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Effect of Music Based Instructional Strategies on Sustained Attention and Working Memory in EFL Learners: A Neuroeducational Approach in an Intensive Language Program ILES

Efecto de las estrategias de enseñanza basadas en la música sobre la atención sostenida y la memoria de trabajo en estudiantes de inglés como lengua extranjera: un enfoque neuroeducativo en un programa intensivo de idiomas ILES

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ABSTRACT

This study analyzes the effect of music-based instructional strategies on sustained attention and working memory in English as a Foreign Language (EFL) learners within an Intensive Language Program (ILE). The research was developed through a qualitative, non-meta-analytic systematic literature review, guided by the PRISMA model. A total of 22 studies published between 2008 and 2025 were selected after applying inclusion and exclusion criteria. The analysis focused on four central variables: music-based instructional strategies, sustained attention, working memory, and EFL learning. The findings suggest that music-based strategies, such as songs, rhythmic repetition, melodies, chants, and lyric-based activities, may support vocabulary acquisition, pronunciation, listening comprehension, classroom engagement, and language retention. The results also indicate that rhythm, repetition, and melody can help sustain learners' attention and support working memory by organizing linguistic input into more manageable units. However, the effectiveness of music depends on its pedagogical design and its alignment with specific language objectives. The study concludes that music should not be considered a peripheral classroom resource, but a neuroeducational strategy capable of supporting cognitive and linguistic processes in intensive EFL contexts.

Keywords: music based instruction, sustained attention, working memory, EFL learning, neuroeducation.

RESUMEN

Este estudio analiza el efecto de las estrategias de enseñanza basadas en la música sobre la atención sostenida y la memoria de trabajo en estudiantes de inglés como lengua extranjera (EFL) dentro de un Programa Intensivo de Idiomas (ILE). La investigación se desarrolló mediante una revisión sistemática cualitativa, no metaanalítica, guiada por el modelo PRISMA. Después de aplicar los criterios de inclusión y exclusión, se seleccionaron 22 estudios publicados entre 2008 y 2025. El análisis se centró en cuatro variables principales: estrategias de enseñanza basadas en la música, atención sostenida, memoria de trabajo y aprendizaje del inglés como lengua extranjera. Los hallazgos sugieren que estrategias como canciones, repetición rítmica, melodías, chants y actividades con letras pueden favorecer la adquisición de vocabulario, la pronunciación, la comprensión auditiva, la participación en clase y la retención del idioma. Asimismo, los resultados indican que el ritmo, la repetición y la melodía pueden ayudar a mantener la atención y apoyar la memoria de trabajo al organizar el input lingüístico en unidades más manejables. Se concluye que la música no debe considerarse un recurso periférico, sino una estrategia neuroeducativa capaz de apoyar procesos cognitivos y lingüísticos en contextos intensivos de aprendizaje del inglés.

Palabras clave: enseñanza basada en música, atención sostenida, memoria de trabajo, aprendizaje EFL, neuroeducación.

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1. INTRODUCTION

In recent decades, the intersection between music, neuroscience, and language learning has gained increasing attention in educational research, particularly in the field of English as a Foreign Language (EFL). Traditional instructional approaches have often prioritized the cognitive and structural aspects of language acquisition; however, research in cognitive neuroscience suggests that affective, auditory, rhythmic, and memory-related processes also play a crucial role in shaping how learners perceive, process, and retain linguistic information (Jäncke, 2012; Patel, 2008). Within this framework, music-based instructional strategies have moved beyond their traditional use as motivational supplements and are increasingly understood as structured pedagogical tools capable of supporting language acquisition processes.

From a neuroscientific perspective, music and language share overlapping cognitive and neural mechanisms, particularly in relation to auditory processing, rhythm, pitch, sequencing, memory, and pattern recognition. These shared mechanisms suggest that musical exposure and musical training may facilitate linguistic processing by strengthening auditory discrimination, temporal processing, and phonological sensitivity (Patel, 2008; Tierney & Kraus, 2013). In addition, empirical evidence has shown that musical training can influence speech and language-related abilities, supporting the possibility of transfer effects between musical and linguistic competencies (Moreno et al., 2009). Thus, music may contribute not only to learners' affective engagement but also to the cognitive processes involved in language learning.

Recent empirical studies have highlighted the potential contribution of music-based instruction to foreign language learning outcomes. For instance, singing has been shown to facilitate the learning and recall of unfamiliar foreign language phrases, suggesting that melody and rhythm may strengthen verbal memory and retrieval (Ludke et al., 2014). In EFL contexts, technology-enhanced language learning through music has also been associated with improvements in academic achievement, creative thinking, and self-esteem (Chen et al., 2024). Similarly, music-mediated language learning experiences have been linked to learners' socio-emotional development, collaboration, intrinsic motivation, and awareness of interpersonal skills (Cores-Bilbao et al., 2019). These findings are relevant because music

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can activate emotional and motivational systems that influence learners' willingness to participate and sustain engagement during language tasks (Koelsch, 2014).

From a pedagogical standpoint, the role of music has shifted toward what has been conceptualized as Music as a Medium of Instruction (MMI), in which musical elements are systematically embedded into English language teaching rather than used merely as occasional reinforcement. This approach allows music to function as a strategic instructional resource for guiding attention, supporting oral production, and improving listening comprehension (Fernández de Cañete García et al., 2025). Music-based instruction may operate through at least three complementary mechanisms: affective regulation, which can reduce anxiety and increase engagement; rhythmic–prosodic entrainment, which supports pronunciation, fluency, and speech timing; and memory enhancement through repetition, melody, and retrieval practice (Fonseca-Mora et al., 2011; Hallam, 2010; Thaut, 2005).

In this context, sustained attention and working memory become particularly relevant cognitive processes. Sustained attention allows learners to maintain goal-directed focus over time, while working memory enables them to temporarily store, process, and manipulate phonological, lexical, and syntactic information during language comprehension and production (Baddeley, 2003; Oberauer, 2019; Wen et al., 2015). These processes are especially important in intensive language programs, where learners are exposed to accelerated instructional conditions and must continuously process new linguistic input. Evidence from intensive language learning research suggests that even short periods of intensive language study may influence attentional functions, reinforcing the importance of examining attention as a core variable in this type of educational context (Bak et al., 2016).

Despite these advances, the literature remains fragmented. Although many studies report positive effects of music and songs in second or foreign language classrooms, recent systematic evidence cautions that many intervention studies are not sufficiently robust to support firm causal conclusions about linguistic outcomes (Hamilton et al., 2024). Moreover, much of the existing research has focused on vocabulary acquisition, pronunciation, motivation, or socio-emotional engagement, while less attention has been given to the specific cognitive mechanisms through which music-based instruction may influence sustained attention and working memory in intensive EFL learning environments. This gap

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highlights the need for research that integrates neuroeducational theory, instructional design, and empirical validation.

Therefore, this study aims to analyze the effect of music-based instructional strategies on sustained attention and working memory among EFL learners within an Intensive Language Program (ILE), adopting a neuroeducational approach. By bridging neuroscientific, cognitive, and pedagogical perspectives, this research seeks to contribute to the development of evidence-based instructional models that integrate music as a core component of language instruction rather than as a peripheral classroom resource.

2. THEORETICAL FRAMEWORK

2.1 Neuroeducational Foundations of Music and Language Learning

Music and language share several neurocognitive processes, including auditory perception, rhythm, sequencing, memory, attention, and emotional regulation. From a neuroeducational perspective, this relationship is relevant because language learning does not depend only on grammar or vocabulary instruction, but also on how learners process, organize, and retain auditory information. Patel (2008) argues that music and language are deeply connected systems, since both involve structured sound patterns processed over time. This idea supports the use of music in EFL learning, especially because English learners must identify new sounds, stress patterns, intonation, and rhythmic features while developing comprehension and oral production.

Jäncke (2012) also explains that music and language are related through pitch perception, rhythm, auditory processing, and auditory-motor integration. In EFL contexts, these elements are important because many learners struggle with pronunciation, listening discrimination, and fluent oral production. Therefore, music can be understood not simply as entertainment, but as a neuroeducational stimulus that may support learners' ability to process sound patterns more effectively.

Rhythm is particularly relevant for language learning. Tierney and Kraus (2013a) found that rhythmic synchronization is related to neural timing consistency, while Tierney and Kraus (2013b) demonstrated its relationship with auditory processing and speech perception. These processes are directly connected to pronunciation and listening comprehension in EFL contexts. In the classroom, rhythm-based strategies such as chants, clapping patterns,

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melodic repetition, and rhythmic pronunciation practice may help learners organize linguistic input more effectively.

Music also contributes to affective regulation. Koelsch (2014) shows that music can activate brain structures related to emotion, pleasure, memory, and motivation. This is important in intensive language programs, where students may experience anxiety, cognitive overload, or reduced attention due to the accelerated pace of instruction. In this sense, music may help create a more favorable emotional state for learning while also supporting attention and memory processes.

For this study, the neuroeducational foundation is significant because it allows music-based instruction to be examined as a structured pedagogical tool, not as a decorative classroom activity. Music may support EFL learning through three main mechanisms: auditory pattern recognition, rhythmic organization of input, and emotional regulation. These mechanisms are directly related to the study's focus on sustained attention and working memory.

2.2 Music-Based Instructional Strategies in EFL

Music-based instructional strategies in EFL refer to the systematic use of songs, rhythm, melody, lyrics, chants, repetition, and prosodic patterns to support language learning. These strategies can be applied to vocabulary acquisition, pronunciation, listening comprehension, oral fluency, and memory retention. Unlike occasional musical activities, music-based instruction requires a clear pedagogical purpose: music is used to organize language input, promote repetition, increase engagement, and facilitate retrieval.

Ludke et al. (2014) provide important experimental evidence in this area. Their study showed that a listen-and-sing method helped learners remember foreign language phrases better than spoken repetition alone. This is relevant for EFL teaching because it suggests that melody can support the encoding and recall of verbal material, particularly when learners are exposed to unfamiliar language forms.

In the Iranian EFL context, Tilwani et al. (2022) found that songs improved implicit vocabulary learning among intermediate female EFL learners. Their study focused on spoken-form recognition, form-meaning connection, and collocation recognition, showing that songs can support different dimensions of vocabulary knowledge, not only word meaning.

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In Turkey, Saldıraner and Cinkara (2021) examined the use of songs for pronunciation instruction with young EFL learners. Their findings indicated that songs can positively influence pronunciation development because they expose learners to rhythm, intonation, stress, and repeated oral patterns in a meaningful way. This is useful for EFL classrooms where pronunciation is often taught through mechanical repetition.

Similarly, Zhang et al. (2023) studied Chinese adolescent ESL learners and found that singing familiar melodies supported pronunciation and vocabulary learning. Their contribution is valuable because it shows that singing can be used as a classroom-based intervention, not only as an informal activity.

However, the field still requires stronger empirical designs. Hamilton, Schulz, Chalmers, and Murphy (2024) reviewed intervention studies on the use of songs in second and foreign language classrooms. Although many studies reported positive effects, the authors concluded that more robust research is needed to make stronger causal claims. This limitation supports the relevance of the present study, which focuses on specific cognitive variables—sustained attention and working memory—within an Intensive Language Program.

Therefore, this study contributes by moving beyond the idea of music as a motivational resource. It frames music-based instructional strategies as neuroeducational tools that may help learners maintain attention, process auditory input, and retain linguistic information under intensive learning conditions.

2.3 Sustained Attention in Intensive Language Learning

Sustained attention is a key cognitive process in intensive language learning because it allows learners to maintain concentration on linguistic input for extended periods of time. In an Intensive Language Program (ILP), students are exposed to large amounts of vocabulary, grammar, pronunciation, listening tasks, reading activities, and oral practice within a reduced period. Therefore, learning does not depend only on the quality of instruction, but also on the learner's capacity to remain mentally engaged during continuous and cognitively demanding tasks.

From a cognitive perspective, sustained attention is essential because language input must be noticed before it can become meaningful intake. Schmidt (1990) argues that attention plays a central role in second language learning, since learners need to consciously notice linguistic features in order to process and internalize them. This means that students may be

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exposed to English, but exposure alone is not enough if they do not maintain attention to sounds, words, structures, and meanings. In this sense, sustained attention becomes a condition for effective EFL learning, especially in intensive contexts where the amount of information is high.

Robinson (2003) also connects attention and memory in second language acquisition by explaining that attention helps encode language input, keep it active in short-term and working memory, and retrieve it from long-term memory. This argument is important for the present study because sustained attention is not an isolated mental ability; it directly supports memory, comprehension, and language production. When EFL learners lose attention, they may also lose the opportunity to encode new linguistic information effectively.

Empirical evidence also supports the relevance of attention in language learning. Bak et al. (2016) found that even a short intensive language course could influence attentional functions, suggesting that intensive language learning involves cognitive effort, novelty, and practice. Similarly, Martínez-Vicente et al. (2023) reported that students with higher academic achievement in EFL tended to show stronger sustained and selective attention, better attentional control, and greater concentration on task. These findings support the idea that attention is not merely a general classroom behavior, but a cognitive variable closely related to language learning performance.

In the context of this study, sustained attention is especially relevant because music-based instructional strategies may help learners maintain focus during intensive learning sessions. Rhythm, melody, repetition, and auditory variation can reduce monotony, organize classroom activities, and help students re-engage with linguistic input. Therefore, the present research does not treat attention only as a personal characteristic of the learner, but as a cognitive process that may be supported through instructional design. This perspective gives the study an important contribution: it examines whether music can function as a pedagogical mediator that helps students remain attentive while processing English in an intensive program.

2.4 Working Memory and EFL Learning

Working memory is another essential cognitive process in EFL learning because it allows learners to temporarily hold and manipulate linguistic information while they understand, repeat, produce, or retrieve language. Unlike simple memorization, working

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memory involves active processing. For example, when students listen to a sentence in English, they must retain sounds, identify words, connect meanings, understand grammatical relationships, and prepare a response almost at the same time.

Baddeley (2003) explains working memory as a temporary storage and processing system that supports complex cognitive activities, including language processing. This is highly relevant for EFL learners because language learning requires the coordination of several elements at once: pronunciation, vocabulary, syntax, meaning, and communicative intention. In this sense, working memory is not only related to remembering words; it also supports real-time comprehension and oral production.

Juffs and Harrington (2011) argue that working memory plays an important role in second language learning, but they also clarify that it is not a single, simple construct. Its role varies according to the learner's age, the linguistic task, and the language domain being studied. This point is important for the present research because working memory should not be discussed only in general terms. In EFL learning, it may affect vocabulary retention, sentence processing, reading comprehension, listening comprehension, and oral fluency in different ways.

In EFL contexts, Bailer, Tomitch, and D'Ely (2013) found that differences in working memory capacity affected students' ability to attend simultaneously to form and meaning during reading tasks. This is significant because EFL learners often need to process meaning while also noticing grammatical structures or unfamiliar vocabulary. If working memory capacity is limited, students may focus on one aspect and lose the other. For example, they may understand the general meaning but fail to notice grammar, or they may focus on form and lose comprehension.

More recently, Teng (2024) examined working memory and vocabulary learning across different input modes, including listening, reading, reading while listening, and viewing captioned videos. The study showed that working memory and prior vocabulary knowledge play distinct roles in incidental vocabulary learning. This evidence is useful for the present study because it shows that working memory interacts with the way input is presented. Therefore, music-based instruction may be relevant if it helps organize auditory input, support repetition, and reduce cognitive load.

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For this study, working memory is important because music may serve as a cognitive scaffold. Rhythm and melody can help students group language into memorable patterns, while repetition can support phonological rehearsal and retrieval. However, the argument is not simply that music improves memory automatically. Rather, music-based strategies may support working memory when they are intentionally designed to help learners retain, process, and retrieve English language material. Therefore, analyzing working memory and sustained attention in relation to music-based instructional strategies allows this study to move beyond affective explanations and examine the cognitive mechanisms through which music may support intensive EFL learning.

2.5 Relationship between Music-Based Instruction, Sustained Attention, and Working Memory

The relationship between music-based instruction, sustained attention, and working memory can be understood through the way music organizes cognitive activity during language learning. In an intensive EFL context, learners are required to maintain focus, process unfamiliar sounds, retain vocabulary, identify grammatical patterns, and produce language within a limited period of time. Therefore, music-based instruction should not be understood merely as a strategy for making lessons more enjoyable, but as a pedagogical resource that may help regulate attention and support temporary memory processes during language learning tasks.

From a cognitive perspective, this relationship is closely connected to executive functioning. Diamond (2013) explains that executive functions include working memory, inhibitory control, and cognitive flexibility. These processes are essential in EFL learning because students must control distractions, maintain attention on linguistic input, hold information in mind, and connect new language forms with previous knowledge. In this sense, sustained attention and working memory do not operate separately; rather, they interact during listening, repetition, comprehension, and oral production. Music-based activities may support this interaction when rhythm, melody, and repetition are intentionally used to direct learners' attention toward specific sounds, words, stress patterns, or grammatical structures.

Music may also contribute to language learning by activating cognitive systems involved in attention and verbal processing. Moreno et al. (2011) found that short-term music training enhanced verbal intelligence and executive function in children, suggesting that

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musical activities can engage cognitive processes related to language and attentional control. Although this evidence does not imply that music automatically improves EFL learning, it supports the idea that music can stimulate cognitive mechanisms relevant to language acquisition when it is used with a clear instructional purpose.

Working memory is particularly important in this relationship because learners need to retain and manipulate linguistic information while they process it. Musical patterns may support this process through repetition, rhythm, melody, and chunking. Roden et al. (2012) found that school-based instrumental music training was associated with improvements in verbal memory among primary school children. This finding is relevant to EFL learning because students often need to remember unfamiliar sounds, words, phrases, and sentence structures before they can use them communicatively. In this way, music-based instruction may help learners organize linguistic input into more manageable and memorable units.

Similarly, Zuk et al. (2014) found associations between musical training and executive functioning, including working memory and verbal fluency. This strengthens the argument that music may support language learning through cognitive mechanisms rather than through motivation alone. However, this relationship must be interpreted with caution. Music does not necessarily improve attention or memory by itself. Its educational value depends on how it is selected, sequenced, and aligned with language objectives. If songs or musical activities are not pedagogically planned, they may increase distraction or cognitive load instead of supporting learning.

The emotional dimension of music is also relevant to this relationship. Plass and Kalyuga (2019) argue that emotion can influence cognitive load, motivation, and the amount of mental effort learners invest during learning. This is especially important in intensive language programs, where students may experience fatigue, anxiety, or cognitive overload due to the accelerated pace of instruction. Music-based instruction may help regulate emotional states, reduce monotony, and create conditions that make it easier for learners to sustain attention and use working memory effectively.

Thus, the relationship among music-based instruction, sustained attention, and working memory can be summarized as a cognitive sequence: music organizes and structures linguistic input; sustained attention allows learners to remain engaged with that input over time; and working memory enables them to temporarily retain, process, and

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manipulate the information for comprehension and production. This relationship is central to the present study because it explains why music-based instruction may be relevant in intensive EFL learning, not only as an affective strategy, but as a possible cognitive support for language processing.

2.6 Theoretical Contribution of the Study

The theoretical contribution of this study lies in proposing a more precise and critical understanding of the role of music in EFL learning. Instead of treating music as a general motivational resource, this research frames music-based instructional strategies as neuroeducational tools that may influence specific cognitive processes, particularly sustained attention and working memory. This distinction is important because much of the existing literature on music and language learning has focused on vocabulary, pronunciation, motivation, or academic achievement, while fewer studies have examined the cognitive mechanisms that may explain how music supports language learning.

This study also contributes by avoiding a superficial interpretation of neuroscience in education. Bruer (1997) warned that direct connections between brain research and classroom practice can be problematic when they are not mediated by cognitive psychology and educational theory. Following this position, the present study does not claim that music automatically improves the brain or guarantees language acquisition. Instead, it uses sustained attention and working memory as cognitive bridges between music-based instruction and EFL learning. This makes the theoretical proposal more cautious, testable, and educationally relevant.

Ansari et al. (2012) argue that neuroeducation should connect neuroscience, psychology, and education through an interdisciplinary and critical approach. The present study follows this perspective by integrating three dimensions: musical instruction, cognitive processes, and classroom learning conditions. Its contribution is not only to argue that music can be beneficial, but to explain under what conditions music may support learning. Specifically, music-based strategies may be effective when they guide attention, organize auditory input, support repetition, reduce emotional barriers, and help learners retain and manipulate linguistic information.

Howard-Jones (2014) also emphasizes the importance of avoiding neuromyths in educational practice. For this reason, this study does not present music as a universal or magical

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solution for language learning. Rather, it proposes a focused theoretical model: music-based instructional strategies may support EFL learners when they are pedagogically designed to regulate emotion, structure input, sustain attention, and reinforce working memory processes. This position allows the study to move beyond general claims about the benefits of music and toward a more evidence-informed explanation of its possible role in language learning.

Therefore, the main theoretical contribution of this study is the construction of a cognitive-neuroeducational framework for music-based EFL instruction in intensive programs. This framework connects three central elements: the instructional use of music, the learner's capacity to maintain sustained attention, and the learner's ability to retain and manipulate linguistic information through working memory. In this way, the study contributes a clearer explanation of why and under what conditions music-based instruction may support intensive EFL learning.

3. METHODOLOGY

3.1 Research Approach

This study followed a qualitative documentary approach based on a non-meta-analytic systematic literature review. This approach was selected because the objective was to analyze and synthesize previous scientific evidence on music-based instructional strategies, sustained attention, working memory, and English as a Foreign Language (EFL) learning, rather than to apply an experimental intervention with a specific group of students.

The study was descriptive, analytical, and applied. It was descriptive because it organized previous research according to variables, contexts, methods, and findings. It was analytical because it examined the relationship between music-based instruction and cognitive processes involved in intensive language learning. It was applied because its findings may support the design of evidence-based pedagogical strategies for Intensive Language Programs (ILPs). Following Codina (2020), systematized literature reviews are useful in Humanities and Social Sciences because they allow researchers to organize, evaluate, and synthesize academic literature through a transparent and structured process.

3.2 Research Design

The research used a non-meta-analytic systematic review design. A meta-analysis was not applied because the selected studies differed in population, educational level, instructional strategy, instruments, cognitive variables, and language learning outcomes. For this

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reason, the study used qualitative thematic synthesis to identify patterns, theoretical contributions, methodological limitations, and pedagogical implications.

The selection and reporting process was guided by the PRISMA 2020 model, which provides criteria for transparent reporting of the identification, screening, eligibility, and inclusion of studies in systematic reviews (Page et al., 2021). In this study, PRISMA was used as an organizational and reporting framework rather than as a statistical method. This process followed systematic review principles, including defining search strategies, applying inclusion and exclusion criteria, and organizing data through structured matrices (Ferreras-Fernández et al., 2016).

3.3 Search Strategy and Sources

The search was conducted in academic databases and scientific repositories, including Scopus, Web of Science, ERIC, ScienceDirect, SpringerLink, PubMed, Frontiers, MDPI, Taylor & Francis, and Google Scholar. The search focused on the main variables of the study: music-based instructional strategies, EFL learning, sustained attention, working memory, executive functions, neuroeducation, and intensive language learning.

The following keywords and Boolean combinations were used:

"music-based instruction" OR "songs" OR "singing" OR "rhythm" OR "music and language learning"

AND

"EFL" OR "English as a foreign language" OR "second language learning"

AND

"sustained attention" OR "working memory" OR "executive functions" OR "neuroeducation" OR "intensive language learning"

The review considered empirical studies published between 2008 and 2025. Foundational theoretical works published before 2008 were included only when they were essential for defining key constructs such as attention, working memory, second language acquisition, or neuroeducation.

3.4 Study Selection Process

The study selection process was organized into four phases: search, evaluation, analysis, and synthesis. In the search phase, scientific studies related to music-based instruction, songs, rhythm, EFL learning, attention, working memory, and neuroeducation were

identified. In the evaluation phase, duplicate records were removed, and the remaining studies were screened by title and abstract. Then, full-text articles were reviewed according to their relevance to the objective of the study.

The selected studies were analyzed through a data extraction matrix. The matrix included author and year, country or educational context, research design, participants, type of music-based strategy, cognitive variable, language learning outcome, main findings, and limitations. This procedure made it possible to compare studies from different contexts and identify connections between music-based instruction, sustained attention, working memory, and EFL learning.

Finally, the findings were organized through thematic synthesis. This method allowed the study to identify and interpret recurring categories across the literature, such as auditory organization, rhythmic input, repetition, emotional regulation, sustained attention, phonological rehearsal, and working memory support (Thomas & Harden, 2008).

3.5 Inclusion and Exclusion Criteria

Studies were included when they met the following criteria: peer-reviewed publication, relation to EFL, ESL, or second/foreign language learning, focus on music-based instruction or related musical strategies, connection with sustained attention, working memory, executive functions, or cognitive learning processes, and availability of full text.

Studies were excluded when they were unrelated to language learning, focused only on clinical music therapy without educational application, did not address cognitive or pedagogical variables, were outside the selected period, were not available in full text, or corresponded to theses, editorials, opinion essays, or conference abstracts.

3.6 PRISMA Flow Diagram

The article selection process was represented through a PRISMA flow diagram. The diagram reports the number of records identified, duplicates removed, records screened, articles excluded after title and abstract review, full-text articles assessed for eligibility, full-text articles excluded with reasons, and the final number of studies included in the review.

Figure 1

PRISMA flow diagram of the study selection process

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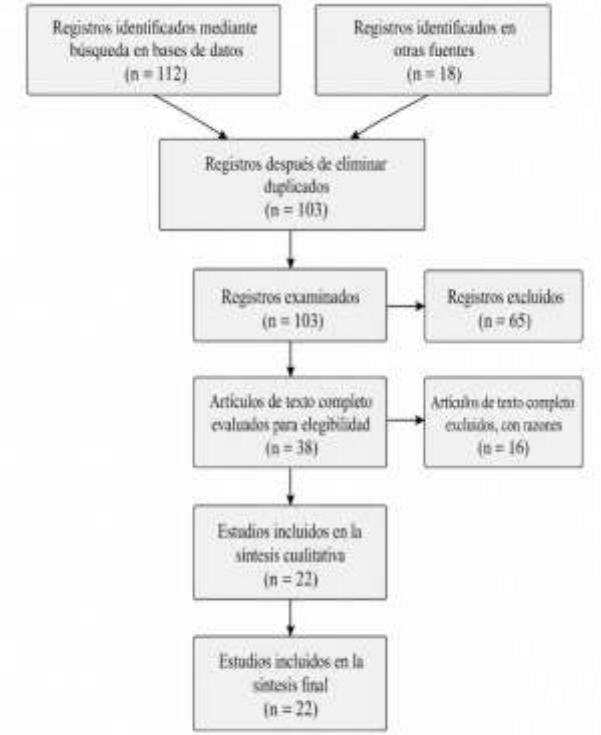

Note. Description of the identification, screening, eligibility, and inclusion process according to the PRISMA 2020 model. Own elaboration based on Page et al. (2021).

3.7 Data Analysis

The selected studies were analyzed using a thematic procedure. First, the articles were read to identify information related to the main variables. Second, recurring ideas were coded, including rhythm, melody, repetition, attention, memory, vocabulary retention, pronunciation, emotional regulation, and cognitive load. Third, these codes were grouped into broader categories related to the role of music-based instruction in EFL learning.

This process allowed the study to move beyond a general description of previous research. Instead, it made it possible to explain how music-based instructional strategies may support sustained attention and working memory in intensive EFL learning contexts. However, because this is a non-meta-analytic review, the study does not calculate effect sizes. Its conclusions are interpretive and analytical rather than statistical.

4. RESULTS

4.1 Introduction to the Results

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This section presents the main findings derived from the analysis of the selected studies through a qualitative and non-meta-analytic systematic review. The purpose was to examine the relationship between music-based instructional strategies, sustained attention, working memory, and English as a Foreign Language (EFL) learning.

After applying the inclusion and exclusion criteria, 22 articles were selected for the final analysis. The reviewed studies were published between 2008 and 2025 and were obtained from academic databases such as Scopus, Web of Science, ERIC, ScienceDirect, SpringerLink, Frontiers, MDPI, and Google Scholar.

The results are organized according to the main variables of the study. This organization allows the findings to be interpreted not only as isolated effects, but as part of a broader cognitive and pedagogical relationship between music, attention, memory, and intensive EFL learning.

4.2 Results According to the Studied Variables

4.2.1 Music-Based Strategies and EFL Learning

The reviewed studies show that music-based strategies, such as songs, rhythmic repetition, melodies, chants, and lyric-based activities, can support EFL learning in several dimensions. These strategies were mainly associated with vocabulary acquisition, pronunciation practice, listening comprehension, oral fluency, and classroom engagement.

However, the findings suggest that music is more effective when it is used with a clear pedagogical purpose. It should not be treated as entertainment or a filler activity, but as a resource that organizes linguistic input and promotes repetition, participation, and recall. Chen (2020), for example, found that familiar melodies, chanting, and captioned music videos supported vocabulary acquisition in young EFL learners. Similarly, Chen et al. (2024) reported positive effects of language learning through music on academic achievement, creative thinking, and self-esteem among EFL learners.

Figure 2

Comparative Impact of Music-Based Instruction on Learner Engagement

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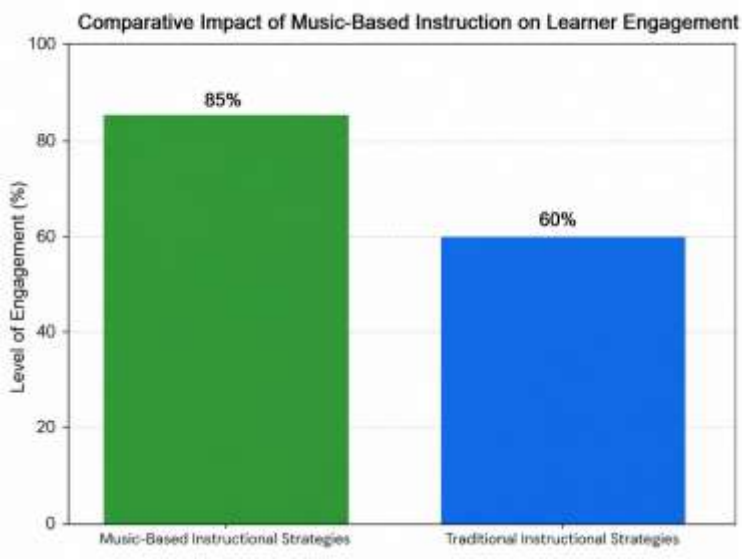

Note. Estimated distribution of learner engagement levels based on the patterns identified in the reviewed studies. Own elaboration.

4.2.2 Sustained Attention in English Learning

The results indicate that sustained attention is a key factor in intensive EFL contexts. Students in these programs must maintain concentration for extended periods while processing vocabulary, grammar, pronunciation, listening tasks, and oral interaction.

Music-based strategies may support sustained attention because they introduce rhythm, variation, and dynamism into classroom activities. These elements help reduce monotony and keep learners cognitively engaged. Kiss and Linnell (2021) found that preferred background music increased task-focused attentional states by reducing mind-wandering, although it did not significantly improve reaction time. This finding suggests that music may help maintain focus, but its effect depends on task type, learner characteristics, and instructional design.

4.2.3 Working Memory and Language Processing

Working memory was identified as a central cognitive process in EFL learning because it allows learners to temporarily retain and manipulate linguistic information during comprehension and production. In practical terms, learners must hold sounds, words, meanings, and grammatical structures in mind while they listen, repeat, read, or speak.

The reviewed evidence suggests that music-based strategies may support working memory through repetition, chunking, rhythm, and melodic organization. These elements can help

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learners group information into more manageable units. Lu and Murao (2023) found that working memory was significantly related to foreign vocabulary learning under background music conditions, although the effect of background music itself was not always positive. This result is important because it shows that music does not automatically improve memory; rather, its effect depends on how it interacts with learners' cognitive capacity and language proficiency.

4.2.4 Integrated Relationship Between the Variables

The analysis shows that sustained attention and working memory are closely connected during EFL learning. Attention allows students to remain focused on linguistic input, while working memory allows them to retain and manipulate that input for comprehension and production.

Music may act as an integrating element because it organizes auditory input, supports repetition, and creates a more engaging learning environment. Nevertheless, the findings also show that music-based instruction must be carefully planned. If musical activities are not connected to language objectives, they may become distracting or superficial. Therefore, the value of music in EFL learning depends on how it is integrated into the instructional process.

Table 1

Matrix of Music-Based Instructional Strategies

Strategy	Pedagogical Use	Application Context
Songs	Vocabulary learning and pronunciation practice	Secondary education / EFL
Rhythmic repetition	Reinforcement of linguistic patterns	Intensive English classes
Melodies and chants	Oral fluency practice	Primary and higher education
Lyric-based activities	Listening comprehension and meaning association	EFL contexts

Note. Strategies identified in the reviewed studies. Own elaboration.

5. DISCUSSION

This section compares the findings of the present review with previous scientific research, integrating and critically analyzing the main results. The findings suggest that

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music-based instructional strategies may support EFL learning when they are intentionally aligned with pedagogical objectives, particularly in relation to learner engagement, sustained attention, and working memory.

A first key finding indicates that music-based strategies contribute to vocabulary acquisition, pronunciation, listening comprehension, and classroom participation. This aligns with Chen (2020), who identified music as a mnemonic resource for vocabulary learning, and with Chen et al. (2024), who reported positive effects on academic achievement, creative thinking, and self-esteem. These findings reinforce the idea that music has pedagogical value not only as a motivational tool but also as a structured resource that supports language processing.

Regarding sustained attention, the results suggest that music may help learners maintain focus by introducing rhythm, repetition, and variation into instructional activities. This is consistent with Kiss and Linnell (2021), who found that preferred background music may reduce mind-wandering and increase task-focused attention. However, the present review also shows that music does not automatically enhance attention. Its effectiveness depends on factors such as task type, learner characteristics, and instructional design. Therefore, music should be understood as a potential attentional support rather than a universal solution.

In relation to working memory, the findings indicate that melody, rhythm, repetition, and chunking may support the retention and manipulation of linguistic information. This is consistent with Lu and Murao (2023), who found that working memory and language proficiency influence vocabulary learning under background music conditions. However, their findings also highlight that music may increase cognitive load if not properly designed. This supports a key argument of the present study: music-based instruction must be pedagogically structured to avoid negative effects on learning.

The integrated analysis of the variables shows that sustained attention and working memory are closely interconnected in intensive EFL learning contexts. Learners require attention to engage with linguistic input and working memory to process and retain it. In this sense, music may function as an instructional mediator that organizes input, promotes repetition, and enhances engagement. However, this relationship must be interpreted cautiously. Hamilton et al. (2024) emphasize that, although many studies report positive effects of music in language learning, stronger methodological designs are still required to establish causal conclusions.

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From a theoretical perspective, these findings support a neuroeducational interpretation of music-based instruction, where music contributes through auditory organization, emotional regulation, rhythmic structure, and memory reinforcement. From a pedagogical perspective, the results suggest that teachers should use music with clear objectives, such as reinforcing vocabulary, supporting pronunciation, improving listening comprehension, and sustaining attention. Therefore, music should not be treated as a recreational activity, but as a structured instructional strategy.

6. CONCLUSIONS

The results of this study indicate that music-based instructional strategies may support EFL learning by improving vocabulary acquisition, pronunciation, listening comprehension, and learner engagement. These effects are more consistent when music is used with clear pedagogical objectives.

The findings suggest that music may support sustained attention and working memory through rhythm, repetition, melody, and chunking. These elements help learners organize input, maintain focus, and retain linguistic information during intensive learning processes.

Future research should incorporate stronger empirical designs, including experimental or quasi-experimental studies, larger samples, validated cognitive instruments, and pre-test/post-test measures. This would allow for a more precise evaluation of the effects of music-based instruction on attention and memory.

Further research should explore the role of music-based instruction in diverse contexts, such as online learning environments, bilingual education, inclusive classrooms, and early language learning. These contexts may provide a broader understanding of how music interacts with different learner profiles.

Music-based instruction has the potential to become a relevant component of neuroeducational approaches to EFL teaching. However, its effectiveness depends on rigorous empirical evidence and careful pedagogical planning. When properly implemented, music may contribute to improving attention, memory, motivation, and overall language performance.

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