specifications:

- OS: Windows 11 Enterprise, version 24H2
- Processor: Intel(R) Core(TM) Ultra 7 165U (2.10 GHz)
- Memory available: 32.0 GB
- Software version: R 4.5.1