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Contributions from Musical Education to the development of Linguistic Communication Skills in Primary Education

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Abstract. The skill-based curriculum model involves the interaction of all areas of knowledge to transfer learning to different social and educational settings. Specifically, musical education works on content that can serve to develop key skills in linguistic communication through the creation of situations involving language as an expressive means, among others. Accordingly, this article assesses the acquisition of this skill as from the introduction of a musical teaching programme in primary education. 129 students – 69 males (53.5%) and 60 females (46.5%) – took part in the programme, divided into a control group (63 students – 48.8%) and an experimental group (66 students – 51.2%), studying the sixth year of primary education at three public and subsidised private schools in the city of Madrid. To carry this out, an ad hoc programme of musical activities was designed and that was introduced in the music room over the course of an academic year. The results obtained in the post-test phase indicated an improvement in the marks obtained by the experimental group in Linguistic Communication Skills in terms of group presentations, the correct use of verbal and musical language in different contexts, and in the selection and organisation of relevant information. These points to the suitability of musical education for the development of oral expression, written expression, oral comprehension and written comprehension defined by the structural union of both languages.
Keywords: Key skills; Linguistic Communication Skills; Musical Education; Primary Education.

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1. Introduction

The concept of skills has been used at an educational level since the onset of the year 2000, with the publication of the Tuning and DeSeCo projects (OECD, 2003; Bolívar, 2010). In Spain, they were included for the first time under the Education Act 2/2006, of 3 May, (LOE, 2006), called basic skills, which then changed to key skills with the approval of the Improvement in Education Quality Act 8/2013, of 9 December (LOMCE, 2013). The inclusion of these skills in the curriculum led to the reorganization of content, spaces, time and education practice so that students could acquire, a compendium of skills and capabilities that would help them develop as active members of society in addition to knowledge (López, 2016). To achieve that, it is necessary to develop interdisciplinary work on skills that contribute to a comprehensive education enhancing teamwork and critical thought (Zabala & Arnau, 2014). Accordingly, a skilled student is capable of transferring the set of knowledge, skills, capabilities and attitudes in the resolution of problems that arise in their daily lives (Larraz, 2013). Furthermore, of the seven key skills included in Royal Decree 126/2014, of 28 February, establishing the basic Primary Education curriculum, linguistic communication skills and mathematical skills, along with basic skills in science and technology are subject to evaluation by national bodies (external exams in the sixth year of primary education and the fourth year of compulsory secondary education – ESO) and by international bodies (PISA), as the prototype for the attainment of skills by students at the end of the educational stages, which amounts to an objective evaluation of the acquisition of

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these skills. As regards linguistic communication skills, which are studied in this article, it can be observed that the specific fields of oral comprehension and written comprehension and expression are evaluated in these tests, leaving to one side the evaluation of oral expression, an area that is evaluated in this research. It should also be pointed out that the evaluation procedures should be improved upon given that, for example, the testing in the area of oral comprehension consists of students responding to a series of questions posed to them after listening to an interview or recorded narrative, a question that is altered by aspects such as the existing acoustic contamination in primary schools, bad quality recordings or audio systems, which raises doubts as to the efficacy of the results obtained in these tests. In this regard, Fernández-Cano (2016) adds greater uncertainty regarding the efficacy of the tests by stating that they are not designed according to the skills present in the national curriculum, and hence THEY raise serious doubts as to whether the marks obtained represent the level of skill performance of the participants in each country, which means a lack of accurate information to be able to improve the learning process, along with the immediate effect this has on improving the education system and the potential reforms stemming from it (Díez & Utrera, 2014).

2. Linguistic Communication Skills in Primary Education

Linguistic communication skills refer to the interaction of linguistic, pragmatic-discursive, socio-cultural, strategic and personal components, and hence, THEY are skills that should be addressed in all areas of the curriculum (LOMCE, 2013). The way in which people communicate nowadays has changed significantly, along with the diversity of existing formats. Accordingly, these skills are the gateway to knowledge, to the resolution of problems and interpersonal communication, among others and are developed longitudinally over the course of one's life in a host of situations and contexts. These skills promote the capacity for oral and written communication, along with the search, selection and processing of information, facilitating their transfer in a diverging social scenario. For this reason, it is necessary to implement teaching strategies in which learners use the areas that make up these skills – oral expression, written expression, oral comprehension and written comprehension.

The content related to oral and written expression processes seeks to provide students with the capabilities to summarize and provide a global meaning to a text in different situations, and express themselves coherently. In turn, content relating to oral and written comprehension processes focuses on interpreting and understanding texts in different formats, along with interacting and organising information in written form (LOMCE, 2013).

As regards communication skills and capabilities, the student with linguistic skills must be able to read comprehensively, document and transfer these skills to different types of documents, ideas and opinions, be able to understand what they hear in different situations, and express ideas, feelings and opinions in different registers and contexts (Order ECD/65/2015); in other words, to be able to transfer them to multiple social and cultural realities (Rychen & Salganik, 2004). To carry out this interdisciplinary skill-based focus, it is important a) to promote interdepartmental coordination, b) develop teaching programmes using different teaching-learning strategies, c) foster cooperation between students, and d) employ a standardized use of different resources (Ros et al., 2013). In some cases, this implementation of skills has led to teachers stating that they feel safer putting content-based teaching into practice, as well as criticising the lack of training received from the competent authorities on education, to thus incorporate skill-based teaching into the curriculum (Schleicher, 2016). Accordingly, all the agents involved in the education process must ensure their criteria and teaching focuses converge to contribute all the content that students need to become integrated as active and critical members of society in the current context (Campollo, 2019).

3. Musical education and Linguistic Communication Skills

The inclusion of musical education as a compulsory part of the curriculum in the official regulations was not introduced into Spanish classrooms until passing the General Organisation of the Education System Act 1/1990, of 3 October was approved (LOGSE, 1990). In pre-primary and primary education, musical education uses a methodological approach based on the acquisition of content through activities that use melodies, songs, actions or centres of interest to facilitate their understanding (Iwasaki et al., 2013), which serve to confirm the ties between musical education and other subjects. Music and language share a nexus of union, given that they share the same structures, making interdisciplinary work possible (DiDomenico, 2017). Dyer (2011) stresses the importance of shared work with music to boost more significant learning of linguistic communication skills.

From a neurological perspective, similarities and differences exist between the procedures for linguistic and musical development. Thus, the Broca area and the Wernicke area share functions of both expressions, as they are responsible for the processing of grammar and the acquisition of vocabulary, while they are also responsible for musical processing (Patel, 2008). In addition, music and language share the fundamental elements of their structures, but use different processes for the coding and processing of syntax, semantics, phonetics …, as part of their temporary structures (Peretz et al., 2015). In this way, the combination of these elements can constitute phrases, sections, periods, movements and works in the case of music, and syllables, words, sentences, paragraphs and texts in the case of language. However, despite their similarities, Hernández-Ruiz (2019) explains that music and language differ in

their neural activation patterns and in the cerebral processing regions, which show differences in the discrimination of sounds and of words, and hence brain functions, and require greater decoding in the case of musical sounds.

About the area of oral expression, in which students must use language in different contexts, vocal education promotes the development of socialisation within the group through physical and emotional responses that music suggests through this type of activity (Pérez-Aldeguer, 2010). Furthermore, phonological processing is developed in a cross-cutting fashion through singing, and decoding through the identification of sounds (Intartaglia et al., 2017). Magne et al. (2006) prove that the use of intonation and singing, as well as having positive effects on the acquisition of phonological skills, improve pronunciation, intonation and accentuation in grammar structures that are necessary in the literacy process (Garví et al., 2015). In turn, Swaminathan and Schellenberg (2017) claim that a close relationship exists between rhythmic perception and the area of oral expression when working on the words of songs, associating syllables with rhythmic modules. Accordingly, the activities that can be developed relating to oral expression converge in the use of such strategies as thinking routines, in which students must orally express, with clarity, coherence and correct diction, a summary of videos or musical listening proposed by the teacher, while using and applying the different registers of oral language. Furthermore, they may resort to students expressing feelings and opinions conveyed by the vocal and instrumental interpretation of works from different eras and styles.

As regards the area of written comprehension, Gómez (2013) states that, in non-linguistic areas, linguistic skills contribute to written comprehension, which converges with the meta-analysis made by Butzlaff (2000), where we find strong correlations between musical education and the reading process. In turn, the longitudinal study performed by Moreno et al. (2008) with primary students with no prior musical knowledge, shows that musical education influences the development of neural processes, with a clear transfer between music and communicative skills. In this way, musical activities can be proposed to work in the area of written comprehension through the search, selection and organisation of information on research projects relating to different musical periods, along with the reading of musical and linguistic texts, both on web pages, texts in different languages and musical scores, among others.

In relation to the area of written expression, the meta-analysis carried out by Gordon et al. (2015) shows good results obtained in reading fluency and grammatical skills using musical activities. Furthermore, works such as those by Martínez et al. (2020) conclude that musical stimulation promotes the area of written expression in terms of creativity and product quality. Accordingly, activities like the creation of rhythms, the preparation of cooperative research work, both analogically and digitally, can contribute to written expression in different mediums, along with the correct and normalised use of grammar, spelling and musical rules.

As regards the area of oral comprehension, the development of listening skills shows greater recognition in language coding, which suggests that students with better listening skills have a greater understanding of oral texts, as well as the processing between sounds and words (Mankel et al., 2020). Furthermore, active listening work in the classroom enhances the acquisition of phonological and listening skills, thus facilitating lexical comprehension through listening, and thus the capacity for oral comprehension (Vyspinska, 2019). To achieve this oral comprehension, the use of activities is recommended in which the student works on the recognition of musical elements in listening, while introducing the qualities of the social and natural environment, and respecting behaviour rules when listening. In this regard, musical education is the area in which linguistic and cognitive processes converge, and where the expressive dimension of the skill acts as the cornerstone of the communication process (Whitehorne, 2019). This brief revision serves to emphasise the importance of presenting the content in the classroom through different learning experiences, in which musical education can contribute to the assimilation of the knowledge, skills and capabilities inherent to linguistic communication skills.

Accordingly, the main aim of this work is to evaluate the effect of the implementation of a programme for musical teaching activities to acquire different areas of linguistic communication skills by sixth year primary education students.

4. Method

This research follows a quantitative methodology. A quasi-experimental design has been used with an experimental group and a non-equivalent control group. Afterwards, an evaluation was performed before and after the programme implementation.

4.1. Participants

129 students from six groups of sixth-year primary education from three primary schools in the capital city of Madrid took part in this study: 69 males (53.5%) and 60 females (46.5%), divided into three control groups (66 students – 51.2%) and three experimental groups (63 students – 48.8%), of which 37 studied at a public centre (28.7%) and 92 (71.3%) at two subsidised private centres. The assignment of the students to each group was performed following the distribution of the centres in two lines. It was decided randomly that classes with letter A would comprise the control group and letter B the experimental group, with the composition of an initial sample of 133 subjects, of which four left the programme as they left their respective education centres.

The characteristics of the participating centres were as follows: a) Centre 1 was a subsidised private centre located in the district of Chamartín, with a medium socio-economic level and a broad cultural diversity ($n_{control}$= 23, $n_{experimental}$

= 22), b) Centre 2 was a subsidised private centre located in the district of La Latina, with a medium socio-economic level ($n_{control}$= 24, $n_{experimental}$ = 23) and c) Centre 3 was a public centre with a medium-low socio-economic level and a high level of cultural diversity ($n_{control}$= 16, $n_{experimental}$ = 21). They all had a specific music room with percussion instruments, a digital piano, IT equipment, a projector and musical equipment, along with mobile devices to perform digital tasks.

In addition, three teachers specialised in musical education took part with more than 10 years of experience as music specialists in primary education that used such methodological strategies in the course of their classes as Project-based Learning and Cooperative Learning, and ITC tools, who were in charge of implementing the programme and evaluating the progress of the students.

As regards the sample, non-probabilistic convenience sampling was used given that students were included at the centres that accepted their participation in this research.

4.2. Instrument

The measurement instrument used was a questionnaire designed on an *ad hoc* basis, which was employed both before and after the intervention to measure the effect of the programme for musical teaching activities, as well as to verify the homogeneity between the control group and the experimental group as regards their initial level of knowledge of Linguistic Communication Skills. To prepare this, each of the students under evaluation was analysed regarding the different content blocks in all of the areas that contributed to the acquisition of these skills, as indicated in the LOMCE (2013) and in Order ECD/65/2015, where the pathways are shown for the focus and skill evaluation of the student. Once these standards were selected, the specifics that contributed to the development of the content of the area were removed to thus attend to the skill profile. Accordingly, the questionnaire was made up of 18 items grouped into the areas of these skills: a) oral expression (items 2, 3, 4, 5, 7, 8, 15, 17 and 18), b) written expression (items 11, 12 and 16), c) oral comprehension (items 6, 13 and 14) and d) written comprehension (items 1, 9 and 10), calculating the average value of the items to analyse the data according to these areas, and, after the intervention, of each of them separately. These items were evaluated according to a Likert scale of five points (from 1 Never to 5 Always). Once the instrument was prepared, its validity and reliability were estimated. To study the validity of the content, a technique for effective validation and habitual use in the design of instruments in the field of education was put to expert judgement (Adams & Wieman, 2010). In the selection of 17 expert participants, their ties with the field, their professional experience and their research performance were taken into account. Accordingly, this included educators, researchers and musical education specialist with a professional career spanning more than ten years, who assessed the pertinence, relevance and clarity of the items making up the questionnaire. The responses were analysed using the Aiken coefficient V with values of equal to or higher than 0.76, which assert that evidence of the validity of the content exists (Merino & Livia, 2009).

In addition, the construct validity was measured using a factor analysis, which was previously subjected to the Bartlett and the Kaiser, Meyer and Olkin test, which gave a value of .951, indicating that the results obtained adapt to a model of factor analysis (Bartelett's test of sphericity $\chi 2$ = 3348.035, p <.000), and hence be able to proceed to this type of analysis (López-Aguado & Gutiérrez-Provecho, 2019). Accordingly, a factor analysis was carried out using the extraction method of principal components with an Oblimin rotation, from which a single factor was extracted that indicates a close relationship between the items comprising the dimensions that make up Linguistic Communication Skills.

In turn, reliability was analysed using the Cronbach Alfa coefficient, which obtained a value of .986, indicating that the instrument has an optimum reliability index (Lacave et al., 2016). The coefficients obtained by grouping the items according to the areas of linguistic communication skills were also commendable: a) oral expression .983, b) written expression .882, c) oral comprehension .942 and written comprehension .957, respectively.

4.3. Procedure

Before implementing the programme of activities, the level of acquisition of Linguistic Communication Skills of the control and experimental groups was evaluated. After completing the intervention, the data on the acquisition of these skills was again evaluated in both groups.

As regards the programme of musical teaching activities, 22 sessions were designed with the aim of addressing the content of each of the areas of the skills in the music room in a cross-cutting fashion, in which different teaching-learning strategies were employed (Thinking routines, Project-based Learning and Cooperative Learning). This programme was also validated by eight specialists in musical education (with more than 25 years of teaching experience), who very positively rated the design and content of the proposed activities.

The activities included in the programme are now briefly described. In relation to oral expression, a) intonation and interpretation of vocal and instrumental works of different styles (Jazz, Pop, Rock, Classical and Folk) have been used, b) the creation by students of choreographies and performances through such musical styles as Pop, Rock and Folk c) the production of videos with a soundtrack (*My little suede shoes*) and research projects (Life and work

of Tchaikovsky) through cooperative groups with the aim of using oral language in diverse contexts and scenarios. For written expression, the following activities were selected: a) creation of rhythmic and melodic accompaniments (binary, ternary and binary compasses of ternary subdivision), b) experimentation with regular and irregular musical figures, and c) the presentation of interactive musical images using web tools (*Glogster, Thinklink* and *Genially*) through the design, sequencing and organisation of content. In the area of oral comprehension, students carried out a) a search for information in teams, b) experimentation and knowledge of musical forms throughout the history of music (Baroque sonata, basso continuo, binary and ternary structures), c) active musical listening and d) knowledge of different genres and styles of music. Finally, as regards written comprehension, activities were designed on the reading of conventional spelling (music scores of works of musical literature, along with the rhythmic and melodic reading of simple and compound compasses), and non-conventional (symbols, musicograms), as part of the writing process.

The sessions took place over the course of the 2018-2019 school year and were structured in the following way: a) Preparation: thinking routine and review of some of the activities from the expression block of the previous session, b) first activity: this corresponds to the more practical content of the interpretation and movement block, c) second activity: individual and group musical creation activities, or research activities, d) end of session: reflection activities on the teaching and learning process and group interpretation activities.

Once the intervention programme was drawn up, a training and advisory work was carried out so that the three specialist teachers tasked with implementing the programme followed the same methodological and procedural criteria. Accordingly, a teaching guide was prepared which set out the procedure, along the material resources and criteria for the evaluation of each session.

The usual activities were carried out in the control groups, following the class programme at the same time span.

The IT programme SPSS for Windows, version 23, was used for the data analysis.

5. Results

To begin this section, the following table shows the descriptive statistics of the pre-test and post-test phases of the control and experimental groups, with items grouped according to the areas of linguistic skills.

Table 1. Pre-test and post-test descriptive statistics of the control and experimental groups.

	Areas	Group	N	Mean	Median	Standard deviation	Interquartile range
Pre-test phase	Oral expression	Control	63	2.87	3.11	0.753	1.44
		Experimental	66	2.87	2.83	0.973	1.87
	Written expression	Control	63	2.71	2.66	0.758	1.33
		Experimental	66	2.74	2.66	0.931	1.33
	Oral comprehension	Control	63	3.05	3.00	0.904	1.67
		Experimental	66	3.10	3.16	0.975	1.67
	Written comprehension	Control	63	2.89	3.00	0.836	1.67
		Experimental	66	2.95	2.83	1.035	1.67
Post-test phase	Oral expression	Control	63	3.30	3.44	0.892	1.22
		Experimental	66	3.64	3.83	1.040	1.58
	Written expression	Control	63	3.02	3.00	0.812	1.33
		Experimental	66	3.49	3.50	1.167	1.58
	Oral comprehension	Control	63	3.62	4.00	1.118	1.67
		Experimental	66	3.87	4.33	1.151	2.00
	Written comprehension	Control	63	3.30	3.33	0.954	1.33
		Experimental	66	3.65	4.00	1.109	1.67

Note: 1= never, 2= almost never, 3= sometimes, 4= almost always, 5= always.

As can be seen in Table 1, the mean and median scores obtained by the control and experimental groups in the pre-test phase are similar, standing at around 3, and hence it can be said that they start off with a similar level of Linguistic Communication Skills. In the post-test phase, both the mean and the median of the experimental group were higher than the control group in the areas of oral expression, written expression, oral comprehension and written comprehension.

To continue, normality was measured using the Kolmogorov-Smirnov test, obtaining significantly higher values in all areas and their corresponding items; hence we can assume the normal distribution of the scores obtained and consequently, we proceeded to use non-parametric tests to carry out the inferential analysis.

Accordingly, the Mann-Whitney U test was used to compare the scores obtained by the two groups in the pre-test phase (see Table 2).

Table 2. Mann-Whitney U range test in the pre-test phase according to group and the size of the effect (Rosental r equivalent).

Area	Group	N	Average range	Total of ranges	Z	p
Oral expression	Control	63	66.31	4177.50	–.390	.690
	Experimental	66	63.75	4207.50		
Written expression	Control	63	65.26	4111.50	.937	.937
	Experimental	66	64.75	4273.50		
Oral comprehension	Control	63	64.11	4039.00	.789	.789
	Experimental	66	65.85	4346.00		
Written comprehension	Control	63	64.72	4077.50	.934	.934
	Experimental	66	65.27	4307.50		

As can be observed in Table 2, the results showed there were no statistically significant differences in the pre-test phase between the control and experimental groups, and hence both started with the same initial scores; therefore, it can be stated that these are homogenous groups in terms of the initial level of linguistic skills.

Subsequently, the Wilcoxon range test was performed in the skill areas in the pre-test and post-test phases, with the aim of comparing the changes in the two groups before and after the intervention, the results of which are shown in Table 3.

Table 3. Wilcoxon pre-test and post-test range test in the skill areas according to group and the size of the effect (Rosental r equivalent).

Area	Group	% Negative ranges	% Positive ranges	% Ties	Z	p	r
Oral expression	Control	7.93	79.36	12.69	-5.342	.000*	.47
	Experimental	7.57	83.33	9.09	-6.178	.000*	.54
Written expression	Control	7.93	55.55	36.50	-3.856	.000*	.34
	Experimental	12.12	65.15	22.72	-5.374	.000*	.47
Oral comprehension	Control	6.34	73.01	20.63	-4.962	.000*	.44
	Experimental	4.54	72.72	22.72	-5.716	.000*	.50
Written comprehension	Control	9.52	68.25	22.22	-4.911	.000*	.43
	Experimental	4.54	72.72	22.72	-5.729	.000*	.50

*$p < .05$

As can be seen in Table 3, the results were statistically significant for both groups in the areas of oral expression, written expression, oral comprehension and written comprehension, the scores of which indicate an improvement following the implementation of the intervention programme. The scores obtained in the ranges have been presented as percentages for a better appreciation of the differences in the results, accompanied by the values of the size of the effect (Miksza & Elpus, 2018, indicate that the size of the effect is small in values of $r \geq .10$; medium in $r \geq .30 < 50$ and large in $r \geq .50$). Accordingly, it can be observed that both the experimental group and the control group obtain higher scores in the post-test phase in the area of oral expression, with the experimental group obtaining a higher percentage in the positive ranges with a large effect size. In the area of written expression, both groups improved their scores in the post-test phase, in which the experimental group presents a higher percentage in the positive ranges with a large effect size. For the area of oral comprehension, although both groups improved their scores after implementing the programme, the control group obtains a slightly higher percentage with a medium effect size. Lastly, higher scores were also obtained in the post-test phase for the area of written comprehension, in which the higher percentages corresponded to the experimental group with a large effect size.

To continue, a Mann-Whitney non-parametric U analysis was carried out to compare the scores obtained by the two groups in the post-test phase (see Table 4).

Table 4. Mann-Whitney U range test in post-test phase according to the group and the size of the effect (Rosental r equivalent).

Area	Group	N	Average range	Total of ranges	Z	p	r
Oral expression	Control	63	57.82	3642.50	-2.138	.033*	.19
	Experimental	66	71.86	4742.50			
Written expression	Control	63	56.68	3571.00	-2.488	.013*	.22
	Experimental	66	72.94	4814.00			
Oral comprehension	Control	63	58.75	3701.50	-1.877	.060	
	Experimental	66	70.96	4683.50			
Written comprehension	Control	63	58.17	3664.50	-2.044	.041*	.18
	Experimental	66	71.52	4720.50			

*$p < .05$

As can be observed in Table 4, the statistically significant results indicate that the experimental group obtained higher scores than the control group in the area of oral expression, written expression and written comprehension with a small effect size. For the area of oral comprehension, there were no statistically significant differences.

Lastly, the Mann-Whitney U test was implemented item-by-item in the post-test phase (see Table 5).

Table 5. Mann-Whitney U range test item-by-item in the post-test phase according to group and size of the effect (Rosental r equivalent).

	Items	Group	N	Average ranges	Total of ranges	Z	p	r
Oral expression	2. Undertake work and make presentations at a group level	Control	63	52.47	3305.50	-3.849	.000*	.34
		Experimental	66	76.96	5079.50			
	3. Describe the main artistic and cultural movements	Control	63	51.74	3259.50	-4.122	.000*	.36
		Experimental	66	77.66	5125.50			
	4. Employ oral language in different contexts	Control	63	58.68	3697.00	-1.953	.051	
		Experimental	66	71.03	4688.00			
	5. Express feelings and emotions as a way of communication using verbal and non-verbal language	Control	63	61.17	3854.00	-1.182	.237	
		Experimental	66	68.65	4531.00			
	7. Express oneself with clarity, coherence and correction	Control	63	65.46	4124.00	–.141	.888	
		Experimental	66	64.56	4261.00			
	8. Express oneself with pronunciation and correct diction	Control	63	66.24	4173.00	–.382	.703	
		Experimental	66	63.82	4212.00			
	15. Use musical language to interpret a work	Control	63	57.61	3629.50	-2.268	.023*	.20
		Experimental	66	72.05	4755.50			
	17. Interpret vocal and instrumental pieces from different eras, styles and cultures for different groupings, accompanied and unaccompanied	Control	63	61.49	3874.00	-1.083	.279	
		Experimental	66	68.35	4511.00			
	18. Use the body as an instrument to express feelings and emotions	Control	63	59.29	3735.00	-1.767	.077	
		Experimental	66	70.45	4650.00			
Written expression	11. Write texts from aspects of daily life in different mediums	Control	63	59.67	3759.00	-1.654	.098	
		Experimental	66	70.09	4626.00			
	12. Correctly use grammar and spelling rules	Control	63	56.71	3572.50	-2.553	.011*	.22
		Experimental	66	72.92	4812.50			
	16. Translate simple melodies and rhythms in conventional musical language	Control	63	55.30	3484.00	-2.982	.003*	.26
		Experimental	66	74.26	4901.00			
Oral comprehension	6. Respect the opinions of others in the activities proposed	Control	63	63.36	3991.50	–.530	.596	
		Experimental	66	66.57	4393.50			
	13. Identify and classify the qualities of sounds in the natural and social environment	Control	63	58.58	3690.50	-1.972	.049*	.17
		Experimental	66	71.13	4694.50			
	14. Respect the rules of conduct in musical listening and performance	Control	63	61.18	3854.50	-1.212	.225	
		Experimental	66	68.64	4530.50			
Written comprehension	1. Search, select and organise concrete and relevant information	Control	63	54.06	3405.50	-3.360	.001*	.30
		Experimental	66	75.45	4979.50			
	9. Comprehend general information in texts read by oneself and by other people	Control	63	60.59	3817.00	-1.359	.174	
		Experimental	66	69.21	4568.00			
	10. Ability to obtain the main ideas from a text	Control	63	62.46	3935.00	–.779	.436	
		Experimental	66	67.42	4450.00			

*p< .05.

As can be appreciated in Table 5, following the implementation of the programme, the statistically significant results in the area of oral expression show higher scores in the average range for the experimental group than for the control group for Item 2. Undertake work and make presentations at a group level, and for Item 3. Describe the main artistic and cultural movements with a medium effect size, and for Item 15. Use musical language to interpret a work with a small effect size.

In the area of written expression, the results were significant for Item 12. Correctly use grammar and spelling rules, and for Item 16. Translate simple melodies and rhythms in conventional musical language with a small effect size, items where the average range of the experimental group was higher than that obtained for the control group.

Furthermore, in the area of oral comprehension, significant results were obtained for Item 13. Identify and classify the qualities of sounds in the natural and social environment with a small effect size, where the average range for the experimental group was higher than for the control group.

Lastly, in relation to written comprehension, the results were statistically significant for Item 1. Search, select and organise concrete and relevant information with a medium effect size, where, as for the previous areas, the experimental group obtained higher scores than the control group.

6. Discussion and conclusions

To offer a response to the main objective of this research, the results are discussed below based on the assessment of the acquisition of the different areas of linguistic communication skills.

In general, both groups showed an improvement which, in the case of the control group, can be explained by the fact that the students in this group have continued learning the curriculum content according to the usual classroom programme, and hence have also acquired certain linguistic skills. However, the experimental group has seen a greater improvement after completing the programme of activities designed, as can be clearly seen in the scores described in the previous section.

Specifically, these improvements in the area of oral expression can be seen in undertaking work and making presentations at a group level, the description of the main artistic and cultural movements, and in the use of musical language to interpret a work, which is closely related to the implicit procedures in the undertaking of musical activities developed in the programme, and which converge with the study by Magne et al. (2006), which evidences the direct relationship in the improvement in oral expression through musical activities which foster the communication of ideas set out by students, while also enhancing group work.

As regards the area of written expression, the experimental group has seen their written skills boosted regarding the correct application of grammar and spelling rules, both at a linguistic and a musical level, as well as in the creation of melodies and rhythms in conventional musical language in which the transfer between language and music can be clearly distinguished (Martínez et al., 2020; Moreno et al., 2008), while also enhancing the acquisition of lexical-musical skills that help improve the writing process (Ríos-López et al., 2017). However, Cogo-Moreira et al. (2013) indicates that more evidence is required to explain this impact of musical education on written expression.

In the area of oral comprehension, it should be indicated that the work through exclusively musical activities of listening perception and identification in which the student had to actively listen to different sound qualities facilitated the recognition of texts while improving lexical comprehension stemming from auditory training (Mankel et al., 2020) and phonological memory (López-Casanova & Nadal-García, 2018).

In terms of written comprehension, the programme developed has served to work on the capacity to search for, select and organise information, which can be explained in the fact that the development of this task must begin in a highly structured form in the same way as with musical procedures such as the analysis of a musical work as a whole (Gordon et al., 2011). To achieve that, the design of this type of teaching experience must be taken into account to consolidate linguistic and musical development through the converging structures that both languages share in line with the study by Intartaglia et al. (2017).

It should be stated that the limitations of this study include not being able to introduce the intervention programme at a larger number of education centres to obtain greater representation. In this regard, it has also been difficult to count on the participation of teachers, since it is complicated to open up centres to carry our classroom-based research, to which should be added the additional difficulty of developing a specific programme that does not exactly coincide with the centre's own programmes.

In conclusion, this study shows the need to integrate areas of the curriculum to promote unified and open learning following an interdisciplinary perspective while providing evidence to reflect on how musical education effectively contributes to the acquisition of knowledge, capabilities and skills related to Linguistic Communication Skills at the end of primary education. This also represents the starting point to address future studies that can be carried out in other educational contexts and in other autonomous regions, as well as in other stages of education to test out the development of linguistic communication skills through musical teaching activities.

7. References

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