

The Effect of Music on the Communication Ability: A Case of Vocabularies

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Abstract Vocabulary growth predicts communication ability and communication without vocabulary is impossible. The study was done among 50 EFL learners to examine the effect of music-based instruction on their vocabulary retention and attitudes. They were divided into experimental and control groups. First, a pre-test was conducted to fulfill the homogeneity assumption. Then, the photo dictionary part of the “English for Schools Prospect 1” book was set to music and the experimental group underwent music-based practices. While the control group received audio-visual instruction. Immediately after the instructions, a 20-item test was given to the groups. Subsequently, a 9-item attitude scale was distributed among the teacher, observer, and groups. After two weeks, a long-term memory test was conducted between the two groups. Results presented that the experimental group significantly outscored in the short- and long-term memory tests compared with the control group. Moreover, results from the attitude scale indicated that they welcomed music-based instruction allowing more profound vocabulary learning and communication ability than the audio-visual practices.

Keywords: *Communication ability, Short-term memory, Long-term memory, Vocabulary retention, Attitude*

1. Introduction

Being able to communicate effectively is of utmost importance in language learning. Communication, at its simplest, is the process of transmitting information allowing learners to understand and be understood by others. In this process, the conveyance of meaning is the crux of effective communication. Words have meaning and power and are the fundamental unit of a language (Subekti & Lawson, 2007; Susanto & Fazlinda, 2016). Actually, adequate vocabulary knowledge is the building block of successful communication (Khan, 2018). Vocabulary learning is particularly prominent for foreign language learners who are null in the target language words (Schmitt & Carter, 2000). Most foreign language learners complain about a lack of word knowledge or forgetfulness. A reason can be attributed to the selection of inappropriate instructional materials (Nugroho, 2020).

Vocabulary teaching demands the selection and employment of involving materials along with manifold instructional practices (Hadi, 2017). Materials should stimulate learners’ background knowledge (Popova et al., 2014) and

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arouse their senses and emotions to influence their cognition (Ebrahimi et al., 2022). In this regard, the incorporation of music-based practices can awaken senses and emotions (Arleo, 2000). Levitin (2008) states that music imitates some language facets, although, in emanating emotions, music acts beyond language because it inspires emotional, rewarding, and motivational patterns in the brain as well. Music-based practices advance exposure to language (Mora, 2000; Wiggins, 2007), create active vocabulary learning (Neumon & Dwyer, 2009), and enhance the retention of vocabulary (Köksal et al., 2013). In a way, music characteristics influence the underlying brain functions and structure, dealing with retention and memory processes (Tamminen et al., 2015).

Although music-based instruction has been used in language teaching and learning, its impact on Iranian students' English school books and their vocabulary retention has not been studied. This paper focused on examining the effect of music on 7th-grade Iranian EFL learners' short- and long-term memory retention. Besides, the study analyzed the students' attitudes towards music-based instruction in combination with the teacher's and observer's views. Generally, the study tried to find answers to the following questions:

1. Is there any difference in short-term memory vocabulary test scores of the students in the control and experimental groups?
2. Is there any difference in long-term memory vocabulary test scores of the students in the control and experimental groups?
3. What are the teacher, observer, and students' attitudes toward the power of music in material development?

2. Theoretical Framework

A pivotal issue in language learning is communication ability enabling learners to make connections with others (Aubrey, 2011). L2 learners' effective communication with others is an essential competence allowing them to exchange their thoughts and emotions (Abdolmanafi-Rokni & Ataei, 2014; Boudreau et al., 2018). Communication is not just a way of voicing their thoughts, but it is a way, if used effectively, to influence their audiences (Cheng & Xu, 2022). Effective communication enables L2 learners to achieve their goals, and it can have a direct impact on their success and progress (Cheng & Xu, 2022). One of the challenges that foreign language learners face is a communication failure. The challenge is particularly more prominent in foreign language contexts. Foreign language learners "do not develop a balanced interlanguage regarding different dimensions of production, and most of them have problems in fluency and difficulty performing tasks in real-life tasks" (Bahrami et al., 2018, p. 978). Two of the most important reasons for communication failure can be little word knowledge and word forgetting. A language learner can communicate in an efficient way with knowing enough vocabulary. Successful vocabulary choice gives rise to effective communication. In fact, vocabulary as a substantial component of communication assists language learners in expressing themselves clearly.

A way to achieve positive outcomes and satisfy learners' needs in communication is the growth of vocabulary knowledge (Khan et al., 2018) via successful language teaching materials (Harsono, 2015; Nikoopour & Amini Farsani, 2011). Materials can be visual, kinesthetic, or linguistic and may be presented through live display, in print, on cassette, CD-ROM, DVD, and Internet (Harsono, 2015). Textbooks are known as "silent partners", which have leading roles in shaping and guiding instructional activities (Orton, 2010). However, "various senses have to be integrated into the textbooks to enhance learning and communicative skills, which seems to have been overlooked" (Ebrahimi et al., 2022, p. 1). In fact, the involvement of senses and emotions is absent in textbooks, activities, and classroom environments (Pishghadam & Ebrahimi, 2020). Senses and emotions can revive enthusiasm in learners, which is the prerequisite of a successful education system (Ebrahimi & Jahani, 2021; Tabatabaee Farani & Pishghadam, 2021). In a sensory-based model of teaching (coined as emotioncy), Pishghadam (2015) highlights that emotions that are elicited by sensory experiences can relativize and form learners' cognition. Based on the emotioncy model, by creating an effective learning environment, learners' indirect knowledge will advance to the direct level enhancing memory and retention processes (Boustani et al., 2021). Therefore, the integration of senses, emotions, and cognition can formulate a

unified picture of an excellent education, named emo-sensory model (Pishghadam & Shayesteh, 2017) (Figure 1).

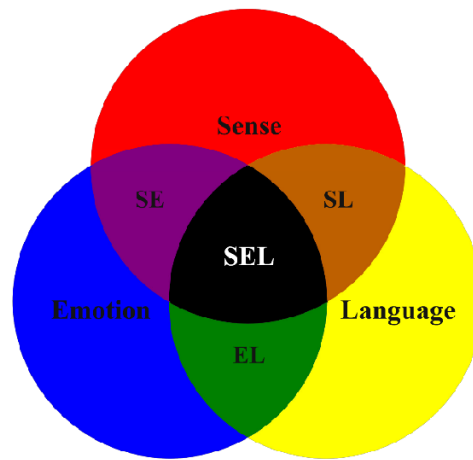


Figure 1

The Three-Set Model of Emo-Sensory Expression (Note. Adapted from “Emo-Sensory Expression at the Crossroads of Emotion, Sense, and Language: A Case of Color-Emotion Associations,” by R. Pishghadam and S. Shayesteh, 2017, *International Journal of Society, Language and Culture*, 5(2), p. 22).

Figure 1 illustrates how learners’ perception of sensory inputs and aroused emotions are interwoven with language learning experiences. The emotioncy and emo-sensory models pinpoint the appropriate selection and employment of sense- and emotion-based materials and teaching methods that precondition an effective learning environment. With these in mind, the inclusion of music-based instruction may awaken senses and emotions and can encourage pedagogical diversity (Arleo, 2000). Indeed, music is beyond an artistic concept; it is a complicated neural activity that is tightly knitted in the brain’s complex functions like language, memory, retention, emotion, etc. (Orton, 2010; Wolfe, 2010). Music is the “art of mind” (Bahrami et al., 2018), improving language learning skills in general (Saricoban & Metin, 2000) and English language teaching (ELT) in particular (Kara & Aksel, 2013; Speckman, 2004). Music-based materials stimulate students’ background knowledge and concepts (Gilles et al., 1998). As a matter of fact, in ELT material development, music is a way of contextualizing concepts that facilitates language learning.

More specifically, music makes a worthwhile contribution to vocabulary learning (Abbott, 2002; Li & Brand, 2009). Studies (e.g., Gan & Chong, 1998; Moyeda et al., 2006) have identified enhancements in learners’ receptive and active vocabulary knowledge as a result of receiving new words via music. In effect, music provides opportunities for active learning (Neumon & Dwyer, 2009) and memory activation (Ludke et al., 2013).

A central issue with regard to music-based instruction is memorization (LeDoux, 1996; Ortis, 2008). Investigations have mostly demonstrated the worth of listening to music for better memory and retention (Calvert & Tart, 1993; Kilgour et al., 2000; Tamminen et al., 2015). In the retention process, not only vocabulary and semantic encoding are crucial, but the richness and depth of information are also important (Craik & Tulving, 2004). Although the notions of the depth of information and elaboration are complex, suggesting music-based instruction may be a helpful supplementary strategy to operationalize them. Essentially, music intensifies students’ senses and awakens their emotions, preconditioning greater retention of information (Ortis, 2008). In effect, sensitivity to emotions can encourage communication (Naji Meidani et al., 2022). Overall, music-based instruction can create a rich learning environment, address multiple senses, and support changes in emotions. By providing a multi-stimulant environment, music accelerates rehearsal and retention of information. As a result, the employment of music-based practices may enhance the retention of vocabulary and incorporate it in effective communication ability.

3. Methodology

3.1. Participants

Fifty-four students were assigned as the control ($n = 26$) and the experimental ($n = 28$) group. However, during the procedure, four of them were excluded since two of the students' proficiency levels were higher than the pre-determined level, and they had English learning experiences in institutions. Moreover, two of them did not take the long-term memory test. The study was administered among female students in the age range of 12-14 years at a school in Shiraz, Iran. All of them were Persian native speakers (i.e., as L1) and English learners (i.e., as L2). Besides, they had no English learning experiences.

3.2. Instruments

Two lessons (i.e., 5 & 6) from the "English for Schools Prospect 1" book, which had not been taught to the students, were selected. In line with the aim of the study, the photo dictionary parts of the book were set to music. The selected pieces of music were in the lower intermediate level and were chosen and mixed from various ELT websites. A pre-test was designed to homogenize the students. After the treatments, short-term and long-term memory tests were designed to examine the students' vocabulary retention. The point should be mentioned that the two tests were driven from the lessons, in the same manner, to be assured of reliability. Moreover, a 9-item attitude scale questionnaire with a focus on attention, pleasure, engagement, development, memory retention, motivation, efficiency, benefit, and preference was given to both groups ($\alpha = .94$).

3.3. Procedure

The first step was the pre-test administration consisting of the demographic and vocabulary questions. In fact, the pre-test was designed to check the homogeneity assumption of the participants' vocabulary knowledge. The 20-item test was distributed among the students, and they were asked to write the number of each picture in front of its correct word in the answer sheet, and they were informed that three words were extra. The test was finished in 20 minutes. It was based on a 0-1 scoring procedure. Subsequently, to teach the photo dictionary parts of the book, a two-hour class was conducted for each group. To modify the confounding variables, the classes were managed by one teacher, and they were observed by the author of the study and an observer. In the experimental group, the teacher played music two times for the first time. Then, she asked the students to pay attention to the words and played music two times again. In the third step, the teacher stopped the music and explained the meaning of the words two times. However, in the control group, the photo dictionary parts were instructed based on the common audio-visual method of teaching in the absence of music-based practices. At the end of each session, the teacher distributed a 20-item short-term memory test and asked them to write the correct number of each picture. Thereafter, a 9-item scale (0%, 25%, 50%, 75%, 100%) was distributed among the students, the teacher, and the observer, and they were asked to mark the percentages faithfully. Two weeks (designed based on Yousefi et al., 2014) after the treatment session, the experimental and control groups took an alternative form of the previous tests to examine the students' long-term memory retention.

4. Results

To examine the normality of data, the distribution of the points in the tests was analyzed. The values were near the 45-degree line diagram. The equilibrium in the diagram occurred since the aggregated expenditure line crossed the 45-degree line and indicated a high validity. Moreover, results from the P-P plot presented the scattering of the points and the validity of the test. The P-P plot of the residuals consisted of the observed cumulative probability and expected cumulative probability axes. The aggregation of the observed cumulative probabilities was close to the diagonal line indicating that there was no violation of the normality assumption.

4.1. Short-Term Memory Scores

An independent-sample t-test was conducted to see whether there was any significant difference between the short-term memory vocabulary test scores of the students in the control and experimental groups (Table 1). An examination of the data indicated that there was no violation of the normality assumption. Based on the analysis, the experimental group ($M = 17.48$, $SD = 1.93$) outscored the control group ($M = 15.68$, $SD = 2.54$).

Table 1
One-Sample Statistics of Short-Term Memory Test Scores

	N	Mean	Std.Deviation	Std. Error Mean
Short_Term_Memory_Control	25	15.68	2.54	.50
Short_Term_Memory_Experimental	25	17.48	1.93	.38

In addition, the findings of Table 2 indicate that the difference between the groups is significant ($p = .001$, $df = 24$).

Table 2
One-Sample Test of Short-Term Memory Test Scores

	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Short_Term_Memory_Control	30.80	24	.000	15.68	14.63	16.73
Short_Term_Memory_Experimental	45.07	24	.000	17.48	16.68	18.28

4.2. Long-Term Memory Scores

Through an independent-sample t-test, the mean scores of the control and experimental groups were compared. There was no violation of the normality assumption. The experimental group showed a higher mean score ($M = 16.28$, $SD = 2.44$) in comparison to their counterparts ($M = 12.64$, $SD = 3.93$) (Table 3).

Table 3
One-Sample Statistics of Long-Term Memory Test Scores

	N	Mean	Std. Deviation	Std. Mean Error
Long_Term_Memory_Experimental	25	16.28	2.44	.48
Long_Term_Memory_Control	25	12.64	3.93	.78

Besides, the output of the one-sample t-test (Table 4) reported that the difference between the two groups was significant ($p = .001$, $df = 24$).

Table 4
One-Sample Test of Long-Term Memory Test Scores

	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Long_Term_Memory_Experimental	33.34	24	.000	16.28	15.27	17.29
Long_Term_Memory_Control	16.05	24	.000	12.64	11.02	14.26

Figure 2 also illustrates the findings and the differences between the two groups in the short-term memory and long-term memory retention scores.

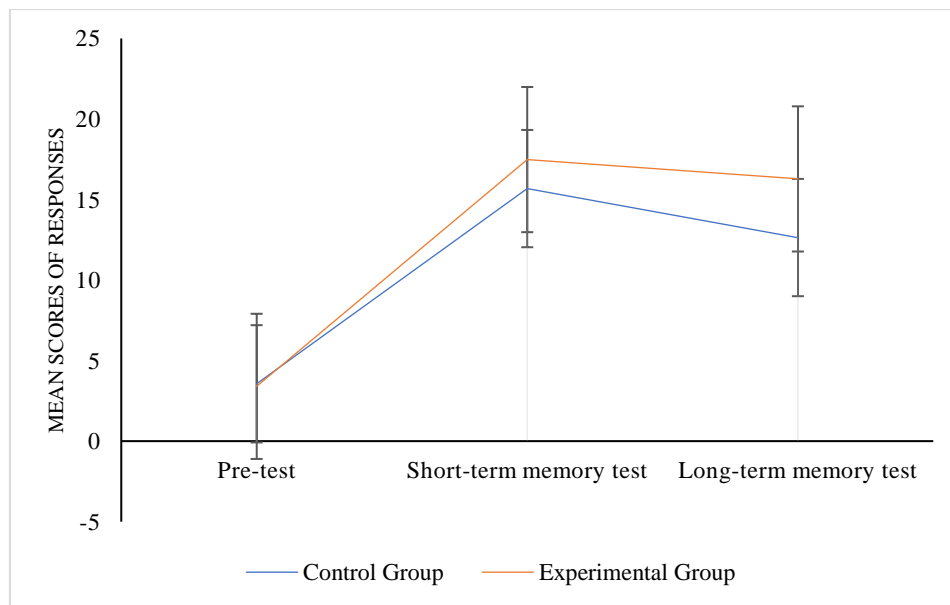


Figure 2
Control and Experimental Groups' Mean Scores

Accordingly, the participants' pre-test scores were $M = 3.56$ and $M = 3.4$ in the control and experimental groups, respectively. The non-significant difference between the groups paved the way for further analysis. After the pre-test, both the experimental ($M = 17.48$) and control ($M = 15.68$) groups had an increase in short-term memory scores. Although the mean scores of the groups decreased after two weeks, the experimental group ($M = 16.28$) indicated higher performance in comparison to the control group's score ($M = 12.64$).

4.3. Attitude Scale Questionnaire

The observer, teacher, and students' attitudes toward each question were analyzed separately. The key components of the 9-item attitude scale were attention, pleasure, engagement, development, memory retention, motivation, efficiency, benefit, and preference.

4.3.1. Attention

The average of the responses presented that the students in the experimental group ($M = 71\%$) believed in the positive role of music in increasing their attention. However, the average decreased to 40% in the control group ($M = 40\%$). The teacher and observer shared similar attitudes towards the role of music-based practices in the experimental group's attention ($M = 75\%$).

4.3.2. Pleasure

The second question was about the pleasure of learning new words with music-mode or audio-visual instruction. Results presented similarities between the teacher and observer's attitudes towards the music-mode practices (100%) and audio-visual instruction (25%). The results for the students in the experimental and control groups were $M = 71\%$ and $M = 40\%$, respectively.

4.3.3. Engagement

The third question was about the students' engagement level in learning new vocabulary across the two instructions. Results showed that the average score of the experimental group ($M = 70\%$) was higher

than that of the control group ($M = 21\%$). The observer ($M = 100\%$) and the teacher ($M = 75\%$) also believed in the students' engagement in music-based practices.

4.3.4. Development

The fourth question was organized to analyze the impact of the instructions on the students' vocabulary development. The lowest mean score belonged to the teacher and observer's attitudes toward the control group's development (25%). The students' average scores in the experimental ($M = 61\%$) and control ($M = 32\%$) groups were also different.

4.3.5. Memory Retention

Another important issue is the retention of new words in memory. The fifth question posed this issue. Based on the results, the observer and teacher's scores in the control and experimental groups were 50% and 75%, respectively. The scores indicated that there was a consensus between the teacher and the observer about the effect of the instructions on retention. Moreover, the students' mean score in the experimental group ($M = 64\%$) was different from the control group's score ($M = 41\%$).

4.3.6. Motivation

Motivation as an influential factor in learning was posed in question six. Based on the results, differences between the control ($M = 36\%$) and experimental ($M = 36\%$) groups were noticed. In addition, the teacher (100%) and the observer (75%) believed in the power of music over the audio-visual method.

4.3.7. Efficiency

Question seven was about the efficiency of learning with the music-based practices in comparison to the audio-visual method. The surprising result was the observer's attitude towards the equal efficiency of the two methods (50%). However, the students' mean score in the experimental group ($M = 70\%$) was not similar to that in the control group ($M = 32\%$).

4.3.8. Benefit

The observer and teacher in the no-music group and music group had consensuses on the benefit of the instructions, 50% and 75%, respectively. Another notable point was the difference between the students' responses in control ($M = 33\%$) and experimental ($M = 70\%$) groups.

4.3.9. Preference

The last question was about the students' as well as the teacher and observer's preferences for the continuation of the two teaching practices. Based on the findings, the highest mean belonged to the students in the experimental group ($M = 78\%$), which was not very different from the observer and teacher's (75%) preferences. However, the mean in the control group ($M = 32\%$) indicated that the participants had a low preference for the audio-visual approach.

5. Discussion

The study compared the effect of the music-based instruction with the audio-visual method on the learners' vocabulary scores. In what follows, the short- and long-term memory test and attitude scale results are discussed.

5.1. Short- and Long-Term Memory Test

The obtained results acknowledged that the significant effect of music-based instruction on the retention process improved vocabulary scores. Similarly, several studies have indicated the positive effect of music on learners' achievements in vocabulary (e.g., Alipour et al., 2012; Köksal et al., 2013; Shakerian et al., 2016; Yousefi et al., 2014). The findings are particularly consistent with the results of Köksal et al. (2013), which evidence that new vocabularies taught with music enable learners to involve all memory channels and then engage the parts to encode pieces of information. They also considered that music empowers better learning and longer retention of vocabulary. In effect, practices associated with

music are memorable and accessible for mental rehearsal (Mora, 2000), and music stimulates language acquisition by the occurrence of involuntary mental rehearsal (Salcedo, 2002). A reason may be the memorable effects of melody and rhythm, characteristics of music, on retention and rehearsal processes (Bahrami et al., 2018; Good et al., 2015; Tamminen et al., 201). Another reason for the positive influence of music can be attributed to the dopaminergic system (Frank et al., 2004, Salimpoor et al., 2011), paving the way for higher neural firing and brain functions (Jaušovec et al., 2006). In this respect, the cortical firings reinforce the enhancement of other higher cortical patterns resulting in changes in behavior (Leng & Shaw, 1991) and emotion (Ortis, 2008). As a matter of fact, “memory is aided by the emotional response that music brings to life in the listener. This response allows for greater retention of the lyrics due to strengthened pathways in the brain” (Ortis, 2008, p. 219). More specifically, modifications in emotions precondition long-term memory and retention processes (Ortis, 2008). In effect, music creates long-term changes in the brain as well as changes in long-term memory (Ortis, 2008, Wolfe, 2010). On the other hand, the emotional responses to music are associated with changes in the secretion of serotonin, allowing students to be more receptive to inputs (Wolfe, 2010).

Generally, the appreciation of music-based instruction is on account of the modifications it generates in the underlying brain structure. The study implies that music can be considered a powerful tool in arousing senses, emotions, and cognitive processes, as they were highlighted in emotioncy (Pishghadam, 2015) and emo-sensory (Pishghadam & Shayesteh, 2017) models. In this respect, music can help learners to transcend from null to full levels of understanding of a concept leading to improvements in communicative ability.

5.2. Attitude Scale

Differences in attitudes were also evident in attention, pleasure, engagement, development, memory retention, motivation, efficiency, benefit, and preference. In accordance with studies (e.g., Abdolmanafi-Rokni & Ataee, 2014; Shakerian et al., 2016), the students in the experimental group had more positive attitudes towards the music-based instruction than the students in the control group towards the audio-visual method. In this line, preparing materials for a foreign language classroom, Abrate (1983) mentions the remarkable impact of music on students' attention. Similarly, Morton et al. (1990) delineate the positive function of music in attention span and notice that music may modify the right hemisphere functions and intensifies the bilateral cerebral arousal levels.

In line with the results from the attitude scale, Lee and Lin (2015) mention that music as a “non-threatening way” boosts language learning and makes learning more enjoyable. Indeed, music as an enjoyable strategy can minimize communication obstacles by improving the encoding and retention of words (Çetin & Flamand, 2010; Madani & Mahmoodi Nasrabadi, 2017). The processes are facilitated by organizing new words in contexts and integrating new with old information. More specifically, various components of music excite microstructural alterations in the cerebellum, hence making learning more pleasurable (Levitin, 2008). In effect, enjoyment creates pleasure as well as motivation in learners (Abbott, 2002; Levitin, 2008; Moufarrej & Salameh, 2019). In this vein, the power of music on emotion (Lee & Lin, 2015) and mood regulation (Adaman & Blaney, 1995; Saarikallio & Erkkilä, 2007) is undeniable, forming the basis for positive memory experiences (LeDoux, 1996) and memory retention (Ortis, 2008). More specifically, engaging the emotion-related regions of the brain, music facilitates the retention and recall of words. In effect, the emotional responses trigger attention, and attention stimulates learning (Wolfe, 2010). Furthermore, the functional connections of listening to music have been reported in association with autonomic and physiological responses, reward systems, and dopamine release (Menon & Levitin, 2005). These connections provide insights into explaining why music-mode practices can be a pleasurable experience for learners. In fact, the more the ELT materials involved the brain in doing various practices, the more effective the results would be. According to Ortis (2008), music involves multiple intelligences reinforcing the brain's neural pathways through multiple exposures.

Moreover, the present study reported the positive attitude of the students towards the engaging or involving role of music. Pertinently, in a cognitive-motivational model of involvement, Laufer and Hulstijn (2001) mention the involvement load hypothesis and highlight the basic roles of “need, search, and involvement” in the retention of unfamiliar words. Accordingly, the retention of new words is

determined by the amount of involvement in tasks (Laufer & Hulstijn, 2001). Regarding the superiority of involvement in tasks, music can be recommended as a high involvement load strategy for better retention. Naturally, the retention process supports vocabulary development by stimulating learners' background knowledge (Gilles et al., 1998). Finally, the analyses of responses to the ninth question presented the teacher, observer, and students' preferences for the repetition of the music-based instruction for the following lessons of the book. Generally, the results showed the superiority of music-integrated instruction in learning over non-music-mode instruction on short- and long-term memory. Music-integrated instruction has a strong effect on students' retention and enlivens the classroom environment foregrounding opportunities for better vocabulary learning and communication skill. Furthermore, to overcome the problem of lack of vocabulary knowledge as an indisputable part of effective communication, music-based instruction is suggested. To accomplish this suggestion, the inclusion of music-integrated practices and materials in the ELT syllabus can be satisfactory.

Last but not least, future studies should investigate the role of music on different grade levels and also with larger samples. Further research should be conducted with more treatment sessions. It is also recommended to examine the effect of various types of music with varied musical characteristics on learning language components.

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References

- Abbott, M. (2002). Using music to promote L2 learning among adult learners. *TESOL Journal*, 11(1), 10-17. <https://doi.org/10.1002/j.1949-3533.2002.tb00061.x>
- Abdolmanafi-Rokni, S. J., & Ataei, A. J. (2014). The effect of background music on vocabulary recall and retention of children learning English as a foreign language. *International Journal of Basic Sciences & Applied Research*, 3(8), 491-495.
- Abrate, J. H. (1983). Pedagogical applications of the French popular song in the foreign language classroom. *The Modern Language Journal*, 67(1), 8-12. <https://doi.org/10.2307/326687>
- Adaman, J. E., & Blaney, P. H. (1995). The effects of musical mood induction on creativity. *The Journal of Creative Behavior*, 29(2), 95-108. <https://doi.org/10.1002/j.2162-6057.1995.tb00739.x>
- Alipour, M., Gorjian, B., & Zafari, I. (2012). The effects of songs on EFL learners' vocabulary recall and retention: The case of gender. *Advances in Digital Multimedia (ADMM)*, 1(3), 140-143.
- Arleo, A. (2000). Music, song and foreign language teaching. *Cahiers de l'APLIUT*, 19(4), 5-19.
- Aubrey, S. (2011). Facilitating interaction in East Asian EFL classrooms: Increasing students' willingness to communicate. *Language Education in Asia*, 2(2), 237-45. <https://doi.org/10.5746/LEIA%2F11%2FV2%2FI2%2FA06%2FAUBREY>
- Bahrami, Z. N., Izadpanah, S., & Bijani, H. (2019). The impact of musical mnemonic on vocabulary recalling of Iranian young learners. *International Journal of Instruction*, 12(1), 977-994. <https://doi.org/10.29333/IJI.2019.12163A>
- Boudreau, C., MacIntyre, P., & Dewaele, J. M. (2018). Enjoyment and anxiety in second language communication: An idiodynamic approach. *Studies in Second Language Learning and Teaching*, 8(1), 149-170. <https://doi.org/10.14746/ssllt.2018.8.1.7>
- Boustani, N., Pishghadam, R., & Shayesteh, S. (2021). Multisensory input modulates P200 and L2 sentence comprehension: A one-week consolidation phase. *Frontiers in Psychology*, 4234. <https://doi.org/10.3389/fpsyg.2021.746813>
- Calvert, S. L., & Tart, M. (1993). Song versus verbal forms for very-long-term, long-term, and short-term verbatim recall. *Journal of Applied Developmental Psychology*, 14(2), 245-260. [https://doi.org/10.1016/0193-3973\(93\)90035-T](https://doi.org/10.1016/0193-3973(93)90035-T)
- Çetin, Y., & Flamand, L. (2010). Mental pollution hypothesis and foreign vocabulary retention. *Poznań Studies in Contemporary Linguistics*, 46(3), 275-293. <https://doi.org/10.2478/v10010-010-0016-4>

- Cheng, L., & Xu, J. (2022). Chinese English as a foreign language learners' individual differences and their willingness to communicate. *Frontiers in Psychology, 13*, 1-10. <https://doi.org/10.3389/fpsyg.2022.883664>
- Craik, F. I. M., & Tulving, E. (2004). Depth of processing and the retention of words in episodic memory. In D. A. Balota & E. J. Marsh (Eds.), *Cognitive psychology: Key readings* (pp. 296–308). Psychology Press.
- Ebrahimi, S., Tabatabaeian, M. S., & Al Abdwani, T. (2022). Enhancing the communicative skills of normal and mentally-challenged learners through emo-sensory textbooks. *Journal of Business, Communication & Technology, 1*(2), 1-12. <http://doi.org/10.56632/bct.2022.1201>
- Ebrahimi, S., & Jahani, Z. (2021). The “cultuling” analysis model as an effective approach in teaching Iranian culture to non-Persian speakers: The case of the cultuling of mortal thoughts in the Shahname. *Journal of Teaching Persian to Speakers of Other Languages, 10*(2), 105-135. <https://doi.org/10.30479/jtpsol.2021.15104.1521>
- Frank, M. J., Seeberger, L. C., & O'reilly, R. C. (2004). By carrot or by stick: Cognitive reinforcement learning in Parkinsonism. *Science, 306*(5703), 1940-1943. <https://doi.org/10.1126/science.1102941>
- Gan, L., & Chong, S. (1998). The rhythm of language: Fostering oral and listening skills in Singapore pre-school children through an integrated music and language arts program. *Early Child Development and Care, 144*, 39-45. <https://doi.org/10.1080/0300443981440105>
- Gilles, C., Andre, M., Dye, C., & Pfannenstiel, V. (1998). Talking about books: Constant connections through literature-using art, music, and drama. *Language Arts, 76*(1), 67-75.
- Good, A. J., Russo, F. A., & Sullivan, J. (2015). The efficacy of singing in foreign-language learning. *Psychology of Music, 43*(5), 67-640. <https://doi.org/10.1177/0305735614528833>
- Hadi, A. S. A. (2017). Significance of vocabulary in achieving efficient learning. *American Academic Scientific Research Journal for Engineering, Technology, and Sciences, 29*(1), 271-285.
- Harsono, Y. M. (2015). Developing learning materials for specific purposes. *Teflin Journal, 18*(2), 169-179.
- Jaušovec, N., Jaušovec, K., & Gerlic, I. (2006). The influence of Mozart's music on brain activity in the process of learning. *Clinical Neurophysiology, 117*, 2703-2714. <https://doi.org/10.1016/j.clinph.2006.08.010>
- Kara, Z. E., & Aksel, A. S. (2013). The effectiveness of music in grammar teaching on the motivation and success of the students at preparatory school at Uludağ University. *Procedia-Social and Behavioral Sciences, 106*, 2739-2745. <https://doi.org/10.1016/j.sbspro.2013.12.314>
- Khan, R. M. I., Radzuan, N. R. M., Shahbaz, M., Ibrahim, A. H., & Mustafa, G. (2018). The role of vocabulary knowledge in speaking development of Saudi EFL learners. *Arab World English Journal (AWEJ), 9*(1), 406-418. <http://doi.org/10.31235/osf.io/68gwj>
- Khedir Sharabian, S., Kheierabadi, R., Alavi Moghaddam, S. B., Anani Sarab, M. R., Forouzandeh Shahraki, E., & Ghorbani, N. (2013). *English for schools: Prospect 1*. Iran's School Book Publishers.
- Kilgour, A. R., Jakobson L. S., & Cuddy L. L. (2000). Music training and rate of presentation as mediators of text and song recall. *Memory and Cognition, 28*(5), 700-710. <https://doi.org/10.3758/BF03198404>
- Köksal, O., Yağışan, N., & Çekiç, A. (2013). The effects of music on achievement, attitude and retention in primary school English lessons. *Procedia-Social and Behavioral Sciences, 93*, 1897-1900. <https://doi.org/10.1016/j.sbspro.2013.10.136>
- Laufer, B., & Hulstijn, J. (2001). Incidental vocabulary acquisition in a second language: The construct of task-induced involvement. *Applied Linguistics, 22*(1), 1-26. <https://doi.org/10.1093/applin/22.1.1>
- LeDoux, J. (1998). *The emotional brain: The mysterious underpinnings of emotional life*. Simon and Schuster.
- Lee, L., & Lin, S. (2015). The impact of music activities on foreign language, English learning for young children. *Journal of the European Teacher Education Network, 10*, 13-23.
- Leng, X., & Shaw, G. L. (1991). *Toward a neural theory of higher brain function using music as a window*. World Scientific Publishing Company.
- Levitin, D. J. (2008). *The world in six songs: How the musical brain created human nature*. Penguin.

- Li, X., & Brand, M. (2009). Effectiveness of music on vocabulary acquisition, language usage, and meaning for mainland Chinese ESL learners. *Contributions to Music Education*, 36(1), 73-84.
- Ludke, K., Ferreira, F., & Overy, K. (2013). Singing can facilitate foreign language learning. *Memory and Cognition*, 41(5), 41-52. <https://doi.org/10.3758/s13421-013-0342-5>
- Madani, D., & Mahmoodi Nasrabadi, M. (2017). The effect of songs on vocabulary retention of preschool young English language learners. *International Journal of Research Studies in Language Learning*, 6(3), 63-72. <https://doi.org/10.5861/ijrsl.2016.1562>
- Menon, V., & Levitin, D. J. (2005). The rewards of music listening response and physiological connectivity of the mesolimbic system. *NeuroImage*, 28(1), 175-184. <https://doi.org/10.1016/j.neuroimage.2005.05.053>
- Mora, C. F. (2000). Foreign language acquisition and melody singing. *ELT Journal*, 54(2), 146-152. <https://doi.org/10.1093/elt/54.2.146>
- Morton, L. L., Kershner, J. R., & Siegel, L. S. (1990). The potential for therapeutic applications of music on problems related to memory and attention. *Journal of Music Therapy*, 27(4), 195-208. <https://doi.org/10.1093/jmt/27.4.195>
- Moufarrej, G., & Salameh, C. (2019). The effects of songs on vocabulary retention in foreign language acquisition: The case of Arabic. *Al-'Arabiyya*, 52, 101-124.
- Moyeda, I. X. G., Gómez, I. C., & Flores, M. T. P. (2006). Implementing a musical program to promote preschool children's vocabulary development. *Early Childhood Research & Practice*, 8(1), 1-11. <https://doi.org/10.1177/8755123312458292>
- Naji Meidani, E., Makiabadi, H., Zabetipour, M., Abbasnejad, H., Firoozian Pooresfehni, A., & Shayesteh, S. (2022). Emo-sensory communication, emo-sensory intelligence and gender. *Journal of Business, Communication & Technology*, 1(2), 54-66. <http://doi.org/10.56632/bct.2022.1206>
- Neumon, S. B. & Dwyer, J. (2009). Missing in action: Vocabulary instruction in pre-K. *The Reading Teacher*, 62(5), 384-392. <https://doi.org/10.1598/RT.62.5.2>
- Nikoopour, J., & Amini Farasani, M. (2011). English language teaching material development. *Language and Translation*, 2(2), 1-12.
- Nugroho, A. (2020). English material needs of accounting students: An English for specific purposes approach. *IDEAS: Journal on English Language Teaching and Learning, Linguistics and Literature*, 8(1), 1-15. <http://doi.org/10.24256/ideas.v8i1.1239>
- Ortis, J. M. (2008). The effects of music, rhymes and singing on the classroom environment. In J. Ensign, E. Hargrave, & R. Lasso (Eds.), *Masters in Teaching Program 2006-2008 Teaching the Child in Front of You in a Changing World* (pp. 214-221). The Evergreen State College.
- Orton, J. (2010). Culture and English materials. In H. P. Widodo & L. Savova (Eds.), *The Lincom guide to ELT materials design and development: Theory and practice* (pp. 215-228). Lincom Europa.
- Pishghadam, R. (2015, October). *Emotioncy in language education: From exvovement to involvement* [Paper presentation]. The 2nd conference on interdisciplinary approaches on language teaching, literature, and translation studies. Mashhad, Iran.
- Pishghadam, R., & Ebrahimi, Sh. (2020). Introducing an effective communication model in light of emotioncy-based education. *Language and Translation Studies*, 53(1), 31-61. <https://doi.org/10.22067/lts.v53i1.81074>
- Pishghadam, R., & Shayesteh, S. (2017). Emo-sensory expression at the crossroads of emotion, sense, and language: A case of color-emotion associations. *International Journal of Society, Language and Culture*, 5(2), 15-25.
- Popova, A., Kirschner, P. A., & Joiner, R. (2014). Effects of primer podcasts on stimulating learning from lectures: How do students engage?. *British Journal of Educational Technology*, 45(2), 330-339. <https://doi.org/10.1111/bjet.12023>
- Saarikallio, S., & Erkkilä, J. (2007). The role of music in adolescents' mood regulation. *Psychology of Music*, 35(1), 88-109. <https://doi.org/10.1177/0305735607068889>
- Salcedo, C. S. (2002). *The effects of songs in the foreign language classroom on text recall and involuntary mental rehearsal* [Doctoral dissertation, LSU]. https://doi.org/10.31390/gradschool_dissertations.1458

- Salimpoor, V. N., Benovoy, M., Larcher, K., Dagher, A., & Zatorre, R. J. (2011). Anatomically distinct dopamine release during anticipation and experience of peak emotion to music. *Nature Neuroscience*, *14*(2), 257-262. <https://doi.org/10.1038/nn.2726>
- Saricoban, A., & Metin, E. (2000). Songs, verse and games for teaching grammar. *The Internet TESL Journal*, *6*(10), 2739-2745.
- Schmitt, N., & Carter, R. (2000). The lexical advantages of narrow reading for second language learners. *Tesol Journal*, *9*(1), 4-9. <http://doi.org/10.1002/j.1949-3533.2000.tb00220.x>
- Shakerian, P., Rezaei, O., Murnani, Z. T., & Moeinmanesh, H. (2016). Investigating the role of pop songs on vocabulary recall, attitude and retention of Iranian EFL learners: The case of gender. *Advances in Language and Literary Studies*, *7*(2), 121-128. <https://doi.org/10.7575/aiac.all.v.7n.2p.121>
- Speckman, V. W. (2004). *Music and language development: The effect of the inclusion of music in specially designed academic instruction in English (SDAIE) content lessons for English language learners* (Publication No. 1431084) [Doctoral dissertation, California State University, Fresno]. ProQuest Dissertations and Theses Global.
- Subekti, N. B., & Lawson, M. J. (2007). Vocabulary acquisition strategies of Indonesian postgraduate students through reading. *International Education Journal*, *8*(2), 485-496.
- Susanto, A., & Fazlinda, A. (2016). English vocabulary acquisition through vocabulary learning strategy and socio-educational factors: A review. *Applied Science and Technology*, *1*(1), 166-173.
- Tabatabaee Farani, S., & Pishghadam, R. (2021). Examining emotion in sense-based teaching: a cognitive task of sentence comprehension. *Language Related Research*, *12*(4), 73-104. <https://doi.org/10.29252/LRR.12.4.3>
- Tamminen, J., Rastle, K., Darby, J., Lucas, R., & Williamson, V. J. (2015). The impact of music on learning and consolidation of novel words. *Memory*, *25*(1), 107-121. <http://doi.org/10.1080/09658211.2015.1130843>
- Wiggins, D. G. (2007). Pre-K music and the emergent reader: Promoting literacy in a music-enhanced environment. *Early Childhood Education Journal*, *35*(1), 55-64.
- Wolfe, P. (2010). *Brain matters: Translating research into classroom practice*. ASCD.
- Yousefi, A., Yekta, R. R., & Farahmandian, H. (2014). The effect of modern lyrical music on second language vocabulary acquisition. *Mediterranean Journal of Social Sciences*, *5*(23), 2583-2583. <https://doi.org/10.36941/mjss>