

Article

Music as a Tool for Promoting Environmental Awareness. Experiences of Undergraduate Education Students on the Production of Video Tales in the COVID-19 Pandemic

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Abstract: This paper elaborates on the didactic implementation of musical theater with undergraduate education students. Students had to select, prepare, justify, design, elaborate, rehearse, stage, and record an educational tale that targets ecological and environmental values in its main plot or storyline. Due to the COVID-19 pandemic, the implementation of this didactic proposal went online, and the interactions between students took place through video calls. This study surveyed a sample of 86 participants ($n = 86$) from a population of 116 students ($N = 116$) from the Faculty of Education of Albacete (UCLM) to investigate the advantages and disadvantages of carrying out this activity in an online format. The main challenges exposed the complexity of coordinating a team in a completely online format, problems related to physical isolation, and the limited access to a high-quality internet connection. The reported benefits included the development of digital competences, the interactions through social media, and creative thinking. Most students viewed this activity as didactically innovative and 98.84% agreed that musical tales and musical theater can be useful for promoting environmental awareness.

Keywords: COVID-19 pandemic; environmental awareness; music education; online education; undergraduate students



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1. Introduction

In the Spanish educational system, teachers of early childhood and primary schools receive formal training through official undergraduate programs [1]. These programs span four academic years and a total of 240 ECTS (European Credit Transfer and Accumulation System) credits and include the writing and defending of a bachelor's thesis (also known as *TFG*, in Spanish). A series of concentrations or majors are available to students in their junior and senior years, e.g., music, physical education, therapeutic pedagogy, foreign language, natural sciences, information, and communication technologies in education, to cite a few. Basic musical training is a mandatory component of the core curriculum of all undergraduate programs in early childhood and primary school teaching.

The latest educational reforms in Spain argue that teachers should seek meaningful learning in their students. Teaching students to assess a set of key skills (to know, to know-how, and to know how to be) achieves meaningful learning in this context [2]. To make teaching and learning proactive and effective, a teacher should consider these three aspects: (a) experimentation and collaborative learning; (b) adequate teaching methods; and (c) a positive classroom environment. These pedagogical aspects can help to promote personal and social responsibility in students [3]. Presently, in the Spanish curriculum music is taught in primary schools as a subject called Arts Education which can be divided into Plastic and Visual Education, and Music and Dance [4].

The importance and relevance of music education in general public schools is defended by multiple authors [5–9]. There are many publications that attribute many developmental

benefits to music—cognitive, psychomotor, and socio-emotional [10–17]. However, recent meta-analyses and systematic reviews argue that empirical evidence for the improvement of cognitive and academic skills from music training is rather limited [18–22]. It should be noted that these negative reviews do not diminish the aesthetic value of music and its importance in society, as well as other benefits derived from musical training. Musical experiences can have transformative psychological effects on listeners in the domain of music therapy [23–25]. Additionally, making music can have positive personal and social outcomes for a student, helping them to overcome challenges, develop teamwork and cooperation skills, build self-confidence, develop a sense of self-achievement, and feel more integrated with a sense of belonging to a group [26]. This paper will argue that music can be a powerful vehicle for promoting ecological values and raising students' environmental awareness and care.

1.1. Environmental Awareness

Presently, there is an increased awareness of the need to care for, respect, and support our natural environment and ecological behaviors from early childhood. In Spain, the General Organic Law of the System of Education of 1990 (known as *LOGSE*, in Spanish) [27] introduced the concept of environmental education in the curriculum by focusing on the importance of caring for the environment, promoting more responsible consumption by reducing, reusing, and recycling wastes, warning students about the setbacks of non-renewable energies, and raising awareness of air pollution, among other issues. The United Nations declared 2005–2014 as the Decade of Education for Sustainable Development [28], promoting new initiatives to be incorporated into education [29].

The number of publications featuring ecological values and environmental awareness has significantly grown in recent decades, particularly in the domain of education [30–39]. Dunlap and Jones defined environmental concern as “the degree to which people are aware of environmental problems regarding the environment and support efforts to solve them and/or indicate the willingness to contribute personally to their solution” [35] (p. 485). Environmental awareness includes a set of favorable values and beliefs about caring for and respecting the environment and reducing the environmental impact of human actions [36,37]. Some issues of environmental concern are the extinction of species, the limitations drawn from non-renewable energies, the management of natural resources, global warming, and air, soil, and water pollution, among other issues [38]. Environmental awareness requires a specialized set of knowledge and experiences, and calls for action to improve the environment in which present and future generations live [39,40].

Curtis et al. [41] have reviewed eight case studies that include ecological proposals through the arts. Their research suggests that there are at least three ways in which the arts can contribute to ecological and environmental awareness: (a) communicating information (through the message of the work of art itself); (b) creating empathy for the natural environment (developing an emotional rapport with nature); and (c) embedding the arts in ecologically sustainable mediums (e.g., creating art with recycled materials). Woynarski [42] reaffirms the relevance that the arts and music have in promoting ecological thinking: “Ecological thinking is to do with art, philosophy, literature, music, and culture as ecology includes all the ways we imagine how we live together” (p. 8).

1.2. Musical Tales in Music Education

A tale is a short fictional story with a small number of characters and a simple plot [43]. Tales are a powerful tool for developing transversal competences, as they stimulate creativity and imagination, awaken students' sensitivity, aid in developing their personality and critical judgment, and promote social values [44,45]. In education, tales present multiple benefits in all areas of the curriculum through instating interdisciplinary rapport and inclusive, active-learning methodologies. Preparing, rehearsing, and staging tales in the classroom is a project-based learning methodology where a student's final performance becomes a recorded educational product. One of the outcomes of a proper educational

implementation of tales is constructive learning, which implies integrating and connecting new knowledge and experiences with previous ones [46].

A musical tale unites narrative and dramatic elements with musical expressions (dancing, singing, and playing instruments) [47]. It is necessary to account for the didactic goals that one is pursuing when establishing an action plan for designing and staging a musical tale as a short play. These goals can target diverse ecological themes in an interdisciplinary way. To this end, the plot of a musical tale can be invented, adapted, or retrieved from similar proposals [46]. Musical tales are an excellent didactic resource for value-based education, raising ecological awareness and critical thinking for environmental care [48,49]. At the same time, the design, preparation, rehearsal, and staging of musical tales as short educational plays help students to learn new concepts and positively affects their integral development as humans [50].

1.3. Research Goals

The objectives of this study were to analyze the students' perceived challenges, benefits, and the perceived relevance of a didactic implementation with musical theater as a teaching and learning methodology for online education. This study aimed to identify (i) the challenges and benefits experienced by students in the online didactic implementation of the musical tale and (ii) the overall didactic benefits reported by the students working on the musical tale project.

2. Materials and Methods

The present study is descriptive, mixed with quantitative and qualitative approaches. It examined a didactic implementation that moved online due to the COVID-19 pandemic. In this implementation, students engaged in a team project requiring them to select, prepare, justify, design, elaborate, rehearse, stage, and record an educational tale making use of musical expressions (singing, dancing, and playing instruments). The storylines and plots of these musical tales aimed to raise environmental awareness and to promote ecological thinking. This study followed Supplementary Materials: Checklist for Reporting Results of Internet E-Surveys (CHERRIES) [51].

2.1. Participants

The sample consisted of 86 participants ($n = 86$) out of a total of 116 students ($N = 116$, female = 88) enrolled in a music education course in their third year of the bachelor's degree of Primary Education Teaching. The music education course is taught in two languages, Spanish to native speakers, Group A ($n_1 = 64$, $N_1 = 79$), and English as a Second Language (ESL), Group B ($n_2 = 22$, $N_2 = 37$). The participation rate was 75.86% with a completion rate of 98.73%. Data collected from the study were part of in-classroom activities that students performed in a music project. Participants consented to the use of their answers in anonymized form for research purposes. No identifiable or personal information was stored.

2.2. Questionnaire Design

The data were collected, analyzed, and interpreted through a questionnaire that was sent to all enrolled students. The electronic questionnaire was tested before fielding the questionnaire for testing usability and technical functionality. Additional questions, not included in this study, assessed student experience and satisfaction with the virtual experience of the musical tale project. The questionnaire had six items: three items were short open-ended questions; two were binary close-ended questions (yes/no), and one aimed at group identification (Spanish vs. ESL). All questions were laid in a single screen or page and no adaptive questioning was used. In order to guarantee the completeness of the submitted answers, all questions were marked as mandatory, providing non-response items when applicable (e.g., "rather not say").

2.3. Questionnaire Administration and Data Extraction

The questionnaire was administrated as a closed survey, since the questionnaire was restricted to students enrolled in the Music Education course. The questionnaire was advertised in class as a voluntary survey at the completion of the musical tale project and its respective assessment. No incentives were offered for replying to the questionnaire and participation carried no repercussions on the grades of students. Google Forms was used for automatically capturing the responses and items were randomized to prevent biases. To avoid duplicate responses from the same individual, the number of responses per participant was limited to one. Once the questionnaire was filled and the answers sent, respondents were not allowed to change their answers. Only completed questionnaires were analyzed. Data extraction was performed using Microsoft Excel 16.0. The verification of the extracted data was performed by both authors.

2.4. Data Analysis

An iterative qualitative data analysis model was followed to reduce the data collected from the students' impressions and to identify the main challenges and benefits of the online musical project [52]. The results were reported as the number of answers and the percentual weight of each item. A single category was selected in each answer, indicating the main benefit and the main challenge reported by the student. Statistical analysis on the differences in the weight of each item between groups A and B was performed using the students' *t*-test calculating *p*-values.

2.5. Didactic Implementation Procedure

In the second semester of the 2019/20 academic year, junior students of the bachelor's degree in Primary Education Teaching were asked to design and present an educational musical tale. This assignment, weighing 60% of the final grade, was an alternative to the final exam [53]. The other 40% corresponded to individual activities. In pre-pandemic times, students completed this group project as a short play in a face-to-face format. Students made use of the available spaces and materials of the Faculty of Education. However, due to COVID-19, the procedure of this project was required to change. As a result, students individually recorded their musical tales. Afterward, students edited these short videos and merged them to submit a single video [54,55].

At the beginning of the course, the professors presented and described the musical tale project and asked students to create groups comprising approximately 6–7 individuals. This resulted in 17 projects. The didactic goal of each project was the interaction of three artistic expressions (music, visual arts, and theater) framed within environmental education as a general thematic axis. The professor indicated the various stages of the project requiring, in addition to a performance, a short report that included a justification, a didactic unit (contextualization, learning goals, competences, contents, materials, methodologies, activities, and assessment), and some closing personal remarks on the overall project.

During the semester, the first wave of the COVID-19 pandemic imposed a lockdown that forced all educational activities to move online. Music Education lessons continued online, although many of the in-person musical practices needed adaptation. Students met online through video calls (Microsoft Teams) to work on their musical tales. Teamwork took place through instant messaging apps (WhatsApp) and email (Microsoft Outlook). The COVID-19 lockdown negatively affected the overall psychological state of students [56–65], which could have in turn affected student satisfaction ratings and project feedback.

3. Results

There were a series of issues with completing the musical tale project in an online format. The students' answers were grouped into eight items according to the similarity of the reported challenges (Table 1). The most recurring difficulty was the complexity of organizing and coordinating teamwork in a completely virtual environment. This struggle seems to be related to the second most common difficulty: dealing with the physical

isolation imposed by COVID-19 restrictions and the lockdown. Other problems included weak internet connection and communication issues.

Table 1. Challenges expressed by the students in the online project of a musical tale.

| Challenges | Group A (n ₁ = 64) | | Group B (n ₂ = 22) | | Total (n = 86) | | One Tailed p Value |
|---|-------------------------------|-------|-------------------------------|-------|----------------|-------|-----------------------|
| | n | % | n | % | n | % | |
| Complex coordination of teamwork | 36 | 56.25 | 10 | 45.45 | 46 | 53.49 | 0.197 |
| Physical isolation | 15 | 23.44 | 3 | 13.64 | 18 | 20.93 | 0.146 |
| Weak internet connection | 9 | 14.06 | 1 | 4.55 | 10 | 11.63 | 0.068 |
| Communication issues | 3 | 4.69 | 2 | 9.09 | 5 | 5.81 | 0.261 |
| Musical content | - | - | 2 | 9.09 | 2 | 2.33 | 0.081 |
| Lack of experience in audio and video editing | 1 | 1.56 | 1 | 4.55 | 2 | 2.33 | 0.270 |
| Noise pollution in domestic environment | - | - | 1 | 4.55 | 1 | 1.16 | 0.164 |
| Plot on environmental education | - | - | 1 | 4.55 | 1 | 1.16 | 0.164 |
| Rather not say | - | - | 1 | 4.55 | 1 | 1.16 | 0.164 |

Note. Own elaboration from data collected through questionnaire.

However, the students also identified a series of benefits from carrying out the musical tale project online (Table 2). Greater heterogeneity was found in students' responses. Students valued the interaction positively due to greater access to digital tools and an increased understanding of basic video editing. They also appreciated the interactions through social media and the possibility of using video editing and sharing apps such as TikTok. Another recurring benefit was the possibility of recording oneself as many times as needed. Students indicated that this provided psychological relaxation as they did not need to stage a final, live performance. Creativity, time management, increased comfort, and better concentration are a few of the other benefits that students indicated toward favoring online education.

Table 2. Benefits expressed by the students in the online project of a musical tale.

| Benefits | Group A (n ₁ = 64) | | Group B (n ₂ = 22) | | Total (n = 86) | | One Tailed p Value |
|----------------------------------|-------------------------------|-------|-------------------------------|-------|----------------|-------|-----------------------|
| | n | % | n | % | n | % | |
| Use of ICT and video editing | 11 | 17.19 | 7 | 31.82 | 18 | 20.93 | 0.101 |
| Interaction through social media | 9 | 14.06 | 5 | 22.73 | 14 | 16.28 | 0.200 |
| Psychological relaxation | 10 | 15.63 | 2 | 9.09 | 12 | 13.95 | 0.202 |
| Creativity, reinventing yourself | 9 | 14.06 | 1 | 4.55 | 10 | 11.63 | 0.068 |
| Better use of time | 8 | 12.50 | 1 | 4.55 | 9 | 10.47 | 0.101 |
| Greater comfort, no commuting | 5 | 7.81 | 2 | 13.64 | 7 | 8.14 | 0.429 |
| Better concentration | 1 | 1.56 | 1 | 4.55 | 2 | 2.33 | 0.270 |
| Decoration and special effects | 2 | 3.13 | - | - | 2 | 2.33 | 0.079 |
| Rather not to say | 9 | 14.06 | 3 | 13.64 | 12 | 13.95 | 0.481 |

In Table 3, the students identify the single most valuable aspect that the musical tale project had for their education training as teachers. The most reported benefit was the didactic innovation of the project and its use of active learning methodologies (project-based learning). The second most popular answer pointed to the importance of music in general education and its benefits. In total, 16.28% of the students pointed out that the main benefit of this project was that it helped them to increase their environmental awareness. The musical tales helped the students to increase their motivation in an enjoyable and positive manner. Other aspects included the relevance of the musical tale as a tool for conducting cooperative, meaningful, and interdisciplinary learning through musical activities. In the final two questions of the questionnaire, 98.84% of the students indicated that the musical tale was a useful didactic resource for promoting ecological values and environmental awareness in an interdisciplinary way. A total of 90.70% indicated that they felt prepared

to develop this activity in primary education schools in the future. After applying the students' *t*-test, no significant differences were encountered between groups A and B, suggesting that both groups experienced similar challenges and benefits from the didactic implementation.

Table 3. Reported relevance of the musical tale as a didactic tool.

| Relevance | Group A (n ₁ = 64) | | Group B (n ₂ = 22) | | Total (n = 86) | | One Tailed <i>p</i> Value |
|---|-------------------------------|-------|-------------------------------|-------|----------------|-------|------------------------------|
| | n | % | n | % | n | % | |
| Didactic innovation. Active methodology | 21 | 32.81 | 5 | 22.73 | 26 | 30.23 | 0.180 |
| Importance of music | 12 | 18.75 | 4 | 18.18 | 16 | 18.60 | 0.477 |
| Environmental awareness | 11 | 17.19 | 3 | 13.64 | 14 | 16.28 | 0.346 |
| Highly motivational, playful, and fun | 6 | 9.38 | 4 | 18.18 | 10 | 11.63 | 0.173 |
| Singing, dancing, playing instruments | 6 | 9.38 | 2 | 9.09 | 8 | 9.30 | 0.485 |
| Interdisciplinary context | 3 | 4.69 | 3 | 13.64 | 6 | 6.98 | 0.135 |
| Use of digital technologies | 2 | 3.13 | 1 | 4.55 | 3 | 3.49 | 0.390 |
| Assessment system | 1 | 1.56 | - | - | 1 | 1.16 | 0.161 |
| Rather not to say | 2 | 3.13 | - | - | 2 | 2.33 | 0.079 |

4. Discussion

The main limitations of this study are that (i) the didactic implementation of the musical tale was delivered in a pseudo-experimental way without a control group; (ii) this study was performed during the COVID-19 pandemic, potentially altering the student perception of online learning due to external factors; (iii) teachers did not undergo a prolonged specific training in online teaching methodologies due to the sudden and unexpected evolution of the pandemic. These limitations may partially limit the interpretation of the presented results.

There is a large amount of Spanish literature on the topic of “musical tales” (*cuentos musicales* or *cuentos musicados*, in Spanish), understood as an effective didactic resource for unifying musical expressions through the dramatization of a children’s story [29,46,49,50,54]. Many of these studies approach the musical tale from a theoretical perspective. Arguedas Quesada [47] analyzes the activities of a musical tale highlighting its literary, musical, aural, motor, creative, and plastic components. Toboso Ontoria and Natividad [66] offer a classification of musical tales according to the nature of musical materials used (e.g., narrative songs, programmatic instrumental music, or background music to spoken word).

There are also practical proposals in the literature, with musical tales promoting environmental awareness. Montes Martín [67] shares a didactic experience called “Recycled Sounds” (*Sonidos reciclados*, in Spanish) which suggests the creation of recycled instruments as part of a workshop on trash and waste. The recycled instruments are used to improvise and compose the soundtrack of a musical tale in order to promote ecological awareness. García Sánchez [29] analyzed the presence of sustainability topics in the story plots of the musical fables that were created by undergraduate students of Early Childhood Education at the University of Cordoba. Although moral and environmental education had a significant presence in the story plots, many ecological topics were left undiscussed, e.g., the use of renewable energies, the inequality of natural resources, or irresponsible and unsustainable consumption.

In the literature, musical tales are understood as musical theater, where students stage and perform a children’s story by making use of musical activities in-person. Therefore, this paper elaborates on the transformation of musical tales into an online format with students interacting remotely through videocalls. The questionnaire responses identified several benefits and drawbacks to working on the musical tale project in this format. The most notable challenges included the complexity involved in coordinating a group within an online environment. The internet offers many tools for connecting people, but it also presents considerable drawbacks such as increased distractions, an overflow of information,

and the effacing of the boundary between personal life and work. These factors might have negatively affected the coordination of a team online. An added issue was the physical isolation derived from the lockdown and social distancing measures resulting from the COVID-19 pandemic.

The students also identified the many benefits of carrying out the musical tale project online. Some of the reported benefits are applicable to online education in general, e.g., there is no need to commute, greater comfort in an individual's personal space, opportunity for better concentration, and better time management. However, there are baseline requirements needed to fully gain from online education. In particular, improvement is required with regards to better concentration without distractions. It should be noted that not all students have the adequate conditions for an acoustically isolated, private space for studying at home. Some students reported that they grappled with a weak internet connection and noise pollution in the domestic environment (e.g., roommates, younger siblings, TV in the background, household chores, noisy neighbors, etc.).

The pedagogical value of the musical tale lies in its engagement with active and meaningful learning. However, when considering an online environment, deficiencies in teaching methodology can reduce learning to observation and passive repetition [68]. Students reported that working on this project helped to improve their psychological state, despite the setbacks imposed by the COVID-19 pandemic. Students positively valued the creativity, cooperative learning, and the interdisciplinary context of designing, preparing, and recording musical tales.

Music education is a fundamental area in human development with several interdisciplinary liaisons in the social, intercultural, communicative, linguistic, artistic, and environmental domains. The results of the questionnaire explore the multiple aspects that should be considered for the delivery of a successful undergraduate music education course within a virtual learning environment. Musical tales can promote ecological values through theatrical play as ecodramaturgies [42]. As Kireeva [69] points out, "the natural-oriented method in the framework of ecological approach has not lost its significance in solving vital tasks of the formation of a creatively active personality" (p. 116).

Music education should be regarded as an interdisciplinary subject that promotes sustainability and environmental awareness and helps to develop key competences that lead to integral student development. Some recommendations for teachers are that (i) the design, rehearsal, justification and staging of musical tales helps to boost students' creativity, teamwork, organization, and planning and helps their acquirement of key competences to work online in an interconnected environment; (ii) curriculum adaptations should be encouraged to address the learning needs of the students through a more integrated and holistic approach; and (iii) participation in specific training for online active methodologies should be encouraged to design interdisciplinary online learning experiences.

Supplementary Materials: The following are available online at <https://www.mdpi.com/article/10.3390/educsci11100582/s1>, Checklist for Reporting Results of Internet E-Surveys (CHERRIES) [51].

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