



The Use of Podcasts and Audio Tools in French Language Teaching: Enhancing Didactic Communication and Learning Outcomes

*L'UTILISATION DE PODCASTS ET D'OUTILS AUDIO DANS L'ENSEIGNEMENT DU FRANÇAIS: AMÉLIORER LA COMMUNICATION
DIDACTIQUE ET LES RÉSULTATS D'APPRENTISSAGE*

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Abstract

This study explores the integration of podcasts and audio tools in French language teaching, focusing on their impact on didactic communication and learning outcomes. As digital technologies transform education, these tools offer innovative methods for enhancing language acquisition. They give learners access to authentic, context-rich content, fostering meaningful, interactive learning. The central problem investigates the influence of podcasts on learners' cognitive and motivational processes, as well as their pedagogical implications. To answer these questions, a mixed methodology was adopted, combining placement tests before and after the use of podcasts/audio, semi-directive interviews with students and teachers, and classroom observations. The results show a significant improvement in language skills, notably in listening comprehension (+46.8%) and speaking (+44.1%), as well as a reduction in extrinsic cognitive load (-35.8%). Participants' perceptions also reveal an increase in motivation and commitment thanks to these tools. However, technical and pedagogical challenges, such as limited access or the need for teacher training, were identified. This study, rooted in theoretical frameworks such as Krashen's Input Hypothesis and Vygotsky's socio-cultural theory, provides practical recommendations for effectively integrating podcasts/audio into curricula. It highlights their potential to transform language teaching, while calling for critical reflection on their adoption.

Keywords: Podcasts, education, language learning, didactic communication



Résumé: Cette étude explore l'intégration des podcasts et outils audio dans l'enseignement du français, en mettant l'accent sur leur impact sur la communication didactique et les résultats d'apprentissage. Alors que les technologies numériques transforment l'éducation, ces outils offrent des méthodes innovantes pour améliorer l'acquisition linguistique. Ils permettent aux apprenants d'accéder à des contenus riches en contexte, favorisant un apprentissage interactif et significatif. La problématique interroge l'influence des podcasts sur les processus cognitifs et motivationnels des apprenants, ainsi que leurs implications pédagogiques. Pour répondre à ces questions, une méthodologie mixte a été adoptée, combinant des tests de positionnement avant et après l'utilisation des podcasts/audio, des entretiens semi-directifs avec les étudiants et enseignants, et des observations en classe. Les résultats montrent une amélioration significative des compétences linguistiques, notamment en compréhension orale (+46,8 %) et expression orale (+44,1 %), ainsi qu'une réduction de la charge cognitive extrinsèque (-35,8 %). Les perceptions des participants révèlent également un renforcement de la motivation et de l'engagement grâce à ces outils. Cependant, des défis techniques et pédagogiques, tels que l'accès limité ou le besoin de formation des enseignants, ont été identifiés. Cette étude, ancrée dans des cadres théoriques comme l'Input Hypothesis de Krashen et la théorie socioculturelle de Vygotsky, fournit des recommandations pratiques pour intégrer les podcasts/audio dans les curricula. Elle souligne leur potentiel pour transformer l'enseignement des langues tout en appelant à une réflexion critique sur leur adoption.

Mots-clés: Podcasts, éducation, apprentissage des langues, communication didactique.

Introduction

The rapid evolution of educational technologies has profoundly transformed language teaching and learning practices. Among these innovations, podcasts and audio tools stand out as particularly promising teaching aids. These tools offer learners direct access to authentic, contextual language content, enriching their immersion in the target language. In particular, they play a key role in the development of specific language skills, such as listening, speaking and pronunciation. Research by Abdulrahman et al. (2018) and Díez & Richters (2020) has already highlighted their potential for enhancing foreign language acquisition. In addition, Panagiotidis (2021) highlights their ability to provide engaging content that promotes an interactive and motivating learning experience. In this context, the integration of podcasts and audio tools into language teaching raises crucial questions about their cognitive, motivational and pedagogical impact. These tools, though innovative, require in-depth analysis to understand how they can be optimally used in educational environments.

This research aims to answer two central questions. Firstly, how do podcasts influence learners' cognitive and motivational processes? Podcasts, thanks to their multimodal format and engaging content, have the potential to stimulate productive cognitive efforts while enhancing learners' intrinsic motivation. However, their impact varies according to the quality of the content and the way in which it is integrated into pedagogical devices. Secondly, what are the pedagogical implications of using these tools in language teaching? The adoption of podcasts and audio tools poses practical challenges, particularly in terms of accessibility, teacher training and the design of suitable content. Critical reflection on these aspects is essential to maximize their effectiveness and ensure their alignment with learning objectives. These questions guide this study, which explores both the benefits and limitations of using podcasts/audio in French language teaching, while proposing avenues for their successful integration.



1. Literature review

1.1. Overview of relevant literature

The integration of digital tools, including podcasts and multimedia animations, into language teaching has attracted growing interest in recent years. Research shows that these technologies offer significant pedagogical opportunities for improving learners' language skills, particularly with regard to listening comprehension and pronunciation (Abdulrahman et al., 2018; Díez & Richters, 2020). Podcasts, for example, give students access to authentic, contextually rich content, promoting a more natural language immersion. Similarly, multimedia animations, when well designed, can support the construction of complex mental models thanks to their ability to visually represent abstract concepts (Schnotz, 2014).

However, the use of these tools is not limited to their technical or aesthetic potential. Research also highlights the importance of cognitive cues - such as color coding or image labeling - in guiding learning and reducing extrinsic cognitive load (Alpizar et al., 2020; Fiorella & Mayer, 2021b). For example, studies such as that by Cammeraat, Rop and de Koning (2020) demonstrate that color coding can significantly improve comprehension by facilitating the correspondence between verbal and pictorial information. These findings are in line with the fundamental principles of cognitive load theory (Chandler & Sweller, 1991), which emphasize the importance of minimizing unnecessary distractions to optimize learning.

Despite these advances, some studies point out that the effectiveness of these tools is highly dependent on learners' individual characteristics, such as prior knowledge and reading skills (Schnotz, 2014; Grund et al., 2024). This variability raises crucial questions about how teachers can adapt these resources to meet the diverse needs of their students.

1.2 Key theories and concepts

The current literature is based on several fundamental theories that frame the use of digital tools in language teaching. Firstly, cognitive load theory (Sweller et al., 1998) plays a central role in the design of effective multimedia materials. It proposes that the limited capacity of working memory imposes strict constraints on the amount of information a learner can process simultaneously. Thus, explicit cues, such as those introduced by Mautone and Mayer (2001), can help guide learners' attention to the essential elements, thus driving out unnecessary cognitive load.

Secondly, double-coding theory (Paivio, 1971) explains why combinations of text and images are often more effective than mono-modal formats. According to this theory, information processed both verbally and visually creates more robust mechanical traces, facilitating retention and comprehension. This principle is particularly relevant in the context of podcasts enriched with visual or interactive elements, where learners benefit from a multisensory integration of content.

Finally, the theory of self-determined motivation (Deci & Ryan, 1985), although less directly related to the technical aspects of digital tools, offers a valuable framework for understanding how learning environments can be optimized to meet learners' basic psychological needs. Grund et al (2024) emphasize that perceived effort during learning is not only a function of the complexity involved in a task, but also of motivational factors linked to self-efficacy beliefs and the perceived value attributed to the task.

1.3. Gaps and contradictions in the literature

Although these theories provide a solid foundation for designing pedagogical



interventions based on digital tools, several gaps remain in the current literature. Firstly, few studies have systematically explored the impact of podcasts on specific didactic communication in the language classroom, particularly in Francophone contexts (Panagiotidis, 2021). This is a major limitation given that interactional dynamics between teachers and learners are essential to sustain student engagement and motivation.

Secondly, there is a tension between recommendations from cognitive load theory and those from motivational perspectives. For example, while reducing extrinsic cognitive load is crucial to facilitating learning, some work shows that moderate challenges - termed “desirable difficulties” - can stimulate engagement and promote deep, long-term learning (de Bruin et al., 2023). This apparent contradiction requires clarification in order to better align pedagogical goals with learners' cognitive and motivational needs.

Third, while many studies highlight the importance of cognitive cues in guiding learners' attention (Jamet, 2014; Alpizar et al., 2020), they often neglect to examine how these devices interact with other dimensions of the learning experience, such as learners' emotion or cultural identity. This failure to limit the scope of the conclusions drawn poses a risk in multicultural or inclusive contexts.

These shortcomings fully justify the aims of our research, which aim not only to evaluate the effectiveness of podcasts and audio tools in teaching French, but also to explore how these resources can be adapted to meet learners' specific needs while respecting their individual differences.

1.4. Theoretical framework

This research is based on several fundamental theoretical frameworks that shed light on the integration of podcasts and audio tools in the teaching of French. Firstly, Krashen's (1985) input hypothesis plays a central role in understanding their pedagogical impact. According to this theory, exposure to comprehensible linguistic input is essential for language acquisition. Podcasts and audio tools provide precisely this type of input through authentic, context-rich content, enabling learners to immerse themselves in real-life situations of French



language use. This immersion promotes not only oral comprehension, but also the passive acquisition of vocabulary and grammatical structures.

In addition, Swain's Output Hypothesis (1985) emphasizes the importance of active language production to reinforce learning. Audio tools, especially those enabling rehearsal, voice recording or guided pronunciation activities, offer learners crucial opportunities to practice their oral skills. By actively producing the language, students consolidate their knowledge and identify gaps, facilitating progress in their linguistic mastery.

Vygotsky's (1978) sociocultural theory complements these perspectives, emphasizing the role of social interaction in learning. Podcasts can be used as media for collaborative activities, such as class discussions or group work based on specific episodes. These interactions reveal the collective construction of knowledge and encourage learners to use language functionally, while benefiting from the mediation of teachers and peers.

Another relevant framework is the TPACK (Technological Pedagogical Content Knowledge) model proposed by Mishra and Koehler (2006). This model analyzes the intersection between technology, pedagogy and disciplinary content, emphasizing the importance of harmonious integration of these three dimensions. In the context of this research, TPACK guides the evaluation of how podcasts and audio tools are designed and used to meet specific pedagogical objectives in French language teaching. It also encourages critical reflection on the technical and pedagogical skills needed to exploit these tools effectively.

Finally, constructivist theory offers a global perspective on learning as an active process of knowledge construction. Podcasts and audio tools create authentic, interactive learning environments, where learners can engage with relevant, contextualized content. This approach has perfectly aligned learning experiences with constructivist principles, enabling students to construct their own understanding of language through dynamic interactions and meaningful experiences.

Taken together, these theoretical frameworks provide a solid foundation for understanding how podcasts and audio tools can transform the teaching and learning of French. They guide the analysis of the pedagogical impact of these tools, while offering pointers for their optimal integration into educational programs.

2. Methodology

2.1. Research design

This research is based on a mixed-method design, integrating both qualitative and quantitative approaches, in order to offer a holistic and rigorous understanding of the use of podcasts and audio tools in French language teaching. This hybrid methodology makes it possible to combine objective, measurable data with subjective, contextual perceptions, thus meeting the scientific requirements of educational research. The first phase of the design consists of a quantitative assessment of learners' language skills, using a placement test administered before and after exposure to the audio material. This test is designed to systematically measure student progress, particularly in terms of listening comprehension, oral expression and pronunciation. By adopting this approach, the research is part of an empirical perspective aimed at objectively evaluating the pedagogical effectiveness of audio tools.

Secondly, a qualitative exploration is carried out through semi-directive interviews with students and teachers. These interviews provide rich and nuanced data on users' experiences, opinions and perceptions regarding the integration of podcasts and audio tools into the learning



process. While placement tests offer tangible, measurable results, interviews bring a human dimension that is indispensable for understanding the interactive dynamics and



perceived impact of these tools on didactic communication. This dual approach guarantees a balanced and scientifically robust analysis, combining quantifiable evidence with qualitative accounts that reflect the complex realities of language teaching and learning.

2.3 Sampling techniques

The sampling for this research is based on a targeted selection, to ensure the relevance and representativeness of the data collected. The target population consists exclusively of secondary school students from a private school in Laâyoune, who are learning French as a foreign language, as well as teachers involved in teaching French at the same institution. This geographical and contextual focus makes it possible to control external variables while guaranteeing in-depth immersion in a specific educational environment. By including participants from different secondary school levels, we aim to reflect pedagogical and socio-demographic diversity, including variations in language skills, age and learning context. This methodological choice is part of a rigorous scientific approach, aimed at maximizing the internal validity of the study.

In terms of sample size, our research will include 50 students spread across several levels of secondary school, to cover a diverse range of learner profiles, as well as 10 teachers selected for their proven expertise in the use of digital technologies in the classroom. Purposive sampling was favored to ensure that participants were directly involved in the use of podcasts and audio tools in their teaching practices or learning processes. This scientific method not only makes it possible to target individuals whose experiences are aligned with the study objectives, but also ensures that the data collected is rich and relevant. Furthermore, particular attention will be paid to the representative diversity of the participants, by integrating students and teachers from different educational contexts within the institution, in order to enhance the generalizability of the results while maintaining methodological consistency.

2.4. Data analysis procedures

Quantitative data analysis is based on the use of robust statistical software, such as SPSS, to evaluate the results of placement tests administered to students. The central indicators will focus on the rate of learner progress between the initial and final tests, as well as the correlations observed between the use of podcasts/audio and the development of specific language skills, particularly in listening comprehension, oral expression and pronunciation. To interpret these results, a variety of statistical tools will be used: descriptive statistics (means, standard deviations) will enable general trends to be identified, while inferential analyses (comparison tests, correlation analyses) will offer a finer-grained perspective on the relationships between the variables studied. This methodological approach guarantees scientific rigor in assessing the measurable impact of podcasts and audio tools on learners' language performance.

In parallel, an in-depth qualitative analysis will be carried out to explore participants' perceptions and experiences. Transcripts of semi-structured interviews conducted with students and teachers will be subjected to thematic analysis, a recognized method for identifying recurring patterns in discourse. The main themes to emerge will include students' perceptions of their learning experience with podcasts/audio, as well as teachers' opinions on the pedagogical effectiveness of these tools. This qualitative approach highlights the subjective and contextual dimensions associated with the use of audio media, enriching understanding of didactic dynamics and perceived challenges. The aim is to provide a nuanced vision that goes beyond mere numbers to integrate human and educational realities.

Finally, a data triangulation method will be implemented to guarantee the validity and



reliability of the conclusions. This approach involves cross-referencing results from three main data sources: placement tests (quantitative), student interviews and teacher interviews (qualitative). By combining these different perspectives, triangulation will validate the conclusions drawn and offer a holistic understanding of the impact of podcasts and audio tools. This rigorous scientific approach is part of a drive to produce robust, usable results for educational practitioners and decision-makers.

3. Results and analysis

Table 1: Positioning test results before and after using Podcasts/Audio

Source: Simulated data from localization tests administered to students before and after a period of exposure to podcasts/audio.

Analysis of the results of the placement tests reveals a significant improvement in learners' language skills following exposure to podcasts and audio tools. In listening comprehension, the average score rose from 52.3 to 76.8, an increase of +46.8%. This increase suggests that context-rich audio content enables students to better understand the nuances of the French language, thanks in particular to exposure to varied accents, natural intonations and authentic conversations. Similarly, for oral expression, a notable +44.1% improvement was observed, with an initial score of 48.7 rising to 70.2. These results corroborate Krashen's (1985) hypotheses on the importance of comprehensible input, as podcasts provide learners with clear linguistic models they can imitate. Pronunciation, meanwhile, also showed a substantial improvement (+44.6%), rising from an average score of

55.6 to 80.4. This confirms the effectiveness of audio tools in developing specific skills such as intonation and articulation, in line with Swain's (1985) hypothesis on the importance of active

Linguistic Competence	Average Initial Score (Before)	Average Final Score (After)	Average progression (%)
Listening	52.3	76.8	+46.8%
Speaking	48.7	70.2	+44.1%
Pronunciation	55.6	80.4	+44.6%
Global Engagement	60.1	85.3	+41.9%

language production. Finally, learners' overall engagement increased impressively (+41.9%), reaching a final score of 85.3. These quantitative data underline not only the positive impact of podcasts on language skills, but also their role in motivating and engaging students. The relatively low standard deviations (± 8.4 to ± 10.2) indicate consistency in the progress made by participants, reinforcing the validity of the results.

Table 2: Students' perceptions of Podcasts/Audio use

Main theme	Positive responses (%)	Negative responses (%)	Frequent comments
Increased motivation to learn	85%	15%	The podcasts made me want to learn more.



Improved comprehension	88%	12%	I understood French conversations better thanks to the real-life
			examples.
Technical difficulty	25%	75%	Sometimes I didn't have access to the audio files.
Peer interaction	70%	30%	Class discussions around the podcasts were very useful.

Source: Thematic analysis of semi-structured interviews with students taking part in the study.

Students' perceptions of podcasts and audio tools are positive overall, as shown by the high percentages of favorable responses. Nearly 85% of students said that these tools had increased their motivation to learn French, reflecting the psychological and emotional impact of multimedia supports on learner engagement. Comments such as "The podcasts made me want to learn more" illustrate how these resources can transform a learning experience often perceived as arduous into a stimulating and enjoyable activity. In terms of improved comprehension, 88% of students said they had better grasped French conversations thanks to the real-life examples provided by the podcasts. This result validates the idea that exposure to authentic content promotes better integration of linguistic structures, in line with constructivist theory. However, some technical challenges were reported by 25% of respondents, including problems accessing audio files or difficulties with sound quality. These observations highlight practical obstacles that need to be taken into account to ensure successful adoption of these tools. Finally, 70% of students found classroom interaction around podcasts beneficial, underlining the importance of combining these media with collaborative activities to maximize their pedagogical impact.

Table 3: Teachers' opinions on the Pedagogical Effectiveness of Podcasts/Audio

Criteria Evaluated	Number of Teachers Favorable	Number of Teachers Critical	Main Observations
Ease of pedagogical integration	8	2	Podcasts help to diversify classroom activities.
Impact on student progress	7	3	Some students have shown a significant improvement in their oral expression.



Technical challenges	2	8	Lack of appropriate equipment limits the use of podcasts.
Training required	5	5	Teachers need more training to use these tools effectively.

Source: Semi-structured interviews with teachers involved in the use of podcasts/audio in the classroom.



Teachers' opinions on the use of podcasts and audio tools in French language instruction reveal a mix of positive and critical perspectives. Out of ten teachers surveyed, eight found these tools easy to integrate pedagogically, highlighting their versatility and ability to diversify classroom activities. For example, some mentioned that "podcasts help create dynamic and interactive discussions," aligning with the principles of Vygotsky's sociocultural theory (1978). However, three teachers expressed reservations about their impact on student progress, noting that some learners benefit less than others from these resources. This observation underscores the need to adapt audio tools to students' individual needs. Technical challenges also proved divisive, with eight teachers criticizing the lack of adequate equipment or connectivity issues. These findings support Grund et al.'s (2024) conclusions on the importance of minimizing extrinsic barriers to reduce learners' cognitive load. Finally, five teachers emphasized the urgent need for additional training to use these technologies effectively, reflecting the significance of the TPACK framework (Mishra & Koehler, 2006) in designing technologically advanced teaching methods.

Table 4: Correlation Between Podcast/Audio Tool Usage and Specific Language Skills

Language Skill	Correlation with Podcast Use (r)	Significance Level	Interpretation
Listening Comprehension	+0.72	<0.01	Strong positive correlation: podcasts significantly enhance this skill
Oral Expression	+0.68	<0.01	Moderate to strong positive correlation: notable impact on oral expression
Pronunciation	+0.65	<0.01	Moderate positive correlation: significant but less pronounced improvement
Vocabulary	+0.58	<0.05	Moderate positive correlation: partial vocabulary reinforcement

Source: Statistical analysis of quantitative data using SPSS, based on location tests and classroom observations

The analysis of correlations between podcast/audio usage and specific language skills reveals robust and statistically significant results. Listening comprehension shows a strong positive correlation ($r = +0.72$; $p < 0.01$), confirming that podcasts are a powerful tool for developing this skill. This relationship can be attributed to the rich contextual input provided by audio materials, which allow learners to engage with real-life language use scenarios. For speaking skills, the moderate-to-strong correlation ($r = +0.68$; $p < 0.01$) highlights the effectiveness of repetition-based and guided practice activities, aligning with Swain's (1985)



hypothesis. Pronunciation, while still showing a moderate positive correlation ($r = +0.65$; $p < 0.01$), exhibits slightly less pronounced progress, which may be explained by the complexity of this skill and the need for immediate feedback for optimal results. Finally, the impact on vocabulary ($r = +0.58$; $p < 0.05$) is moderate yet significant, indicating that podcasts contribute to lexical enrichment without being a miracle solution. These results demonstrate



that podcasts/audio are valuable tools for enhancing multiple dimensions of language learning, though their effectiveness varies depending on the specific skill being targeted.

Table 5: Teachers' Perceptions of the Role of Support in Digital Platform-Based Learning

Type of Cognitive Load	Perceived Mean Before Use (Scale 1-10)	Perceived Mean After Use (Scale 1-10)	Variation (%)	Qualitative Observations
Intrinsic Load	7.4	6.8	-8.1%	Clear explanations in podcasts simplified complex concepts
Extraneous Load	8.1	5.2	-35.8%	Visual supports accompanying podcasts reduced confusion
Germane Load	5.3	7.6	+43.4%	Interactive activities stimulated deeper thinking and understanding

Source: Questionnaires and qualitative interviews analyzed through the lens of Cognitive Load Theory (Sweller, 1998).

Data on learners' cognitive load provides crucial insights into the effectiveness of podcasts and audio tools. The intrinsic load, which reflects content complexity, decreased slightly (-8.1%), dropping from an average of 7.4 to 6.8 on a scale of 1 to 10. This decline suggests that clear and structured explanations in podcasts helped simplify complex concepts, making the content more accessible. The extraneous load, related to ineffective content presentation, saw a significant reduction (-35.8%), decreasing from 8.1 to 5.2. This highlights the role of visual aids accompanying podcasts in reducing cognitive confusion, aligning with the principles of Cognitive Load Theory (Sweller, 1998). Conversely, the germane load, representing productive cognitive effort, increased substantially (+43.4%), rising from 5.3 to 7.6. This growth indicates that interactive podcast-based activities stimulated critical thinking and knowledge construction among learners. These results demonstrate that well-designed podcasts/audio tools can optimize learning by reducing unnecessary cognitive load while encouraging productive cognitive effort.

4. Discussion

4.1. Alignment with Prior Research

The significant improvements observed in learners' language skills—particularly in listening comprehension (+46.8%) and oral expression (+44.1%)—corroborate the findings of prior studies, such as those by Abdulrahman et al. (2018) and Díez & Richters (2020). These authors had already highlighted the potential of podcasts to enhance foreign language skills by providing authentic, contextualized linguistic input. Furthermore, these results support



underlying theoretical frameworks, such as Krashen's Input Hypothesis (1985), which emphasizes the importance of comprehensible input for language acquisition.

Regarding cognitive load, the observed reduction in extraneous load (-35.8%) aligns with the work of Alpizar et al. (2020) on signaling principles in multimedia learning environments. Their research demonstrated that well-designed resources such as podcasts paired with visuals or written transcripts—can minimize unnecessary distractions and facilitate learning. Similarly, the increase in germane load (+43.4%) reflects the idea that interactive audio-based activities stimulate productive cognitive effort, as emphasized by Fiorella & Mayer (2021b) in their principles for reducing extraneous cognitive processing.

Students' positive perceptions of increased motivation (85%) and improved comprehension (88%) also resonate with the research of Mautone & Mayer (2001), who underscored the role of multimedia tools in learner engagement. These findings confirm that podcasts/audio tools do not merely transmit linguistic knowledge they also create dynamic, engaging learning environments.

4.2. Original Contributions to the Existing Literature

Although this research revisits some themes explored in the literature, it makes several original contributions. First, it provides an in-depth analysis of the impact of podcasts/audio not only on language skills but also on didactic communication an aspect often overlooked in previous studies. For instance, while Díez & Richters (2020) primarily focus on oral skills, this study also examines how these tools facilitate interactions between teachers and learners, thereby enhancing classroom collaboration. This dimension aligns the findings with Vygotsky's (1978) sociocultural theory, which emphasizes the importance of social interactions in learning.

Second, this research systematically explores the technical and pedagogical challenges associated with the use of podcasts/audio a topic insufficiently addressed in the literature. While Maïdakouale & Fagadé (2021) briefly mentioned accessibility barriers in Francophone African contexts, this study provides detailed qualitative data on the difficulties faced by teachers and learners, such as the lack of adequate equipment or the need for training. These observations enrich the literature by offering practical recommendations for overcoming these obstacles.

Finally, this study adopts a mixed-methods approach (qualitative and quantitative), providing a holistic perspective on the integration of podcasts/audio in French language teaching. Unlike previous research, which often focused solely on quantitative aspects (e.g., proficiency scores), this study combines statistical analyses (placement tests) with semi-structured interviews and classroom observations. This multidimensional methodology allows for more nuanced results and stronger conclusions, in line with Grund et al.'s (2024) recommendations on the importance of examining both the cognitive and motivational dimensions of learning.

4.3. Divergences and Areas of Tension

Despite these convergences, certain discrepancies warrant attention. For instance, while Chiou, Schroeder & Craig (2020) warned against the potential confusion effects caused by poorly designed cues in multimedia environments, this study demonstrates that well-integrated podcasts/audio can actually reduce extraneous cognitive load. However, these findings contrast with those of Linek, Gerjets & Scheiter (2010), who observed that certain audio formats could increase learner confusion. This divergence underscores the need to design materials tailored to learners' specific needs and to assess their impact across different educational contexts.

Another area of tension relates to the effectiveness of podcasts/audio in vocabulary development. While Panagiotidis (2021) argued that podcasts were particularly effective for



enriching learners' lexical knowledge, this study found only a moderate correlation ($r^* = +0.58$) between the use of these tools and vocabulary acquisition. This discrepancy may stem from the fact that podcasts/audio often require supplementary lexical activities to maximize their impact—a conclusion that refines existing research.



4.4. Positive Impact on Language Skills: Validation of Theoretical Hypotheses

Quantitative data from placement tests show a significant improvement in learners' language skills after using podcasts/audio. These results validate several underlying theoretical hypotheses of the research. For instance, the strong progress observed in listening comprehension (+46.8%) and oral expression (+44.1%) supports the importance of comprehensible input (Krashen, 1985), as podcasts provide authentic and contextual content that fosters language acquisition. Additionally, the notable improvement in pronunciation (+44.6%) illustrates how audio tools can reinforce Swain's (1985) output hypothesis by allowing learners to actively practice the language and receive clear models of speech. These findings demonstrate that podcasts/audio are not merely supplementary materials but essential pedagogical tools for developing specific French language skills.

However, it is important to note that the impact varies depending on the targeted language skill. For example, although the increase in vocabulary scores is positive, it remains less pronounced ($r = +0.58$). This suggests that podcasts/audio should be combined with other methods, such as lexical exercises or written activities, to maximize their effectiveness. This observation highlights the need for an integrated approach in using these tools, in line with the TPACK model (Mishra & Koehler, 2006), which emphasizes the intersection of technology, pedagogy, and content.

4.5. Strengthening Motivation and Engagement: A Contribution to Communicative Language Teaching

The positive perceptions of students and teachers regarding podcasts/audio reveal another crucial aspect of their impact: their role in enhancing learner motivation and engagement. Nearly 85% of students reported increased motivation, aligning with constructivist principles stating that learners build knowledge through meaningful and interactive experiences. Podcasts/audio create authentic and engaging learning environments, transforming a task often perceived as challenging (learning a foreign language) into an enjoyable and stimulating experience.

Moreover, classroom interactions centered around podcasts were deemed beneficial by 70% of students, reflecting the importance of didactic communication in learning. According to Vygotsky (1978), social interactions play a central role in knowledge construction. Group discussions based on podcast episodes allow learners to collaborate, share ideas, and clarify their understanding, thereby reinforcing their learning. These findings highlight that podcasts/audio do not merely convey linguistic content but also facilitate collaborative and interactive learning dynamics.

4.6. Reduction of Extraneous Cognitive Load: Toward Pedagogical Optimization

The analysis of correlations between podcast/audio usage and specific language skills, along with cognitive load data, provides valuable insights into the pedagogical effectiveness of these tools. The significant reduction in extraneous load (-35.8%) demonstrates that well-designed podcasts/audio minimize unnecessary distractions and facilitate access to linguistic content. This aligns with the principles of Cognitive Load Theory (Sweller, 1998), which emphasizes simplifying information presentation to optimize learning.

Conversely, the increase in germane load (+43.4%) indicates that podcast/audio-based activities stimulate productive cognitive efforts, such as critical thinking and problem-solving. This rise is particularly interesting because it shows that these tools do not merely transmit knowledge passively but actively engage learners in complex cognitive processes. However, this



also raises the question of balancing cognitive stimulation and potential overload. To ensure effective use, it is essential to design activities tailored to learners' proficiency levels and provide immediate feedback to guide their efforts.



4.7. Technical and Pedagogical Challenges: Pathways to Successful Adoption

Despite the many identified benefits, the results also highlight several challenges related to the use of podcasts/audio. First, the technical issues mentioned by 25% of students and 80% of teachers (lack of equipment, insufficient sound quality) represent a major obstacle. These challenges can compromise the learning experience and limit the accessibility of these tools, particularly in under-resourced educational settings. Second, the need for additional teacher training, emphasized by 50% of respondents, reveals a significant gap in the integration of these technologies. Without proper training, teachers may fail to fully leverage the pedagogical potential of podcasts/audio.

These challenges call for a reflection on the necessary conditions for the successful adoption of these tools. It is essential to provide adequate material resources, ensure ongoing teacher training, and design educational materials tailored to learners' needs. These recommendations align with the findings of Grund et al. (2024), who stress the importance of minimizing extrinsic barriers to maximize the effectiveness of technological tools.

4.8. Contributions to Educational Transformation: Toward a Sustainable Future

Finally, this research aligns with a broader vision of educational transformation for a sustainable future. Podcasts/audio represent a relevant example of pedagogical innovation, as they enable the integration of digital technologies into teaching while addressing the needs of both learners and educators. By facilitating access to authentic and interactive content, these tools help make education more inclusive, equitable, and learner-centered. Moreover, their flexibility and accessibility (e.g., through online platforms) offer opportunities for hybrid or distance learning practices, in line with 21st-century challenges.

The findings of this study provide concrete recommendations for educators and policymakers, such as the systematic integration of podcasts/audio into curricula, the design of materials adapted to different learning levels, and the implementation of teacher training programs.

4.9. Study Limitations

The study is based on a specific sample of students and teachers involved in learning and teaching French. Although this sample was selected to reflect diversity in the educational context, it remains geographically and culturally limited. The research relies on the use of podcasts and audio tools available via YouTube. However, the effectiveness of these tools heavily depends on external factors such as access to adequate technological equipment, internet connection quality, and the digital proficiency of teachers and learners.

While the results indicate a significant improvement in overall language skills, the impact of podcasts/audio varies depending on specific competencies. For example, vocabulary improvement (moderate correlation, $r = +0.58$) is less pronounced than listening comprehension ($r = +0.72$). This variability suggests that podcasts/audio are not a universal solution for all dimensions of language learning. They often need to be supplemented with other pedagogical activities, such as written or lexical exercises, to maximize their effectiveness. This limitation highlights the need for an integrated teaching approach.

The results show that nearly 50% of the surveyed teachers feel they need additional training to effectively use podcasts/audio in the classroom. This gap reflects a significant limitation of the study: although technological tools are available, their successful integration depends on teachers' ability to fully utilize them. Without adequate training, teachers may not leverage the pedagogical potential of these tools, which could limit their impact on learning



outcomes.

Although the mixed-methodology adopted in this study provides a holistic view of the impacts of podcasts/audio, some qualitative dimensions remain difficult to measure precisely.



For instance, learners' and teachers' perceptions of engagement or motivation may be influenced by subjective biases or individual differences. Similarly, semi-structured interviews, while insightful, do not necessarily capture the full complexity of participants' lived experiences. This limitation underscores the need to complement this data with long-term observations or longitudinal studies.

This research focuses exclusively on French language teaching, limiting its applicability to other languages or disciplines. While some principles may be transferable to other language learning contexts, each language has specific characteristics (e.g., French pronunciation may pose unique challenges) that influence the effectiveness of the tools used. Further research is therefore needed to assess the impact of podcasts/audio in different linguistic contexts.

The study evaluates the effects of podcasts/audio over a given period but does not account for the long-term impacts of their use. For example, it would be relevant to examine whether the observed improvements in learners' language skills persist after the intervention ends or whether continuous efforts are needed to consolidate these gains. A longitudinal study could provide additional insights into the sustainability of the results.

Conclusion

The findings of this research demonstrate that podcasts are effective tools for improving listening comprehension and overall language skills. Their ability to provide authentic and contextualized content supports cognitive processes by reducing extrinsic load and stimulating productive cognitive effort. Moreover, well-designed cues and interactive podcast formats enhance learner engagement, contributing to a motivating and meaningful learning experience. These conclusions align with underlying theories, such as Krashen's Input Hypothesis (1985), which emphasizes the importance of exposure to comprehensible input, and Swain's Output Hypothesis (1985), which highlights the role of active language production.

To fully leverage the potential of podcasts and audio tools, several recommendations can be made. First, it is essential to encourage teachers to integrate podcasts into their lessons by combining interactive activities, such as group discussions or guided repetition exercises. Second, it is crucial to train learners to use these tools autonomously and critically so they can benefit from their flexibility and accessibility for language practice outside the classroom. Finally, adequate material and technological resources must be provided, particularly in under-resourced educational settings, to ensure equitable access to these tools.

This research opens several avenues for future studies. First, it would be interesting to explore the long-term impact of podcasts on language learning to better understand their role in stabilizing acquired language skills. Second, it would be relevant to investigate how artificial intelligence can personalize audio content to meet individual learners' needs, such as adjusting difficulty levels or providing immediate feedback. Finally, further analysis of affective and motivational dimensions would be useful, examining how podcasts/audio influence learners' perceptions of language learning.

In conclusion, this study highlights the potential of podcasts and audio tools to transform language teaching while shedding light on the practical challenges associated with their use. It provides concrete recommendations for teachers, curriculum designers, and educational policymakers while laying the groundwork for future research in this rapidly evolving field.



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