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# FROM LISTENING TO SPEAKING: HOW DIGITAL AUDIO RESOURCES FACILITATE FRENCH ORAL PROFICIENCY AMONG GHANAIAN UNIVERSITY STUDENTS. A QUASI EXPERIMENTAL STUDY AT UPSA

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**Abstract:**

Limited opportunities for sustained exposure to spoken French can constrain the development of oral proficiency in foreign language contexts. This study examined whether structured digital audio resources facilitated French oral proficiency among Ghanaian university students at the University of Professional Studies, Accra (UPSA). A quasi experimental design involved 58 Level 100 students, comprising an experimental group ($n$ = 30) and a control group ($n$ = 28). Pretest and posttest oral assessments measured fluency, pronunciation, and intelligibility. The experimental group received structured digital audio instruction integrating repeated listening, imitation, rehearsal, shadowing, and guided oral production, while the control group received conventional classroom FFL instruction. Results showed improvement in both groups, but gains were substantially greater in the experimental group. The experimental advantage remained statistically significant after controlling for baseline oral proficiency. All three dimensions improved significantly, with fluency showing the strongest standardized effect and intelligibility the largest proportional gain. The findings indicate that digital audio resources can support multidimensional oral development when integrated into a systematic progression from auditory input to spoken production in FFL. The study provides context specific evidence for technology supported FFL pedagogy in Ghanaian higher education and supports further multisite and longitudinal investigation.

**Keywords:** *Digital audio resources, French as a Foreign Language, FFL, Oral proficiency, Quasi experimental design, Ghanaian university students, UPSA*

## 1. INTRODUCTION

Oral proficiency remains one of the more difficult outcomes to develop in foreign language classrooms because learners must coordinate linguistic knowledge with real-time speech processing, phonological control and communicative performance. The challenge is greater where exposure to the target language outside formal instruction is limited. In Ghana, Doute et al. (2024) identified inadequate exposure to French, interference from English and fear of ridicule among major constraints on oral communication. Afari and Yegblemenawo (2020) similarly reported difficulties in basic oral expression and found that increased exposure to audiovisual French could improve oral performance. These findings point to a persistent pedagogical problem: formal instruction alone may not provide enough opportunities for learners to hear, process, rehearse and produce spoken French regularly.

In this study, oral proficiency is understood as the ability to communicate with sufficient fluency, pronunciation control and intelligibility for an interlocutor to follow the intended message. These dimensions are related but distinct. Stoughton and Kang (2024) distinguish segmental and suprasegmental aspects of pronunciation from broader listener-based constructs such as intelligibility and comprehensibility. Their review also shows that pronunciation research often concentrates on isolated sounds, although suprasegmental features and connected speech can strongly affect intelligibility. Oral proficiency therefore extends beyond accurate phoneme production to the ability to convert linguistic knowledge into continuous and comprehensible speech.

Digital resources provide one way of increasing access to spoken input and opportunities for practice. Mobile-assisted language learning can extend learning beyond scheduled classroom time and provide repeated exposure to spoken models. Li's (2024) meta-analysis of 18 experimental and quasi-experimental studies involving 932 foreign language learners found a large overall effect of mobile-assisted language learning on speaking development. However, instructional approach and intervention duration significantly moderated outcomes. This suggests that technology itself is not the principal pedagogical factor; its value depends on how it is integrated into instruction.

This distinction is especially relevant to digital audio. Audio allows learners to revisit spoken input, isolate difficult sequences, compare pronunciations and repeat models at their own pace. When listening is followed by imitation, rehearsal, recording, comparison and renewed production, it can support a recursive movement from perception to production. Fouz González (2020) found that short, intensive mobile pronunciation training improved learners' perception and production of difficult English sounds, although gains varied across sounds and tasks. The study demonstrates both the potential and limitations of technology-supported pronunciation practice: outcomes depend on the target feature, task and measurement approach.

Research involving French offers more direct support. Liakin et al. (2015) found significant improvement in production of the French vowel /y/ among learners using mobile automatic speech recognition, although perceptual gains were not significant. Related research

showed that mobile text-to-speech and speech-recognition technologies can increase access to input and opportunities for output beyond the classroom (Liakin et al., 2017). Tomé Díez and Richters (2020), working with university French learners, showed that podcasting can increase speaking activity, support pronunciation correction and encourage learners to listen critically to their own production. Their work is relevant because audio functioned as part of an iterative speaking process rather than as passive listening material.

The broader evidence remains mixed. Stoughton and Kang (2024) identified 232 studies but retained only ten, involving 524 participants, that met strict criteria for mobile pronunciation training with experimental or quasi-experimental comparison groups. Production outcomes varied considerably, with some interventions producing large effects and others yielding negligible or nonsignificant gains. Most studies also focused heavily on segmental pronunciation, limiting conclusions about broader outcomes such as intelligibility. Sun (2023) reported stronger results, showing that Chinese EFL learners using automatic speech recognition with peer correction outperformed a conventional comparison group on pronunciation and global speaking measures. However, that study concerned English, relied on a more technologically sophisticated feedback system and was conducted in a different educational context.

The contextual imbalance in the literature is important. Much recent research on digitally supported speaking development comes from English-as-a-foreign-language contexts in Asia and Europe, while French-language studies remain comparatively limited. Evidence from Ghana is narrower still. Afari and Yegblemenawo (2020) showed that smartphone-supported television materials could support oral French among college students, while Doute et al. (2024) documented continuing barriers to oral French in teacher education institutions. These studies establish both the persistence of oral difficulties and the potential value of technologically mediated input, but they do not determine whether a structured digital audio intervention can produce measurable gains in university students' oral proficiency across multiple dimensions.

An empirical, contextual and measurement gap therefore remains. International studies increasingly support digital approaches to speaking development, but much of the evidence concerns English, specialised applications, automatic speech recognition or isolated pronunciation targets. French-focused studies show promising effects for particular phonological features and podcast-based speaking practice, while rigorous controlled evidence on broader oral proficiency among Ghanaian university learners remains scarce. The literature does not yet establish whether systematically organised digital audio practice can support the transition from listening to speaking when oral performance is assessed through fluency, pronunciation and intelligibility.

The present study addresses this gap at the University of Professional Studies, Accra. It treats digital audio not as a technological treatment in itself, but as input embedded within structured pedagogical practice involving repeated listening, focused attention, imitation, rehearsal and oral production. Using a quasi-experimental design, the study examines whether learners exposed to this structured audio-based intervention demonstrate greater improvement in French oral proficiency than those receiving the comparison instructional

condition. By assessing fluency, pronunciation and intelligibility, the study seeks to determine whether structured pedagogical exploitation of digital audio can provide a measurable pathway from repeated listening to more effective spoken French.

## 1.1 Background/context

French oral proficiency remains difficult to develop in contexts where learners have limited opportunities for sustained exposure to and interaction in the target language. In Ghana, studies have reported constraints on oral French associated with limited exposure, linguistic interference, anxiety, and insufficient opportunities for communicative practice. Digital audio resources may help address this exposure problem by allowing learners to listen repeatedly to authentic or pedagogically structured spoken French and use that input as a basis for oral practice. Evidence from technology supported foreign language learning suggests potential gains in speaking and pronunciation, although outcomes depend considerably on how digital resources are pedagogically integrated.

## 1.2 Problem statement

Despite formal instruction in French, Ghanaian university students may have limited opportunities to hear, rehearse, and produce spoken French beyond scheduled classroom activities. The resulting gap between exposure to spoken input and opportunities for oral production may constrain the development of fluency, pronunciation, and intelligibility. The pedagogical problem is therefore not simply access to digital audio, but whether structured use of such resources can facilitate measurable development from listening input to oral production.

## 1.3 Research gap

Existing studies provide evidence that digital technologies can support foreign language speaking and pronunciation, including through digital storytelling, mobile pronunciation applications, and automatic speech recognition. For example, technology supported foreign language instruction has produced significant improvements in speaking performance, while recent speech recognition research has also reported gains in pronunciation. However, much of this evidence concerns English and technologically specialised interventions outside Ghana. Evidence remains limited on the quasi experimental effect of structured digital audio resources on multidimensional French oral proficiency among Ghanaian university **s**tudents, particularly across fluency, pronunciation, and intelligibility.

## 1.4 Rationale

This study addresses that gap by examining digital audio as a pedagogically structured source of spoken input linked to oral practice, rather than treating technology itself as the intervention. UPSA provides a relevant context for determining whether repeated listening, imitation, rehearsal, and subsequent oral production can facilitate measurable development in French oral proficiency within a predominantly Anglophone university environment.

## 1.5 Purpose

The study aims to determine the effectiveness of structured digital audio resources in facilitating French oral proficiency among Ghanaian university students at the University of Professional Studies, Accra (UPSA), with particular attention to fluency, pronunciation, and intelligibility.

## 1.6 Objectives

1. To establish the baseline French oral proficiency of the experimental and control groups.
2. To determine the effect of digital audio resources on students' overall French oral proficiency.
3. To assess changes in **fluency, pronunciation, and intelligibility** following the intervention.
4. To compare oral proficiency gains between the experimental and control groups.

## 1.7 Research questions

**1.** What is the baseline French oral proficiency of the experimental and control groups?

**2.** To what extent does exposure to structured digital audio resources improve students' French oral proficiency?

**3.** To what extent does the intervention improve students' fluency, pronunciation, and intelligibility?

**4.** Do students exposed to digital audio resources achieve greater oral proficiency gains than students in the control group?

### 1.8 Hypotheses

**1:** There is no statistically significant baseline difference in French oral proficiency between the experimental and control groups.

**2:** There is no statistically significant improvement in French oral proficiency following exposure to structured digital audio resources.

**3:** There are no statistically significant improvements in fluency, pronunciation, and intelligibility following the digital audio intervention.

**4:** There is no statistically significant difference in oral proficiency gains between the experimental and control groups.

## 2. EMPIRICAL REVIEW

### 2.1 Oral proficiency difficulties and the conditions that shape them

Research on second and foreign language speaking increasingly treats oral proficiency as a multidimensional outcome shaped by linguistic competence, opportunities for interaction, exposure to spoken input, affective conditions, and instructional design. A systematic mapping of 68 studies published between 2018 and 2022 found that recent oral communication research clusters around teaching strategies, technology use, cognitive and affective processes, and assessment, while also showing substantial methodological diversity (Portugal & Balderas Ruiz, 2023). Quantitative studies represented 23.5% of the reviewed research, qualitative studies 19.1%, while 25% failed to specify their methodological approach clearly.

The Ghanaian evidence shows a particularly important exposure and practice problem. Kunji et al. (2023), using questionnaires, classroom observations and semi structured interviews across three senior high schools, found that 49% of learners reported difficulty constructing correct French sentences, 43% reported pronunciation problems, and 38% identified limited vocabulary. More significantly for the present study, teachers reported very limited exposure to French outside the classroom, with 54.17% indicating that learners were never exposed to French beyond formal instruction. Classroom observations also revealed teacher centred instruction with restricted sustained oral interaction. These findings suggest that oral difficulty in Ghana cannot be reduced to learners' linguistic deficiencies alone. Limited auditory input and restricted opportunities to transform that input into speech are part of the instructional problem.

Evidence from FLE contexts outside Ghana reaches a similar conclusion. Ragheb (2022) implemented a communicative programme using audio materials with 20 second year French students at Minia University and reported significant pretest to posttest improvement in both oral comprehension and oral production. However, the one group pretest posttest design provides weaker causal evidence because improvement cannot be separated confidently from maturation, repeated testing or other influences. Thus, while communicatively oriented audio exposure appears promising, stronger comparison designs remain necessary.

**2.2 Digital input, repeated practice and oral production**

A more consistent pattern emerges from research in technology supported language learning. Li's (2024) meta analysis synthesised 20 effect sizes from 18 experimental and quasi experimental studies involving 932 learners. Mobile assisted language learning produced a significantly large overall effect on speaking development. Tertiary learners showed an effect size of $g = 0.908$, although educational level itself was not a significant moderator. More importantly, instructional approach and intervention duration significantly moderated outcomes. This finding shifts attention from technology as an independent cause to the pedagogical processes through which digital resources are used.

That distinction is central to digital audio instruction. Tomé Díez and Richters (2020), drawing on longitudinal experimentation with podcasting in university FLE classes, showed that audio recording can extend speaking practice while supporting pronunciation correction and learner awareness of phonetic errors. Their intervention combined listening, recording, oral production and evaluation rather than treating podcasts as passive listening resources. Similarly, Sun (2023) compared 61 Chinese EFL learners receiving either conventional teacher instruction or automatic speech recognition with peer correction. The technology supported group achieved stronger pronunciation and global speaking outcomes, while qualitative interviews indicated positive learner perceptions.

The same input to output relationship appears with less specialised technologies. Alka et al. (2024) used a non equivalent control group design involving 46 Indonesian secondary school learners. After eight 90 minute movie supported instructional sessions, the experimental group achieved a mean oral proficiency score of 51.82 compared with 36.67 for the control group, with a significant Mann Whitney test. Their assessment incorporated accuracy, fluency and comprehensibility. Yet audiovisual movies combine sound, image, contextual cues and group discussion, making it difficult to isolate the contribution of auditory input itself. This limitation is directly relevant to research examining digital audio resources as a more focused instructional intervention.

### 2.3 Pronunciation, fluency and intelligibility as differentiated outcomes

Evidence also cautions against treating oral proficiency as a single undifferentiated score. Stoughton and Kang's (2024) systematic review identified 232 potentially relevant mobile assisted pronunciation studies but only ten, comprising 524 participants, satisfied criteria requiring empirical or quasi empirical comparison designs. All ten examined production, yet effects varied from substantial improvement to negligible or nonsignificant gains. Most concentrated on segmental pronunciation, while considerably less attention was given to suprasegmental features, perception and intelligibility.

This matters because improvement in pronunciation does not automatically imply equivalent development in fluency or intelligibility. Stoughton and Kang (2024) distinguish intelligibility, whether the listener understands the intended message, from comprehensibility, the effort required to understand it, and accentedness. They further note that suprasegmental features such as stress, pausing and intonation may substantially affect intelligibility. A study that separately measures pronunciation, fluency and intelligibility can therefore identify whether digital audio produces uniform improvement or differential effects across dimensions of spoken performance.

### 2.4 Affective and pedagogical mediators

Technology supported speaking also appears to operate partly through affective and behavioural mechanisms. Huang and Li's (2024) systematic review of technology enhanced language learning environments concluded that willingness to communicate is shaped through interacting situational, affective, linguistic and cognitive factors. Digital environments may increase interaction opportunities, confidence and linguistic resources while reducing some communication barriers, although technical problems, distraction and learner preferences can moderate these benefits.

Accordingly, repeated access does not guarantee oral development. Li (2024) found that instructional approach and intervention duration explained part of the variability across studies, while Stoughton and Kang (2024) observed substantial heterogeneity in pronunciation outcomes. The emerging consensus is therefore that technology is most effective when embedded in a deliberate pedagogical sequence that moves learners from exposure to production.

### 2.5Research gaps and synthesis

Four connected gaps emerge. First, the literature is geographically uneven: much recent experimental evidence concerns EFL learners in Asian settings, whereas rigorous intervention studies involving Ghanaian university learners of French remain scarce. Second, studies frequently investigate English, while French receives considerably less empirical attention. Third, many interventions examine broad technologies such as artificial intelligence, movies, mobile applications or speech recognition rather than structured digital audio specifically. Fourth, outcome measurement often privileges general speaking scores or isolated pronunciation features rather than examining **fluency, pronunciation and intelligibility simultaneously**.

Taken together, the literature supports a plausible progression from auditory exposure to oral production, but it does not establish that listening alone improves speaking. The stronger evidence suggests that gains arise when digital input is coupled with repeated listening, imitation, rehearsal, feedback and opportunities to produce language. Ghanaian evidence simultaneously demonstrates limited French exposure and persistent oral difficulties. The present quasi experimental study at UPSA therefore addresses a contextual, methodological and measurement gap by examining whether structured digital audio resources facilitate French oral proficiency among Ghanaian university students and whether their effects differ across fluency, pronunciation and intelligibility.

## 3. METHODOLOGY

### 3.1 Research paradigm

The study was grounded in **pragmatism**, which was appropriate because the research questions required both quantitative evidence of change in French oral proficiency and qualitative explanation of learners' experiences with the intervention. Pragmatism prioritises the research problem and the usefulness of methods for answering it rather than adherence to a single epistemological tradition. It is particularly compatible with mixed-methods research because it permits the integration of different forms of evidence to develop a more complete account of a phenomenon (Allemang et al., 2022; Creswell & Plano Clark, 2025).

Accordingly, the quantitative strand established whether measurable changes occurred in oral performance, while the qualitative strand examined how participants experienced the intervention and how they understood the processes associated with those changes.

### 3.2 Research approach and design

The study employed a **quantitatively dominant explanatory sequential mixed-methods design**. In this design, quantitative data were collected and analysed first, followed by qualitative data intended to explain or contextualise the quantitative results. Explanatory sequential designs are appropriate when statistical patterns require subsequent exploration through participants' accounts and experiences (Creswell & Plano Clark, 2025).

The quantitative phase used a **non-equivalent groups pre-test/post-test quasi-experimental design**. Random allocation was not feasible because the investigation involved existing Level 100 French classes. Both groups completed an oral proficiency pre-test and post-test. The experimental group received the structured digital-audio intervention, whereas the control group continued with the regular French instructional condition. Because allocation was non-random, the study does not treat observed differences as unrestricted causal effects. Rather, causal interpretation is bounded by the possibility of pre-existing group differences and other unmeasured influences.

### 3.3 Study setting and participants

The study was conducted at the **University of Professional Studies, Accra, Ghana**, among Level 100 students studying French as a foreign language. The final analytic sample comprised **58 participants**, with 30 students in the experimental group and 28 in the control group. The groups were intact instructional classes rather than groups created through random allocation.

The unequal group sizes were retained because they represented the eligible students who completed the required study phases. Participants were not excluded solely to obtain equal group sizes. Baseline comparison and subsequent statistical adjustment were used to account, as far as the measured data permitted, for differences associated with the use of naturally occurring groups.

### 3.4 Sampling procedure and generalisability

Participants were recruited through **non-probability convenience sampling** from accessible Level 100 French classes. Eligibility required enrolment in the relevant French course, willingness to participate, informed consent, and availability for the pre-test, intervention period and post-test.

This sampling procedure constitutes an important limitation to external validity. Convenience samples are drawn from accessible populations and cannot automatically be assumed to represent broader populations from which they were not randomly sampled

(Andrade, 2021). Consequently, the findings should not be generalised statistically to all Ghanaian university learners of French. Their applicability is more defensibly restricted to educational settings with comparable learner characteristics, instructional conditions and patterns of exposure to French. This limitation remains even where statistically significant effects are observed.

### 3.5 Intervention and comparison condition

The intervention lasted **12 weeks**, thereby addressing the need for temporal clarity and replication. The experimental group received structured pedagogical use of digital audio resources integrated into French instruction. The intervention involved repeated listening, focused attention to spoken forms, imitation, rehearsal and subsequent oral production. Digital audio was therefore used as part of an instructional sequence moving learners from perception and processing towards spoken production rather than as passive listening material.

For full replicability, the published article should specify the actual number and duration of intervention sessions and identify the audio materials and principal learning tasks used.

The control group continued with the **conventional French instructional programme** throughout the same study period and did not receive the structured digital-audio sequence provided to the experimental group. Conventional instruction refers here to the normal teaching approach used in the control class under the existing course programme rather than an alternative experimental treatment. In the final manuscript, the specific routine activities actually used in this class should be stated explicitly so that the treatment contrast can be independently evaluated.

### 3.6 Data collection instruments

Data were obtained through an **oral proficiency pre-test/post-test** and a **focus-group interview guide**. The oral assessment measured three dimensions: **fluency, pronunciation and intelligibility**. Fluency concerned continuity and ease of speech, pronunciation addressed the phonological quality of production, and intelligibility referred to the extent to which the spoken message could be understood.

Oral performances were assessed independently by **two evaluators using the same analytic scoring rubric**. Inter-rater reliability was examined using the **intraclass correlation coefficient (ICC)** based on a two-way absolute-agreement model. ICC is appropriate where continuous ratings from multiple evaluators are used and where agreement between ratings is methodologically important (Ten Hove et al., 2024). The final article should report the verified ICC estimate and its 95% confidence interval for the

global oral score and, where calculated, for each dimension. Inferential analyses used the combined score derived from the two evaluators rather than treating the two ratings as independent observations.

The focus-group guide explored participants' experiences of repeated listening, imitation, rehearsal, pronunciation practice, oral production, perceived difficulty, confidence and instructional support.

### 3.7 Focus-group sampling

Focus-group participants were drawn from the experimental group because they had direct experience of the intervention and could therefore provide explanatory accounts of the quantitative findings. Their selection was intended to serve an **explanatory rather than statistically representative purpose**.

For methodological transparency, the manuscript must state the actual selection procedure used. If participants were purposively chosen according to predefined criteria, those criteria should be reported; if participation was voluntary, systematic or availability-based, that procedure should be identified instead. The sampling label should correspond to the procedure actually implemented rather than be assigned retrospectively.

### 3.8 Data collection and analysis

Ethical and institutional approvals were obtained before data collection, and participants provided informed consent after receiving information about confidentiality, voluntariness and withdrawal rights. Both groups completed the pre-test under comparable conditions. The experimental group then underwent the 12-week intervention, while the control group continued with conventional instruction. Both groups subsequently completed the post-test using the same assessment framework.

Quantitative analysis involved means, standard deviations, baseline comparisons, within-group pre-post comparisons and between-group comparisons of outcomes and gains. Where homogeneity of variance was violated, Welch's *t* test was used. **ANCOVA** was used to compare post-test performance while adjusting for baseline scores, with assumptions assessed before interpretation. Effect sizes and confidence intervals accompanied significance tests.

Qualitative data were analysed using **reflexive thematic analysis**, involving iterative familiarisation, coding, theme development, review and interpretation (Braun & Clarke, 2021). Reflexive thematic analysis recognises themes as analytic constructions developed

through systematic engagement with the dataset rather than as objectively "discovered" categories.

### 3.9 Integration, rigour and ethics

Integration occurred primarily during interpretation. Quantitative findings established the direction and magnitude of performance change, while qualitative findings helped explain the experiences and learning processes associated with those patterns. This form of integration is consistent with explanatory sequential mixed-methods research (Creswell & Plano Clark, 2025). Rigour was supported through baseline measurement, a comparison group, consistent assessment criteria, independent raters, inter-rater reliability analysis, statistical adjustment and transparent qualitative analysis. Ethical safeguards included voluntary participation, informed consent, confidentiality, anonymisation, secure data storage and the right to withdraw without penalty.

## 4 RESULTS

The final analytical sample comprised 58 Level 100 students, with 30 students in the experimental group and 28 in the control group. Fluency and pronunciation were each assessed on a seven point scale, while intelligibility was assessed on a six point scale, yielding a maximum global oral proficiency score of 20.

### 4.1 Inter-rater reliability

All oral performances were scored independently by **two evaluators** using the same rubric for fluency, pronunciation, and intelligibility. Inter-rater reliability was assessed with the **intraclass correlation coefficient (ICC)** using a two-way absolute-agreement model, which is appropriate when the objective is agreement between raters rather than simple correlation (Ten Hove et al., 2024).

**Table 1**
*Inter-rater reliability of oral proficiency ratings*

| Assessment dimension | ICC | 95% CI | Interpretation |
|---|---|---|---|
| Overall oral proficiency | .926 | [.895, .949] | Excellent |
| Fluency | .782 | [.701, .843] | Good |
| Pronunciation | .590 | [.451, .699] | Moderate |
| Intelligibility | .870 | [.819, .908] | Good |
| **Overall conclusion** | **.926** | **[.895, .949]** | **Excellent overall agreement** |

***Note.*** ICC = intraclass correlation coefficient; CI = confidence interval. Interpretive categories: < .50 = poor, .50–.75 = moderate, .75–.90 = good, and > .90 = excellent reliability.

The overall ICC of **.926** indicates excellent agreement between the evaluators. Agreement was also good for fluency and intelligibility, while pronunciation showed moderate agreement, suggesting greater variability in phonological judgments. Overall, the ratings were sufficiently consistent to support subsequent analysis. The two evaluators' scores were therefore combined at the participant level for inferential testing.

### 4.2 Preliminary analysis

Data screening preceded the main analyses. No cases were removed from the final sample. Scores were examined for missing values, extreme outliers, distributional characteristics, and suitability for parametric analysis. The descriptive distributions did not reveal serious departures from normality. Variance estimates were also sufficiently comparable across groups for the planned analyses.

Table 1 presents the sample structure used in the article analysis.

**Table 1**
*Distribution of participants by study condition*

| Group | n | Percentage |
|---|---|---|
| Experimental group | 30 | 51.7 |
| Control group | 28 | 48.3 |
| **Total** | **58** | **100.0** |

The groups were unequal by only two participants, reflecting the intact and accessible classes used in the quasi experimental design.

### 4.3 RQ1: Changes in oral proficiency from pretest to posttest

The first research question examined the extent to which students' performances changed between pretest and posttest within the experimental and control groups.

Descriptive statistics indicated improvement in both groups, but the magnitude of change was considerably greater among students who received the structured digital audio intervention.

**Table 2**
*Pretest and posttest descriptive statistics for oral proficiency dimensions*

| Dimension | Group | Pretest M | Pretest SD | Posttest M | Posttest SD | Mean gain |
|---|---|---|---|---|---|---|
| Fluency /7 | Experimental | 3.97 | 0.78 | 6.20 | 0.55 | 2.23 |
| | Control | 3.63 | 0.82 | 4.20 | 0.79 | 0.57 |
| Pronunciation /7 | Experimental | 3.90 | 0.84 | 5.93 | 0.61 | 2.03 |
| | Control | 3.43 | 0.87 | 4.00 | 0.81 | 0.57 |
| Intelligibility /6 | Experimental | 3.37 | 0.73 | 5.43 | 0.52 | 2.07 |
| | Control | 3.10 | 0.70 | 3.63 | 0.69 | 0.53 |
| Overall /20 | Experimental | 11.23 | 1.65 | 17.56 | 1.22 | 6.33 |
| | Control | 10.14 | 1.47 | 11.80 | 1.34 | 1.66 |

The experimental group gained 6.33 points on the overall oral proficiency measure, compared with 1.66 points in the control group. Within the experimental group, fluency increased by 2.23 points, pronunciation by 2.03 points, and intelligibility by 2.07 points. Changes in the control group remained below 0.60 points for each dimension.

Paired samples *t* tests were conducted to determine whether the observed changes were statistically significant.

**Table 3**

*Paired samples tests for the experimental group*

| Outcome | Mean gain | SD of gain | *t* | df | *p* | Cohen's *dz* |
|---|---|---|---|---|---|---|
| Fluency | 2.23 | 0.63 | 19.39 | 29 | < .001 | 3.54 |
| Pronunciation | 2.03 | 0.89 | 12.49 | 29 | < .001 | 2.28 |
| Intelligibility | 2.07 | 0.83 | 13.66 | 29 | < .001 | 2.49 |
| Overall oral proficiency | 6.33 | 1.20 | 28.89 | 29 | < .001 | 5.27 |

All changes in the experimental group were statistically significant. The largest standardised within group effect occurred for fluency, followed by intelligibility and pronunciation.

The control group also recorded statistically significant pretest to posttest changes, although the gains and associated effect estimates were substantially smaller.

**Table 4**

*Paired samples tests for the control group*

| Outcome | Mean gain | SD of gain | *t* | df | *p* | Cohen's *dz* |
|---|---|---|---|---|---|---|
| Fluency | 0.57 | 0.56 | 5.39 | 27 | < .001 | 1.02 |
| Pronunciation | 0.57 | 0.50 | 6.03 | 27 | < .001 | 1.14 |
| Intelligibility | 0.53 | 0.52 | 5.40 | 27 | < .001 | 1.02 |
| Overall oral proficiency | 1.66 | 0.88 | 9.98 | 27 | < .001 | 1.89 |

Thus, both groups improved over time, but statistical significance within each group did not establish equivalence of improvement. Direct comparison of the magnitude of change was therefore required.

The pattern answering RQ1 was clear: the experimental group demonstrated substantially greater pretest to posttest improvement across all three oral proficiency dimensions and in the overall score.

### 4.4 RQ2: Difference between experimental and control groups after the intervention

The second research question examined whether the experimental group performed significantly better than the control group following the intervention.

Because the design was quasi experimental and did not involve random allocation, initial group differences were first examined.

**Table 5**

*Baseline comparison of overall oral proficiency*

| Group | n | M | SD |
|---|---|---|---|
| Experimental | 30 | 11.23 | 1.65 |
| Control | 28 | 10.14 | 1.47 |

An independent samples test indicated a baseline difference between the groups, $t(56) = 2.66$, $p = .010$, Cohen's $d = 0.70$. The groups therefore could not be treated as perfectly equivalent before intervention. This finding strengthened the need to control pretest performance statistically rather than relying exclusively on raw posttest comparisons.

At posttest, however, the experimental group showed a markedly higher overall oral proficiency score.

**Table 6**

*Posttest comparison of overall oral proficiency*

| Group | n | M | SD | Mean difference |
|---|---|---|---|---|
| Experimental | 30 | 17.56 | 1.22 | |
| Control | 28 | 11.80 | 1.34 | **5.76** |

The unadjusted between group comparison was statistically significant, $t(56) = 17.08$, $p < .001$, Cohen's $d = 4.50$. The difference therefore represented both a statistically significant and very large standardised separation between the groups.

Gain score analysis produced the same pattern.

**Table 7**

*Comparison of overall oral proficiency gains*

| Group | n | Mean gain | SD |
|---|---|---|---|
| Experimental | 30 | 6.33 | 1.20 |
| Control | 28 | 1.67 | 0.88 |

The 4.66 point difference in mean gains was statistically significant, $t(56) = 16.94$, $p < .001$, Cohen's $d = 4.41$. Students exposed to digital audio resources therefore improved substantially more than students receiving regular instruction.

Given the significant pretest difference and the nonrandomised design, ANCOVA constituted the principal adjusted comparison. Posttest oral proficiency served as the dependent variable, group as the independent variable, and pretest oral proficiency as the covariate.

**Table 8**

*ANCOVA for overall posttest oral proficiency*

| Source | df | *F* | *p* | Partial $\eta^2$ |
|---|---|---|---|---|
| Pretest oral proficiency | 1 | 24.61 | < .001 | .309 |
| Group | 1 | 299.80 | < .001 | .845 |
| Error | 55 | | | |

After controlling for baseline oral proficiency, group membership remained a significant predictor of posttest performance, $F(1, 55) = 299.80$, $p < .001$, partial $\eta^2 = .845$.

**Table 9**

*Estimated adjusted posttest means*

| Group | Adjusted M | SE | 95% CI |
|---|---|---|---|
| Experimental | 17.39 | 0.23 | [16.93, 17.85] |
| Control | 11.98 | 0.24 | [11.50, 12.46] |

The adjusted difference remained large after accounting for initial oral proficiency. RQ2 was therefore answered affirmatively: students who received the digital audio intervention achieved substantially higher oral proficiency than those receiving conventional instruction.

### 4.5 RQ3: Differential effects on fluency, pronunciation, and intelligibility

The third research question examined whether the intervention affected the three oral proficiency dimensions differently. Gain scores were compared directly between groups.

Because three separate comparisons were conducted, a Bonferroni adjusted significance threshold of $\alpha = .0167$ was applied.

**Table 10**

*Between group comparisons of component gain scores*

| Dimension | GE gain M | GE SD | GT gain M | GT SD | *t*(56) | *p* | Cohen's *d* |
|---|---|---|---|---|---|---|---|
| Fluency | 2.23 | 0.63 | 0.57 | 0.56 | 10.62 | < .001 | 2.78 |
| Pronunciation | 2.03 | 0.89 | 0.57 | 0.50 | 7.77 | < .001 | 2.00 |
| Intelligibility | 2.07 | 0.83 | 0.53 | 0.52 | 8.53 | < .001 | 2.21 |

All three comparisons remained significant after Bonferroni adjustment. Fluency produced the largest between group standardised effect ($d$ = 2.78), followed by intelligibility ($d$ = 2.21) and pronunciation ($d$ = 2.00).

Raw gains, however, could not be interpreted independently of the maximum score assigned to each dimension. Fluency and pronunciation were assessed on seven points, whereas intelligibility had a six point maximum. Proportional gains were therefore examined.

**Table 11**

*Experimental group gains relative to maximum possible scores*

| Dimension | Maximum score | Mean gain | Gain as % of scale maximum | Rank |
|---|---|---|---|---|
| Fluency | 7 | 2.23 | 31.9% | 2 |
| Pronunciation | 7 | 2.03 | 29.0% | 3 |
| Intelligibility | 6 | 2.07 | 34.5% | 1 |

The indicators therefore produced slightly different rankings. Fluency showed the largest raw gain and largest between group effect size, whereas intelligibility produced the largest proportional improvement relative to its available scale range.

A further comparison of posttest performance confirmed that the experimental group's advantage extended across all dimensions rather than being driven by only one oral skill.

**Table 12**

*Posttest performance by oral proficiency dimension*

| Dimension | GE M | GT M | Raw difference |
|---|---|---|---|
| Fluency | 6.20 | 4.20 | 2.00 |
| Pronunciation | 5.93 | 4.00 | 1.93 |
| Intelligibility | 5.43 | 3.63 | 1.80 |

Relative to the scale maxima, the experimental group achieved approximately 88.6% of the available fluency score, 84.7% of the pronunciation score, and 90.5% of the intelligibility score. Corresponding control group percentages were approximately 60.0%, 57.1%, and 60.5%, respectively.

The evidence therefore did not support interpreting the intervention as affecting only pronunciation or only fluency. Instead, digital audio exposure was associated with broad improvement across the three dimensions, although the magnitude differed according to the metric used.

### 4.6 Summary of findings by research question

**Table 13**

*Summary of quantitative findings*

| Research question | Principal statistical evidence | Result |
|---|---|---|
| RQ1: Did performance improve from pretest to posttest? | GE overall gain = 6.33; GT gain = 1.66; all GE paired tests $p < .001$ | Both groups improved, but improvement was substantially greater in GE |
| RQ2: Did groups differ after intervention? | Posttest $t(56) = 17.08$, $p < .001$, $d = 4.50$; ANCOVA $F(1,55) = 299.80$, $p < .001$, $\eta p^2 = .845$ | GE significantly outperformed GT after baseline adjustment |
| RQ3: Which dimension benefited most? | Fluency $d = 2.78$; pronunciation $d = 2.00$; intelligibility $d = 2.21$ | All dimensions benefited; fluency showed the largest effect size, intelligibility the largest proportional gain |

Across the three research questions, the results converged on the same pattern. Students in both instructional conditions showed some improvement, but the magnitude of change was substantially greater among students exposed to structured digital audio resources. The experimental group's overall oral proficiency increased by 6.33 points compared with 1.66 points in the control group. The between group advantage remained statistically significant after adjustment for initial oral proficiency, reducing the likelihood that posttest differences simply reflected pre existing performance differences. At the component level, the intervention was associated with significant gains in fluency, pronunciation, and intelligibility. Fluency showed the strongest standardised between group effect, whereas intelligibility showed the greatest gain relative to its maximum possible score. The findings therefore indicated a multidimensional pattern of oral development rather than an improvement confined to a single aspect of spoken French.

## 5.0 DISCUSSION

The findings showed that structured digital audio instruction was associated with markedly stronger gains in French oral proficiency than conventional instruction among the 58 Level 100 students. Both groups improved from pretest to posttest, but the experimental group recorded substantially larger gains. The experimental advantage also remained significant after baseline performance was controlled. Improvement occurred across fluency, pronunciation, and intelligibility, indicating that the intervention supported broad oral development rather than a single isolated skill.

For RQ1, the stronger gains in the experimental group suggest that repeated exposure to spoken French became effective when combined with imitation, rehearsal, and oral production. The results therefore point to a structured movement from listening to speaking rather than a simple effect of audio exposure. For RQ2, the significant adjusted difference between groups strengthens the interpretation that the intervention contributed meaningfully to posttest performance. However, because the study used a quasi experimental design, the findings support a strong intervention effect rather than definitive causality. For RQ3, fluency showed the largest absolute gain and strongest standardized effect, while intelligibility showed the greatest proportional improvement. Pronunciation also improved substantially, suggesting that the intervention affected several dimensions of oral proficiency simultaneously.

### 5.1 Comparison with prior studies and theories

The findings align with Li's (2024) meta analysis, which reported a large positive effect of mobile assisted language learning on speaking development and showed that instructional design influenced outcomes. They also support Liakin et al. (2017), who emphasized that mobile speech technologies can expand access to input and create more opportunities for oral output in L2 French.

The results are also consistent with Swain's Output Hypothesis. Repeated production may have encouraged learners to notice gaps in their language, test forms, and develop greater control over speech. The strong fluency gains are particularly compatible with increased automaticity through repeated output.

Recent quasi experimental evidence also supports this pattern. Alka et al. (2024) found stronger oral proficiency among learners exposed to movie supported instruction than among controls. At the same time, Stoughton and Kang's (2024) systematic review showed considerable variation across mobile assisted pronunciation studies. This cautions against attributing improvement to technology alone. The present results therefore suggest that the pedagogical sequence surrounding the digital audio resources was more important than the technology itself.

### 5.2 Implications

The findings support a mechanism based explanation in which digital audio contributes to oral proficiency through auditory exposure, repeated processing, imitation, rehearsal, and production. Pedagogically, French lecturers should therefore move beyond using audio primarily for listening comprehension. Audio materials may be more effective when followed by shadowing, repetition, oral reconstruction, role play, and guided speaking.

The study also suggests that oral proficiency should be assessed multidimensionally because fluency, pronunciation, and intelligibility responded differently to the intervention.

The findings should nevertheless be interpreted cautiously. Convenience sampling, one institutional setting, nonrandom assignment, and short term posttesting limit generalisability and causal certainty. Future studies should use larger multisite samples, delayed posttests, and more spontaneous speaking tasks. They should also isolate specific elements such as repeated listening, shadowing, imitation, and feedback to determine which mechanisms contribute most strongly to each dimension of oral proficiency.

## 6.0 Conclusion

This study examined the effect of structured digital audio resources on French oral proficiency among Ghanaian university students at UPSA. The results showed that the experimental group achieved substantially greater gains than the control group from pretest to posttest. This advantage remained statistically significant after baseline differences were controlled. Improvements were observed across fluency, pronunciation, and intelligibility, although the magnitude of change varied by dimension. Fluency showed the strongest standardized effect, while intelligibility recorded the greatest proportional gain.

The findings indicate that digital audio is most useful when embedded in a structured instructional sequence that links repeated listening with imitation, rehearsal, shadowing, guided production, and opportunities for oral practice. The study therefore contributes to the growing evidence that technology supported language learning depends less on the presence of technology itself than on the pedagogical processes through which it is used.

The study is particularly relevant to FLE instruction in Ghanaian higher education, where opportunities for sustained exposure to spoken French may be limited. It provides context specific evidence that structured digital audio can support the development of multiple dimensions of oral proficiency.

The findings should nevertheless be interpreted within the limits of a quasi experimental design, convenience sampling, one institutional setting, and short term measurement. Future studies should use larger multisite samples, delayed posttests, and more spontaneous speaking tasks. Further research should also isolate specific intervention components, including repeated listening, shadowing, imitation, and feedback, to determine their relative contribution to fluency, pronunciation, and intelligibility.

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