

Musical expression in the training of future primary education teachers in Galicia

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journals.sagepub.com/home/ijm**Francisco César Rosa-Napal**

University of A Coruña, Spain

Pablo-César Muñoz-Carril 

University of Santiago de Compostela, Spain

Mercedes González-Sanmamed

University of A Coruña, Spain

Isabel Romero Tabeayo

University of Santiago de Compostela, Spain

Abstract

In this article, we present the results of a study about the perceptions of students studying for a degree in primary education about their music-teaching knowledge and their training needs in that area. The study was carried out in three public universities in Galicia (Spain). Using a quantitative methodological approach, a questionnaire was used to collect data from 302 participants. The results indicate some gaps in their practical, theoretical, and teaching knowledge related to musical expression which would have to be addressed through continued training during their professional practice. These gaps could also be considered in the design of teaching plans for teachers' initial training. Considering that music is part of the primary education curriculum, and most people's daily lives, careful thought is needed about the elements making up future teachers' training. The measures which are adopted as a result will determine the use that will be made of music, both academically and as an interdisciplinary teaching resource.

Corresponding author:

Pablo-César Muñoz-Carril, Department of Pedagogy and Didactics, Faculty of Teacher Training, Avenida Ramón Ferreiro, 27002. Lugo, Spain.

Email: pablocesar.munoz@usc.es

Keywords

Music education, musical expression, professional teaching knowledge, teacher training, training needs

Introduction

Teacher training is an important area of theory, research and practice which has produced various studies and experiences in response to the concerns and problems raised by the need to have appropriately trained teachers. Teachers need to be ready to tackle the challenges that society requires schools to face, and to meet the expectations placed on them as being responsible for the design, development, and evaluation of teaching-learning approaches that ensure the best education for future generations.

In this case, the research underlying this article was aimed at analysing the musical training of future primary-education teachers. The overall objective of the study was to understand the perceptions of students doing a primary education teaching degree in the universities in the Autonomous Community of Galicia about various ideas related to musical expression. The study also specifically examined their training needs in three areas of musical expression: listening skills, voice-instrument practice, understanding music theory, and competencies related to teaching music. The choice of these areas of inquiry is for two reasons. First, they represent the content blocks that are explicitly laid down in the official directives for primary teacher training in music in Spanish legislation, and second, they are in line with the content types that are covered in the Primary Education curriculum. In this way, this study's approach mirrors the dominant technical focus in official formal teaching of music in Spain, and it will be in the conclusions where a critical perspective will be included to analyse the results and question the relevance of the content and dominant prevailing processes in teacher training in general and in music teacher training in particular. In any case, many authors have highlighted the value of these components in musical training (Bernabé, 2012; Buonviri, 2015; Trainor & Corrigan, 2010; Vernia, 2016).

The identification of gaps in these areas, as perceived by the students themselves, could, in the short term, be the starting point for policy decisions to achieve good quality teacher training, both in initial training, and in the creation of in-service training.

Theoretical background

The phenomenon of music expresses one of the deepest relationships in human groups (Fubini, 2001) where various ideas, meanings, values, and functions are intimately linked to the very sounds of a certain cultural fabric (Hormigos, 2010). This is why musical education has been one of the main focuses of educational interest in recent years. In this regard Lines (2009) stated that musical expression 'provides education with a particular qualitative experience which combines the expression of human-originated sound with social and communicative importance' (p. 15), and because of that, has become a growing area in the 20th century.

In order to ensure that new generations can appreciate and enjoy the potential of music as a socio-cultural manifestation, artistic, and source of knowledge at various levels (Ibarretxe, 2006), it is essential for teachers to have verified, solid, rigorous training in musical knowledge and its teaching in the various stages of the educational system. *Professional teachers' learning and knowledge: implications for the training of primary teachers in music.* The need to train good teachers is a key element of the education system and is one of the most important concerns for everyone involved in the teaching-learning process. From the research point of view, studies on teacher training have aroused much interest since the middle of the last century, and today there is a strong line of research both at the general level and regarding teacher training in various areas of the curriculum (Cochran-Smith & Fries, 2008; Cochran-Smith et al., 2016). Of the many experts engaged in this field, and from the many proposals, one standout is the research led by Shulman (1987) into the study of professional teacher knowledge, its classification, sources and construction. Various authors have worked with and developed Shulman's classification which has evolved and been put into practice in various specific studies. Basically, three types of professional teaching knowledge are identified: subject knowledge, general teaching knowledge, and didactic knowledge of content (which is an amalgam of content knowledge and specific teaching knowledge for a certain subject). Didactic knowledge of content covers the understanding of students and their possible difficulties in learning a certain piece of knowledge, understanding the curriculum subjects and educational resources, as well as the teaching strategies and processes which will contribute to achieving the learning goals for a given topic. The position of Shulman and the authors who follow that same line of research has significant implications for teacher training, especially in relation to the value and relevance of didactic knowledge of content, which puts the primacy of subject knowledge into question along with the separation of the subject from its teaching, regaining an integrated idea of teacher training processes.

In the case of teacher training in the area of music, research is still scarce and limited (Leglar & Collay, 2002). These authors carried out a review in which they indicated that early research was performed under the process-product paradigm, and it was towards the end of the last century when research began to study what teachers know and do with the aim of improving teaching. Ross Hookey (2002) identified different studies about how music teachers learn and how their knowledge guides their practice. Rideout and Feldman (2002) proposed new lines of research and insisted on the utility of analysing the reality of music teaching to show what real objectives it responds to. In this regard, they warned of teachers being hostages to the demands of the curriculum, and the difficulties of promoting innovation.

Practical, theoretical and teaching knowledge: teacher training to learn and teach music

Given the importance of practical, theoretical, and didactic knowledge about music learning in teacher training, we offer some thoughts below about the key content in the preparation of future primary teachers in the area of musical education. In each sections' approach, particular attention is placed on the link between curricular knowledge and its teaching, as the basis for the development of didactic knowledge of content as the backbone of teacher training.

Listening and voice-instrument practice. The skills and abilities making up musical practice can be grouped into two basic, essential areas: listening and voice-instrument practice. Eliot (2009) noted that the skills for listening to and for making music correspond to the five types of knowledge: ‘process knowledge, verbal knowledge, experiential knowledge, intuitive knowledge and meta-cognition’ (p. 133). The attainment of these skills was part of the design of programmes in the first half of the 20th century, and in some way has been present in the thinking of authors who later proposed new theories and new approaches to music education. Along these lines, based on a deep theoretical foundation of the evolving modes of music learning, Swanwick (1991) stated that

The materials of music, the sounds, impress us with their sensorial surface. The attention is then focused on how these sounds are produced, their manipulation, and the pleasure produced directly or indirectly by playing the instruments, the achievement of mastery that Piaget called *virtuosity*. (p. 99)

First of all, music listening was important in the musical education theories of 20 century authors of *active methods* (Díaz & Giráldez, 2007). Willems (2001) analysed the factors involved in musical listening from a psycho-pedagogical perspective. Among the contributions from this work are the classification of these elements in relation to their impact on the human being: ‘auditory sensory receptiveness, auditory affective sensitivity and auditory mental perception’ (p.45.). These three elements form the basis of the author’s theorising on musical education from different fields, which were already present in his analysis of the constituent components of Western music: rhythm, melody and harmony.

One of the most fundamental listening skills in music is the determination of its expressive character via the particular conventions of tonal music, involving major and minor scales. It should be possible to discriminating between these by listening, given their affective roles and the presence of music in people’s lives from childhood. Trainor and Corrigan (2010) stated that research ‘has confirmed that the major-happy minor-sad distinction is acquired during childhood even in the absence of formal musical training’ (p. 110).

Listening is such an important part of musical education that studies have been published on it from various scientific perspectives, in particular, those collected in *Music Perception* (Jones et al., 2010). Considering the importance of listening in overall music training in the context of general education, it should also be part of the musical training of future teachers, as it is part of their teaching knowledge and their personal musical culture. Buonviri (2015) found deficiencies in training of these listening skills, via melody teaching, in schools and universities.

Singing and playing instruments have traditionally formed the core of music training activities, although more modern programmes also include composition. Both in music training offered by conservatories and in general music education, music is usually created using the voice (solfeggio, songs, choral singing) and playing instruments. Quintana et al. (2012) stated that ‘musical education fundamentally consists of initiating students in the recognisable musical traditions. That is why there is such great importance placed on mastering an instrument and learning masterpieces’ (p. 108). Teaching materials and the various methodologies that have arisen have accurate playing as their main objective, with the most common parameters being stable timing, and note length correction in the case of rhythm, along with accurate vocal intonation and the precise execution of intervals in terms of pitch.

Understanding 'music theory'. Before beginning this section, it is important to note the ambiguity that the term *music theory* may present in the context of teaching and learning. Traditionally, this term has been used to refer to the set of rules and notation involved in having a common codification of music, determined by cultural, geographic or historical factors, in other words 'it is related especially to the rules of musical notation' (Swanwick, 1991, p. 15). This terminology somewhat contradicts *theories of music* which have been created from philosophical, sociological, psychological and pedagogical perspectives, among others, which deal more with determining the different meanings of music as a human expression.

The more recent proposed models of musical education, while leaving out reading and writing music, structural comprehension and mastering specific terminology from early stages of education, do not rule out the need for them to be learned later. So much so that the curriculum set out in the current law on primary education in Spain includes conventional reading and writing music, learning historical information, and the descriptive analysis of the constituent elements of music. From that, it follows that future primary education teachers must have a set of competencies including basic mastery of the main structural codes of musical language, along with an understanding of the conventional notation of Western music (Vernia, 2016).

Another 'non-practical' aspect of music, and possibly the most useful for interdisciplinary and intercultural educational programmes, is historical and cultural contextualisation. Bernabé (2012) stated that 'music carries with it a picture of the time and society it came from, it is an important source of cultural information, and because of that, a perfect tool for intercultural work in the classroom' (p. 125).

Distinguishing the main characteristics of music from different periods of history and cultures, just as with any artistic endeavour, is not only part of an individual's all-round education, but it should also be essential elements of teachers' professional knowledge. The elements allowing us to understand the historical and cultural context the music came from include formal structures, melodic contours, rhythm and texture, which, treated generally, should be relatively easy for future teachers to understand if they are well trained. This is one way for teachers to have a potent interdisciplinary teaching resource.

Knowledge of teaching musical expression. Apart from acquiring basic knowledge of the subject, future teachers should also gain teaching knowledge that would allow them to, at the very least, use musical expression as a teaching resource, both in specific teaching of the elements of musical language, and in the use of this language as an interdisciplinary teaching resource. And here is where the main problem appears: depending on the design of the study plan, and bearing in mind the low level of specific music knowledge in most students doing degrees in primary education, the technical content must be dealt with at the cost of the content that truly reflects the subject of Teaching Musical Expression (Napal, 2015).

In addition, in order to cover the minimum requirements of teaching music, or using it as a teaching resource in other subjects, teachers need the assurance provided by command of musical expression as well as its application in teaching. If this assurance is not present, future teachers will reject any link to musical expression in their teaching. Vernia (2016) stated that 'as generalist teachers, the students themselves, without musical knowledge, demonstrate that they would never give a music class, and if it became necessary, they would look for the tools needed to do the job' (p. 10). In a similar context, early childhood education (ECE), López de la Calle (2008) stated that student ECE teachers were not

sufficiently trained to teach in the following areas: understanding the constituent elements; musical language; ways of learning; attention to diversity and use of ITC.

Along these lines, Vernia (2016) proposed a set of music teaching knowledge that should be considered in teacher training in order for teachers to be able to face the challenges of music education and use of music as an interdisciplinary resource. These included,

The understanding of the main methodologies for acquiring musical competence, classroom teaching resources, tools for the development of musical expression, and common ground between competence in teaching musical expression and other subjects. (Vernia, 2016, p. 16)

We could add to that the ability to apply the main criteria for selecting teaching material, mastery of a wide music teaching repertoire, and the ability to use new technologies applied to music education (Napal, 2015). This could ensure the appropriate teaching use of musical resources in future by those who take the subject Teaching Musical Expression.

Methodology

The context: teacher training and teaching musical expression

Following the inclusion of musical expression as an obligatory subject in the primary education curriculum in Spain, after the approval of Organic Law 1/1990, on the General Ordering of the Education System (LOGSE), the need arose for teachers who were fully trained to teach this subject. The Specialist Music Teacher formed part of the mix of qualifications making up the study plans for teacher training until Organic Law 4/2007, 12th April, came into force which placed teacher training within the European Higher Education Area (EHEA), reducing the number of qualifications to two: Early Childhood Education and Primary Education.

In the current plans for teacher training, Teaching Musical Expression is one of the obligatory subjects in the primary education degree. This subject is offered under various names in each of the three universities (Didactics of Musical Expression, Music in Primary Education, and Musical Expression and Language), it is worth 6 ECTS credits (150 hr) and lasts 4 months. This means it is one of the training elements that affects the quality of future teaching, especially in content related to musical expression. Faced with the imminent reform of university courses with Spain's entry into the EHEA, Aróstegui (2006) performed an early analysis of the potential consequences of the disappearance of the specialities, in this case music. He noted that, given appropriate musical training, generalist teachers could perform well in primary music education. However, he also warned of the negative impact if this training were less than satisfactory, as it was a topic with only six credits meaning it would be 'difficult to achieve suitable training for future teachers' (Aróstegui, 2006, p. 843).

Although generalist teachers will not necessarily have musical education as their main role – that would go to specialist teachers, or those who have specific, current knowledge – they could make broad use of this artistic expression as an interdisciplinary teaching resource (Gutiérrez et al., 2011). It is here where some difficulties arise in the efforts to achieve optimum training, as it is unlikely that the music teaching knowledge that students would acquire in such a short time could contribute to full teaching activities in all of the facets of their future professional roles (Shulman, 1987).

This contradiction brings with it the need to carefully select the course content in Teaching Musical Expression, and the concurrent risk of leaving something fundamental out of the plan, either specific musical or teaching knowledge. This also presents difficulties in the exclusion criteria for minimum professional competencies that teachers must have once they complete their training (Tamir, 2005). As a consequence, training in music teaching could end up incomplete, and as such, have a negative impact on the future quality of education (Marcelo & Vaillant, 2009).

Objectives

Bearing in mind the legislative framework around training primary teachers, specifically the content and competencies that future teachers must acquire, we have designed a study aimed at identifying the training needs of future primary school teachers in the area of music teaching. The study has two specific objectives:

- a. Examine the perceptions of future primary school teachers about their training needs in content related to musical expression, vocal-instrumental listening and practice, musical theory, and music teaching.
- b. Identify whether there are significant differences in the perceived needs based on age, sex, place of residence, doing musical activities outside the official curriculum, and participation in musical group performances.

Procedure and participants

Given the nature of the topic and the objectives proposed, the study was designed with a quantitative approach (Gil, 2011). Data was collected using a questionnaire completed by 302 students who were studying for a degree in primary education in five campuses belonging to three public universities in Galicia (Spain). Table 1 gives the participation rates in each of the five campuses.

The questionnaire was given out once students had completed the subjects corresponding to Teaching Musical Expression and had been evaluated, which meant that it was at the end of the academic year. The sample selection criteria meant that the age of the students ensured that their previous education would have been done within the legislative framework in which musical expression was a subject in the curriculum. It should also be remembered that their teacher training took place within the EHEA framework.

Table 1. Population and sample.

University / campus	Population	Sample	Percentage
University of A Coruña (UDC), Elviña campus	106	76	81.7%
University of Vigo (UVigo), Pontevedra campus	81	20	24.7%
University of Vigo (UVigo), Ourense campus	74	30	40.5%
University of Santiago de Compostela (USC), North campus	175	105	61.7%
University of Santiago de Compostela (USC), Lugo campus	80	63	78.8%
Total	516	302	58.52%

Results

Students' perceptions of their training needs in musical expression

The students' answers provided data on their ideas of their training needs in aspects including listening and voice-instrument practice; their knowledge of music theory, and their music teaching competencies. To gather this information, various items were designed for the students to express their level of agreement with statements. The data collected is shown below.

Table 2, which covers listening and voice-instrument practice, shows that the majority agreed with the statements. More than 50% agreed that they should improve skills such as discriminating major and minor scales by ear, intonation, and rhythm accuracy, while 41.5% thought that their vocal range was sufficient for the repertoire that is usually used in primary education.

Gaps in music theory (Table 3) were evaluated similarly to listening and voice-instrument practice, although it is clear that the students' main concern was determining formal structures (59% agree) – regardless of the fact that most music that they usually listen to always follows some preconceived formal scheme, whatever the style or historical period – and the

Table 2. Listening and voice-instrument practice.

Items	Percentages					Mean	SD
	CD	D	N	A	CA		
I need to train my ear to distinguish major/minor scales by listening	4.1	13.5	5.4	58.1	18.9	3.74	1.042
I must improve my command of intonation	2.7	8.8	9.1	50.7	28.7	3.94	0.986
My vocal range is sufficient for the school repertoire	4.8	17	24.8	41.5	11.9	3.39	1.051
The accuracy of my rhythm, singing or playing should be better	4.7	14.9	9.1	50.3	20.9	3.68	1.105

CD: completely disagree; D: disagree; N: neither agree nor disagree; A: agree; CA: completely agree; SD: standard deviation.

Table 3. Knowledge of music theory.

Items	Percentages					Mean	SD
	CD	D	N	A	CA		
I have a basic theoretical understanding of musical language	3.1	21.8	13.9	45.6	15.6	3.49	1.089
I need to broaden my skills in reading music	4.4	14.2	10.8	48.1	22.4	3.70	1.101
I must have a more thorough understanding of formal structures	1.4	8.1	13.5	59.8	17.2	3.83	0.853
I need more information to place examples of music in their historical context	3.1	9.9	14.3	52.9	19.8	3.76	0.981

CD: completely disagree; D: disagree; N: neither agree nor disagree; A: agree; CA: completely agree; SD: standard deviation.

possibility of contextualising a piece in a certain historical period or culture, something that not only refers to music used educationally, but rather is the main signifier of the identity of any piece of music.

The highest levels of perceived training need were found in music teaching knowledge, with the exception of the item related to applying selection criteria to the choice of teaching materials. There were notable means of 4.10 and 4 in the items 'It is important to broaden my current teaching repertoire' and 'I need to improve the information I have on current topics in music education' (Table 4).

Comparing the results of training needs with other data collected in the study

In order to have a more complete analysis of the data about students' training needs, other items that could produce significant results were considered: age (item 1), sex (item 2), residence (item 18) and training in instruments received in conservatories, music schools, cultural associations, individual classes, and so on (item 20). Two non-parametric methods were used, the Kruskal-Wallis test and the Mann Whitney U test.

Age

This variable was split into three categories: students aged 19–20 ($n=90$); 21–22 ($n=112$) and over 22 ($n=97$).¹ The Kruskal–Wallis test did not give any statistically significant differences between age and the scores of training gaps by students following their education in musical expression.

Sex

As Table 5 shows, significant differences were found ($p < .05$) by sex. Women reported more needs in aspects such as training their ears to distinguish between major and minor scales ($p = .038$), placing musical examples in their historical context ($p = .032$), and in the need to get up to date with new technologies applied to music and its teaching ($p = .004$).

Table 4. Music teaching knowledge.

Items	Percentages					Mean	SD
	CD	D	N	A	CA		
I have solid criteria for choosing teaching materials for teaching music	5.7	27.7	18.6	38.2	9.8	3.19	1.089
It is important to broaden my current teaching repertoire	1.7	5.1	5.4	57.5	30.3	4.10	0.841
I must train in the creation of "musicograms"	3.1	5.4	14.2	54.9	22.4	3.88	0.920
I have to get up to date with new technologies applied to music and teaching music	1.7	9.8	9.2	52.5	26.8	3.93	0.950
I need to improve the information I have on current topics in music education	1.7	5.1	8.1	61.4	23.7	4	1.023

CD: completely disagree; D: disagree; N: neither agree nor disagree; A: agree; CA: completely agree; SD: standard deviation.

Table 5. Mann Whitney U test. Grouped on: Sex.

	Sex	N	Median range	Sum of ranges	Comparison Statistics
I need to train my ear to distinguish major/minor scales by listening	Man	84	133.04	11,175.50	Mann-Whitney U: 7605.500 Wilcoxon W: 11,175.500 Z: -2.070 Asymptotic sig. (bilateral): .038
	Woman	210	153.28	32,189.50	
I need more information to place examples of music in their historical context	Man	83	130.66	10,845.00	Mann-Whitney U: 7359.000 Wilcoxon W: 10,845.000 Z: -2.140 Asymptotic sig. (bilateral): .032
	Woman	208	152.12	31,641.00	
I have to get up to date with new technologies applied to music and teaching music	Man	84	126.18	10,599.00	Mann-Whitney U: 7029.000 Wilcoxon W: 10,599.000 Z: -2.916 Asymptotic sig. (bilateral): .004
	Woman	209	155.37	32,472.00	

Table 6. Kruskal–Wallis test. Grouped on: residence.

	Location of family residence	N	Median range	Comparison statistics
I have a basic theoretical understanding of musical language	Rural	83	168.28	Chi-squared: 10.813 df: 2 Asymptotic sig.: .004
	Semi-urban	95	129.05	
	Urban	114	145.18	
I have solid criteria for choosing teaching materials for teaching music	Rural	83	164.96	Chi-squared: 6.297 df: 2 Asymptotic sig.: .043
	Semi-urban	95	134.53	
	Urban	116	145.63	

Residence

Significant differences were found via the Kruskal–Wallis test (Table 6) according to where the students lived.

Statistically significant differences were found in the variable ‘I have a basic theoretical understanding of musical language’ in students who lived in semi-urban areas compared to those living in rural areas ($p = .003$). Students from rural areas reported having greater basic theoretical knowledge of the language of music compared to those in semi-urban areas.

There were also statistically significant differences in the variable ‘I have solid criteria for choosing teaching materials for teaching music’. The *post hoc* analysis showed that students in rural areas had higher mean scores than those in semi-urban areas ($p = .038$) in terms of having selection criteria for teaching materials.

Musical activities outside the official curriculum

An analysis of the students’ perceived needs in musical expression with respect to the type of musical activities they engaged in outside of their official teaching showed significant differences at the asymptotic level ($p < .05$) via the Mann Whitney U test (Table 7). Students who

Table 7. Mann Whitney U test. Grouped on: Amount of musical activities outside official teaching.

	Musical activities outside of official teaching	N	Median range	Sum of ranges	Comparison statistics
I need to train my ear to distinguish major and minor scales by listening	Never/infrequently/occasionally	218	153.18	33,394.00	Mann-Whitney U: 6609.000
	Often/very often	74	126.81	9384.00	Wilcoxon W: 9384.000 Z: -2.612
I need to improve my music reading skills	Never/infrequently/occasionally	217	157.68	34,216.00	Asymptotic sig. (bilateral): .009
	Often/very often	74	111.76	8270.00	Mann-Whitney U: 5495.000 Wilcoxon W: 8270.000 Z: -4.337
I have a basic theoretical understanding of musical language	Never/infrequently/occasionally	217	132.25	28,699.00	Asymptotic sig. (bilateral): .000
	Often/very often	73	184.88	13,496.00	Mann-Whitney U: 5046.000 Wilcoxon W: 28699.000 Z: -4.919
I have solid criteria for choosing teaching materials for teaching music	Never/infrequently/occasionally	218	139.93	30,504.00	Asymptotic sig. (bilateral): .000
	Often/very often	74	165.86	12,274.00	Mann-Whitney U: 6633.000 Wilcoxon W: 30504.000 Z: -2.387
I must improve my command of intonation	Never/infrequently/occasionally	218	153.86	33,540.50	Asymptotic sig. (bilateral): .017
	Often/very often	74	124.83	9,237.50	Mann-Whitney U: 6462.500 Wilcoxon W: 9237.500 Z: -2.784
My vocal range is sufficient for the school repertoire	Never/infrequently/occasionally	216	137.90	29,786.00	Asymptotic sig. (bilateral): .005
	Often/very often	74	167.69	12,409.00	Mann-Whitney U: 6350.000 Wilcoxon W: 29786.000 Z: -2.770
The accuracy of my rhythm, singing or playing should be better	Never/infrequently/occasionally	218	157.85	34,411.00	Asymptotic sig. (bilateral): .006
	Often/very often	74	113.07	8,367.00	Mann-Whitney U: 5592.000 Wilcoxon W: 8367.000 Z: -4.258
					Asymptotic sig. (bilateral): .000

Table 8. Mann Whitney U test. Grouped on: Instruction in playing instruments received in conservatories, music schools, cultural associations, individual classes, and so on.

	Instruction in playing instruments received in conservatories, music schools, cultural associations, individual classes, and so on	N	Median range	Sum of ranges	Comparison statistics
I must have a more thorough understanding of formal structures	Never/infrequently/occasionally Often/Very often	287 7	149.01 85.43	42,767.00 598.00	Mann-Whitney U: 570.000 Wilcoxon W: 598.000 Z: -2.213 Asymptotic sig. (bilateral): .027
I need to train my ear to distinguish major and minor scales by listening	Never/infrequently/occasionally Often/very often	287 7	149.97 46.36	43,040.50 324.50	Mann-Whitney U: 296.500 Wilcoxon W: 324.500 Z: -3.569 Asymptotic sig. (bilateral): .000
I need more information to place examples of music in their historical context	Never/infrequently/occasionally Often/very often	284 7	148.36 50.43	42,133.00 353.00	Mann-Whitney U: 325.000 Wilcoxon W: 353.000 Z: -3.313 Asymptotic sig. (bilateral): .001
I need to improve my music reading skills	Never/infrequently/occasionally Often/very often	286 7	148.53 84.64	42,478.50 592.50	Mann-Whitney U: 564.500 Wilcoxon W: 592.500 Z: -2.107 Asymptotic sig. (bilateral): .035
I have a basic theoretical understanding of musical language	Never/infrequently/occasionally Often/very often	285 7	145.05 205.64	41,338.50 1439.50	Mann-Whitney U: 583.500 Wilcoxon W: 41,338.500 Z: -1.992 Asymptotic sig. (bilateral): .046
I have to get up to date with new technologies applied to music and teaching music	Never/infrequently/occasionally Often/very often	286 7	148.73 76.14	42,538.00 533.00	Mann-Whitney U: 505.000 Wilcoxon W: 533.000 Z: -2.449 Asymptotic sig. (bilateral): .014
I must improve my command of intonation	Never/infrequently/occasionally Often/very often	287 7	148.95 88.00	42,749.00 616.00	Mann-Whitney U: 588.000 Wilcoxon W: 616.000 Z: -2.037 Asymptotic sig. (bilateral): .042
The accuracy of my rhythm, singing or playing should be better	Never/infrequently/occasionally Often/very often	287 7	149.01 85.79	42,764.50 600.50	Mann-Whitney U: 572.500 Wilcoxon W 600.500 Z: -2.094 Asymptotic sig. (bilateral): .036

did fewer outside musical activities reported greater gaps in aspects such as ‘I need to train my ear to distinguish major and minor scales by listening’; ‘I need to broaden my skills in reading music’; ‘I must improve my command of intonation’; and ‘The accuracy of my rhythm, singing or playing, should be better’.

Instruction in playing instruments received in conservatories, music schools, cultural associations, individual classes, and so on (item 20)

Table 8 shows the statistically significant differences ($p < .05$) found comparing the variables ‘perceived student needs following education in musical expression’ and ‘Instruction in playing instruments received in conservatories, music schools, cultural associations, individual classes, etc’. Students who had received very little instruction in playing instruments reported greater training needs in musical expression.

Discussion and conclusion

The perceptions of students doing the degree in primary education about their listening, vocal and instrumental skill, their knowledge of theoretical aspects of music and competencies related to teaching musical expression show some specific training needs for their future performance in teaching music. Analysing the results leads to deeper reflection on the evaluation of the training teachers receive, and the skills acquired during the degree course, raising questions about what comprehensive training students should acquire as future teachers.

According to their direct responses, students believed that they were not sufficiently trained to face the challenge of using music as a teaching resource, and much less well trained for teaching the subject with the command and assurance that they would wish. This is in line with results of previous studies into the same topic (López de la Calle, 2008).

Looking at the comparison analyses, it is possible to conclude that most of the students doing the degree in primary education have not had contact, or have not had significant contact, with musical expression outside of the official education system or their professional training. They reported extremely low levels of participation in planned activities in which music is played or appreciated. They also reported very low levels of attendance at music schools, conservatories or individual classes. Richmond et al. (2016), referring to this reality, said ‘this pattern of non-participation in musical production seems to be a Western phenomenon’ (p. 144), based on the low levels of involvement in musical activities in the United States and the United Kingdom. As Jorquera (2017) noted, for students to enjoy good musical experiences, it is essential for teachers to be well trained, and that needs the development of musical skills in general teachers in compulsory education (Nixon et al., 2017). This evidence indicates that practical skills and theoretical knowledge about musical production depended exclusively on subjects taken in compulsory education, and then in teacher training (Napal, 2015). The result of this is that most of the responsibility for musical education falls on the official training institutions, as it is not possible to ensure that students doing the degree in primary education have sufficient prior knowledge of music from other places. In this regard, it is worth noting that teacher training takes place not only in the theoretical-practical courses organised by universities, but also via the practicum and the interactions with teaching tutors in the schools where students gain their classroom experience (González-Sanmamed & Fuentes, 2011). However, the possibilities of learning

music teaching here are also limited as music teaching in primary education is still quantitatively and qualitatively underdeveloped. As many authors have highlighted, the learning possibilities during practical work depend on many factors, fundamental among which are the relationships with tutors, and enriching classroom experiences (Caires et al., 2012; Valencia et al., 2009).

Once these conclusions have been made, it is possible to understand that, owing to the realities of the university environment, the way to square this circle lies in optimising the students' initial training and in the design of stable, progressive plans which ensure continued training of teachers in musical education. In this way, despite any lack of sufficient training during the teaching degree, if there is a firm, structured programme, it would be possible to give teachers multiple teaching tools that involve musical expression in all of its aspects, especially as an interdisciplinary resource. In order to design this process, it would be essential to have specific research on this topic that could provide data from which the content to work on could be chosen and sequenced, both from the point of view of musical language and from a teaching perspective.

In any case, one cannot guarantee that mastering this knowledge about music and its teaching will ensure successful practicums and excellent professional practice because teaching is not a technical puzzle that can be solved by applying sound, solidly acquired knowledge. Overcoming the positivist perspective and the limitations of the process-product approach have allowed the exploration of new avenues of inquiry, and a review of the role of teachers, who must now be able to reflect and research into their own practice, seeking alternative ways of thinking and acting that they can challenge themselves with and verify continuously and systematically. The teacher becomes a knowledge worker who critically faces teaching challenges (Adams, 2016; Smyth, 2011; Vaughan & Burnaford, 2016) and takes advantage of the opportunities offered by the digital society for their learning and professional development (González-Sanmamed et al., 2016).

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ORCID iD

Pablo-César Muñoz-Carril  <https://orcid.org/0000-0001-5417-8136>

Note

1. There were 3 missing values from students who did not answer the question about their age.

Supplemental Material

Supplemental material for this article is available online.

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