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ARTICLE

Use of animated stories to improve music education practices of trainee primary school teachers in Spain

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Abstract
This article analyses an interdisciplinary educational experience combining music, ICT, language and art to create an animated story with active listening as a means of improving knowledge of music education practices. The method consisted of a qualitative, exploratory and descriptive study, with a semi-structured open-ended interview and analysis of the corresponding portfolio by both students and teachers with the aim of encouraging systematic reflection on practices and optimising teaching-learning in the nature of action research. The research population consisted of 104 students of the Bachelor's Degree in Teaching of the Faculty of Education of the University of Alicante (Spain). The results indicated an improvement in music education practices relating to active listening following the pedagogical intervention, leading to the conclusion that inclusion of ICT in music education facilitates real and effective insertion and enhances students' autonomy in the process of acquisition of musical skills.

Keywords: Music education; animated story; ICT; interdisciplinarity; action research

Introduction

One of the challenges currently faced by the education system is the need to adapt to the growing needs of an increasingly digitalised society (Agrawal & Mittal, 2018). Advances in information and communications technology (ICT) reflect the need to establish a relationship between the education and the technical training of both the general public (Becker et al., 2017; Maderick et al., 2016; Romero-García et al., 2020) and those responsible for changes in pedagogical processes in the classroom, that is teachers, regardless of the education level (Esteve-Faubel & Oller Benítez, 2019).

For this reason, over the last decade the Spanish university system and, more specifically, the Faculties of Education that train early childhood and primary education teachers, among others, have included at least one subject with a value of 6 ECTS (European Credit Transfer System) in their curricula to directly address ICT with the aim of achieving an adequate level of proficiency in this area.

Teacher digital competence (TDC) refers to the ability to use ICT correctly as part of a permanent teaching-learning process, which entails new ways of approaching educational action. This has led to a change from a paradigm focusing solely on teaching to one where learning is based on both students' work and the establishment of specific methodological strategies (Lockee & Wang, 2014; Nicolaou et al., 2019).

However, the use of ICT does not imply radical transformations of the purposes or meaning of learning, nor a belief that ICT constitutes an end in itself (Lim & Oakley, 2013), but rather a search for new pedagogical procedures. The question is whether the use of ICT can contribute to improve the learning process of future primary school teachers in terms of music education innovation.

The scientific literature concerning teacher training related with Digital Competence and Digital Skills in higher education emphasises that these aspects are increasingly present in the classroom at a general level (Instefjord & Munthe, 2017) and also at a music-specific level (Savage, 2005; Stowell & Dixon, 2014; Wise, 2016).

Teachers are also vital in this process, given that they are responsible for educating and training future generations (Admiraal et al., 2017; Mills & Murray, 2000). Teachers in general tend to use ICT either for personal use or as tools to search for information. Therefore, training in this area is more instrumental and theoretical rather than practical-educational, for example in relation to problem-solving items, management of over-information and critical thinking (Prensky, 2001). This implies that musical knowledge is not necessarily generated in line with the European Digital Competence Framework (National Institute of Educational Technologies and Teacher Training, 2017a, b; Kluzer & Pujol Priego, 2018) and the Goals of the 2030 Agenda for Sustainable Development (United Nations, 2015). In other words, the mere use of music software such as score editors does not imply the generation of musical knowledge through the use of ICT in line with the parameters of the European Digital Competence Framework or the 2030 Agenda mentioned above.

In relation to university students, although they are considered digital natives, as opposed to teachers, who are seen as digital immigrants (Bayne & Ross, 2011), they also suffer the same limitations when it comes to generating knowledge (Kirschner & De Bruyckere, 2017). Nonetheless, they have a positive attitude towards the use of ICT in teaching practice (Hammond et al., 2011). All studies of TDC stress that teachers have a direct need to acquire an adequate level for their professional practice (Nelson et al., 2019), although they also highlight one problem being the scarcity of subjects in this field during teacher training studies (Instefjord & Munthe, 2017).

Music listening plays a fundamental role in music learning (Elliott, 1995; Haack, 1992). However, the actual listening to a musical work, whether "classical" in the broad sense of the term or contemporary, presents intrinsic difficulties (non-traditional use of sonorous material) and extrinsic difficulties (limited exposure) that impact the listener's cognitive processes (Esteve-Faubel et al., 2016). For these reasons, since the 1970s different strategies have been sought to achieve intentional and focused listening through active listening as a means of arriving at an effective way of appreciating music (Haack, 1992). Some of the various approaches developed to achieve this purpose include the simultaneous presentation of visual materials (Geringer et al., 1997), visual listening or perceptual-motor maps (Gromko & Poorman, 1998) and musicograms (Boal-Palheiros & Wuytack, 2006). This pedagogical approach seeks to overcome the difficulty of remembering the different fragments of music that make up the work due to the fact that music perception occurs over time (Tillmann & Bigand, 2004).

With reference to ICT music, authors including Biasutti et al. (2015), Muhonen (2016), Seddon and Biasutti (2008) and Thorpe (2017), among others, indicate the need to propose innovative face-to-face and/or virtual learning environments in order to apply didactic models that favour the acquisition of musical knowledge regardless of the starting level of these future teachers. The studies by Cain (2004) and Hunt and Kirk (1997) also highlight the need to establish specific methodological strategies in the music classroom and that music-specific ICT is already a reality in the classroom (Savage, 2005; Stowell and Dixon, 2014; Wise, 2016).

The working hypothesis is that an interdisciplinary educational intervention involving education and ICT in the field of music not only leads to improved knowledge of teaching practices but it can also allow transfer of these learning approaches to their professional practice.

To confirm this hypothesis, among other strategies a pedagogical model was designed based on audiovisual resources for the subject of *Listening as an Educational Element* in the Music Teaching Department of the Bachelor's Degree in Primary Education at the University of Alicante.

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The purpose of the study was to put this model into practice as a means of motivating and improving analysis of the works proposed during the activity of active musical listening.

For all the above reasons, this study aims to further develop knowledge in this area and provide a basis for teachers to apply this pedagogical approach in a given learning situation in primary classrooms, especially in the case of interdisciplinary activities.

It should be pointed out that the legal regulations governing the key competences of compulsory education training indicate that, among others, competence in linguistic communication, digital competence and personal, social and learning to learn competence are essential in certain learning situations, and it is therefore necessary to provide future teachers with resources that can help them to provide a global response to this pedagogical approach.

Animation is used in education for the construction and communication of scientific understanding. Multimedia products facilitate the construction of knowledge (Hoban, 2020; Mayer & Moreno, 2002; Unsworth, 2020) and comprise an additional instrument for the design and creation of teaching actions for training of future teachers (Esteve-Faubel & Oller Benítez, 2019; Esteve-Faubel et al., 2020; Hoban, 2020), without forgetting that the ultimate aim is the aural recognition of the musical elements of the work, and learning of these actions for their subsequent application in primary education classes.

This approach focuses on the action research paradigm, which aims to develop a substantive theory of action in the classroom (Elliott, 1990) whereby individualistic culture is converted into a cooperative culture that allows development of new professional knowledge needed to resolve complex practical problems. In light of the above, the objectives of the current study are as follows:

A. To determine the prior knowledge to ensure effective development of the educational-musical project.
B. To examine digital competence as a determining factor for its possible use in future music teaching work.
C. To analyse the methodological positions deriving from the pedagogical intervention and carry out planning, implementation and evaluation of the action.

Educational context in Spain

In order to understand the current proposal, the following aspects should be borne in mind:

a) In the Spanish primary education system, music teachers are one of the specialist teachers that work together with general teachers, and they assume responsibility for teaching music education at this stage of education.
b) The Primary Education curriculum, apart from contemplating a transversal approach in all subjects, also works specifically on music in three blocks; a) listening, perception and musical repertoire, comprising both more popular traditional music and avant-garde music, along with rhythms and melodies from different countries and cultures as a reflection of the multicultural reality of a globalised world; b) musical performance, comprising expressive and creative processes such as interpretation, improvisation and creation through vocals, musical instruments and other electronic devices and knowledge and use of specific codes and techniques.
c) Future teachers receive training as general teachers in the Faculties of Education with a total of 240 credits, and in the case of specialist music teachers, they complete 30 credits specifically for music.
d) Access to this specialisation is open to both students with a high level of previous musical knowledge and also to those who lack such knowledge.

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Method

The method consists of a qualitative, exploratory and descriptive study comprising both a semi-structured open-ended interview and portfolio analysis. Given that the aim is to analyse and interpret the concepts of the research topic in a given social context, this approach is justified as it facilitates access to the underlying information, attitudes, experiences, perceptions and beliefs of the participants and reflections on their thoughts and experiences (Briggs, 2008; Duggleby, 2005). This type of approach also allows analysis and interpretation of contextualised responses in a given social environment (Clandinin & Murphy, 2009), namely the Teaching Degree of the Faculty of Education of the University of Alicante.

The sample was made up of 104 students of the Bachelor's Degree in Teaching, selected by way of accidental non-probability sampling which was accessible to the researchers and therefore non-random, from the 2016–2017 academic year through to the 2020–21 academic year.

The objectives of the study were explained to all the informants, who participated on a voluntary basis, and there was no incentive for their collaboration. The subject chosen to implement the study was *Listening as an Educational Element*, which is taught in the first term of the 4th academic year of the Degree.

Field work

The pedagogical intervention proposed consists of project-based learning of an interdisciplinary nature, the end result of which is the production of an animated story which combines audio and images through cooperative work. The basis for the intervention is the selection and analysis of a musical work combined with the disciplines of art, language and ICT, with these latter elements being used as tools for audio recording and editing, creation of images and video editing.

The initial premise is to use these audiovisual resources to create interdisciplinary material that overcomes individualism and compartmentalisation of knowledge.

The elements of the study are as follows: a) musical: selection of the work that will serve as the central focus of the project, analysis of the musical recording, creation, manipulation and editing of an audio file and processing and use of voice for the narration; b) artistic: consisting of the specific features of the image, selection of the technique, selection of the main and secondary images, creation and editing; c) linguistic: relating to the creation of a coherent story with a narrative structure and the correct use of appropriate terminology.

Five planning processes were designed to implement a proposal based on both projects and collaborative work:

- Phase 1: Music. At the start of the course in the first week, working groups are established based on a cooperative learning structure. The number of members is always four, except when the total number of students is not a multiple of this number, in which case the corresponding group always consists of three students.

The groups are heterogeneous in terms of their level of knowledge, with assignment of specific roles in accordance with the totality of phases in the design. In addition, a portfolio is prepared for the "animated story" project, including all the phases and the final project, together with a reflection on the different phases that shape the nature of the project.

Musical knowledge is not assessed in the classical sense by means of a test. The students group themselves into three large groups in a very objective manner and without any affective impact.

Group 1 is made up of students whose knowledge of music is derived solely from compulsory education. They do not tend to read or sing sheet music of average difficulty nor do they have mastery of a musical instrument. Among other reasons, this low level of training may be directly related to the limited time allocated to music, which ranges from 45 to 90 minutes per week

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Table 1. Tempo Table Based on the Structure of the Musical Work

Intro-A-B-Bridge-C-A-Bridge-C-Coda
Intro; 0–0:11. Agogic: allegro. Dynamic: piano
A: a1 (0:12–0:17) + a2 (0:18–0:23)
B: b1 0:24–0:27 – 0:30–0:33
Bridge: 0:35–0:40
C: c1 (0:41–0:46) + c2 (0:47–0:52) + c3 (0:53–0:58) + c4 (0:59–l:04)
A: al (l:05–l:10) + a2 (1:11–1:13)
Bridge: 1:14–1:20
C: c1(1:21–1:26) + c2 (l:27–l:32) + c3 (l:33–l:38) + c4 (l:39–l:43)
Coda: c1 (l:44–l:55) + c2 (2:01–2:11)

depending on the level during primary and secondary education, despite the fact that the legislation imposes high curricular requirements (Esteve-Faubel, 2019).

Group 2 consists of students who receive extracurricular musical training in musical societies which are deeply rooted in the Valencian Community. These students read sheet music well and have mastered a musical instrument or sing. Finally, Group 3 is made up of students who study in music conservatories and have a high level of musical training.

In terms of the specific musical elements, firstly a work is selected that must be very expressive and with a certain time limit: a minimum of one minute and a maximum of four minutes. After selecting the work, the structural and technical-compositional analysis is carried out, identifying the most outstanding elements in the recording and firstly establishing a tempo table as shown in Table 1.

After completing this structural framework, a complete timeline analysis is carried out in minutes and seconds, which then forms the basis for the narrative development.

The musical pieces or fragments are chosen by the students. They may or may not have been worked on in class previously but they must be very expressive, that is the melodies evoke narrative elements, images, etc., such as the fifth movement of the Symphonie Fantastique by Hector Berlioz "Dream of a Witches' Sabbath" or "Frere Jacques" used as a funeral march in the third movement of Symphony No. 1 "Titan" by Gustav Mahler.

- Phase 2: Language. The construction of the language is based on the characteristics of the musical work and its most salient elements which are identified as being relevant to the musical and narrative discourse. Based on these, the theme of the story, the characters and the plot are developed. This narrative is incorporated on the timeline prepared in Phase 1, with the relevant information coinciding with the times of the different elements in the recording.
- Phase 3: Creation of the audio file. A voice recording is made adjusted to the time marked on the timeline and an audio file is created. Work is carried out on vocal technique, breathing and projection of the spoken voice, paying special attention to the expressiveness of the tone, modulation and diction. The merging of the audio files of the musical work and the voice story created is carried out using an audio editor freely chosen by the students. Free software such as Audacity is recommended for audio editing and digital sound recording.
- Phase 4: Art. Selection of the type of image, the technique and the resources necessary for its preparation and creation of the storyboard using free software such as Storyboard That. The number of scenes in the animation and the illustrations that each of the scenes will contain is chosen, associating each of them with the times marked on the timeline.

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- Phase 5: Video production and editing. Phases 3 and 4 are linked using free software such as OpenShot. The digital platform Padlet is used to share and disseminate the projects created, as it allows creation of collaborative walls. The teachers of the subject carry out the registration process and the students access their specific wall via a link and a password. The different projects are inserted on the wall in the specific section of the group. This will have a column layout, with one column for each group. The projects consist of the video created and the description, the analysis and group reflection on its constituent phases.

The project evaluation is the final phase of the project and contains the following items:

- Title of the work and justification for its selection.
- Project phases: planning and implementation.
- Coordination of the group, both physically in the classroom and online.
- Tools used during the process and for execution of the product.
- Difficulties encountered.

It should be noted that the students were introduced to the listening prior to the study as part of the active listening process. For example, one of the works used in this manner was "Hungarian Dance No. 1" by Johannes Brahms. This short musical piece consists of three brief musical fragments that repeat and contrast with each other. Brevity, repetition and contrast aid the listener's concentration, an essential factor when introducing active listening, with verbal expression acting as a facilitator of listening in this case.

The first step is to create a text consisting of four distinct parts (I + A + B + C) which also makes sense taken as a whole, as is the case of the musical structure. All the students learn the text part by part, but always reading it with the exact rhythm and tempo that characterises the piece they are going to listen to.

The roles are then assigned. A soloist will interpret a brief introduction (I). One group recites A, another group recites B, and then, they all come together in C, that is the orchestral tutti. Once this has been worked on and assimilated, the actual listening takes place. At this time, the students react with joy upon recognising the piece and they are subsequently asked to search among the musical repertoire to identify pieces for which they can apply this and other procedures worked on – corporal, verbal, vocal, instrumental, etc. – depending on the educational intention of the musical fragment chosen. This is also a way of achieving active musical listening by associating it with a symbolic visual representation that the students are familiar with.

Analysis strategies

Two sessions were designed: an initial exploratory session at the beginning of the course to set up the working groups and learn more about their beliefs, self-perceptions, possibilities for analysis of musical listening and subsequent application to teaching, level of digital competence and so on, and a final confirmatory session at the end of the course to analyse whether or not there was an evolution in their learning following the intervention.

The focus group technique was used for this purpose, with the groups consisting of between six and nine students in each of the phases. The average duration of the interviews was around 45 minutes, always ending with saturation of the discourse, with a total of three focus groups for each of the academic years analysed 2016–17 (7 + 7 + 6), 2017–18 (8 + 8 + 8), 2018–19 (8 + 8 + 7), 2019–20 (6 + 6 + 7) and (6 + 6 + 6). All the sessions were recorded with the consent of the participating students. Subsequently, both the two scheduled sessions and the information from the corresponding portfolios were imported into the qualitative analysis software Atlas.ti7. The three researchers conducted a year-by-year individual analysis of the qualitative content, assigning

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Table 2. Socio-demographic Characteristics

	Age Range: 21–22 $N = 104$							
	Male $N = 50$				Female $N = 54$			
	Level of previous musical studies at the conservatory level							
Academic year	No1	Ele2	Pro3	High4	No1	Ele2	Pro3	High4
2016–17	2	3	3	1	3	4	3	1
2017–18	3	3	3	2	4	4	4	1
2018–19	2	4	5	1	3	3	4	1
2019–20	2	3	3	1	3	3	3	1
2020–21	2	2	2	3	2	3	3	1
Total	11	15	16	8	15	17	17	5
	(22%)	(30%)	(32%)	(16%)	(27.65%)	(31.48%)	(31.48%)	(9.26%)

1No: Without studies; [2]Elementary; [3]Last year of Professional Studies; [4]Higher Studies.

emergent codes to sentences or paragraphs with the same meaning and grouping codes to identify categories. Once the various emergent code maps had been obtained by each researcher, they were pooled to examine commonalities and divergences through triangulation of the results. It was unnecessary to redefine the codes or categories in any of the sessions. Minor nuances that emerged did not constitute real discrepancies and were addressed respectively in each of the joint working sessions, reaching a 97% consensus.

An inductive and deductive analysis was used to determine the organisational structure of the code map from which the resulting categories emerge. One portfolio was analysed per working group, that is five portfolios corresponding to the 2016–17, 2019–20 and 2020–21 academic years and six portfolios corresponding to 2017–18 and 2018–19. The results are presented in tables that group the codes in each of the categories, and the comments shown were chosen due to their clarity and representativeness.

Results

The socio-demographic characteristics as set out in Table 2 indicate that the age range in all cases is between 21 and 22 years; 48% are male and 52% female. No significant differences were found both in terms of this aspect and the analysis of student opinions, and so the results are presented as if they were a single group. 55.77% of the students had a low level of musical knowledge, compared to 44.23% who had previous knowledge, with a resulting imbalance in the classroom for the development of musical skills.

The average time spent on each of the phases was as follows:

1. Selection, analysis of the work and recording of highlights, timing in minutes and seconds and selection of the theme: 2 hours.
2. Development and drafting of the work and framing within the time in oral format: 2 hours.
3. Storyboard and recording: 2 hours.
4. Selection and creation of images according to the text: 4 hours.
5. Staging and editing: 2 hours

After analysing their opinions, focus groups and portfolios and assessing their project, four categories emerged:

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Table 3. Self-perception at the Beginning of the Course Concerning Musical Listening Analysis and its Application to Teaching

	Code		Opinions	104	%
Musical listening analysis and application to teaching	Structural and technical-compositional analysis and teaching application taking into account the compositional characteristics: form, rhythm, characteristics of the melody, elements of musical expression with agogics and dynamics, tone, harmony and texture.	No Proficiency	I am unable to distinguish between the elements in the listening exercise. I have no musical knowledge.	20	19.23
		Low Proficiency	I definitely have difficulty distinguishing some of them.	38	36.54
		Basic Proficiency	I have always found it difficult to recognise the form of the work, but not the elements.	33	31.73
		High Proficiency	My level of musical knowledge is high, but it is easier if I have the score in front of me.	13	12.50

1) Self-perception at the beginning of the course regarding musical listening analysis and its application to teaching;
2) Self-perception of the level of digital competence at the beginning of the course;
3) Evaluation of the project and degree of application;
4) Improvement of knowledge following the intervention.

The first two are prior to the educational intervention and the last two after the corresponding portfolios have been completed and analysed.

With regard to the first category (see Table 3), it is noteworthy that 55.77% considered their musical knowledge would not allow them to tackle the subject successfully. 31.73% believed they could achieve the objective, and 12.50% indicated that they had full mastery.

With regard to the degree of acquisition, the students believe they have in terms of their level of digital competence, almost all of them considered it to be high or very high. However, when posed with the levels of competence taken from the Common Digital Competence Framework for Teachers (National Institute of Educational Technologies and Teacher Training, 2017a, b), with respect to 1. Information and Data Literacy; 2. Communication and Collaboration; and 3. Digital Content Creation, the levels were more realistic (see Table 4), and this trend was even more pronounced at the start of the project:

"I can't believe it. I thought I had it all clear, but now . . . "

In general, they mostly showed user-level mastery of word processing, social media, file sharing, etc., but with deficiencies in specific areas such as manipulation, creation and editing of audio, image and video files and in terms of platforms for team collaboration.

As for the evaluation of the project and its degree of application, basically two blocks of results were extracted, one of which is generic and the other regarding the improvement of knowledge following the intervention. 100% of students had a positive opinion (see Table 5).

The codes grouped in the category of knowledge improvement (see Table 6) obtained very good results that recognise the essential guiding role of the teacher in the whole process: "Without you, this would be impossible."

The results in Tables 4, 5 and 6 are also a faithful reflection of what the students express in the portfolios. Use of portfolios is important as their analysis facilitates evaluation, training, innovation and research, and they act as a constant guide in light of the disparity of prior knowledge of music among students undertaking teacher training studies (Esteve-Faubel et al., 2009; Esteve-Faubel et al., 2013).

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Table 4. Digital Competence Level Derived from the Common Digital Competence Framework for Teachers

Digital competence			.	%
1. Information and Data Literacy 2. Communication and collaboration 3. Digital content creation	Basic	For use of the mobile phone and the computer, yes. Otherwise no.	33	31.73
	Intermediate	I use a little of all three levels. I am comfortable with ICT for personal use.	69	66.35
	Advanced	I think I have good digital competence. I've made videos and designs using programmes and montages.	2	1.92
Level of knowledge of specific elements of the project				
Audio file creation, manipulation and editing	No knowledge	I have never had to manipulate an audio file, nor create an image.	80	76.93
	Some kind of level	I have used them for myself or for friends.	24	23.07
Video creation, manipulation and editing	No knowledge	Video creation or manipulation? No,	88	84.62
	Some kind of level	The videos I've created have been based on photos of family or friends.	16	15.38
Digital image creation and editing	No knowledge	I don't know how that works.	90	86.54
	Some kind of level	I've done a little, but I'm not sure what level is required.	14	13.46
Use of collaborative digital platforms	No knowledge	All I do is use the Cloud to store and share things with my colleagues and friends.	99	95.19
	Some kind of level	Apart from virtual drives, I've also uploaded a few things to my YouTube channel.	5	4.81

It also allows both students and teachers to critically reflect (Bird 1997; Cheng et al., 2018; Shulman, 1998; van der Schaaf et al., 2017), analyse the effectiveness of teamwork, learn about research and creativity, etc., with the aim of supporting and contributing towards adapted musical training through documentation of their learning experience (Orland-Barak & Maskit, 2017).

Teachers use portfolios to reflect on the coherence of what they intend to teach, allowing them to develop their critical thinking regarding educational action. The portfolio shows not only the learning progress made with the work assigned but also how the students perceive and internalise it, highlighting their autonomous work, their progress and evidence of their achievements (Hamilton, 2018).

Discussion

The comments of the students and the results obtained reflect the importance placed on innovative face-to-face and/or virtual learning environments in order to apply teaching models that foster the acquisition of musical knowledge, regardless of the starting level of these future teachers (Biasutti et al., 2015; Muhonen, 2016; Seddon & Biasutti, 2008; Thorpe, 2017).

The action research approach applied in this project consisting of an animated story facilitated development by the students of skills in the musical elements of listening through a specific application involving progressive use of digital competence through manipulation of images, audio and video and achievement of an interdisciplinary vision of learning through cooperative work. This is a means of harnessing the pedagogical potential of emerging technologies (Ferrari, 2013) to improve skills in the music teaching-learning process and meet current educational challenges.

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Table 5. General Assessment of the Pedagogical Proposal

		Opinions
Generic	Positive assessment	Not only did I have a great time, I learned a lot. I like it and I think it is one of the activities I have done that can benefit me the most in my future work as a teacher. I was greatly motivated by this activity.
Improvement of knowledge following the intervention	Interest and improved aural analysis of a work due to its applicability	Due to the importance given to each of the elements that stand out in the listening exercise, it is more motivating and productive than just analysing the score and following the music. It makes it less dry and I consider it to be useful for future use in the classroom.
	Encouraging creativity	This way I can give it a different perspective. I loved creating.
	Motivating	I had zero expectations but I really enjoyed it. I really liked this way of learning because I learned a lot.
	Increased knowledge of digital tools	This is the first time I've seen that ICT can be useful for more than just the typical applications. Possibility for use in the classroom.
	Collaborating on a project involving a specific product	I found the project very interesting. I worked well with my colleagues. We learned from each other and I think we did very well.
	Positive view of the interdisciplinarity, moving beyond compartmentalisation of knowledge through its applicability.	Now I understand how to take a cross-cutting approach to the subject and my work with colleagues, the use of different tools and my vision of the different disciplines . . . I really think they enrich the learning experience.
	Improved view of integration of subjects to form an ILU	I would like to implement an Integrated Learning Unit (ILU) when I do my internship in a school. I will raise this possibility, especially due to the COVID-19 pandemic, and let you know.

Despite the positive assessments of the pedagogical intervention carried out, it should be noted that in order to adopt correct music teaching approaches it is necessary to know how to sequence the salient elements of the listening exercise that are linked to the areas referred to in the music curriculum which must be applied by music teachers (Hennessy, 2000). This requires a balance between training as a general teacher and as a music specialist (Esteve-Faubel et al., 2007; Esteve-Faubel et al., 2009; Esteve-Faubel et al., 2013), given that construction of the music teaching approach must be based on mastery of the technical-compositional and structural elements of the work and its recognition in the listening exercise. Furthermore, it must be taken into account that this educational action is aimed at the general public; that is to say, primary music education is not synonymous with conservatory education, but rather with students acquiring the skills corresponding to their educational level (Esteve-Faubel, 2019; Holden & Button, 2006).

The results reflect the need for training in ICT, but with the specific aim of evolving towards more specific knowledge, at all times accompanied by methodologies and applications developed by the future teachers themselves that allow them to incorporate ICT into their daily work (Wise et al., 2011). This situation reinforces the importance of teaching-learning processes in university

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Table 6. Knowledge Improvement

			Medium	High	Very High
Knowledge improvement	Music	Aural analysis	$N = 15$ (14.42%)	$N = 66$ (63.46%)	$N = 23$ (22.12%)
			I came with zero expectations and I've learned a lot. I've started to get the hang of it, but I'm still lacking more musical proficiency.	I have intermediate-level conservatory studies, but I never would have imagined myself doing something like this. It's another way of doing things and I think you learn more.	I loved seeing how the analysis is reinforced through the story itself, it helps to highlight and choose what is most relevant in the listening exercise.
		Application of the listening exercise	$N = 6$ 5.76%	$N = 88$ 84.62%	$N = 10$ 9.62%
			Although I still find it difficult because my level of musical knowledge is low, I think I can do it well.	I think it's been a very positive experience. This is a new approach for me.	The applicability is very high, you can get a lot out of it: advertisements, publicity . . . I see a lot of possibilities.
		Awareness of spoken voice	$N = 6$ 5.76%	$N = 88$ 84.62%	$N = 10$ 9.62%
			I find it difficult to control the intonation of my voice when speaking, but it has helped me to be aware of how I do it.	I had never thought about voice before and it's really important. I hadn't stopped to think about it. I'm more aware and I've improved as a result.	Voice is very important as a means of communication, the tone, the breathing, the pauses . . . I've become more aware of the way I use it following the recording.
	Music-Art-Language	Interdisciplinary vision	$N = 2$ 1.92%	$N = 99$ 95.19%	$N = 3$ 2.89%
			Yes, it is both appropriate and necessary. It's impressive.	I see it as being useful because it broadens the vision of teaching. It's helpful for me and I think I'll be able to apply it in my classes. I don't know if it will work as well without your help.	I was pleased to see there's a lot of knowledge that can be worked on jointly, even if it is derived from different subjects. I think it's very interesting to apply it to other subjects.
		Techniques and resources: interdisciplinary projects	$N = 2$ 1.92%	$N = 99$ 95.19%	$N = 3$ 2.89%
			I need to practice to be able to integrate it into my future teaching planning	I see the possibility of project-based learning with a music-related perspective or content.	It's very important to integrate these tools into normal classroom practice and the methodology should not be restricted to the subject matter nor be approached in a compartmentalised manner.

(*Continued*)

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Table 6. (*Continued*)

		Medium	High	Very High
	Future application in the classroom	*N* = 2 1.92%	*N* = 99 95.19%	*N* = 3 2.89%
		I would need help, but I think I can come up with small projects. Can I ask you for help if I need it?	I think it's important to see the connections between the subjects. I think this activity is useful for me to transfer it to other subjects.	I believe it's one of the subjects with the greatest applicability because it incorporates content from various subjects; it's creative and highly applicable.
Digital Competence	Expansion of knowledge and use of software	*N* = 3 2.88%	*N* = 18 17.31%	*N* = 83 79.81%
		Although I think I have improved, I still need to be more confident. But I have improved.	It's helped me with my knowledge and skills with digital tools.	I've broadly improved my digital competence by working with different tools for a specific purpose and in a meaningful way.
	Future use for teaching	*N* = 3 2.88%	*N* = 93 89.42%	*N* = 8 7.7%
		I don't think I have an adequate level to be able to apply it in the classroom yet.	Although I haven't completely mastered it yet, I think it's very necessary for future teachers.	I have certainly broadened my knowledge and practice with digital tools that will be an integral part of future teaching.
	Inclusion as a methodological tool	*N* = 3 2.88%	*N* = 93 89.42%	*N* = 8 7.7%
		I knew about such tools, but not so much about how to make them useful.	The applications used have made me see another way of learning. I think they are good for teaching.	After what we've seen, their inclusion is undoubtedly essential in order to improve teaching at all levels of education.

classrooms based on cooperative training where the student is an active agent in their learning process. This ensures that each student, regardless of the courses studied or mastery of the subject at the start, feels involved and effectively develops skills, with the teacher acting as a guide throughout the process.

According to Beck (2017), experiences like these are positive for students as examples of real incorporation through practice and also due to the fact that it is not a one-off intervention but rather a cyclical one with constant feedback. However, it is equally true that interdisciplinary work in university classrooms is less common due, among other reasons, to the fixed and relatively inflexible timetable structure, the compartmentalisation of different subjects and the resulting dynamics that hinder its application.

This pedagogical approach explores an interdisciplinary vision and application of knowledge that is both motivating and creative given that it is related to their real world (Bolden, 2009), as well as including and integrating a type of educational intervention that moves them away from a totally passive role in their training (Bacher, 2009; Cook-Sather, 2007) and allows them to acquire the skills and attitudes they need to successfully deal with the complexities of specific real-life situations and demands.

The construction and improvement of musical and digital knowledge with the aim of producing an applicable end product is achieved through action, production and research, working together with their peers to build knowledge cooperatively in a heterogeneous group.

Although this article focuses on improvement of music studies through the use of ICT and audiovisual and linguistic tools, it can be seen how this collaborative work also reinforces soft skills and validates use of the digital portfolio as a self-regulator of learning in the music education classroom and a source of constant feedback both for the students themselves and for the teachers.

As has been made clear, the teacher assumes a key role to guide and reorient the students, but above all as a researcher of classroom problems. This is the origin of the cooperative work model proposed, which aims to form the basis of a culture of collective, non-individualistic teaching action in the future work carried out by university students who complete their training as primary teachers.

This methodological approach can be used by them as a model as it includes collaborative work for the organisation and development of specific proposals, as well as adaptation to the contexts and demands of the environment. At the same time, these tasks are closely related to the creative, adaptive and interdisciplinary responses that will form part of their future professional reality. Within this context, the inclusion of ICT as an inseparable aspect of educational practice at a global level (Tondeur et al., 2008) can help to achieve real and effective insertion that facilitates independent learning of musical skills, the ultimate aim of the entire project.

While the animation activity proposed in this study has covered the perspectives of musical aural analysis, digital competence and the interdisciplinary nature of learning, along with feedback to foster reflection-action, the fact that follow-up cannot be performed when the participants are actually teaching limits the results and the possible improvements of any initiative of this type. However, when teacher training students spend short periods of time in schools to carry out practicums, their reports often include activities of this type which are carried out in the primary classroom.

Conclusion

The music teaching training model presented not only brings students closer to real situations typical of their future work, it also offers them the possibility of broadening their previous musical beliefs and improving their acquisition of a series of practical musical abilities, skills, knowledge, values and attitudes, among others, which all combine to achieve a specific end. The results show the advantages of using ICT (visual materials in this case) as a means of achieving the proposed

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goal of improving music education and in a manner where music listening plays a fundamental role in the learning process. In addition, in a certain manner the activity proposed is perceived as a playful activity. This fosters participation and motivation, key aspects to increase students' knowledge of the musical topic while at the same time developing research and personal skills. To this end, students need guidance regarding their approach to situations requiring a combination of knowledge, intellectual skills, techniques, attitudes and values from the viewpoint of both a general teacher and a music specialist in order to successfully execute projects that are duly connected with reality.

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