Exploring the impact of songs on student cognitive and emotional development

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1. Introduction: Scope of the article

This article presents a critical review of the discourse on the use of these genres in L2 learning. Recent empirical studies on primary FL teaching practice have shown that songs, in particular, are very popular among young learners of English. Learners not only seem to enjoy singing in the classroom, but they also make use of digital media to listen to songs in their free time. The fact that listening skills were found to be positively influenced by children's out-of-school encounters with narrative and song [1], highlights the potential of songs for FL learning. Scholars have observed many teachers' reluctance to employ songs in language teaching, at least not as frequently in their classrooms as their popularity would suggest that they should do [2]. Believe it or not, across many EFL contexts and levels, including secondary schools, tertiary education, or vocational training, the use of songs and music has not entered regular and frequent practice in EFL classrooms. Even in primary schools where teachers are aware of the popularity of songs among their learners, they are only occasionally by teachers as an additional idea but not a main resource.
2. Rationale: why songs the classroom

Songs, with their rich, innovative, and playful nature, have the power to engage L2 learners cognitively, kinaesthetically, and emotionally. They tap into us as a whole person with dreams, values, and a sense of beauty. Songs are Literature. Lyrics as literary texts have always had a place in L2 learning. Through songs, learners train themselves toward the mastery of pronunciation. Language is presented according to themes and in context so that learning can happen in meaningful ways. Songs are found to be effective, particularly for children’s L2 vocabulary retention. Due to the nature of the melody, the presence of rhyme, and the frequent repetition, songs are found to be helpful in facilitating the memorization of new elements of language [3]. Educators noted that songs could support the establishment of a positive learning environment. Integrating music into language learning leads to higher motivation and engagement. Fisher compared four kindergarten classrooms, whereby two of them utilized music and songs as part of pedagogy while the other two did not employ such an approach [4]. Two years’ observation of these processes revealed that children who are in music-integrated classrooms display high enthusiasm toward school, whereas those in classrooms without music tend to be quieter and more reserved. Similarly, another study involving 12 L1 Chinese and Malay children in Singapore also found that incorporating music improved students’ confidence in using a new language [5]. Hall, who provides a comprehensive overview of literary texts in education, suspects that literature is sometimes used ‘in ways that fail to coordinate the literary and the linguistic’ [6]. While the teaching of literature in tertiary FL programs seems to overemphasize ‘literariness’ and neglect linguistic aspects of literary texts, the use of literature as part of a communicative curriculum at the lower secondary level tends to focus on linguistic aspects but avoids the engagement with literary features [6]. Apart from that, both of the above approaches to literature all too often fail to address the impact that a literary text, or any piece of art, has on the individual.

3. The discourse on learners’ cognitive and emotional development

With reference to some modern FL programs that refrain from incorporating literature in their curriculum in order to concentrate on the transfer of knowledge and skills relevant to learners’ future careers, one has to admit that if our learners study an FL in order to use it at work, in an office or shop, for example, then they will need to be prepared to handle language normally used in these contexts, of course. However, if we designed our FL programs to include only materials and activities that cover our FL learners’ future work lives, we would reduce our teaching to being a vehicle for the development of professional skills alone. This kind of teaching reduces learners to their future role as working citizens when they are more than that. They are human beings who, by learning a FL not only acquire new language skills but also continue to learn about life and grow as personalities through the materials and activities we offer as well as the challenges we set them. This is true for learners of all ages but it is an even more compelling argument in the discussion on FL teaching at primary or secondary schools where learners are younger and spend a larger proportion of their lifetime in an FL classroom. Paran, who discusses the divide on the question of literature in FLT among educationalists, points out that language learning ‘is not only about language but is about learning as well; it is not only about training but also about education’ [7]. In this way, the decision to incorporate literature or other artistic texts that address the learner as a whole person reflects a holistic and humanistic approach to teaching. Within the tradition of humanistic teaching, learning involves the whole person, mind as well and body [8], and learning not only utilizes the left hemisphere of the brain, which is associated with logical thinking, but also the right hemisphere is linked to intuition as well as creativity. Language, as produced by the learner in humanistic exercises, stems from a personal or group experience so that ‘students speak to the teacher because they have something to express, something that has welled up from their emotions’ [8]. FL learners, then, make genuine use of the FL as they also discover something new about themselves or others, while teachers may find it easier to respond in a genuine way [8]. Literary texts, including songs, can, in a similar way, create personal as well as group experiences and lend themselves to humanistic teaching practices.

In this way, literature not only offers opportunities for understanding the world we live in but is also a means for human beings to express themselves. It includes both receptive as well as productive dimensions of language use. Thus, literature provides ample opportunity to learn more about our inner life and to grow as human beings, or, as Wright et al. have put it: ‘In using stories in language teaching, we are using something bigger and more important than language teaching itself’ [9]. And yet, this
positive view of literature in language education should not prevent us from acknowledging that literature has also been used and abused in language classrooms for the assertion of political power in the past. Hall reminds us that the teaching of literature in English language classrooms during colonial times is associated with suppression and the assumption that the cultural achievements of one community, that of the ruling colonial power, are superior to others, the colonized communities [10], [11]. This aspect is, to some extent, still of relevance today when English-speaking countries dominate world politics and needs to be considered in the discussion of literary texts in EFL classrooms in order to raise awareness among teachers about the vulnerability of literature for the misuse in political conflicts. Literature can ‘contribute to the emotional development of the child’ [12]. Through engaging in stories, for example, the child is presented with aspects that are part of human life, such as friendship, solidarity, and kindness, but also illness, loss, and feelings of loneliness [12]. If the child identifies with the literary figures, the problems that they face become his or hers, and through the actions that the literary figures take to solve a conflict, the child lives through and learns from this experience. The fostering of empathy is central in that respect, which is also the case for an understanding of ‘otherness’ that literary texts help to address and raise awareness of [13].

Mourão provides some suggestions as to how artistic texts, such as rhyme, song, and picture books, alongside action games, can help very young children develop their emotional intelligence, which includes a range of competencies, such as ‘empathy, intuition, creativity, flexibility, resilience, stress management, coping, leadership, integrity, intra-personal and interpersonal skills’ [14]. With emotional intelligence involving so many personality traits, it cannot be attended to appropriately within one particular lesson once or twice a week. Rather, it has to be worked on continually across different subject areas, including MFL learning [14]. For example, the singing of a song in the FL or the reading of a picture book can teach children how to show and handle emotions [14]. More recently, two other aspects of personal development have been associated with the teaching of literature, namely the teaching of visual and literary literacy [15]. In a digital world where information is not only transported through the use of language but also increasingly through the use of images in the form of pictures as well as video, children need to be enabled to understand multiple modes of communication. What seems to be needed is a ‘pedagogy of multiliteracies’ [16], which has to be practiced in teacher training as well as in primary and secondary schools [15]. The teaching of literature in EFL should therefore include ‘visual art forms’, or multimodal literary texts, such as picture books, comics, graphic novels, or films [15]. The reading of multimodal literary texts is seen as a contribution to the promotion of literary literacy, which entails much more than the teaching of reading ‘as a merely informative skill’ [15]. Literary literacy involves a deep appreciation for the relevance of literature in our daily lives. Through the teaching of literary literacy, then, our learners become lifelong readers in their first as well as their second language, something that is easily threatened by a focus on ‘everyday and business-related communication’ as well as ‘out-put oriented’ approaches that dominate European and national guidelines [15].

4. Lyrics as a literary text for learning

Not all songs have high-quality lyrics, but it should be up to teachers to select texts that are worth learning from. In many cases, it is especially open, ambiguous literary texts, such as postmodern picture books, that lend themselves to the teaching of multiliteracy in an EFL classroom. It is the juxtaposition of meanings created through pictures, words, layout, and gaps that encourage learners to search for meaning. Because the picture book can only be fully understood if both pictures and verbal text are read, children learn to make sense of images and relate them to the verbal text that accompanies them. They are challenged to look for meaning, make assumptions, and formulate hypotheses. They will, therefore, develop visual literacy alongside literary literacy. All of the above-mentioned considerations for the use of literary texts, and stories in particular, support a humanistic line of argumentation. However, it has been stressed that a decision to use literature that is based on purely non-linguistic aspects cannot sufficiently justify the use of literature in the FL classroom. After all, for literature to be a valuable contribution to an FL program, it has to serve its objective, namely, to teach and foster language learning. One might also suspect that a humanistic approach to literature in the FL classroom may hastily focus on ‘content and response’ with ‘insufficient attention’ to the language of the literary text that affected the reader and produced the response in the first place [11]. Therefore, the question cannot be avoided as to what exactly, in terms of linguistic competence, literary texts, including songs, can bring to the endeavor of second or FL learning.
5. Songs for linguistic development

One argument that has already transpired in the discussion of humanistic approaches to language teaching is the issue of meaningful communication. Literature in language classrooms, if handled adeptly, can provide young learners with genuine language in meaningful contexts [12]. This, of course, is in line with preconditions for FL learning as suggested by CLT theory as well as the concept of ‘comprehensible input’ formulated and further developed by Krashen since the 1970s [17]–[19]. The latter states that we acquire language when we are presented with language that we can just about decode with the focus being on understanding the message it contains rather than the language itself. This argumentation for language acquisition draws on situations where the learner is confronted with the FLs in natural spoken communication as well as in reading for pleasure. Voluntary engagement with literary texts creates opportunities for the learner to receive comprehensible input. Since literary texts address us as a whole person and may touch and move us, they can also fill learners with the desire to express their thoughts and feelings triggered by the text, and in sharing their ideas and trying to make themselves understood, learners are challenged to use the FL for genuine statements. In doing so, they may encounter difficulties in expressing themselves and may be forced to rephrase their verbal contributions. According to the ‘output hypothesis’ [20], this should foster productive FL use and be beneficial for FL proficiency. Apart from these very general assumptions about the positive influence of literature on progress in the FL, the question arises as to how different genres of literary texts can contribute to the development of specific language skills. It seems sensible to get to terms with the nature of these genres, and to identify their characteristics in order to understand in which ways these texts can facilitate language acquisition. In the following, I will first look at song, chant, and rhyme since they share a number of features, and then turn my attention to stories.

6. The attraction of rhythm, rhyme, and melody

Rather than a stream of continuous speech as in prose, lyrical texts are bound by the restrictions of the length of a line or a verse. However, the written form of a verse is a purely external feature. The true nature of verse is uncovered through its sound patterns [21]. Lyrical poetry, in this view, is a musical piece of art that reveals its beauty through the act of performance [21]. In the English language, the musical dimension of poetry is rooted in the patterns of stressed and unstressed syllables that evoke a sense of rhythm, whereas in Ancient Greek, for example, patterns of shorter and longer syllables were used [22]. Unlike prose, the verse is ruled by a rhythmic pattern, the meter, that provides a certain type of frame for the language to be used [21]. This brings with it highly condensed language that is used to express the speaker’s feelings and inner thoughts without any objectification as can be found in narrative or dramatic texts. Its immediacy of expression makes lyrical poetry appear to be the prototype of all literature. Songs have been recommended as mnemonic learning devices in FL learning. However, it has to be noted that these suggestions have mainly addressed the cognitive element in language learning, namely the correct recall of language items. However, as I have argued, literary genres, such as song, chant, and rhyme, cannot be reduced to their ‘usefulness.’ It is precisely their aesthetic qualities and their musical nature that appeal to learners and afford instances of joyful repetition of language that reconcile what has often been conceived as opposing sides, namely cognitive versus emotional aspects of learning. One could argue that in the same way as rhythmic language in song, chant, and rhyme appeals to young L1 learners and aids their language acquisition, it can also engage and support young FL learners. It is noteworthy that verses in the form of songs, chants, and rhymes have to be performed and that this experience is normally part of the intimate and affectionate interaction between caregiver and child. This fuels the child’s continued interest in repeated encounters with the verse, which supports retrieval and recall of language. It is the highly emotional aspect of the passing down of verses from one generation to the next that, according to Hunt [23], has ensured the survival of nursery rhymes over many centuries.

6.1. Rhymes

Rhymes have been found to help sensitize children to similar-sounding words, which supports the development of literacy. Thus, they normally feature in preschool education in the English-speaking world, and rhymes, including nursery rhymes, can be regarded as a worthwhile contribution to the EFL classroom as well.
6.2. Melody

Another aspect that increases the musical character of a genre is melody. Jolly who taught beginners and intermediate Japanese courses for which she used songs as supplements, found that songs not only provided some variation that made work on language appear less tedious but also helped to teach certain aspects of language [24]. In ‘class evaluations’ at the end of term, students themselves thought that the songs created a ‘relaxed and enjoyable atmosphere’ and contributed to vocabulary learning as well as to a better understanding of Japanese culture [24]. From the teacher’s perspective, songs supported the development of pronunciation, grammatical structures, vocabulary, and idiomatic expression, which led her to conclude that ‘there is an innate receptiveness in us to respond to the rhythmic patterns of language’ and that ‘we are merely capitalizing on’ by using songs in the FL classroom [24].

Murphey, who brought up ‘the song stuck in my head phenomenon’ (SSIMH), suggested that music or song may activate the language acquisition device (LAD) or be a ‘strategy of the LAD’ [25]. In his discussion, he argues that SSIMH may be linked to other phenomena that have been reported in connection with language learning, such as ‘involuntary rehearsal of a FL’ or ‘Din in the head’ [26], during intense exposure to the FL. egocentric language as observed in children [27], [28] and the inner speech that evolves from egocentric speech and has also been called verbal thought [29]. According to Murphey, the song can trigger similar rehearsal of language and aid FL acquisition, because if ‘involuntary rehearsal is the humming of the efficient LAD, music and song may initially play an associative facilitating role in engaging and stimulating it’ [30]. While SSIMH is mostly involuntary, there have been accounts of voluntary playback of others’ speech as in the example of a Japanese lady who had learned to master English by replaying any instances of exposure to the target language [31]. Findings from the ELLiE project [32] suggest that young learners also use songs and commercials for voluntary replay outside school, which has a positive effect on their overall competence in the FL.

Fonseca Mora argues that sounds are fundamental to both music and speech and that therefore, language teaching should emphasize the melodic character of language [33]. Referring to L1 research that suggests that the typical melodic contour or musical patterns of a language are mastered and attended to first by children [33], [34], Fonseca Mora argues that FL teachers should exaggerate the rhythmic articulation of an utterance so that their intonation is more musical, in the same way as caregivers modify their speech to young L1 children when they use Child Directed Speech (CDS) [33]. The use of tunes is also recommended. Songs are seen to be ‘an effective way of providing students with lexical patterns that are stored in their minds and that can be effortlessly retrieved’ [33]. Apart from the memorization of language chunks, song lyrics can also provide example language that can be used ‘to deduce grammatical information’, according to Fonseca Mora [33]. Reviewing a body of studies by psychologists, linguists, anthropologists, and musicologists, Brandt, Gebrian, and Slevc argue that musical ability is an essential ingredient in the language acquisition process [35]. After all, infants do not understand the meaning of the language spoken to them during most of their first year. Speech, for them, is not referential yet, but rather some sort of ‘vocal performance’, and in this way very much like music [35]. It is this interrelatedness of music and emerging language acquisition that suggests that the use of music and song might also be beneficial in the FL classroom. Song highlights prosodic features of speech and can therefore pave the way for mastering intonation and pronunciation, which serves as stepping stones for L1 and L2 acquisition. Song, and other musical texts, such as chants and rhymes, encourage ‘creative play with sound’ [35], which precedes and paves the way for language production. While there seem to be many arguments that suggest that songs should be of great value in primary English FL classrooms for both, general educational as well as linguistic reasons, the question remains if empirical studies of actual classroom practice can confirm this assumption.

7. Empirical Research

Empirical research on the role of songs, chants, and stories in language learning can inform this project on primary EFL and provide a valuable basis for the analysis of questionnaire and classroom data. While there seems to be a bulk of studies that have examined the impact of rhythmic language, as in song or rhyme, and of the story on L1 acquisition, there seems to be less research with respect to L2 learning [36], and even less regarding young learners in FL classrooms. Findings of studies that looked at primary FL classroom practice, such as the ELLiE project [1], [32], have already suggested...
a positive influence of children’s repeated exposure to song and narrative in the FL on their language competence. With their focus being on general aspects of classroom management, such as the choice of material and activities in the primary FL classroom, these studies do not allow for a detailed understanding of how songs or stories contribute to linguistic development in the FL. In the following, I will discuss empirical studies that have focused on the use of musical or literary texts in young learners’ instructed L2 and learning.

8. Musical texts and learner progress in formal L2 learning

Songs have been found to further vocabulary growth. In an Austrian context, teenagers learn vocabulary incidentally from oral input in the form of English pop songs that they listen to in their free time [37]. Similar results have been obtained with preschool children in a Spanish EFL context. Coyle and Gómez Gracia report that using songs in the teaching of new language items can facilitate the development of receptive knowledge of vocabulary in learners [3]. Five-year-old children, who had had two years of EFL instruction prior to the study, were presented with the song The wheels on the bus in three 30-minute sessions on consecutive days. The key vocabulary of the song was taught explicitly and repeated through the use of gestures and images in all three sessions. The song was sung or listened to seven times in total with accompanying actions. Children either joined in the actions or, if they wanted to, joined in the singing as well. Vocabulary picture tests were given to each individual child on three occasions, namely once before and twice (immediately and five weeks) after the teaching sessions. Results showed significant gains in learners’ receptive vocabulary, but productive vocabulary did not grow significantly. Only four children out of a total of 25 were able to reproduce any of the five target words.

The authors report that the children had seemed more focused on repeating onomatopoeic phrases and on copying actions than on saying the target words while listening to the song. They conclude that ‘some caution should be taken not to over-emphasize gestures and amusing sounds’ if that distracts children’s attention away from the target vocabulary [3]. They suggest that ‘younger learners should be encouraged to actively reproduce L2 songs to improve their retention of L2 vocabulary’ [3]. It seems that preschool children may need more opportunities to listen to and join in the song in order to be able to reproduce words. It would be interesting to see, for example, how children’s productive test scores were to change if instead of the explicit teaching of the target words they had listened to and joined in the song more often. It is worthwhile considering that for these very young children, the imitation of onomatopoeic phrases and gestures might be more helpful in learning about a word’s meaning than direct teaching of vocabulary. Rather than drawing less attention to these features, it may actually be a good idea to let these very young learners enjoy imitating sounds and actions, and in doing so address their need for contextualized learning [27], [28]. There is another aspect that deserves some reflection with regard to testing. Apart from the fact that children will also have learned the target words through repeated exposure to the test situation, which means that their performance cannot be traced back to the teaching of the song alone, one should also remember that individual testing can be problematic with very young children.

Although common practice in psychological studies, it has been pointed out by educational researchers that one-to-one interviews can be intimidating for very young EFL learners and should therefore be avoided [38]. If we agree with the notion of a friendly and relaxed atmosphere being an important ingredient in the primary EFL classroom, then we have to acknowledge that a testing situation that may easily trigger feelings of insecurity in participants is inconsistent with our normal teaching routine. This is very likely to confuse learners, especially if they are very young. We cannot expect a testing situation that causes nervousness and inhibition to provide a true picture of a learner’s competence in the FL. It has been noted that negative emotions can prevent our memory from working properly. Research on native speakers’ language production in interview situations Howeler suggests that native speakers’ language production is negatively influenced by negative emotions [39]. This can also be anticipated for FL learners. Therefore, settings that the researcher creates to elicit learner talk need to be perceived as non-threatening and informal in order to ensure that learners can demonstrate their true language abilities. In another study on the use of music in EFL classrooms, it has been reported that the introduction of ‘musical stimuli’ in the form of songs as part of the FL program in Year 6, the final year of primary school in Spain, had a positive impact on listening, reading and speaking skills in particular. This has also been documented for reading skills in particular in a study conducted with 7- to 8-year-old Spanish EFL learners [36].
9. Songs in compensation for what reading cannot do: phonological training

Drawing on research that has linked difficulties in the learning-to-read process to poor phonological language skills [40], [41] and referring to studies that have suggested that musical training may counteract poor phonological skills in L2 learning [42], the authors tested a phonological training program with 63 Spanish EFL learners. The two experimental groups were taught ‘early reading skills such as the alphabetic principle, phonological awareness, and phonics’ through video clips [36]. Whereas one group worked with video clips that included melodies, the other received the same training but without the musical support. Tests on ‘musical abilities,’ ‘early reading skills,’ ‘working memory,’ and ‘socio-cultural level’ were conducted before the eleven-week training program and immediately afterward [36]. Test results showed that children in both experimental groups outperformed children in the control group in the ‘Correct letters read in English’ as well as the ‘Initial sound identification’ and the ‘Correct words read in an English dialogue’ tasks. However, ‘a further impact of the music support was not demonstrated [36]. The researchers note, however, that pre-tests revealed significant differences between groups with regard to learners’ musical aptitude, with the non-musical experimental group reaching the highest mean scores, which might explain why no difference could be detected between musical and non-musical experimental groups in the post-tests. The authors suggest that ‘learners with higher musical aptitude may tend to benefit more from the phonological training program than children with lower musical aptitude’ [36]. The researchers stress that the children in the musical experimental group did achieve better results in the reading tasks than their peers who did not receive phonological training. Fonseca Mora et al. argue that the repeated encounters with melodies and their ‘memorable lyrics’ helped children to remember words and speech sounds [36].

While the above study highlights the importance of phonological training, it does not provide evidence of musical training being superior to other non-musical training. And yet, the results of this study are interesting because they indicate that musical intervention in the FL classroom is twofold. On the one hand, learners may benefit from singing because words and speech sounds that occur in song lyrics are more easily acquired. On the other hand, singing itself may refine their musical expertise and their phonological skill in the long term, which helps them in the acquisition of new words and speech sounds and improves their reading performance. Indeed, singing ability has been linked to speech imitation ability, although it has to be pointed out that these experiments were conducted with adults [43]. In the study, working memory, as well as the participants’ sense of rhythm and their ‘vocal flexibility’ accounted for 66% of the variation in speech imitation of a sample of Hindi which was unfamiliar and unintelligible to participants. It is likely that children with musical training in singing show similar abilities when it comes to imitating speech. Therefore, it has been suggested that singing training might be used for the teaching of pronunciation in L2 and FL classrooms [43].

Enjoyment can have a positive effect on their long-term performance not only in the target language but also in other subject areas. Furthermore, the study shows that success in L2 learning is not just about L2 exposure but more about reading something that sparks the learners’ interest and engages them. It seems that we have to differentiate much more between different kinds of songs used in classrooms. Along this line, Cook highlights that literary texts create an alternative world for learners [22]. These stories, in a way, created an alternative naturalistic environment, which may seem paradoxical since stories are rooted in fiction and may be anything but realistic. Very much like L1 learners trying to make sense of their natural environment, the L2 learners find themselves transported into the world of the story that they want to understand and be a part of. The focus shifts from doing a language exercise to making sense of a situation that happens to be portrayed in a language other than the L1. In a way, L2 learners then experience the same type of situational learning as they did when they learned their L1. Of course, this high level of engagement in lyrics can only be achieved if the text appeals to the learner and is approved of as being a genuine story, which always entails an artistic quality that many didactic texts lack.

Younger learners have the ability and aptitude to imitate the language they are exposed to. Thanks to this inclination, teachers can develop various strategies for songs to scaffold language learning. For example, learners can imitate pronunciation, shadow vocabulary, mimic sentence patterns, memorize metaphors, practice idioms, recycle language, analyze meaning, and adapt ways of thinking creatively. Songs also tap into imagination and help learners make sense of the narrative, which in the long run would benefit the ability to build narratives into language use, be it spoken or written form. The article
10. Play-based song performance in the classroom

Play-based activities are categorized based on their integration into different learning areas, such as physical play, musical play, dramatic play, art play, and so on. Such play activities have received extensive research attention in the context of English as a second language. For example, studies investigating the use of storybooks as a vocabulary teaching tool found that 20–30% of words taught could be retained on a long-term basis [44]. The retention rate could be increased by another 10% if discussions of contents are added [44]. Due to the nature of the melody, the presence of rhyme, and the frequent repetition, songs are found to be helpful in facilitating the memorization of new elements of language [3]. Additionally, using multisensory methods can also significantly enhance vocabulary acquisition in children. This is because it is more likely to create a deeper memory trace by engaging in multiple sensory modalities, which improves the chances of language acquisition [45].

11. Conclusion

The article has highlighted how songs can yield positive effects on cognitive and emotional development. Such effects include the fostering of abstract thinking skills, intercultural competence, visual and literary literacy, and emotional intelligence. At the same time, songs are generally regarded as beneficial for linguistic development since they afford meaningful and genuine communication, contextualized learning, and repeated exposure due to their aesthetic qualities. Nevertheless, research findings on the productive use of songs remain patchy. While there has been some conceptual discourse on the use of songs in classrooms, there seems to be a general lack of empirical work that analyses learner’s verbal and non-verbal responses to songs and their exposure to music over a longer period of time.

Acknowledgment

The authors would like to thank the School of Education Culture & Society, Monash University, Australia for the granted support.

Declarations

Author contribution: The author is the main contributor to this paper.

Funding statement: None of the authors have received any funding or grants from any institution or funding body for the research.

Conflict of interest: The authors declare no conflict of interest.

Additional information: No additional information is available for this paper.

References


Dat Bao (Exploring the impact of songs on student cognitive....)
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(Exploring the impact of songs on student cognitive ....)