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Digital competence and the use of technological resources by teachers in music conservatories and schools of music

Competência digital e uso de recursos tecnológicos na área de ensino de conservatórios e escolas de música

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Abstract: At present, digital technology provides innumerable new possibilities in the field of musical education. Its tools are, a valuable mediator in teaching-learning processes at the levels of elementary and university education, and specialisation. This study examines the knowledge and use of technological resources in the specific sphere of teaching in elementary, intermediate and superior stages

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in music conservatories and schools of music. By means of an online questionnaire administered to 82 teachers in this field, significant data was obtained regarding said knowledge and use of technological tools. These results provide evidence that those tools are scarcely applied, whether in preparing classes or in learning processes in the classroom. The only positive data appears in connection with the use of sound and sheet music editors.

Palavras-chave*:* Digital Technology. Musical Education. Music Conservatories. Schools of Music.

Resumo: Hoje, a tecnologia digital traz um universo de novas possibilidades no campo da educação musical. Suas ferramentas se mostram como um valioso mediador nos processos de ensino-aprendizagem, seja na educação básica, universitária ou especializada. Este estudo examina o conhecimento e a utilização de recursos tecnológicos na área específica do ensino em conservatórios -–fundamental, médio e superior– e escolas de música. Através de um questionário online dirigido a 82 professores da área, foram obtidos dados significativos em relação ao conhecimento e utilização de ferramentas tecnológicas. Esses resultados mostram sua escassa aplicação, tanto na preparação das aulas, quanto nos processos de aprendizagem desenvolvidos em sala de aula. Apenas dados positivos podem ser vistos no uso de editores de som e de partitura.

Keywords: Tecnologia Digital. Educação Musical. Conservatórios de Música. Escolas de Música.

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Introduction: musical education and new technologies

The permanent development of information and communication technologies may be a decisive factor in the profound transformations that are taking place in all sectors of contemporary society. In the educational context, their impact has led to a growing interest in the field of teaching and in multiples areas of research. In the last ten years, new technologies have acquired greater relevance and are attracting greater attention (Adelsberger, Collis and Pawlowski, 2013). According to Webster (2002: 38), "Music is everywhere in these media, and music teachers are continually inspired to use these computer-based technologies in their work. [...] Thus, our fascination with technology and its role in teaching and learning continues to grow". From this perspective, it is essential for teachers to stay abreast of technological innovations in order to use them efficiently for teaching and to satisfy the needs of new generations (Gorgoretti, 2019). As pointed out by Román-Álvarez (2017: 481), "whether we like it or not, technologies are part of our daily life. Learning to coexist with them is not only an obligation, but also a need in order to avoid falling into a new type of illiteracy, namely technological".[5] However, the use of ICTs in the classroom does not guarantee a competent pedagogical approach (Krumsvik, 2008: 279). In this sense, Gisbert, González and Esteve (2016: 78) advocate for taking another step in teacher training, which is traditionally separated from the area of study and pedagogical reflection, and continues to be generic, technical or excessively geared at elementary alphabetization.

The constant technological advance has produced a wide range of resources that can be used in educational contexts; but it has also provoked changes in teaching methods and the profile and role of teachers, currently seen as facilitators of learning (Ho, 2004: 57). This aspect reveals that we are facing a process of transformation that is more complex and deeper than what could be initially

5 Original text: "Las tecnologías, queramos o no forman parte de nuestra vida cotidiana. Aprender a convivir con ellas no solo es una obligación, sino una necesidad para no caer en un nuevo analfabetismo: el tecnológico".

suspected. As highlighted by Delalande (2004, p. 19), technologies are not only tools, but also the effect of a paradigm that promotes another model of musical society. Delalande (2004) establishes two major «technological revolutions» in the history of western classical music. The first one is the development of musical writing, which during the Middle Ages ceased to be a simple means of conservation and transmission and became a way of composing polyphonic music. From this perspective, musical writing must be construed as a compositional tool, as a technology that enables developing sound structures that are unimaginable from the standpoint of orality (GARCÍA, 2020). The second revolution occurred in the 20th century with the possibility of recording and reproducing sounds, and the subsequent development of electroacoustic and computer resources. Delalande (2004) establishes a clear correspondence between the two technological landmarks (musical writing and the phonograph), as both produced profound consequences in the manner of thinking music at the aesthetic and creative level as well as the social and pedagogical one. As stated by Mark and Madura (2010: 140), "technology will continue to evolve and music teachers will need to be prepared for a shifting paradigm for music education". Nonetheless, comprehension of musical technology, which is mainly acknowledged as a tool, is still limited (Southcott and Crawford, 2011: 122). This justifies the need to promote changes that have greater structural repercussion. For example, Gorgoretti (2019, p. 1) insists on the importance of updating curriculums to integrate ICTs in the training of music teachers. This also depends on two major factors, namely the economic investment to equip schools and their classrooms, and the training of teachers (Román-Álvarez, 2017: 482). As Aróstegui points out (2010: 18):

> The educational possibilities of Information and Communication Technologies (ICT) and the need to teach students how to use them are two major challenges faced by the school system. In order to deal with these new challenges successfully, it is necessary to provide schools with materials which will also have to be constantly updated as this technology advances, in addition to proper training

for teachers - not only in technical terms, but also in terms of the educational use of these resources.

In this process of constant teacher adaptation, one must also bear in mind that in Spain, the country in which this study was carried out, and in the majority of western countries, students have normally been alphabetized in digital environments (Hagood and Skinner, 2012: 4), both in respect to the use of mobile devices with tactile screens (PDAs, iPods, iPads, *tablets* and smartphones) and the use of multiple applications that enable them to play with sounds and music in a direct and intuitive manner (Stephenson and Limbrick, 2015: 3777). These resources could be a medium with which to foment creativity in connection with strategies such as the resolution of problems. Jeffrey and Craft (2004, p. 84) consider that one of the principal characteristics of creativity is 'possibility thinking', as it enables students who engage in activities based on new technologies to take control and act in an innovative manner. In order to implement these strategies in an effective manner in the field of musical education, Webster (2007, p. 1311-1328) proposes three necessary conditions: a) appropriate technological development; b) availability and integration; and c) to always follow a constructivist approach in teaching-learning processes. In addition, teaching critical comprehension of the tools that are being used is also essential, given that as Aróstegui (2010: 28) points out, "knowledge is a social construction. This is an ideological question, which is frequently denied if it is stated that this resource is objective and aseptic in itself". From a similar perspective, Román-Álvarez (2017, p. 483) proposes the example of Web 2.0 (or online) resources and free or open source software, which allow creating and freely sharing, without the need for a large economic investment (by schools or students). Moreover, this promotes education in values and respect for community work, as evidenced by the use of free musical applications such as Audacity and Musescore.

Digital competence in the field of teaching in music conservatories and schools of music

In respect to other educational spheres, the specific context of teaching in music conservatories and schools of music shows greater resistance to incorporating pedagogical innovations related to the new technologies (Díez-LATORRE, 2018). In his study on the integration of ICTs in conservatories of music in the Spanish region of Galicia, Belló (2012) found that the use of educational technologies was scarce, due to a low level of motivation, as well as lack of time and training of teachers. Along the same lines, Palau, Usart and Ucar (2019: 24) state that "in general, in conservatories of music there is very little use of educational technologies, with teachers claiming lack of time and training in this field. In addition, few scientific studies have been devoted to measuring and analyzing teacher self-perception of their own Digital Competence".6 Authors such as Gutiérrez, Palacios and Torrego (2010, p. 269) argue that in order to achieve the adequate integration of ITCs in the curriculums, it is essential to focus on the initial training phase of future teachers. In contrast, Díez-Latorre and Carrera (2018, p. 41) uphold that the necessary preparation to exercise future teaching effectively must be acquired in the elementary and professional conservatories and schools of music, where the content of curriculums and teaching guidelines of the subject of Musical Pedagogy must be urgently revised. In addition, this would also entail adopting a more reflexive and critical approach in respect to the pedagogical processes, since not only is it a question of acquiring aptitudes and knowledge, but also of seriously reconsider the implications that ICTs may have in their future profession (Díez-Latorre, 2018: 32). Lastly, in addition to the aforementioned initial training and preparation in superior music conservatories, Bautista and Fernández-Morante (2018, p. 4) state that another fundamental element of this technological implementation is academic research promoted by universities.

6 Original text: En los conservatorios de música en general existe un parco uso de la tecnología educativa, con un profesorado que alega falta de tiempo y formación en este ámbito. Además, pocos son los estudios científicos dedicados a medir y estudiar la autopercepción de los docentes sobre su propia Competencia Digital".

On the other hand, note should be made that new technologies in themselves do not entail pedagogical innovation. Their effectiveness depends on their use and teachers' attitudes. In this sense, different studies show very positive results in the use of new technologies, particularly in common subjects. For example, note should be made of the contributions of ICTs in the field of auditory education, particularly of activities involving dictation, listening and transcription of musical fragments (Balo, Lago and Ponce de León, 2014). Another area that provides interesting solutions is the application of specific software, such as applications for audio, sheet music editors, accompaniment software, virtual classrooms, etc. (López, 2011). In the specific case of sheet music editors, their effectiveness to improve sight-singing has been confirmed (Galera, Tejada and Trigo, 2013), as well as auditory training and the acquisition of rhythmic abilities (Ordoñana, Laucirica and Tejada, 2004). Mention should also be made of the benefits of using digital boards in elementary and professional conservatory classrooms, in particular for the subject of Musical Language (Bernabé, 2013).

However, it is evident that a traditional pedagogical model based on a direct teacher-student relationship continues to predominate in instrumental music instruction in conservatories and schools of music in Spain. As highlighted by Bautista and Fernández-Morante (2018, p. 4), in this 'conservatory model', the *maestro* is sometimes presented as a prominent figure (more artist than teacher) whose methods are not usually supervised or questioned. From this point of view, "the new teaching methodologies constitute a threat to the individualism that prevails in the instrumental pedagogical tradition, in a competitive system in which talent takes precedence" (Bautista and Fernández-Morante, 2018: 4).7 This aspect has been even more clearly evidenced since the 2020 global health crisis caused by COVID-19, in which confinement has required finding alternatives for instrumental music instruction. Palau, Mogas and Ucar (2020) point out that the closing of schools during the pandemic, with the resulting physical separation of students and

7 Original text: "las nuevas metodologías de enseñanza constituyen una amenaza al individualismo imperante en la tradición pedagógica instrumental, dentro de un competitivo sistema en el que prima el talento".

teachers, has highlighted the need to consider remote teaching models in which technological resources can provide important solutions. Nonetheless, the difficulties to virtualize instrumental music subjects also revealed that many teachers are not convinced by a possible change of the teaching model, and that the majority are reluctant to modify their traditional in-person model (Palau, Mogas and Ucar, 2020: 108). As indicated by Crawford *et al.* (2020), transformation of traditional or mixed learning to a completely virtual teaching system requires time. In order to implement an online model for instrumental music instruction, Bates (2020) suggests establishing several strategies, such as providing support with prior professional advice, obtaining appropriate technological tools, structural organisation, adjusting student's workload, avoiding group conferences, adapting to available resources, etc. Hence this paper aims to determine the digital competence and use of technology of music conservatory and music school teachers.

Methodology

To achieve this objective, a study was carried out based on an exploratory, correlational and transversal descriptive survey (Bisquerra, 2004) through the application of an online *ad hoc* questionnaire. The choice of an online questionnaire was due to the impossibility of having face to face contact with teachers due to the restrictions imposed as a result of COVID-19. However, this entailed a certain amount of subjectivity, as the results were based on the teachers surveyed.

The questionnaire used was the *Questionnaire of Digital Teaching Competences and Use of Digital Technology in the University Music Classroom* (available at https://reunir.unir.net/handle/123456789/6965) designed and validated by Calderón-Garrido, Carrera y Gustems-Carncier (2020). This is a self-report to evaluate the knowledge and use of different technological resources. The questionnaire was designed on the basis of the

opinion of 16 experts. The validation first consisted of an analysis to verify the Kayser, Meyer and Olkin (KMO) adequacy measure and the Bartlett test, which showed its adequacy (KMO = .812; X2 = 3176.936; p < .001). The exploratory factor analysis showed the adequacy of the eight dimensions presented, indicating the weight of the 8 factors proposed and explaining a total of 75.838% of the variation. This questionnaire showed excellent internal consistency (α = 0.945).

Although the sample analyzed in this study differs from the one to which the original questionnaire was geared, the dimensions analyzed are common to both university music professors and the ones at conservatories and schools of music. In this sense, the sample analyzed in this study also showed excellent internal consistency, (α = 0.943), replicating the adequacy (KMO = .798; X2 = 2918.936; p < .001) and the 8 factors proposed.

After discarding the answers that had not been fully completed, the valid sample consisted of 82 participants from 47 different educational centres in Spain, of which 43.9% were women and 56.1% were men. Their average age was 40.11 (*SD* = 9.657). In respect to the type of subjects they taught, 64.6% were instrumental, 23.2% theoretical and 12.2% both. In respect to the educational level or main work centre, 48.8% worked in an intermediate conservatory, 22% in an elementary conservatory, 14.6% in a superior conservatory, and another 14.6% in a School of Music.

The programme used for the computing and statistical analysis of the results was version 21.0 of *IBM Statistic Package for Social Science* (SPSS). A minimum confidence interval of 95% was established in all cases. The statistics used were those of Mann-Whitney and of Kruskal-Wallis, first performing the normality tests of the Kolmogorov-Smirnov or Shapiro-Wilk sample, depending on the needs, as well as Levene's test to verify the homogeneity of variance. Version 1.5.2 of ATLAS.Ti was used for the qualitative analysis of the answers.

Results

In the case of tools geared at auditory education, the development of audiovisuals, sequencers, software to learn how to handle musical instruments and software for the development of vocal capacities, the data revealed almost complete non-existence of knowledge and use in preparing classes and in the classroom and teaching. There was a little more knowledge and use of sound and sheet music editors. Table 1 shows all of the data obtained.

Table 1. Answers depending on the different tools

		NULL/ NEVER	SUPERFICIAL/ A FEW TIMES	AMPLE/ OFTEN	DEEP/ ALWAYS
AUDITORY EDUCATION	KNOWLEDGE	33 (40.2%)	35 (42.7%)	10 (12.2%)	4 (4.9%)
	CLASS PREPARATION	55 (67.1%)	22 (26.8%)	3 (26.8%)	2 (2.4%)
	USE IN CLASSROOM	61 (74.4%)	15 (18.3%)	4 (4.9%)	2 (2.4%)
	TEACHING	63 (73.2%)	16 (19.5%)	4 (4.9%)	2 (2.4%)
AUDIOVISUALS	KNOWLEDGE	19 (23.2%)	35 (42.7%)	23 (28%)	5 (6.1%)
	CLASS PREPARATION	37 (45.1%)	31 (37.8%)	14 (17.1%)	0
	USE IN CLASSROOM	42 (51.2%)	32 (39%)	7 (8.5%)	1 (1.2%)
	TEACHING	56 (68.3%)	20 (24.4%)	5 (6.1%)	1 (1.2%)
AUDIO EDITORS	KNOWLEDGE	9 (11%)	35 (42.7%)	26 (31.7%)	12 (14.6%)
	CLASS PREPARATION	23 (28%)	38 (46.3%)	19 (23.2%)	2 (2.4%)
	USE IN CLASSROOM	33 (40.2%)	29 (35.4%)	19 (23.2%)	1 (1.2%)
	TEACHING	40 (46.8%)	30 (36.6%)	11 (13.4%)	1 (1.2%)
SHEETMUSIC EDITORS	KNOWLEDGE	2 (2.4%)	17 (20.7%)	35 (42.7%)	28 (34.1%)
	CLASS PREPARATION	7 (8.5%)	25 (30.5%)	32 (39%)	18 (22%)
	USE IN CLASSROOM	21 (25.6%)	23 (28%)	25 (30.5%)	13 (15.9%)
	TEACHING	27 (32.9%)	30 (36.6%)	16 (19.5%)	9 (11%)
SOUND GENERATORS	KNOWLEDGE	28 (34.1%)	27 (32.9%)	18 (22%)	9 (11%)
	CLASS PREPARATION	42 (51.2%)	23 (28%)	14 (17.1%)	3 (3.7%)
	USE IN CLASSROOM	47 (57.3%)	17 (20.7%)	13 (15.9%)	5 (6.1%)
	TEACHING	53 (64.6%)	19 (23.2%)	8 (9.8%)	2 (2.4%)
SEQUENCERS	KNOWLEDGE	35 (42.7%)	22 (26.8%)	14 (17.1%)	11 (13.4%)
	CLASS PREPARATION	55 (67.1%)	14 (17.1%)	10 (12.2%)	3 (3.7%)
	USE IN CLASSROOM	55 (67.1%)	15 (18.3%)	9 (11%)	3 (3.7%)
	TEACHING	60 (73.2%)	12 (14.6%)	8 (9.8%)	2 (2.4%)

INSTRUMENT SOFTWARE	KNOWLEDGE	49 (59.8%)	24 (29.3%)	7 (8.5%)	2 (2.4%)
	CLASS PREPARATION	69 (84.1%)	9 (11%)	2 (2.4%)	2 (2.4%)
	USE IN CLASSROOM	69 (84.1%)	7 (8.5%)	4 (4.9%)	2 (2.4%)
	TEACHING	68 (82.9%)	8 (9.8%)	4 (4.9%)	2 (2.4%)
VOCAL SOFTWARE	KNOWLEDGE	59 (72%)	17 (20.7%)	5 (6.1%)	1 (1.2%)
	CLASS PREPARATION	69 (84.1%)	10 (12.2%)	3 (3.7%)	0
	USE IN CLASSROOM	71 (86.6%)	6 (7.3%)	5 (6.1%)	0
	TEACHING	73 (89%)	4 (4.9%)	5 (6.1%)	0

Depending on gender, statistical differences are observed in the case of knowledge of audio editors (z = 550.5; p = .006), knowledge of sequencers (z = 585.0; p = .003) and knowledge of software geared at developing vocal competences (z = 636.0; p = .023). In all cases men scored higher than women. However, this does not mean that there is a difference depending on gender in the general knowledge of digital resources for musical education (z = 626.5; p = .059).

The sole correlation reported in respect to the age of participants is one between the latter and knowledge of sequencers (r = .221; p = .046), and use of sequencers (r = .261; p = .018).

In no cases were differences detected depending on the type of instruction (instrumental, theoretical or both).

Differences were reported depending on the level of education in the case of audio editor instruction ($X23$ = 12.982; p = .005) and of sheet music editors ($X23$ = 9.576; p = .023), and also in the use ($X23$ = 8.689; p = .034) and instruction ($X23$ = 8.085; p = .044) of vocal software. The difference was with the teachers of the superior conservatory, who scored higher in all cases.

It was found that in all cases knowledge of a resource correlated directly with its use in preparing classes and its use in the classroom. Although this may seem obvious, it is highlighted due to its use in the discussion, given the feedback it entails. Said correlations are shown in Table 2.

Table 2. Correlations between knowledge of a resource and the other parameters

	PREPARATION	USE	INSTRUCTION
KNOWLEDGE OF AUDITORY EDUCATION	*R* = .676; *P* < .001	*R* = .628; *P* < .001	*R* = .651; *P* < .001
KNOWLEDGE OF AUDIO-VISUALS	*R* = .561; *P* < .001	*R* = .609; *P* < .001	*R* = .355; *P* = .001
KNOWLEDGE OF AUDIO EDITORS	*R* = .237; *P* < .001	*R* = .447; *P* < .001	*R* = .289; *P* = .009
KNOWLEDGE OF SHEET MUSIC EDITORS	*R* = .662; *P* < .001	*R* = .525; *P* < .001	*R* = .396; *P* < .001
KNOWLEDGE OF SOUND GENERATORS	*R* = .734; *P* < .001	*R* = .519; *P* < .001	*R* = .574; *P* < .001
KNOWLEDGE OF SEQUENCERS	*R* = .766; *P* < .001	*R* = .710; *P* < .001	*R* = .743; *P* < .001
KNOWLEDGE OF INSTRUMENT SOFTWARE	*R* = .605; *P* < .001	*R* = .633; *P* < .001	*R* = .665; *P* < .001
KNOWLEDGE OF VOCAL SOFTWARE	*R* = .706; *P* < .001	*R* = .676; *P* < .001	*R* = .613; *P* < .001

In this sense, the cluster analysis showed similarities between knowledge, use in preparation, use in classes and software instruction geared at developing instrumental competences. However, as mentioned earlier, said teachers were only a small part of the total sample.

In respect to problems faced by teachers in implementing the digital technology in their teaching, 63.4% considered that they had problems. These answers were analysed with the Atlas.ti software and grouped in four major areas. The first and most common was the generalized complaint about the centre's lack of resources (n = 34). A problem of lack of training of teachers was also detected (n = 21). The analysis revealed concerns regarding students' lack of resources (n = 12). Finally, in some cases existing problems were also associated to the lack of time, as the use of digital technologies was not included in the curriculum (n = 9).

In respect to training in the use of digital technology, in most cases (n = 46) mention was made of self-training, accompanied in some cases by courses organised by the different administrations

(n = 23). Seven answers referred exclusively to prior training. The others (n = 6) made no comments regarding prior training.

Discussion and conclusions

The survey administered to teachers of music conservatories and municipal schools of music has shed light on the technological and digital competences of a specific sector of music teachers in two different environments, namely those of formal and non-formal music education (BERMEL and DIAZ, 2014), which, however, could share their feedback and combine their teaching and learning strategies (ARRIAGA SANZ, ALBA-EGUÍLUZ and CABEDO-MAS, 2019).

In Spain, the country in which the study was carried out, the teachers in these centres provide instruction to students who, in general terms, are digitally literate and for whom the use of technology is present on a daily basis (CALDERÓN-GARRIDO, CARRERA, and GUSTEMS-CARNICER, 2021). Hence, teachers must take this into account and acknowledge that applying ICTs in their teaching work allows them to interpret and organise new types of learning (MAÑAS and ROIG-VILA, 2019) and to encourage the development of creativity (STEPHENSON and LIMBRICK, 2015; GIRÁLDEZ, 2015). However, the results show that music teachers in these contexts have not used sufficient technological tools in the classroom. The musical educational tools used most are sound editors (SILVEIRA and GAVIN, 2016) and sheet music editors. The latter are used in learning musical language, to compose, to listen, etc. (BELLINI, 2008; BRODSKY *et al*., 2008; LETAILLEUR, BISESI and LEGRAIN, 2020; PODOLAK and SCHMUCKLER, 2019; WÖLLNER *et al*., 2003), particularly amongst teachers of superior musical education. These results coincide with studies that point out how teachers of superior music education make better use of digital tools and how technology acquires greater prominence at that level (CALDERÓN-GARRIDO, CISNEROS, GARCÍA, and DE LAS HERAS,

2019). However, as mentioned earlier, there are other technological tools for the development of musical competences that are hardly used by teachers. These are related to auditory development, sequencers, software to learn how to handle musical instruments and software for the development of vocal capacities. In respect to auditory development, the use of practice software is proposed (CHAN *et al*., 2006), along with the use of sequencers and sound generators (FARRIMOND *et al*., 2011), as well as auxiliary software for instrumental performance (NIJS and LEMAN, 2014; ROWE *et al*., 2015) and for the development of vocal capacities (REID *et al*., 2017).

The study reveals some of the reasons which may explain why teachers of superior music conservatories and schools of music do not integrate musical technologies into their classes. Four basic scenarios have been classified: on one hand, the lack of resources in the centres. The National Association of Schools of Music highlights a similar characteristic as one of the drawbacks to integrating technologies in teacher training syllabuses (BAUER and DAMMERS, 2016). In addition, the evidence points to the need to train teachers in technological tools. This coincides with other studies that reveal a need for permanent training for music teachers (FERM THORGSEN *et al*., 2016) as well as self-education, indicating that there are significant deficiencies that must be considered in the field of educational technology in connection with superior musical education (CALDERÓN-GARRIDO, CISNEROS, GARCÍA, and DE LAS HERAS, 2019) and in non-formal music education (BERMEL and DIAZ, 2014). On the other hand, and with respect to students' possible lack, it is important to recall that there are different cell phone applications that are free, are quite widespread amongst students and do not require any specific classroom tool (CHO *et al*., 2019). Furthermore, free high-profile platforms used in related areas such as dance can be useful to create deposits that facilitate learning throughout a student's life (HUDDY, 2017). This free software includes Audacity to edit audio and Musescore to edit sheet music (CALDERÓN-GARRIDO, GUSTEMS-CARNICER and

CARRERA, 2020). Lastly, the participants of this study point to the lack of time of teachers as an obstacle for the use of technology in the classroom, given that it is not included in the curriculum. As a solution to this stumbling block, in the United States there is a proposal to implement a comprehensive technology syllabus in related areas of study, such as the degree in dance (RISNER and ANDERSON, 2008).

On the basis of the data provided by this study, it can be concluded that there continues to exist considerable resistance to incorporating pedagogical innovations related to the new technologies in music conservatories and municipal schools of music. It should be noted that at present implementation of ICTs in society in general is increasing exponentially, and the same applies to this specific area of education. Moreover, this fact has been evidenced since the onset of the global COVID-19 health crisis, during which confinements have made it necessary to reconsider the traditional in-person teaching models based on the teacher-student relationship. This has led to substantial changes in teaching worldwide (DWIVEDI, *et al*., 2020). Finally, this health situation has revealed the changes that are occurring in the field of musical pedagogy and teaching, in which it is clear that ICTs will play a fundamental role in the years to come.

The limitations of this study are also an indication of future work. On the one hand, we believe it is essential to determine whether the results obtained here are related to teachers' professional experience. In addition, determining if the results are similar in all instrumental specialties would provide a deeper understanding of the work carried out by each teacher. On the other hand, extending the sample not only in Spain but to other countries and cultural environments would also be of great interest.

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