
Can Text-to-Speech Systems enable Inclusive Computer-Based Testing? An Evaluation of Yoruba TTS for Visually Impaired Learners

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1 Introduction

2 Computer-Based Testing (CBT) is widely adopted for standardized assessments due to its scalability
3 and efficiency, yet it remains largely inaccessible to visually impaired learners especially in underrep-
4 resented languages like Yoruba. While Text-to-Speech (TTS) technology offers a potential solution
5 by converting exam text into spoken language, most existing systems are designed for high-resource
6 languages and struggle with the tonal and phonological complexity of Yoruba. This study examines
7 the feasibility of using Yoruba TTS systems to deliver exam content in a CBT environment for
8 visually impaired students, assessing both technical performance and user experience to understand
9 whether current solutions can meet accessibility needs.

10 Experiment

11 We used a three-phase approach to compare the effectiveness of human voice, Braille and TTS in
12 delivering standardized exam content to visually impaired students. Five students (three males and
13 two females), aged 15–18, all fluent in Yoruba participated. Ten multiple choice questions were
14 selected from the 2024 West African Examinations Council (WAEC) Yoruba exam paper. In Phase
15 One, each question was read aloud by a fluent Yoruba speaker. In Phase Two, the same questions
16 were provided in Braille and in Phase Three, the exam questions were presented through a web-based
17 interface powered by Yoruba TTS models. Prior to deployment, four models were evaluated using
18 the Mean Opinion Score (MOS) method to assess speech quality. The models and their MOS ratings
19 were as follows: MMS-TTS-Yor (3.7), YarnGPT (3.2), YorubaTTS (2.5) and Tacotron 2 (2.1). Based
20 on these scores, the two models that performed the highest(MMS-TTS-Yor and YarnGPT) were
21 selected and integrated into the web interface for the TTS experiment.

22 Result and Conclusion

23 All five students chose Braille as their top preference, as it gave them a sense of control, quietness
24 and independence during the test. Three students found the human voice method helpful and clear,
25 although they noted that depending on someone else was less ideal. Only one student liked using
26 TTS, mainly for its modern approach, but raised concerns about poor voice quality, mispronunciation
27 and tonal inaccuracies. The main issues with TTS included flat, robotic delivery, mispronunciation
28 and inconsistent tone handling, showing that while TTS offers scalability, it is not yet suitable for
29 CBT in Yoruba due to low naturalness of speech and inadequate tone handling.

30 This study concludes that current Yoruba TTS systems are not yet viable for exam delivery. Future
31 work should focus on creating high-quality Yoruba speech datasets, tone-sensitive models and
32 user-centered design to make TTS a practical accessibility tool in education.