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USING BACKGROUND MUSIC IN PRESCHOOL AND PRIMARY EDUCATION: A SYSTEMATIC LITERATURE REVIEW

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Abstract/Izvleček

This systematic literature review aims to determine the benefits of using background music in preschool and primary education. The study included scientific journal articles, conference proceedings, and doctoral theses published between 2014 and 2024. The results demonstrated the positive impact of background music on the cognitive and socio-emotional development of preschool children. At the primary education level, the benefits of using background music are related to reading comprehension, cognitive processes, and performance quality on written tasks. The pieces of music used during learning activities should be structured, rhythmically balanced, melodic, and instrumental rather than vocal, but should not be too fast or loud.

Keywords:
background music, primary education, piece of music, preschool, systematic literature review.

Uporaba glasbe kot zvočnega ozadja v predšolski in osnovnošolski vzgoji in izobraževanju: sistematični pregled literature

S sistematičnim pregledom literature skušamo ugotoviti prednosti uporabe glasbe kot zvočnega ozadja v predšolski vzgoji in osnovnošolskem izobraževanju. V raziskavo smo vključili znanstvene članke iz revij, zbornikov konferenc in doktorskih disertacij, objavljenih med letoma 2014 in 2024. Rezultati so pokazali pozitiven vpliv glasbe kot zvočnega ozadja na kognitivni in socialno-čustveni razvoj predšolskih otrok. Na ravni osnovnošolskega izobraževanja so se prednosti uporabe glasbe kot zvočnega ozadja pokazale pri bralnem razumevanju, kognitivnih procesih in kakovosti izvedbe pisnih nalog. Glasbena dela, ki se predvajajo med učnimi dejavnostmi, morajo biti strukturirana, ritmično uravnotežena, melodična in instrumentalna (ne vokalna), obenem pa ne smejo biti prehitra ali preglasna.

Ključne besede:
glasba v ozadju, osnovnošolsko izobraževanje, glasbene skladba, predšolska vzgoja, sistematični pregled literature.

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Introduction

Contemporary pedagogical, psychological and sociological research emphasises the necessity of ensuring accessibility to music education for every child (Susić, 2017). Music is an art form that combines sounds and affects us emotionally, physically, cognitively and socially. We can listen to music actively, getting into it, or passively, when it plays in the background while we are doing other activities. It is possible to use various pieces of music as background music, but we must consider what we want to achieve.

Several studies have found evidence that background music can be an effective tool for employees to produce more creative results (Zhu et al., 2022), to help them maintain attention (Park et al., 2020), and ensure better results (Serpian et al., 2022). Moreover, background music is usually played in restaurants, shopping malls, waiting rooms, museums, and other public spaces to create a comfortable atmosphere. Researchers have found that shoppers who are mentally exhausted at the end of a workday increase their purchases in supermarkets when pleasant background music is playing (Ahlbom et al., 2023). Additionally, people visiting art exhibitions find that background music helps them remember artworks (Loureiro et al., 2019). Furthermore, background music can reduce anxiety in waiting rooms (Lai and Amaladoss, 2022) and influence customers' dining times in restaurants (Ting, 2015). Movies and television show also have background music to create the appropriate mood and increase emotional impact.

Background music can be implemented in educational institutions during lessons, breaks, and extracurricular activities. Blatnik and Kopačin emphasise that it is important for teachers to have positive experiences with music during their participation in music lessons as students (Blatnik and Kopačin, 2022), which may foster a willingness to incorporate background music into teaching practices. Several studies have indicated that the effects of background music differ among individuals (Hu et al., 2019), and responses to specific pieces of music playing in the background may be related to factors such as temperament type and noise sensitivity (Hofbauer et al., 2024). Moreover, the familiarity and tempo of the music played can also influence individual responses (Dong et al., 2022). Fast-paced music may enhance immediate recall (Hofbauer et al., 2024), but it is also linked to lower reading comprehension scores (Moreno and Woodruff, 2024). Conversely, slow-paced music can reduce stress, increase motivation to learn (Felseghy et al., 2023), and improve learning outcomes (Moreno and Woodruff, 2024). Emotional responses to background music

are more strongly influenced by engagement with the music than by learning performance (Li et al., 2020). The utilisation of background music in the teaching-learning process encompasses a variety of music genres. However, Ramos found that although all genres can enhance student performance, classical music produces the most significant effects (Ramos, 2021).

Studies have shown that the use of background music in the educational system is contradictory because multiple factors may influence the positive or negative effects of its use on the teaching-learning process. For example, studies conducted on the utilisation of background music in higher education institutions have found that it has a positive impact on student attention and learning outcomes (Azmi et al., 2023) and helps to reduce initial stress levels (Algailani et al., 2023). On the other hand, a previous study reported that the impact of background music on memory and anxiety was negligible (Birman and Ferguson, 2022). In addition, studies conducted on background music demonstrated that self-selected background music can be beneficial for maintaining positive emotions (Que et al., 2020), as well as improving learning efficiency and having a positive effect if the task to be performed required less mental effort (Li et al., 2021). Furthermore, the presence of background music has a significant impact on the reduction of aggressive behaviour in children diagnosed with intellectual disabilities (Gul et al., 2019) and mitigates the problematic behaviours in children diagnosed with autism spectrum disorders (Lanovaz and Huxley, 2017). However, playing background music while studying is more suitable for older students than younger ones (Chen, 2021). Additionally, one study has identified a general distracting effect of background music (Souza and Barbosa, 2023) while another has concluded that background music exerts no impact on students' test results (Ador et al., 2022).

Research indicates that elevated noise levels have an adverse effect on the listening abilities and well-being of preschool children (Mealings and Buchholz, 2025). Additionally, background noise during task performance significantly increases both the number of solution attempts and sensorimotor reaction time in this age group (Kuznetsova et al., 2025). Furthermore, noise exposure impairs verbal working memory and visual attention in primary school children, leading to increased effort and fatigue (Pittana et al., 2025). However, it is imperative to acknowledge the distinction between acoustic noise and musical sounds. Yan's study highlighted an insufficient understanding of the potential value of background music, emphasising that the lack of use of background music in preschool is linked to the fact that teachers believe it has no significant impact on children's education and development (Yan, 2023). Lee

and Welch have also pointed out that almost half of preschool teachers do not utilise background music because they believe it can create an overly noisy environment (Lee and Welch, 2017). Therefore, it is significant in this study to clarify the benefits of using background music and the pieces of music that should be selected to play in the background during learning activities in preschool or primary education. As a result, this study provides preschool and primary teachers with a deep understanding of the benefits of background music and its uses.

Method

The systematic literature review was conducted following the PRISMA protocol (Page et al., 2021) and the nine research steps defined by Newman and Gough (Newman and Gough, 2020).

Data collection

The study was conducted between October 2024 and May 2025. The study aims to determine the benefits of using background music in preschool and primary education. The study addresses two research questions. RQ1: What are the benefits of using background music in learning activities? RQ2: What kind of background music is suitable to play during learning activities? The following five databases were used for data collection: Sage Journals, Web of Science, Scopus, ProQuest and ResearchGate. The following searching strategy was used to select the articles from databases: ("background music" AND preschool) OR ("background music" AND "primary school") OR ("background music" AND "elementary school") OR ("background music" AND "basic school") OR ("background music" AND learning) OR ("background music" AND teaching).

Inclusion and exclusion criteria for articles

The systematic analysis included studies published in scientific journals, conference proceedings, and doctoral theses between 2014 and 2024. The publications selected for analysis were written in English and full text, and the concept of background music had to be in the title or keywords. At the same time, the empirical study had to involve children aged 2 to 16, corresponding to preschool and primary education stages. The present study excluded papers published before 2014 that collected and analysed opinions of other researchers without conducting empirical research, as

well as those publications that were not related to learning activities or in which children and students with special needs were involved in the study.

The search and selection process

The search and selection process was conducted according to the keywords and the specified inclusion and exclusion criteria as follows: (1) reviewing the title and keywords of each article to remove those that did not meet the inclusion criteria; (2) checking whether the selected articles were available in full text and in English. As a result, 22 (n=22) articles were selected from the Sage Journals database, 34 (n=34) articles from the Web of Science database, 46 (n=46) articles from the Scopus database, 23 (n=23) doctoral theses from the ProQuest database, and 25 (n=25) articles from the ResearchGate database (Figure 1).

In total, 151 (n=151) papers were selected from the five databases for study, coding, and quality assessment. In the subsequent article selection process, a total of 151 (n=151) articles were reviewed: (1) to identify duplicate articles; (2) to exclude articles in which the research results were not related to the preschool or primary education stages; (3) to exclude articles in which the research was conducted as part of a bachelor's or master's thesis; (4) to exclude articles that conducted research on children or students with special needs. As a result, 28 (n=28) papers were identified as duplicates and removed from the study, and 102 (n=102) articles did not pertain to the preschool or primary education stages. In addition, the analysis excluded research results obtained as part of a bachelor's or master's thesis, as well as studies involving children and students with special needs (Figure 1).

Consequently, a total of 21 (n=21) articles were selected for analysis to answer the research questions posed. Four (n=4) articles were chosen from the Sage Journals database, five (n=5) articles from the Web of Science database, two (n=2) articles from the Scopus database, four (n=4) doctoral theses from the ProQuest database, and six (n=6) articles from the ResearchGate database.

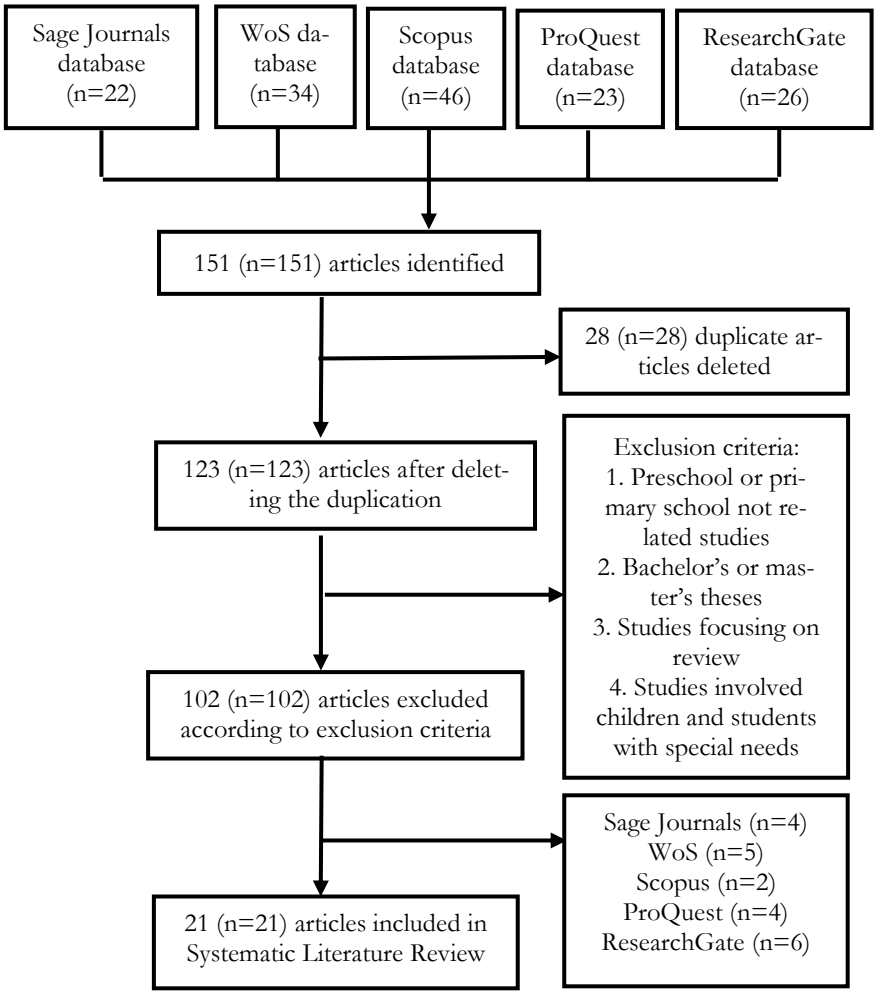

Figure 1
Literature search and evaluation for analysis

The risk of bias assessment

The risk of bias assessment was based on the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines (Page et al., 2021), which facilitate structuring the review and ensure the reliability and quality of the study results. First, each chosen study was evaluated based on the established criteria for

data acquisition, and inclusion and exclusion of articles. Second, to eliminate the possibility of error, the study was conducted twice, three months apart.

Assessment and comparison were carried out at both times from the following aspects: (1) the study selection process; (2) the breadth of the literature search; (3) the inclusion and exclusion of the obtained data; (4) the relevance of the chosen studies; (5) the synthesis of the obtained data.

The methodological quality of the selected studies was assessed using the Mixed Methods Assessment Tool (MMAT) version 2018. All twenty-one studies were evaluated according to criteria matched to their respective study designs. Notably, most studies were identified as having a moderate risk of bias, with only one study demonstrating a low risk of bias (Table 1).

Table 1

Risk of bias assessment

Study	S1	S2	MMAT criteria (n)	Overall risk of bias
Chew & Pan (2022)	Low	Low	4/5	Low to moderate
Cömert & Özbey (2024)	Low	Low	3/5	Moderate
Dong et al. (2022)	Low	Low	3/5	Moderate
Falcetta 2014	Low	Low	3/5	Moderate
Falcon (2017)	Low	Low	3/5	Moderate to high
Humphrey (2014)	Low	Low	4/5	Moderate
Jucan & Simion (2015)	Low	Low	3/5	Moderate
Khaghaninejad et al. (2016)	Low	Low	3/5	Moderate
Koolidge & Holmes (2018)	Low	Low	3/5	Moderate
Lee & Welch (2017)	Low	Low	4/5	Moderate
ManJia (2023)	Low	Low	3/5	Moderate
Mohan & Thomas (2020)	Low	Low	4/5	Moderate
Pohekar et al. (2020)	Low	Low	3/5	Moderate
Rajan (2017)	Low	Low	4/5	Low to moderate
Sahebdel & Khodadust (2014)	Low	Low	3/5	Moderate
Stramkale (2020)	Low	Low	3/5	Moderate
Su et al. (2017)	Low	Low	3/5	Moderate
Weiss (2015)	Low	Low	3/5	Low to moderate
Yan (2023)	Low	Low	5/5	Low
Yu et al. (2021)	Low	Low	4/5	Low to moderate
Yuan et al. (2023)	Low	Low	4/5	Low to moderate

Abbreviations: S1 - clear research questions; S2 - data address the research questions.

In accordance with MMAT guidelines, the selected studies were not excluded based on quality, but the interpretation of the results considered the risk of bias.

Synthesis methods

The use of Qualitative synthesis based on thematic analysis helps to examine the obtained data. The thematic analysis process, according to the ideas of Braun and Clarke, consisted of six stages: (1) familiarization with the content of the articles included in the study; (2) coding to identify significant data units; (3) grouping codes to create broader themes; (4) reviewing and naming themes; (5) defining each theme; (6) describing the themes in narrative form supplemented with paraphrases from studies that provide an opportunity to answer the research questions posed (Braun and Clarke, 2006).

Results

The benefits of background music

Since 2014, several studies have highlighted the benefits of playing background music in preschool. Analysis was performed on studies from six countries in Asia, North America and Europe. The studies focused on the involvement of children in various experiments and identifying the opinions of preschool teachers (Table 2).

Table 2
Studies on background music in preschool

Study	Country	Respondents	Design type
Cömert & Özbey (2024)	Turkey	2-3 years old	Quasi-experimental study
Chew & Pan (2022)	Malaysia	5-6 years old	Experimental study
Yan (2023)	China	Preschool principals, teachers and children	Ethnographic research
Yu et al, 2021	China	5-6 years old	Experimental study
Yuan et al. (2023)	China	5-7 years old	Experimental study
Jucan & Simion (2015)	Romania	Preschool-aged children	Experimental study
Koolidge & Holmes (2018)	USA	5 years old	Quantitative study
Lee & Welch (2017)	South Korea	Preschool teachers	Mixed methods study
Rajan (2017)	USA	Preschool teachers	Quantitative and Qualitative study

Empirical studies revealed that playing background music for children aged 2-3 for an average of 30 minutes per day for four weeks during various preschool activities throughout the day, excluding activities requiring intensive speech, yielded higher intrinsic motivation, better concentration, and greater enjoyment, while reducing negative attitudes in children, compared to the control group (Cömert and Özbey, 2024). Background music can help children aged 5-6 complete Origami tasks. The

study found that children with background music were more attentive, and better able to concentrate and stay calm during the task than those children who completed the task without background music (Chew and Pan, 2022). Moreover, putting together a puzzle, which requires cognitive effort from a 5-year-old child, can be positively influenced by background music that is instrumental without words because the words of a song familiar to the child can encourage children to think more about the lyrics than about performing the task assigned (Koolidge and Holmes, 2018). A study using a digital game to help children aged 5-6 learn clock time found that background music enhanced the ability to read the time for children with no prior experience using touchscreen devices but had no effect on those with experience. That was because the background music helped increase children's engagement and interest in the game, improving learning outcomes (Yu et al., 2021). Jucan and Simion found that background music could positively affect preschool children's socio-emotional skills such as trust, perseverance, planning, understanding, and emotional strength. That is achievable by allowing children to participate in diverse activities, which are arranged according to the week's themes and include background music for 30 minutes daily (Jucan and Simion, 2015).

To benefit from background music, it is essential to regard the environment in which preschool children perform their tasks. If the environment is noisy while performing tasks, then, as Yuan and colleagues found in their study, light music in the background can reduce noise and the stress it causes (Yuan et al., 2023).

It is crucial to determine whether the use of background music in preschool learning activities ever depends on the teacher. A study conducted by Lee and Welch revealed that slightly more than half of preschool teachers use background music during children's play, the choice of which is determined by the mood of the music, the children's preferences and the theme of the lesson (Lee and Welch, 2017). In addition, Yan has found that preschool teachers believe music can be used as a background to create rituals that allow children to feel included and prepared for the day's activities. Such music might be beneficial in promoting children's emotional well-being and musical experience (Yan, 2023). Furthermore, according to Rajan, the challenges preschool teachers face when using background music are mainly related to teacher confidence and the availability of resources. That can limit the effective use of background music, as teachers may choose music that is familiar and easily accessible to them rather than music that is optimal for the developmental needs of preschool children (Rajan, 2017).

Several studies published since 2014 have determined the benefits of background music in primary education. The analysis included studies from six countries in Asia, North America and Europe. The studies involved students from all grades of primary education, aged eight to 16 (Table 3).

Table 3

Studies on background music in primary education

Study	Country	Respondents	Design type
Dong et al. (2022)	China	1st grade students	Experimental study
Falcetta (2014)	USA	7-8 years old	Experimental study
Falcon (2017)	USA	7th-8th grade students	Quantitative study
Humphrey (2014)	USA	4th grade students	Quasi-experimental study
Khaghaninejad et al. (2016)	Iran	12-15 years old	Quasi-experimental study
ManJia (2023)	China	3rd-5th grade students	Experimental study
Mohan & Thomas (2020)	India	13-14 years old	Experimental study
Pohekar et al. (2020)	India	14-16 years old	Experimental study
Sahebdel & Khodadust (2014)	Iran	14-16 years old	Quasi-experimental study
Stramkale (2020)	Latvia	2nd-3rd grade students	Quantitative study
Su et al. (2017)	Taiwan	Elementary school students	Quasi-experimental study
Weiss (2015)	USA	11-14 years old	Quasi-experimental study

Several studies have determined that background music boosts reading comprehension. The results demonstrated that playing background music in primary education classes can enhance reading comprehension. For example, Khaghaninejad and colleagues pointed out that background music had a beneficial effect on the reading performance of students aged 12-15 in English as a foreign language. Students who studied with background music demonstrated significantly better results on a reading comprehension test than those who studied without music (Khaghaninejad et al., 2016). Studies conducted in Iran, involving students aged 14-16 (Sahebdel and Khodadust, 2014), and in India, involving students aged 13-14 (Mohan and Thomas, 2020), also found that playing music in the background positively affected students' reading comprehension. Similar results apply to primary school students. A study by Humphrey revealed that students' reading performance in grade 4 improved when they listened to background music for 30 minutes compared to those who read in silence (Humphrey, 2014). Although background music may not always promote

students' reading comprehension, it can provide a calming environment that ensures students' comfort and facilitates cognitive processing (Falcon, 2017). Furthermore, Su and colleagues have found that background music can positively affect students' reading speed and comprehension, which is achievable because music can effectively reduce student anxiety during reading (Su et al., 2017).

Background music can affect cognitive processes. For example, a study involving students aged 14-16 proved that background music effectively improved students' ability to recall information (Pohekar et al., 2020). Similarly, a study conducted by ManJia involving students in grades 3-5 concluded that background music provided personalised adaptation of learning strategies by considering each student's cognitive development and musical preferences, which is effective in the learning process. However, it is essential that the music played not be fast-paced and be classical rather than pop (ManJia, 2023). Dong and colleagues have found, in a study involving 1st-grade students, that pop music can interfere with concentration on the text during poetry reading (Dong et al., 2022). Furthermore, regular listening to background music can enhance rhythmic recognition skills in students with lower or average musical abilities, particularly for those who express enjoyment of the music (Falcetta, 2014).

Music can be played in the background when students are completing various written assignments during the lesson. A study revealed that background music helped 2nd and 3rd-grade students feel better while doing written assignments in class if the piece of music calmed them down or stimulated them to work. At the same time, background music must promote students' concentration during the task (Stramkale, 2020). It was observed that students in grades 6-8 who listened to music while completing homework assignments received higher scores than those who never listened to music while completing their assignments (Weiss, 2015). Background music can create a calming element while completing written assignments and, at the same time, block out other distracting noises in the room.

The selection of music pieces for background music

Many possible pieces of music could be used as background music in the classroom. However, it is worth noting that the choice of background music played during learning activities can significantly impact students' concentration, mood and productivity. Therefore, according to this systematic review, researchers preferred to choose classical music pieces to be played as background (Table 4) because of

their instrumental, structured and rhythmically smooth features, without sudden breaks.

Table 4
Pieces of music to play in the background

Study	Pieces of music/styles or genres of music
Chew & Pan (2022)	1st movement of Mozart's Sonata for Two Pianos in D Major, K. 448
Falcon (2017)	Classical music
Humphrey (2014)	Mozart's Sonata for Two Pianos in D Major, K. 448
Jucan & Simion (2015)	Nocturne by Frédéric Chopin
ManJia (2023)	Classical music and Chinese pop music
Mohan & Thomas (2020)	Indian Classical Music (Raga Shanmukhapriya) and Western Classical Music (Mozart's Symphony No. 35)
Koolidge & Holmes (2018)	"You're Welcome" from the Disney movie "Moana"
Pohekar et al. (2020)	Instrumental Music by Peder B. Helland
Sahebdel & Khodadust (2014)	Mozart piano sonatas
Stramkale (2020)	A. Vivaldi's Autumn, part 1, Allegro from the concert series "Four Seasons"
Su et al. (2017)	Mozart's Sonata for Two Pianos in D Major, K. 448
Weiss (2015)	Mozart pieces

The sounds in these pieces provide a calm, unobtrusive background to help students stay focused. Background music should not distract from the main activity performed by a preschool child or primary school student, and it should be played at the quietest possible volume. Several studies (Chew and Pan, 2022; Humphrey, 2014; Su et al., 2017) use the first movement of Wolfgang Amadeus Mozart's Sonata for Two Pianos in D Major as background music, a piece which features a fast tempo, with a playful and joyful mood. The piece contains many fast-paced passages, ascending sound sequences and expressive ornaments. A dialogue between two pianos can be heard, dividing the main melody in the exposition and later playing it simultaneously. Studies have shown that playing this piece of music in the background improves spatial intelligence and concentration (Chew and Pan, 2022), enhances reading achievement (Humphrey, 2014), reduces students' learning anxiety, and positively affects reading speed (Su et al., 2017). Mozart's music can enhance reading comprehension in English as a foreign language (Sahebdel and Khodadust, 2014) and influence students' attention and concentration during the process of learning

mathematics (Weiss, 2015). In general, Mozart's pieces have structured, rhythmically balanced, and harmonically rich features, which are particularly important for ensuring a full-fledged teaching and learning process.

As background music, Frédéric Chopin's Nocturnes can be used, which have several specific features as follows: All nocturnes have a lyrical tone, they are melodic and have unexpected harmonic transitions that give the music its splendour; all the nocturnes are composed for piano solo. However, each nocturne is characterised by its unique emotional character, form and level of technical performance. A study conducted by Jucan and Simion using several Chopin nocturnes revealed that these pieces of music, which are melodically and emotionally rich, create a favourable environment for the education and socio-emotional development of preschool children when played in the background (Jucan and Simion, 2015).

Researchers (Falcon, 2017; ManJia, 2023; Stramkale, 2020) also use other classical music pieces for background music, which are played at different tempos and volumes. The studies revealed that classical music played at a slow tempo can significantly improve students' attention (ManJia, 2023); the effect of classical music on students may differ depending on age (Falcon, 2017), and each student's reaction to it is mainly determined by individual characteristics (Stramkale, 2020).

Researchers also choose songs with lyrics and instrumental pieces from Disney animated films to be played as background music; these are particularly recognizable to preschool children. Koolidge and Holmes' study found that background music without lyrics can improve children's cognitive performance on spatial tasks (Koolidge and Holmes, 2018). In turn, relaxing and calming instrumental music is usually characterised by a pleasant melody and is often related to a nature topic. According to a study by Pohekar and colleagues, it may enhance students' ability to remember information, which helps them achieve better academic success (Pohekar et al., 2020).

Using pieces of music from other cultures as background spotlights the context of a particular culture. For example, a study conducted in India on the use of both Indian classical music and Western classical music in the classroom found that students performed better on a reading comprehension task when listening to Indian classical music than when listening to Western classical music (Mohan and Thomas, 2020). The selection of musical pieces to play in the background during learning activities in preschool or primary education is determined not only by a single factor but also by a set of factors, where it is significant to take into account the artistic means of expression of the piece, the individual characteristics of the student, and the specific cultural context.

Discussion

Previous systematic reviews on the use of background music in learning activities have produced conflicting results. Some systemic reviews highlight the benefits, and others shed light on the disadvantages of using background music. For example, de la Mora Velasco and colleagues (de la Mora Velasco et al., 2023) found that using background music in the classroom can promote learning. Background music can boost knowledge retention and support human cognitive processes. Nevertheless, classical and instrumental music may be more conducive to learning than other music genres or types. In addition, Lehmann and Seufert (2017) pointed out that recall tasks, compared to comprehension tasks, do not require high cognitive abilities, and because of that, students should be able to process the relevant content regardless of their working memory capacity and, in this case, background music does not affect recall performance. Moreover, Cheah and colleagues (2022) conclude that background music has a general negative effect on memory and language-related tasks. However, instrumental music has a slightly more negative impact than vocal music, which is also consistent with the results of this study.

This study revealed that the benefits of using background music are related to reading comprehension, which is determined by the means of expression of the chosen piece of music. This finding is supported by a study conducted by Thompson and colleagues (Thompson et al., 2011), which found that playing instrumental music in the background interferes with reading comprehension when the music is fast and loud. At the same time, a study conducted in Indonesia found that using Kahoot games, which also incorporate background music, is an effective method for vocabulary learning among students aged 12 to 14 (Katemba et al., 2022).

This study found that the benefits of background music are related to a personalised approach and consideration of individual differences among students. These findings align with a study by Küssner (2017), which found that extroverts benefit from background music during cognitive tasks, while the positive effects on introverts decrease. In turn, Hastomo and colleagues found in their study that generative artificial intelligence can be used to improve personalised approaches (Hastomo et al., 2026), thereby enabling the adaptation of background music to each student.

The majority of studies included in this systematic literature review showed a moderate risk of quality assessment because they have small sample size (Cömert and Özbey, 2024; Humphrey, 2014; Yuan et al., 2023; Jucan and Simion, 2015), limited

students, since this determines how they will react to the background music. Teachers should experiment and adapt music to suit the situation and students' needs. The methodological quality assessment of the study highlights the need for caution when applying the results, and therefore, further research is necessary to investigate the implementation of background music into the preschool and primary school learning process. In addition, to better understand the complex relationship between background music and learning activities in preschool and primary education, additional research is needed, focusing on the interaction between individual human differences and the means of musical expression.

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Data Availability Statement

The article is based on data fully presented and discussed within the article itself; therefore, no additional data archiving is required.

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