# Music as a Medium of Instruction (MMI): A New Pedagogical Approach to English Language Teaching for students with and without music training

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ABSTRACT: Recent research shows that musical training improves children's development of oral and aural skills. This study focuses on developing and testing a methodological framework (Music as a Medium of Instruction, MMI) in English Language Teaching (ELT) by contrasting MMI and Gamification methodologies with the participation of 22 Spanish children all born in 2008. The differences in progression between participants with and without previous instrumental training are also discussed. Generalized linear model procedures were used for each outcome variable (listening comprehension and oral production skills) to investigate the effect of independent variables (MMI vs. Gamification; students with music training vs. learners without music training). Results revealed that students of the MMI group had significantly higher scores than the Gamification group in oral production. Significant improvement was traced in listening comprehension in the MMI group. This study provides promising initial evidence that the MMI approach can be at least as beneficial as Gamification-based approaches for young learners in the ELT classroom. However, results need to be established on firmer grounds, for instance by using fully randomized experimental designs and by conducting mediation analyses.

**KEYWORDS**: English language teaching, musical training, instrumental training, second language acquisition, gamification, methodological innovations in language teaching.

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# 1. INTRODUCTION

## 1.1. Music and English Language Teaching

There is ample empirical evidence that shows how music training can improve children's oral and aural skills, reading skills and linguistic abilities in general (Magne et al. 2006; Moreno et al. 2009; Thompson et al. 2004; Chan et al. 1998; Kilgour et al. 2000; Ho et al. 2003). In addition, recent neuroscientific studies have found cognitive, perceptual and neurobiological confirmation establishing the connection between language and music in the human brain (Asaridou & McQueen 2013; Fiveash & Pammer 2014; Johns Hopkins Medicine 2014; Peretz & Zatorre 2003; Schön et al. 2010; Slevc 2012; Strait & Kraus 2011). Thus, it is not surprising that English Language Teaching (ELT) practitioners and researchers have explored the benefits of using songs and music in the language classroom for almost a century (Garrigues 2001; Kanel 1997 & 2000; Lake 2003; Lee 2014; Lorenzutti 2014; Martin 1983; Nchindila 2011; Richards 1969; Sahr 2011; Shvidko 2014; Sposet 2008; Zeromskaite 2014).

Over time, songs have been introduced in ELT effectively with a number of purposes. Some experiments have reported the advantages of using songs and music to improve EFL students' learning of vocabulary (Bygrave 1995; Coyle & Gomez García 2014; Chou 2014; De Groot 2006; Kusnierek 2016; Lee & Schreibeis 2012; Li & Brand 2009; Majerus et al. 2008; Metaxa 2013, Tegge 2015). For example, Metaxa (2013) examined the learning outcomes of a teaching methodology that introduced songs into the ELT classroom by comparing the results obtained by the (song) experimental group with the data collected from the (non-song) control group. The participants were 130 Cypriot teenage English as a Foreign Language (EFL) students of a private language school in Limassol, Cyprus. The study revealed that the participants from the song group increased their scores on all three vocabulary tests significantly more than the control group immediately following instruction and also one week after completion of the

course. Similarly, several other scholars have reported on the positive effects of the introduction of songs and music in the ELT classroom with the purpose of improving students' pronunciation skills (for a review see Engh 2013), intercultural awareness (Failoni 1993; Garrigues 2001), students' socio-emotional skills through music-mediated language experiences (Cores et al 2019; Fernandez & Fonseca 2019), reading skills (Foncubierta el at 2020; Gomez et al 2018) and motivation (Ajibade & Ndububa 2008; Chen & Chen 2009).

Very few studies, however, have established positive correlations between music expertise and second language acquisition and proficiency (Chobert & Besson 2013; Fisher 2001; Gordon et al. 2015; Legg 2009; Slevc & Miyake 2006; Zeromskaite 2014). In his seminal work, Patel (2008) established that, at the neuropsychological level, the processing of the acoustic characteristics of music and speech is grounded on similar cognitive processes. Patel (2011) revisited this concept in relation to language acquisition and established what he called the OPERA hypothesis, which explained "why musical training would lead to adaptive plasticity in speech-processing networks. According to this hypothesis, such plasticity is engaged because five essential conditions are met by music processing. These are: overlap, precision, emotion, repetition, and attention" (p. 142). Chobert and Besson (2013) explained the OPERA hypothesis in relation to second language acquisition (SLA) and suggested that language students learn differently depending on their previous music training, thus establishing that musical expertise may benefit the acquisition of a second language. Moreno et al. (2009) highlighted the "positive and reciprocal transfer effects between musical and linguistic abilities and for common pitch processing mechanisms in music and speech" (p. 720). These, in turn, have interesting implications for second language learning and teaching. Notwithstanding, such research findings have seldom been applied in ELT classrooms (Cooper 2007; Legg 2009; Speh & Ahramjian 2011). Consequently, there is a need to design and test a pedagogical model to ELT that incorporates the advantages that musical training can offer.

To fill these research gaps, the present study proposes a new pedagogical approach that adapts and introduces musical training into the teaching of English. The approach is called Music as a Medium of Instruction (MMI). It is a transversal methodology that takes into account the results from cognitive and psychological research in language and musical learning. Similarly to the methodological requirements of English as a Medium of Instruction (EMI), teaching English through the training of musical skills implies a number of changes in teaching practice and in teacher training. In return, learners have the potential to benefit from the application of a multidisciplinary pedagogical framework.

## 2. EMI and MMI

The globalization of the English language has led to an increase in the importance of English as an international lingua franca (Jenkins 2017). As a consequence, not only has English language education gained momentum, but education through English has as well (Galloway et al. 2017). According to Macaro et al. (2018), EMI is defined as: "the use of the English language to teach academic subjects (other than English itself) in countries or jurisdictions where the first language of the majority of the population is not English" (p. 37). EMI is perceived to have a number of advantages over traditional content education in students' mother tongue (L1). Galloway et al. (2017, p. 6), in their research report for the British Council, list a number of perceived advantages of EMI as traced in previous works:

- English proficiency in addition to content knowledge;
- intercultural understanding and global awareness/citizenship;
- enhanced career opportunities;
- staff employment.

Our research originated by establishing a parallel between EMI and MMI. If a transversal methodology such as EMI has been shown to have dual benefits for learners by introducing content and language in Non-Native English Speaking (NNES) classrooms, then the intersection of music training with an ELT methodology may also have dual advantages. Galloway et al. (2017) argued that "one of the major perceived benefits of EMI is the improved English proficiency of students" (p. 6). EMI is understood to help students acquire a higher level of linguistic proficiency through instruction in English. Thus, we might infer that teaching English using music training could in turn improve learners' musical and linguistic abilities. This inference was tested in this research through several experiments conducted both with our treatment group through the implementation of an MMI methodology to ELT and with a Gamification group.

### 2.1 Gamification

The use of game-based learning and gamification has rapidly grown in recent years (Landers et al. 2018; Landers 2015). Gamification has been defined as "the use of game design elements in non-game contexts" (Deterding et al. 2011: p. 9). In ELT, a Gamification methodology implies the use of ludic components such as increased involvement and motivation, interaction, challenge and quantifiable outcomes and instant feedback (Kapp 2012). Among Gamification scholars (Landers 2014; Deterding et al. 2011; Kapp 2012; Hamari et al. 2014) there is a concurrent demand to acknowledge "the growing body of theory development and empirical research on gamification within a post-positivist epistemology" (Landers et al. 2018: p. 315). To this end, and bearing in mind that the language lessons that we designed were extracurricular activities after learners' long school days, we decided that the group with which we would compare our MMI results would follow a Gamification approach to ELT with a ludic design of activities that would motivate students in this context (see Appendix 1 for examples).

Previous research (Chou 2014; Saricoban & Metin 2000; Ara 2009) has considered the pedagogical use of games and music as separate methodological approaches, with the exception of teaching through video games that incorporate music (Parsayi & Soyoof 2018). Therefore, and for a better distinction between the two methodologies included in our study (MMI and Gamification), the Gamification methodology did not include musical exercises.

## 3. Rationale and Research Questions

Over the past twenty years there has been increasing interest in the intersection between music and language both in the human brain (Brandt et al. 2012; Moreno et al. 2009; Patel 2008) and in the language classroom (Chobert & Besson 2013; Engh 2013). There have been surprisingly few studies, however, that analyze the implementation of a methodology that introduces music training to the ELT classroom. The focus of the current investigation was to develop and test a methodological framework incorporating current findings in neuropsychological research which establish the benefits of combining music training in the teaching of English. We developed and tested a new methodological approach to ELT and compared its efficacy against a Gamification approach by using several measuring tools to determine young learners' aural and oral skills.

The effectiveness of the new method was determined by analyzing the results of an experimental study comparing two groups of primary education learners (N = 22): a Music as a Medium of Instruction (MMI) group and a Gamification group, with students receiving instrumental training and musically untrained students participating in each group. A second goal of the current work was to assess whether those students with previous instrumental training obtained different results than those without it, with specific consideration of their oral production and comprehension skills and their membership of the MMI or Gamification group.

The specific research questions driving this study were as follows: (1) What are the differences, if any, between the implementation of the MMI and Gamification methodologies in the reported listening tests? (2) Which ELT pedagogical approach, MMI or Gamification, is more effective with regards to oral production skills? (3) How do students with instrumental training perform as compared with those without it with reference to listening comprehension skills? (4) How do students with previous instrumental training and the musically untrained compare in oral production skill tests? (5) Is there traceable learning progress among students with regards to listening comprehension skills?

Our overarching hypothesis was that instruction through the MMI methodology in the teaching of English as a second language would demonstrate superior results in comparison with the Gamification approach. Different variables were examined and compared in this study, including the students' features (students with previous music training vs. musically untrained students), the instruction type they received (MMI vs. Gamification) and tests of two language skills (comprehension and oral production) collected both prior to and following the language instruction.

## 4. METHOD

### 4.1. Participants

Participants (N = 22) with and without previous instrumental training were recruited by convenience sampling from state schools (C.E.I.P Prácticas Nº1, C.E.I.P Ciudad de Jaén), charter schools (Colegio Concertado Sagrada Familia, Colegio Cardenal Herrera Oria) and private schools (Lycée Français International) of Malaga (Spain). A letter with the research information sheet was sent to the students (and their parents) and those interested contacted the researchers to participate in the study. All students were born in 2008 (fourth-grade students),

aged between eight and nine at the start of the study, and all were Spanish-speaking with limited English proficiency. Among them, students with previous instrumental training (n = 10: one boy, nine girls) were defined as participants who already had one year of music training and were undertaking music training (second year) in conservatoires (C.P.M Manuel Carra, C.P.M Gonzalo Martin Tenllado) or in their second year at private music schools (Hayarte Escuela de Musica) by the start of the study. Six played the piano, one the violin, two the clarinet and one the guitar. Participants without any type of music training were classified as musically untrained students (n = 12: 6 boys, 6 girls).

Twenty-eight participants started the training with the same number of participants (14) per group (MMI and Gamification groups), but voluntary withdrawal of some students over the course of the sessions led to the final sample of 22. The withdrawal happened primarily between the second and third week of the study and in the Gamification group. Parents expressed that this was primarily due to their tight schedule at school.

### 4.2. Procedure

Ethical research guidelines involving children were carefully considered throughout the design and conduct of the study. Data confidentiality and anonymity were maintained through the entire research process. Participants' guardians were informed of the purpose of the study before data collection and provided informed consent. Preparation of the materials, both for the music and Gamification groups, was supervised by an independent scholar to ensure compliance with the Spanish national curriculum for the respective grade. The instructor had previous music training with an official B-Mus Diploma, and was close to finishing a Degree in English Studies. Being a pre-service teacher, she voluntarily offered language training to both groups free of charge to earn teaching experience but was unaware of the main aim of the study.

In a quasi-experimental framework, participants were assigned to one of two different groups based upon their interest in and selection of a methodology of music or games: the MMI group (n = 14: eight musicians, six non-musicians; five boys, nine girls), the content of which was predominantly taught through songs, pitch sequences and rhythms; and the Gamification group (n = 8: two musicians, six non-musicians; two boys, six girls), which implemented a Gamification methodology with nothing related to music. Repetition was used in both groups, either through repeating songs or the creation of new exercises with the same content. The selected linguistic content was the same in both groups, although approached using the different methodologies. Due to this reason, the nature of both groups' exercise-type varied considerably (see Appendix I for the types of exercise included in each group).

Participants in the MMI group were taught using three strategies derived from musical training: (1) linguistic variations of the lyrics of popular children's rhymes, (2) pitch sequences and (3) rhythmic sequences. Children's rhymes were used to facilitate the learning of new vocabulary/linguistic structures using a well-known melody and focusing on the new lyrics introducing the target linguistic content. This methodological strategy was based upon research demonstrating positive correlations between music training and second language acquisition (Chobert & Besson 2013; Patel 2011). In our MMI methodology, pitch sequences were used as short music phrases to reinforce the learning of different material, such as the time of day. Students would learn the necessary expressions to ask or give the time along with the different suprasegmental features of question and answer intonation. Finally, rhythmic sequences were introduced to illustrate stress and intonation patterns in questions, enumerations and descriptions. MMI learners were trained to identify a specific beat that would later be associated with a linguistic stress pattern in the exercises.

Neither the MMI nor the Gamification methodology made explicit use of technology. This way, the methodological comparison addressed two different ludic elements, music and

standard games, isolating the technological component that might have biased the intended comparison. The instructor did not implement a previously tested Gamification curriculum as they included audio-visual elements that were intentionally avoided. Instead, a new programme was created according to the specific goals to be achieved. The creation of the curriculum was grounded in the three basic elements that a game should integrate (Dickey 2005): (1) meta-centred activities, as all the games were oriented towards winning by meeting the intended aims individually or in groups; (2) rewards, promoting an additional commitment providing sweets as prizes for those who received enough points at the end of the lesson; and (3) progression, increasing motivation by keeping students goal-informed through a board on which points were allocated, all within the lesson context. From these three elements, the "meta-centred activity" component was the only one used in the MMI methodology. Nevertheless, students from the MMI group, instead of responding to the aim of "winning", instead had the aim of "participating/enjoying" by singing or making sounds individually or in groups.

Music itself might be considered a "game strategy", as gamification refers to the explicit use of particular elements of games (such as ludic and motivational features) in non-gaming contexts (Sailer et al. 2013). However, the removal of the competitive motivation and incorporation of music-specific mechanics (e.g. rhythmic sequences, melodies, singing, etc) allowed for differentiation from and comparison with the Gamification methodology.

### 4.3. Data collection instruments

Participants first completed an initial listening test to check their baseline ability before the experiment started. This test was exclusively based on the materials covered throughout the sessions in order to facilitate direct measurement of progress across the study. The test consisted of six exercises marked on a 0-100 point scale, each comprising 15-20% of the total,

lasting a duration of 1 hour. The exercises included in this paper-based test did not require reading or writing words, instead having students follow the oral instructions they received given by the teacher. For example, exercises could be completed by placing arrows in clocks, drawing a described physical appearance on a blank face and ticking boxes or circling images when responding to vocabulary relating to places in town, moods or opposites.

When the initial test concluded, sessions started following a specific syllabus to be taught through MMI or Gamification in accordance with their group. Finally, after the seven sessions, a final listening test (similar to the initial test) was conducted, enabling the measurement of student improvement. In addition to the listening test, a final oral test was conducted. This test also comprised six exercises (each with two sub-sections) marked on a 0-100 point scale, each representing 15-20% of the total score, lasting a duration of six minutes. In contrast to the initial/final listening test, there was no paper-based component and participants only needed to follow the teacher's oral instructions. Following the explanation of the test provided by the teacher, the students had 20 seconds to think and provide an answer for each exercise. Exercises were completed by (1) stating the time on a clock set by the teacher, (2) stating which subject on a printed timetable is being described by the teacher, (3) describing a person's hair in a picture, (4) stating what type of place/building is shown in a picture, (5) stating what mood the teacher is expressing with their face or (6) stating a word and its opposite based on gestures performed by the teacher. This test was not introduced at the beginning of the study to avoid priming participants to the content of the material and the format of the final oral test, which might have encouraged memorization of simple responses to the test questions rather than deeper learning of the content. Thus, having to orally produce the indicated picture or description was something they did not expect, though it was worked upon throughout the lessons.

**4.4 Materials**

The material to be learned by the participants was drawn from the official Instructional Guide for the language curriculum of the 4th and 5th grades of primary school, grades not yet passed by the participants. This guide describes the general content items to be covered during the academic year and is published by the school and the local authority, Junta de Andalucía (2015). Therefore, the material to be taught in the lessons (see Figure 1) was generally unknown to the students. See Appendix 1 for more information about the materials.

**<Insert Table 1 Here>**

### 4.5 Data analysis

The statistical software package SPSS (v. 25) was used to perform the descriptive and inferential statistical analyses. Both parametric and non-parametric tests were used to identify whether the instrumental training (or its absence) and the group (MMI or Gamification) variables had any influence on the dependent measures (initial listening test, final listening test, and final oral test).

## 5. RESULTS

The results are reported on a variable-by-variable basis starting with between-groups examinations (2x2 ANOVA) to examine differences between the MMI and Gamification groups in the listening tests, followed by comparisons of how students with previous instrumental training compared with those who had not received any. The test scores were measured on a 0-10 point scale, where higher values indicated better skill level. Descriptive statistics for each measure are presented in Table 2.

**<Insert Table 2 Here>**

### 5.1. Initial Listening Test

To examine differences between groups (MMI and Gamification), and between students with previous instrumental training and the musically untrained in the initial listening test scores reported, a two-way (2x2) ANOVA was conducted. It included groups (MMI & Gamification) and presence/absence of instrumental training (with instrumental training vs. musically untrained) as independent variables, and the initial listening test as the dependent variable. The data met parametric assumptions of normality and homogeneity of variance.

No significant differences in the initial test was found between the MMI group ($M$ = 3.92, $SD$ = 1.78) and the Gamification group ($M$ = 4.23, $SD$ = 1.01; $F_{(1,18)}$ = 0.35, $p$ = .56, $\eta p2$ = .01; see Figure 1). Similarly, no significant main effect was found between students with previous instrumental training ($M$ = 4.18, $SD$ = 1.80) and the musically untrained ($M$ = 3.90, $SD$ = 1.24; $F_{(1,18)}$ = 0.31, $p$ = .59, $\eta_p^2$ = .01; see Figure 2). No significant interaction was found between groups and the presence or absence of previous instrumental training. ($F_{(1,18)}$ = 0.01, $p$ = .92). Therefore, despite the non-randomized nature of the group assignment (i.e. assignment based on participant preference for music- or game-based instruction), no significant (or notable effect sizes regarding) initial differences in baseline ability were shown

**<Insert Figure 1 Here>**

**<Insert Figure 2 Here>**

### 5.2. Final Listening Test

To examine differences between groups (MMI and Gamification groups) and between students with previous instrumental training and musically untrained in the final listening test scores, a two-way (2x2) ANOVA was conducted. The data met parametric assumptions of normality and homogeneity of variance.

A large, though non-significant, effect was found between groups ($F_{(1,18)} = 3.23$, $p = .09$, $\eta_p^2 = .15$; MMI: $M = 8.51$, $SD = 0.95$; Gamification: $M = 7.60$, $SD = 0.96$; see Figure 3). A non-significant difference of negligible effect was found between students with previous instrumental training ($M = 8.49$, $SD = 0.96$) and the musically untrained ($M = 7.92$, $SD = 1.05$; $F_{(1,18)} = 0.29$, $p = .60$, $\eta_p^2 = .01$: see Figure 4). Finally, no significant interaction was found between groups and the presence or absence of previous instrumental training, in relation to the final listening test ($F_{(1,18)} = 0.13$, $p = .72$, $\eta_p^2 = .006$). In considering effect size results, only the MMI vs. Gamification group membership results suggested a potentially meaningful difference, with the lack of statistical significance potentially resulting from the small sample size and a lack of test power. Therefore, a further analysis of overall improvement across the listening test was conducted examining group membership and musical experience separately to allow for larger groups and increased test power within the ANOVA.

**<Insert Figure 3 Here>**

**<Insert Figure 4 Here>**

### 5.3. Improvement in the Listening Test

To examine participant improvement in the listening test before and after training within the two groups, a mixed 2x2 ANOVA was conducted with the initial and final tests as the repeated-measures variable and the two training groups (MMI and Gamification) as the between-groups variable. Results revealed a significant difference between the scores of the initial and final listening tests with a very large effect size ($F_{(1,20)} = 220.80$, $p = .001$, $\eta_p^2 = .92$). While no significant main effect of group was found, a significant interaction effect of large size was found between of the initial and final listening test and the two methodological approaches

($F_{(1,20)} = 5.30$, $p = .03$, $\eta_p^2 = .21$). These results indicated superior improvement in listening test for those in the MMI group in comparison with those in the Gamification group (see Figure 5 and Table 1 for descriptive statistics).

**<Insert Figure 5 Here>**

### 5.4. Final Oral Test

The parametric assumption of normality failed in the final oral test results displayed by the MMI group (Shapiro-Wilk; $p = .02$). Therefore, a non-parametric test was conducted (Mann-Whitney Test) to compare differences between the two independent groups (MMI and Gamification) in relation to the dependent variable (final oral test). Results revealed a significant difference of large effect size ($U = 25$, $p = .03$, $r^2 = .22$) between both groups in the final oral test scores, with the MMI group's results higher than the Gamification group's (see Figure 6 and Table 3 for descriptive statistics).

**<Insert Figure 6 Here>**

**<Insert Table 3 Here>**

Results on the final oral test obtained by students with previous instrumental training and the musically untrained were also considered and examined using a parametric test (independent-sample t-test) as assumptions of normality and homogeneity of variance were met. No significant overall difference was found between scores from students with previous instrumental training ($M = 8.24$; $SD = 1.21$) and the musically untrained ($M = 6.80$; $SD = 2.06$;

$t_{(30)} = 1.95$, $p = .06$, $d = .85$; see Figure 7 and Table 3 for descriptive statistics), though the relatively large effect size should be noted.

**<Insert Figure 7 Here>**

## 6. DISCUSSION

This study compared and evaluated two different methodologies (MMI and Gamification) implemented for the teaching of English as a second language. Each group comprised students with and without previous instrumental training, thus this study also compared the results obtained by the music performance students vs. musically untrained students.

### 6.1. MMI & Gamification methodology

#### 6.1.2 Listening comprehension & Oral skills

The results of the present study found that the comprehension skill enhancement differed in accordance to the methodology used (MMI or Gamification). Differences in the pre-post listening tests showed that comprehension skill improvement was significantly higher in the MMI group (see Figure 5) compared with the Gamification methodology group. While the non-randomized assignment of students to the two groups limits the degree to which pre-existing features of the students can be dismissed as causing this difference, the analysis of the initial listening test showed that there was not a significant difference between the mean scores of both methodologies before the experiment started (see Figure 1) thus supporting the hypothesis that the increased improvement resulted from the instruction method.

In relation to the oral production skill test, the MMI group excelled in the oral test carried out at the end of the experiment (see Figure 6), achieving a significantly higher score than the

Gamification group. The results obtained may indicate that both methodologies were beneficial for the students' oral acquisition, but the use of music could be considered as a more successful approach than the Gamification method in the teaching of English as a Second language.

These results support previous literature in the field demonstrating a close linkage between SLA and music. As discussed in the introduction, music training has been shown to improve children's oral and aural skills and linguistic abilities in general (Magne et al. 2006; Moreno et al. 2009; Thompson et al. 2004; Chan et al. 1998; Kilgour et al. 2000; Ho et al. 2003). In addition, recent neuroscientific studies have found cognitive, perceptual and neurobiological confirmation establishing the connection between language and music in the human brain (Asaridou & McQueen 2013; Fiveash & Pammer 2014; Johns Hopkins Medicine 2014). Thus, it is not surprising that ELT practitioners and researchers have explored the benefits of using songs and music in the language classroom for almost a century (Kanel 1997 & 2000; Lake 2003; Lorenzutti 2014; Martin 1983; Richards 1969; Sahr 2011; Zeromskaite 2014).

Previous studies have also addressed different music-related strategies to improve both listening and oral skills. In their pilot study, Lee and Schreibeis (2012) made use of different melodic structures with the aim to improve second language vocabulary acquisition. In their research, both listening and oral skills were practiced, although the aim was to ascertain which melodic sequence helped the most in the learning process for the target vocabulary. On the other hand, the use of songs is one of the most common tools among the different music-related strategies. This may be seen embodied in Slevc's and Miyake's (2006) research, where the use of songs enhanced the receptive and productive phonological abilities. In the present study, these strategies — the use of melodic sequences and songs — together with the follow-up of different rhythmic patterns with text, have been the main tools of the MMI methodology to achieve a significant improvement in both oral and listening skills.

### 6.2. Students with previous instrumental training & musically untrained

#### 6.2.1. Listening Comprehension & Oral skills

The results of the present study suggest that the reported scores in the listening and oral tests do not differ in accordance to the presence or absence of previous instrumental training. This was reflected in baseline abilities highlighted by the initial listening test (see Figure 2), as well as a lack of interaction with musical experience.

These results add to previous studies in this field. For example, Bygrave's study (1995) revealed significant improvement of the listening skills and language development in those participants who separately took part in a music training program of thirty sessions' length over the course of the experiment. The main focus of Bygrave's experiment, however, was to improve first language skills rather than second language skills. Other recent studies have also supported the hypothesis that previous musical expertise may improve second language acquisition. The majority of these studies consisted primarily of adults (Marques et al. 2007; Schön et al. 2004; Lee & Hung 2008) or children with a long musical trajectory (Magne et al. 2006). Nevertheless, those projects in which participants were students with a short musical trajectory (Moreno et al. 2009; Chobert et al. 2012), similar to the present study, revealed improvement in the native language, not in a second language. Thus, the link between pre-existing musical ability and the acquisition of a second (or additional) language remains unclear and warrants further study.

## 7. Limitations and further research

The length of this experimental study was limited to nine sessions: two of them were dedicated to test their initial and final scores to be compared, and seven to the experiment itself, where the content was taught following the two methodologies (music or games). The sample was also relatively small, limited to fifteen students per group, with the intention to foster a

successful learning process. The research was quasi-experimental in that students were able to choose in which of the two interventions they took part. The lack of significant differences between groups at baseline supports the hypothesis that the MMI intervention caused the increased improvements in outcome. However, it is entirely possible that students' experience of music training influenced their decision as to whether to take part in the music-based or gamification-based learning approach, thus reducing the independence of these two predictor variables. That there was no significant overall difference in outcomes based on musical experience, nor any interaction effect between musical experience and group assignment, provides evidence that the outcomes were not due solely to pre-existing musical experience. The effect sizes for these contrasting methodologies were also negligible, suggesting that the non-significance was not necessarily due to the small sample size of the experiment. That more students with previous music training took part in the MMI intervention, however, does leave open the possibility of musical experience playing a larger role in outcomes than this study suggested. Further research could sample balanced subgroups of students with even numbers of participants with or without music training to clarify the relative weighting and interaction of the variables of teaching approach and musical experience in their relationship with the outcome measures. Further research could also address the lack of gender-balanced groups, exacerbated by several boys who voluntarily withdrew from this study. Thus, this study provides promising early findings that warrant further research to determine the full generalizability of these studies. Such research should seek a larger sample with balanced groups, both in terms of gender and musical experience. Assignment to different intervention groups should be fully randomized in a true-experimental framework, with the opportunity to introduce additional interventions (as well as a non-intervention control). A larger sample would allow for greater statistical control of covariates such as age, academic level, and musical experience. When larger samples are not an option, measures of age, school level, and

socio-economic background would ensure the absence of possible significant differences between groups. And different outcome measures of language proficiency could be employed to better understand the potential and relative benefits of musically-driven interventions, particularly the use of standardized measures (such as the WISC-V: Wechsler et al. 2014; NEPSY: Korkman et al, 1998; or IMMA/AMMA: Gordon 1982, 1989) to allow for direct comparison with findings in the field.

### 7.1. Conclusions

The current research aimed to find practical evidence for theoretical assumptions of the effectiveness of MMI, a newly-developed pedagogical approach in ELT in which music is incorporated into language training. MMI acknowledges current results in neuropsychological research that establish the benefits of combining music training in the teaching of English. This empirical work has analyzed and compared the implementation of two ELT innovative approaches (MMI and Gamification) to ascertain whether one method or the other would affect learners' scores in oral and aural skills tests within a language course with the same learning goals and learning factors (i.e. students' age and language proficiency level, same amount of teaching hours, same instructor). For this purpose, several measuring tools have been designed to attest to the students' learning progress following the implementation of either an MMI or a Gamification methodology. A number of innovative resources were designed to develop the MMI or Gamification approaches (see Appendix 1). MMI was found to be the superior training method in this study, demonstrating larger improvements in the listening test and better overall results on the oral test. The combination of students with previous music training and musically untrained in each group demonstrated that the efficacy of the MMI approach did not necessarily depend on having students with prior music experience as participants of the music methodology group, since students with either profile improved their results in the MMI group.

This study provides promising initial evidence that the MMI approach can be as, if not more, beneficial than Gamification-based approaches for young learners developing English as a second language. From a language acquisition point of view, a natural progression from this research would be to study if there are any long-term impacts of effective MMI teaching performance on learners' language proficiency, if this methodological approach is also effective among older learners and students with higher musical proficiency (including adults), and if a combination of both approaches (MMI & Gamification) would imply an amplification of positive results. Recent research developments in music meditation in ELT (Cores et al 2019; Fernandez & Fonseca 2019; Foncubierta et al 2020; Gomez et al 2018) could be combined with our MMI approach to further consider the positive effects of introducing musical activities in the ELT classroom. Additionally, a wider usage can be conceived by testing MMI not only in the ELT classroom but in any foreign language classroom and in combination with other methods and approaches that do not make systematic use of music and/or games.

One of the most important implications of our study is that ELT practitioners interested in developing this methodology in their classroom might benefit from music training, particularly with regards to Instructional Design and the inclusion of musical activities that help to develop learners' oral and aural skills. Similarly, teacher training (e.g. pre-service/in-service, peer-coaching) would be highly recommended to English language teachers willing to incorporate MMI or Gamification strategies into their practice. By investing in this training, ELT practitioners might expand their repertoire of teaching methods for the benefit of their young students, regardless of their musical background.

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## Tables and figures

**Table 1**

***Sessions and Content***

| Session 1 | Session 2 | Session 3 | Session 4 | Session 5 | Session 6 | Session 7 |
|---|---|---|---|---|---|---|
| Initial Listening Test | The time | Review + Subjects at school | Review + Physical appearance | Review + Places in town | Review + Opposites and moods | Final Listening and Oral Test |

**Table 2**

| Measures | Independent variables | *M* | *SD* | CI | | $\eta_p^2$ |
|---|---|---|---|---|---|---|
| | | | | - | + | |
| **Initial Listening Test** | Previous instrumental training | 4.18 | 1.87 | 2.85 | 5.52 | .01 |
| | Musically untrained | 3.90 | 1.24 | 3.12 | 4.69 | |
| | Games | 4.23 | 1.01 | 3.38 | 5.08 | .01 |
| | MMI | 3.92 | 1.78 | 2.89 | 4.94 | |
| | *Total* | 4.03 | 1.52 | 3.36 | 4.71 | |
| **Final Listening Test** | Previous instrumental training | 8.49 | 0.96 | 7.80 | 9.18 | .01 |
| | Musically untrained | 7.92 | 1.05 | 7.25 | 8.59 | |
| | Games | 7.60 | 0.96 | 6.79 | 8.40 | .15 |
| | MMI | 8.51 | 0.95 | 7.97 | 9.06 | |
| | *Total* | 8.18 | 1.03 | 7.72 | 8.64 | |

**Table 2.** Means, standard deviations, confidence intervals, and effect sizes (based on ANOVA results described below) for the listening test measures by groups and instrumental training.

**Table 3**

| | Independent-sample t-test | *M* | *SD* | CI - | CI + | *d* |
|---|---|---|---|---|---|---|
| **Final Oral Test** | Previous instrumental training | 8.24 | 1.21 | 7.38 | 9.11 | .85 |
| | Musically untrained | 6.80 | 2.06 | 5.49 | 8.11 | |
| | *Total* | 7.46 | 1.84 | 6.64 | 8.27 | |
| | ***Non-parametric test*** | **Mean** | **SD** | **25th** | **50th** | **75th** | ***r*²*** |
| | *Total (MMI & Games)* | 7.46 | 1.84 | 6.56 | 7.70 | 8.85 | .22 |

* $r^2 = z^2/N\text{-}1$

**Table 3.** Means, standard deviations, confidence intervals, and effect sizes (based on Mann-Whitney test and independent-sample t-test results) for the oral test measures by groups and instrumental training.

**Figure 1.**

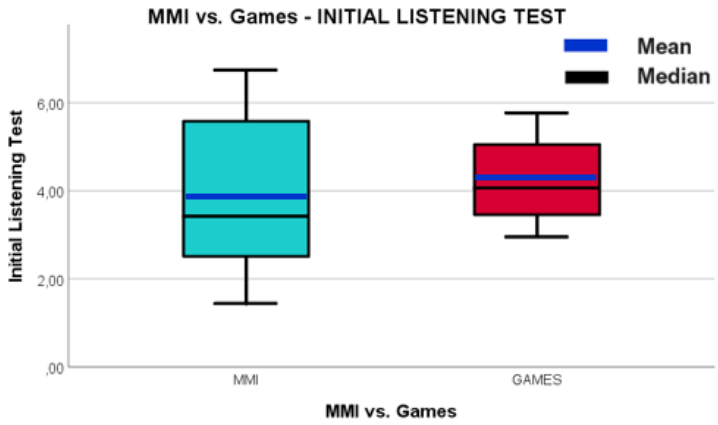


**Figure 1**. Mean and median scores for the initial listening test for the MMI and Gamification groups.

**Figure 2.**

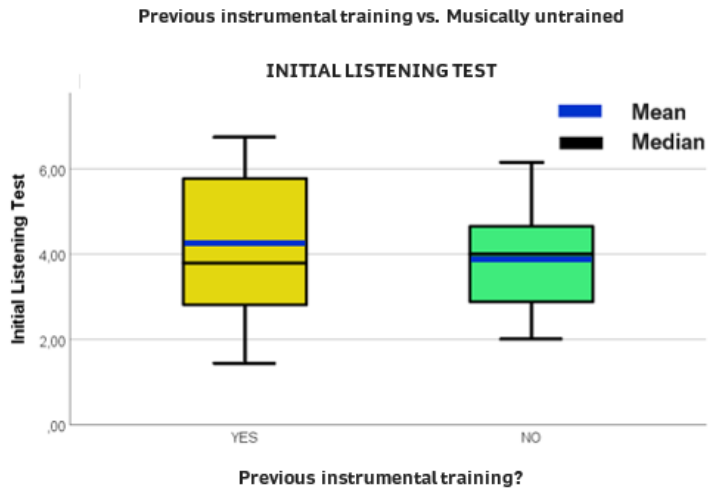


**Figure 2**. Mean and median scores for the initial listening test for students with previous instrumental training and the musically untrained.

## Figure 3.

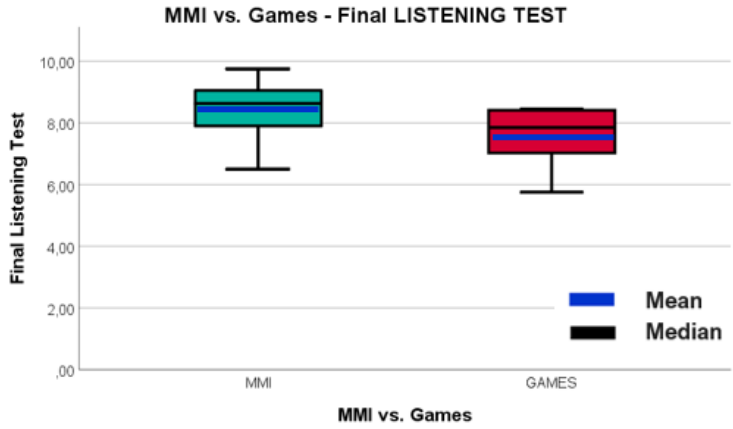


**Figure 3**. Mean and median scores for the final listening test for the MMI and Gamification groups.

## Figure 4.

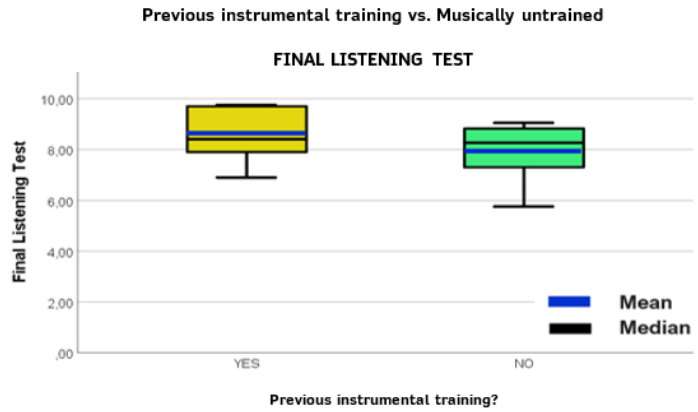


**Figure 4**. Mean and median scores for the final listening test for students with previous instrumental training and the musically untrained.

## Figure 5.

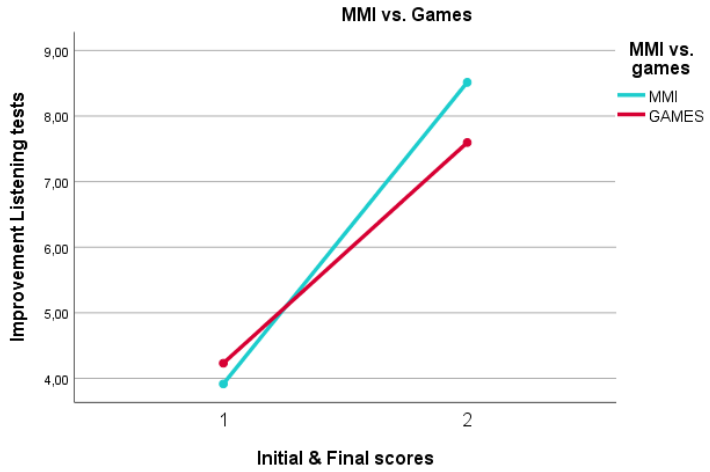


**Figure 5**. Mean improvement scores in the listening test for MMI and Gamification groups.

## Figure 6.

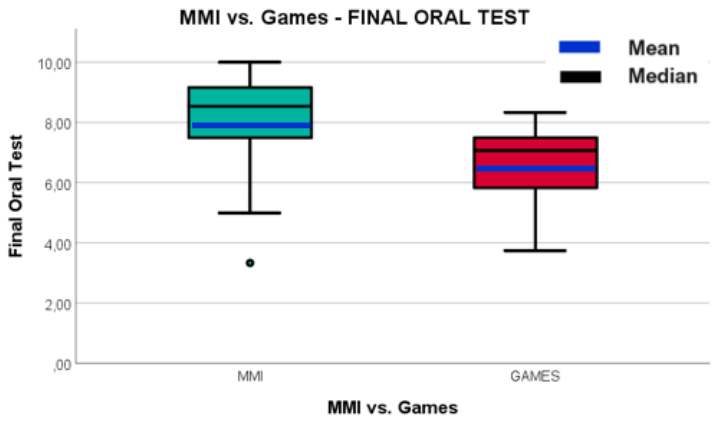

**Figure 6**. Mean improvement scores in the listening test for students with previous instrumental training and the musically untrained.

**Figure 7.**

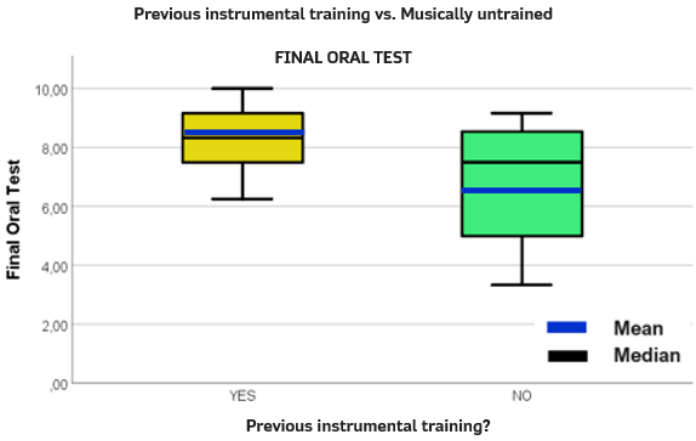


**Figure 7**. Mean and median scores for the final oral test for the MMI and Gamification groups.